TUALATIN CITY COUNCIL MEETING

Monday, November 10, 2025

TUALATIN CITY SERVICES
10699 SW HERMAN ROAD
TUALATIN, OR 97062

Mayor Frank Bubenik
Council President Valerie Pratt
Councilor Maria Reyes *Councilor Bridget Brooks*
Councilor Christen Sacco *Councilor Cyndy Hillier*
Councilor Octavio Gonzalez

To the extent possible, the public is encouraged to watch the meeting live on local cable channel 28, or on the City's website.

For those wishing to provide comment during the meeting, there is one opportunity on the agenda: Public Comment. Written statements may be sent in advance of the meeting to Deputy City Recorder Nicole Morris up until 4:30 pm on Monday, October 10. These statements will be included in the official meeting record, but not read during the meeting.

For those who would prefer to make verbal comment, there are two ways to do so: either by speaking in person or entering the meeting using the zoom link and writing your name in chat. As always, public comment is limited to three minutes per person.

Phone: +1 669 900 6833

Meeting ID: 861 2129 3664

Password: 18880

Link: https://us02web.zoom.us/j/86121293664?pwd=SS9XZUZyT3FnMk5rbDVKN2pWbnZ6UT09

Work Session

1. ***6:00 p.m. (30 min) – Private Property Impoundment Rates.*** In October 2013, City Council passed an ordinance requiring towing operators to seek a license to operate within the city; currently, ten such businesses are licensed to operate in Tualatin. One of the licensed towing operators, has requested a review of the rates previously set by the City Council, which have not been altered since they were first established. At the September 8, 2025 meeting, the City Council discussed the matter and asked that staff return with more information on what our neighboring cities and other regional comparator cities are doing to regulate private property impoundment rates.

2. ***6:30 p.m. (30 min) – Council Meeting Agenda Review, Communications & Roundtable.*** Council will review the agenda for the November 10 City Council meeting, hear a report from the City Manager, and brief the Council on issues of mutual interest.

7:00 P.M. CITY COUNCIL MEETING

Call to Order

Pledge of Allegiance

Announcements

1. Proclamation Declaring Saturday, November 29, 2025, as Small Business Saturday in the City of Tualatin

2. New Employee Introduction- Policy Analyst Quin Brunner

Public Comment

This section of the agenda allows anyone to address the Council regarding any issue not on the agenda, or to request to have an item removed from the consent agenda. The duration for each individual speaking is limited to 3 minutes. Matters requiring further investigation or detailed answers will be referred to City staff for follow-up and report at a future meeting.

Consent Agenda

The Consent Agenda will be enacted with one vote. The Mayor will ask Councilors if there is anyone who wishes to remove any item from the Consent Agenda for discussion and consideration. If you wish to request an item to be removed from the consent agenda you should do so during the Citizen Comment section of the agenda.

1. Consideration of Approval of the Work Session and Regular Meeting Minutes of October 27, 2025

2. Consideration of **Resolution No. 5926-25** to Adopt the City of Tualatin Investment Policy

3. Consideration of **Resolution No. 5927-25** Approval of a Land Lease Agreement with New Cingular Wireless PCS, LLC (AT&T) for Wireless Communications Equipment at 8930 SW Norwood Road, Tualatin, Oregon

Special Reports

1. Tualatin High School Grad Night Committee Request

2. Outside Agency Grant Awardee- Just Compassion

Public Hearings - *Quasi-Judicial*

1. Consideration of an Appeal or Request for Review of the Architectural Review Board (ARB) September 10, 2025, Decision to Approve, with Conditions, AR24-0002 Lam Research Corporation's TUX Development to Construct Four Buildings on 4 Lots Located at 11155-

11361 SW Leveton Drive (Tax Lots: 2S122AA500 & 800, 2S122A00100, 2S122BA00100) in the Light Manufacturing Park Zone (MP)

General Business

1. Consideration of Recommendations from the Council Committee on Advisory Appointments

Items Removed from Consent Agenda

Items removed from the Consent Agenda will be discussed individually at this time. The Mayor may impose a time limit on speakers addressing these issues.

Council Communications

Adjournment

Meeting materials, including agendas, packets, public hearing and public comment guidelines, and Mayor and Councilor bios are available at www.tualatinoregon.gov/citycouncil.

Tualatin City Council meets are broadcast live, and recorded, by Tualatin Valley Community Television (TVCTV) Government Access Programming. For more information, contact TVCTV at 503.629.8534 or visit www.tvctv.org/tualatin.

In compliance with the Americans with Disabilities Act, this meeting location is accessible to persons with disabilities. To request accommodations, please contact the City Manager's Office at 503.691.3011 36 hours in advance of the meeting.

CITY OF TUALATIN

Memorandum

TO:	Honorable Mayor and Members of the City Council
THROUGH:	Sherilyn Lombos, City Manager
FROM:	Don Hudson, Assistant City Manager/Finance Director William Sullivan, Management Analyst II - Finance
DATE:	November 10, 2025
RE:	Private Property Impoundment Rate Comparisons to Neighboring/Comparator Cities

BACKGROUND:
In October 2013, City Council passed an ordinance (codified in Tualatin Municipal Code 8-5) to require towing operators to seek a license to operate within the city and follow certain rules when towing a vehicle on private property ("private property impoundment"). Currently, ten such businesses are licensed to operate in Tualatin. Beaverton Towing, one of the licensed towing operators, has requested a review of the rates previously set by the City Council, which have not been altered since they were first established.

At the September 8, 2025 meeting, the City Council discussed the matter and asked that staff return at a future meeting with more information on what our neighboring cities and other regional comparator cities are doing to regulate private property impoundment rates.

SUMMARY:
Other than Tualatin, only three other cities in the metro area regulate private parking impoundment: Portland, Gresham, and Fairview. A review of other neighboring and comparator cities showed that while other cities regulate towing done by or at the request of their police departments, most do not regulate towing requested by a private party from private property.

Of the few cities that regulate private parking impoundment, Tualatin's rates almost all fall in the middle of the four cities, with Fairview's rates generally the lowest, then Tualatin's, then Gresham's, and finally Portland allowing tow companies to charge higher rates than the other three cities. A comparison of City rate caps can be found below in Table 1. With the exception of Portland's City Service Fee (which is paid to the City), all fees are paid by the owner of a towed vehicle directly to the towing company.

Adopting the rates proposed by Beaverton Towing would allow licensed towing companies in the city to charge the highest rates of the region's cities that regulate private parking impoundment and would exceed Portland's rate caps. Those proposed rates can be found in the rightmost column of Table 1.

Additionally, staff also reviewed towing-related sections of other cities' municipal codes. A comparison of those cities can be found in Table 2. While those cities do not regulate rates for

private parking impoundment, all cities in Oregon are subject to rule-making by Oregon's State Board of Towing's. The Board's Private Property Impound (PPI) Public Policy states that the Board can hear complaints about predatory towing practices and issue disciplinary findings, but the Board itself has not regulated rates and fees (though doing so is a stated goal in their 2025 Strategic Plan, so that may change).

Table 1. Comparison of City Rate Caps related to Private Property Impoundment

	Portland	**Gresham**	**Fairview**	**Tualatin**	**Beaverton Towing Proposed Rates**
Corresponding Municipal Code §§	7.24	9.75	8.3	8-5	
Policy/Fees last updated:	7/1/2025	2/1/2019	12/2/2016	10/28/2013	
Hookup Fees					
Class A	$196.00	$200.00	$150.00	$175.00	$250.00
Class B	$206.00	$250.00	$160.00	$200.00	$395.00
Class C	$363.00 per hour	$350.00	$240.00	$250.00	$495.00
Data Services Fee	$23.00	N/A	N/A	N/A	N/A
City Service Fee	$53.00	N/A	N/A	N/A	N/A
Towed Mileage Fee					
Class A	$5.00/mile	$4.50/mile	$3.80/ mile	$4.50/mile	$8.00/mile
Class B	$6.80/mile	$5.00/mile	$4.50/mile	$4.50/mile	$8.00/mile
Class C	Included in hourly Hookup Fee	$6.00/mile	$5.50/mile	$4.50/mile	$8.00/mile
Maximum miles chargeable (all classes)	8	5	5	10	10
Lien Filing Fee					
Charged after vehicle has been in storage for 5 days					
Vehicles valued under $1,000.00	$47.00	$45.00	N/A	N/A	N/A
Vehicles valued $1,000.00 - $2,500.00	$64.00	$60.00	N/A	N/A	N/A
Vehicles valued more than $2,500.00 *(for Portland and Gresham, this also includes any vehicle with plates from a state other than OR or WA)*	$99.00	$85.00 plus advertising cost as required by law	N/A	N/A	N/A
Release At Scene (RAS)/Drop Fee					
Class A	$196.00 Hookup Fee + $23.00 Data Services Fee + $53.00 City Service Fee	$200.00	$150.00	$175.00	$250.00
Class B	$206.00 Hookup Fee + $23.00 Data Services Fee + $53.00 City Service Fee	$250.00	$160.00	$200.00	$395.00
Class C	Port to Scene Hourly Fee + $23.00 Data Services Fee + $53.00 City Service Fee	$350.00	$240.00	$250.00	$495.00
Storage Fee					
After grace period of…	4 hours	2 hours	4 hours	N/A	N/A
Per 24-hour period (or part thereof after first day):	$32.00	$30.00	$25.00	$25.00	$50.00
Vehicles over 20' long	$43.00	$35.00	$35.00	$35.00	$70.00
Additional Fees					
After Hours Release/Gate Fee	$45.00	$50.00	$25.00	$25.00	$55.00
Applicable between 6pm-8am Monday-Friday and all day Saturday, Sunday, and City holidays					
Labor Standby/Recovery Time	$22.00 per quarter-hour after 30 minutes on-scene	$18.00 per quarter-hour after 15 minutes on-scene	$18.00 per quarter-hour after 30 minutes on-scene	N/A	N/A
Tarping Fee	N/A	$25.00	N/A	N/A	N/A
Securing a vehicle from weather					

Table 2. Review of Cities that do not Regulate Private Parking Impoundment

Beaverton	Beaverton may have previously regulated towing fees (Beaverton Municipal Code Chapter 6.06), but the City repealed most sections of the chapter in March 2001, leaving only one section requiring the City to maintain a list of towing companies available on an on-call basis for *City-requested* tows (§ 6.06.060). § 6.05.050 allows the Council to set charges "deemed reasonable," but no such regulations were found in the City's Code, ordinances, nor resolutions.
Canby	Canby Municipal Code does not contain any regulations specifically related to private parking impoundment.
Happy Valley	Happy Valley Municipal Code does not contain any regulations specifically related to private parking impoundment. On July 30, 2025, the Clackamas County Sheriff's Office, Happy Valley PD, Wilsonville PD, Oregon City PD, and state partners took coordinated enforcement actions against predatory illegal towing operations (CCSO press release here), but there does not seem to have been any relevant regulations codified locally to-date.
Hillsboro	Hillsboro Municipal Code does not contain any regulations specifically related to private parking impoundment.
Lake Oswego	Lake Oswego Municipal Code does not contain any regulations specifically related to private parking impoundment.
Milwaukie	Milwaukie Municipal Code does not regulate private towing fees. It only stipulates that private towing companies have to notify the Police Department before towing or face a penalty not to exceed $500.00. (Code § 10.54.020-030).
Oregon City	Oregon City Municipal Code does not contain any regulations specifically related to private parking impoundment.
Sherwood	Sherwood Municipal Code does not contain any regulations specifically related to private parking impoundment.
Tigard	Tigard Municipal Code does not contain any regulations specifically related to private parking impoundment.
West Linn	It seems that the West Linn Municipal Code used to have a Code section on private parking towing (6.250), but that was repealed in June 2016.
Wilsonville	Wilsonville Municipal Code does not contain any regulations specifically related to private parking impoundment.

Attachments:

-Portland Bureau of Transportation Private Property Impound Rates
-City of Gresham Resolution No. 3343 (updating PPI fees)
-City of Fairview Maximum Rates – Towing & Related Services
-Tualatin Municipal Code 8-5-080 Towing and Storage Rates
-Letter from Beaverton Towing Requesting City Council Review Towing Rates

City of Portland

Private Property Impound Rates

Information

Approved rates for private property impound towing. Information provided by the Regulatory team at the Portland Bureau of Transportation (PBOT).

Fees for PPI towing must not exceed:

- **Class A hookup fee $196.00**
  Includes hookup, dollies, ½ hour on scene, tower's dispatch and photo fee.
- **Class B hookup fee $206.00**
  Includes hookup, dollies, driveline or axle pull, ½ hour on scene, tower's dispatch and photo fee.
- **Class C hookup fee $363.00 per hour**
  Port to port hourly fee, includes hookup, driveline or axle pull, ½ hour on scene, tower's dispatch mileage and photo fee.

Also applicable to all PPI tows:

- **Data services fee: $23.00**
  Payable to Tow Desk on redeemed vehicles.
- **City of Portland service fee: $53.00**
  Payable to the City on redeemed vehicles.

The following fees may be added, as appropriate: Upon request, PPI Tower must provide documentation to support such additional charges. **Towed Mileage**, as follows, up to a maximum of 8 miles:

- Class A: $5.00/towed mile
- Class B: $6.80/towed mile
- Class C: Included in hourly fee

Labor/Standby: time on-scene in excess of 30 minutes $22.00/quarter hour

When charging for standby time, PPI tower must report to Tow Desk the time of arrival at, and departure from, the scene.

After hours release fee: $45.00

Applicable only after 6:00 p.m. or before 8:00 a.m. M-F, all day Saturday and Sunday and City holidays. Fee must be validated by documenting the date

Contact

PBOT Regulatory Program

Customer Service

regulatory@portlandoregon.gov

503-823-7483

Related

Towing and private property impounds

and time of the appointment on all copies of the tow invoice. If the tower arrives more than 30 minutes after the time agreed on for release of a citizen's vehicle, the tower may not charge a gate fee.

Lien filing fee: (Chargeable after a vehicle has been in storage 5 days):

Vehicles valued under $1,000.00
$47.00

Vehicles valued $1,001.00 - $2,500.00
$64.00

Vehicles valued more than $2,500.00 or out of state (not OR, WA) $99.00

Release At Scene (RAS): Includes hookup rate plus Data Service fee plus City Service fee

A. This fee may be assessed only if:

1. The required prior notification to Tow Desk has been carried out; and,

2. The PPI tower has completed the hookup and attachment of all safety equipment, including tow lights, and is in full possession of the vehicle as defined in 7.24.070.G.

B. RAS fees must not exceed:

1. Class A: hookup + data services + city service

2. Class B: hookup + data services + city service

3. Class C: port to scene hourly + data services + city service

Storage Fees:

- Storage fee per 24 hour period from the completion of the tow $32.00/day
  (After a four-hour grace period, starting from notice of completion to Tow Desk)
- Vehicles over 20’ long $43.00/day
  (After a four-hour grace period, starting from notice of completion to Tow Desk)

***Rates may be verified with the City of Portland Towing Coordinator* (503)823-7483 or regulatory@portlandoregon.gov**

RESOLUTION NO. 3343

A RESOLUTION ESTABLISHING RATES FOR TOWING AND STORAGE FOR PRIVATE PROPERTY IMPOUND PURSUANT TO GRESHAM REVISED CODE ARTICLE 9.75 AND REPEALING RESOLUTION NO. 3039

The City of Gresham finds:

A. GRC 9.75.070 provides that the council shall establish a schedule of approved maximum rates and fees that may be charged for Private Property Impounds.

THE CITY OF GRESHAM RESOLVES:

Section 1. The following definitions shall apply to this resolution:

Class A Tow. A tow of a passenger vehicle, motorcycle, truck or van up to ¾ ton size, unloaded, or a vehicle not exceeding 10,000 pounds, which requires a Class A tow truck.

Class B Tow. A tow of a vehicle exceeding 10,000 pounds Gross Vehicle Weight (GVW), which requires a Class B tow truck.

Class C Tow. A tow of a vehicle exceeding 20,000 pounds GVW, which requires a Class C tow truck.

Section 2. The maximum rates and fees for GRC Article 9.75 are set as follows:

Basic fees for towing may not exceed:

	Current	Effective 2/1/2019
Class A Hookup Fee	$ 157.25	$200.00
Class B Hookup Fee	$ 164.25	$250.00
Class C Hookup Fee	$ 240.25	$350.00

The following fees may be added, as appropriate. PPI Tower must provide documentation to support such additional charges upon request:

Towed Mileage, as follows, up to a maximum of 5 miles:

	Current	Effective 2/1/2019
Class A	$ 3.80/per towed mile	$4.50/per towed mile
Class B	$ 4.50/per towed mile	$5.00/per towed mile
Class C	$ 5.50/per towed mile	$6.00/per towed mile

	Current	Effective 2/1/2019
Labor/Standby Time On-Scene, in excess of 15 minutes from the time the vehicle owner/operator arrives on the scene (when charging for standby time, PPI Tower must report to Tow Desk the time of vehicle owner / operator's arrival at the scene)	$ 18.00 per ¼ hour	$18.00 per ¼ hour

	Current	Effective 2/1/2019
After Hours Release Fee (applicable only after 5:00 p.m. or before 8:00 a.m. Monday-Friday, all day Saturday and Sunday and City holidays)	$ 25.00	$50.00

Release at Scene (RAS)

A. This fee may only be assessed if:

1. The PPI Tower has completed the hookup and attachment of all safety equipment, and the tow truck's transmission is engaged, and it has commenced driving forward
2. If PPI Tower is outside of vehicle when vehicle owner / driver returns, a RAS fee may not be charged.

B. RAS fees must not exceed:

	Current	Effective 2/1/2019
1. Class A Tow	$ 157.25	$200.00
2. Class B Tow	$ 164.25	$250.00
3. Class C Tow	$ 240.25	$350.00

	Current	Effective 2/1/2019
Storage Fees		
A. Storage fee per 24-hour period from the completion of the tow (after a two-hour grace period, starting from "Tow Desk Notification" of the towed vehicle)	$ 25.00/day	$30.00/day

B. Vehicles over 20-feet long (after a two-hour grace period, starting from "Tow Desk Notification" of the towed vehicle)	$35.00/day	$35.00/day

	Current	Effective 2/1/2019
Lien Filing Fee (applicable after a vehicle has been in storage 5 days)		
Vehicles valued under $1,000	$40.00	$45.00
Vehicles valued $1,001 - $2,500	$50.00	$60.00
Vehicles valued more than $2,500 or out of state (not Oregon or Washington)	$85.00	$85.00 plus advertising cost as required by law
If a PPI tower incurs expenses substantially higher than the amount allowed for processing a lien, the tower may request permission to recoup the additional costs by sending a written request for approval to the Tow Desk, with receipts to verify the additional expense. Lien fees in excess of the established rate may not be assessed without prior approval by the Tow Desk.		

	Effective 2/1/2019
Tarping Fee (securing from weather)	$25.00

Section 3. Resolution No. 3039 is hereby repealed.

Yes: _____

No: _____

Absent: _____

Abstain: _____

Passed by the Gresham City Council and effective on _____.

_____ _____

Erik Kvarsten
City Manager

Shane T. Bemis
Mayor

Approved as to Form:

_____

Kevin R. McConnell
Senior Assistant City Attorney

Maximum Rates Towing & Related Services

The terms used below if not defined under the Fairview Municipal Code may be fund under the Oregon Revised Statutes or Oregon Administrative Rules.

Basic Fees for Towing may not exceed:

Class A Hookup Fee*	$150
Class B Hookup Fee*	$160
Class C Hookup Fee*	$240

The following fees may be added, as appropriate if documented on a receipt.

Towed Mileage up to a maximum of five miles:	
Class A	$3.80/mile
Class B	$4.50/mile
Class C	$5.50/mile
Labor Standby Time on Scene in excess of 30 minutes When charging the tower must report to the time of arrival at and departure from the scene	$18/quarter hour
After Hours Release Fee (applicable only after 6 pm or before 8 am Mon-Friday, all day Saturday and Sunday and City holidays)	$25
Release at Scene (RAS) This fee may only be assessed if: 1. The Tower has completed the hookup and attachment of all safety equipment and the tow truck's transmission is engaged and it has commended driving forward If Tower is outside of vehicle when vehicle owner/driver returns an RAS fee may not be charged	
RAS fees may not exceed:	
Class A	$150
Class B	$160
Class C	$240
Storage Fees	
Per Day (from time of Fairview PD notification)	$25
Vehicles over 20' long (from time of Fairview PD notification)	$35

*Hookup Fee includes hookup, dollies, driveline or axl pull, 30 minutes of on-scene time, tower's dispatch and photo fees.

TMC 8-5-080 - Towing and Storage Rates.

A tow company must not charge more than the following amounts for motor vehicles towed from private property:

(1) "After Hours Release Fee" of $25.00 for release of the motor vehicle between the hours of 6:00 p.m. and 8:00 a.m., Monday through Friday; and all hours on Saturday, Sunday, and City recognized holidays.

(2) "Hookup Fee" of no more than the following fees, which includes: hookup, dollies, driveline or axle pull, 30 minutes of on-scene time, tower's dispatch, and photo fees and:

(a) One hundred seventy-five dollars for motor vehicles weighing less than 10,000 pounds gross vehicle weight;

(b) Two hundred dollars for motor vehicles weighing from 10,000 pounds gross vehicle weight to less than 20,000 pounds gross vehicle weight; and

(c) Two hundred fifty dollars for motor vehicles more than 20,000 pounds gross vehicle weight.

(3) "Mileage Fee" of no more than $4.50 per towed mile, up to a maximum of ten miles.

(4) "Release at Scene Fee" of no more than the Hookup Fee.

(5) "Storage Fee" per 24-hour period from completion of the tow of no more than:

(a) Twenty-five dollars per day; or

(b) Thirty-five dollars per day for motor vehicles over 20 feet long.

(Ord. 1356-13 §1, 10-28-13)

Jean Underwood
Beaverton Towing
503-644-3533

July 14, 2025

Don Hudson
Assistant City Manager
18880 SW Martinazzi Ave.
Tualatin, OR 97062-7092

To Whom It May Concern,

My name is Jean Underwood, and I represent Beaverton Towing. We have proudly served businesses in the City of Tualatin for over 20 years. During that time, we have consistently provided professional and reliable towing services, and we value the strong working relationship we've developed with the community.

Back in 2013, the City of Tualatin implemented regulated towing and storage rates. These rates have remained unchanged for over a decade, despite the significant increases in operational costs—including labor, insurance, fuel, equipment, and compliance requirements. We are now operating in a substantially different economic environment, and I am writing to formally request a review and adjustment of the current rate structure.

We have reviewed other local government towing programs, such as the Washington County Tow Contract, and have proposed rate adjustments that align with current regional standards and industry realities.

Suggested Updated Rates:

- **After-Hours Release Fee:** Increase to $55 (from current $25)
- **Hookup Fee (includes hookup, dollies, driveline or axle pull, 30 minutes on-scene time, dispatch, and photos):**
  a. $250 for vehicles under 10,000 lbs GVW (previously $175)
  b. $395 for vehicles 10,000 to under 20,000 lbs GVW (previously $200)
  c. $495 for vehicles over 20,000 lbs GVW (previously $250)
- **Mileage Fee:** $8.00 per towed mile, up to 10 miles (previously $4.50)
- **Release at Scene Fee:** No more than the applicable Hookup Fee
- **Storage Fees (per 24-hour period):**
  a. $50 per day for vehicles up to 20 feet (previously $25)
  b. $70 per day for vehicles over 20 feet (previously $35)

These proposed rates are consistent with regional standards and better reflect the current economic realities of the towing industry. We respectfully ask that the City consider revisiting and revising the existing rate schedule to ensure the continued viability of quality towing services in Tualatin.

Thank you for your time and attention to this matter. I am available at your convenience to discuss this further or to provide any supporting documentation you may need.

Sincerely,
Jean Underwood
Beaverton Towing

City of Tualatin

Don Hudson

18880 sw martinazzi Ave,

Tualatin OR 97062

Rich Sprute

Pro Tow

Beaverton Oregon

Date 9/8/2025

Subject: Towing Rates

I listened to the meeting tonight and felt like the city of Tualatin and a few of the council members just have a strong dislike / hateful feeling towards our industry. I know Jean at Beaverton Towing sent a letter requesting a rate adjustment, I think this is very fair being that's its been since 2013. I think there is a lot to our business that the council does not understand or value.

- We only tow a vehicle at the property owners request, there is no patrol towing so most people that get towed have generally been abusing the parking situation for some time as owners are not quick to call.
- We respond to 100% of the calls that come in, but generally only tow about 67% of the vehicles for various reasons, owner show up most of the time.
- There is much more work involved in impound towing and requirements that we have to follow, it is not a quick and simple tow like a break down tow.
- We provide a very valuable service to the community in that we also tow all your abandoned motorhomes and boats that are left on others property. A motorhome will cost me $3,000 or more to dispose of as there is very little recycle value in these items, boats are the same way.

- I agree with Beaverton Towing and the rates she proposes. If you look at inflation rates you will see about a 3% rise in cost. It is very reasonable to expect a rate increase after all this time, our costs have soared and our towing has decreased.
-

I would be happy to come down to the city and help you produce a reasonable rate increase. I would also like the city to consider reimbursing us for our cost of impounded Motorhomes and boats.

Regards,

Rich Sprute

Rich Sprute

CITY of TUALATIN

Proclamation

WHEREAS, the City of Tualatin, Oregon, celebrates our local small businesses and the contributions they make to our local economy and community; according to the U.S. Small Business Administration and its Office of Advocacy, there are now approximately 36.2 million small businesses in the United States — accounting for nearly all U.S. firms and contributing to nearly 46 % of private-sector employment.

WHEREAS, small businesses employ nearly half of all private-sector workers (approximately 45 % of the U.S. workforce) and are responsible for roughly 90 % of net new jobs created from March 2023 to March 2024 (small businesses accounted for a net increase of about 1.2 million jobs of the 1.4 million total).

WHEREAS, small businesses continue to face post-pandemic challenges — including inflation, supply-chain disruptions, labor and benefit costs — even as many have adapted with increased online presence and pivoting business models.

WHEREAS, consumers continue to value purchasing from locally-owned businesses — studies indicate that a very high percentage of Americans believe small businesses positively impact their communities and local economies.

WHEREAS, Tualatin, Oregon strongly supports our local businesses that create jobs, boost our local economy, and preserve our communities; and

WHEREAS, advocacy groups, as well as public and private organizations across the country, have endorsed the Saturday after Thanksgiving as “Small Business Saturday”.

NOW THEREFORE BE IT RESOLVED, that the City of Tualatin does hereby proclaim November 29, 2025, as Small Business Saturday® and urge the residents of our community to support small businesses and merchants on Small Business Saturday and throughout the year.

INTRODUCED AND ADOPTED this 10th day of November, 2025.

CITY OF TUALATIN, OREGON

BY _____
Mayor

ATTEST:

BY _____
City Recorder

CITY OF TUALATIN

Staff Report

TO: Honorable Mayor and Members of the City Council

THROUGH: Sherilyn Lombos, City Manager

FROM: Nicole Morris, Deputy City Recorder

DATE: November 10, 2025

SUBJECT:
Consideration of Approval of the Work Session and Regular Meeting Minutes of October 27, 2025

RECOMMENDATION:
Staff respectfully recommends the Council adopt the attached minutes.

ATTACHMENTS:

-City Council Work Session Meeting Minutes of October 27, 2025

-City Council Regular Meeting Minutes of October 27, 2025

TUALATIN CITY COUNCIL

OFFICIAL WORK SESSION MEETING MINUTES
FOR OCTOBER 27, 2025

PRESENT: Council President Valerie Pratt, Councilor Maria Reyes, Councilor Cyndy Hillier, Councilor Christen Sacco, Councilor Octavio Gonzalez
ABSENT: Mayor Frank Bubenik, Councilor Bridget Brooks

Council President Pratt called the meeting to order at 6:03 p.m.

1. ***Parks and Trails Project Update.***

Parks and Recreation Director Dustin Schull and Project Manager Kira Hein presented an update on the Parks and Trails Bond. Manager Hein stated that the bond funds six primary areas: trail connections, new river access, athletic field improvements, upgrades to existing parks, natural areas, and play equipment replacements. She explained that project updates are being communicated through Council briefings, the City's website, newsletters, email notifications, and social media.

Manager Hein shared updates on several ongoing projects, including the Nyberg Creek Trail connections, new river access locations, and athletic field investments. She stated that this year's utility fee will fund the replacement of the playground at Tualatin Community Park. Manager Hein stated over the summer, staff conducted public outreach engaging 435 participants across eight community events to gather input on equipment preferences for the park. The upgraded playground will accommodate approximately 200 children and incorporate inclusive and accessible play features. She stated construction is scheduled to begin in April 2026, and the city has secured grant funding to assist with project costs.

Manager Hein also provided updates on American Rescue Plan Act (ARPA) projects. She stated that construction of Las Casitas Park is nearing completion and expected to open early 2026. Manager Hein stated Basalt Creek Linear Park will be built in two phases, with construction anticipated to begin in late spring or early summer 2026.

Councilor Gonzalez expressed concern about the long-term cost of maintaining new parks and facilities. Director Schull stated that certified playground auditors will complete inspections and a formal maintenance plan will be implemented to ensure the sustainability of new amenities.

Councilor Gonzalez asked about the City's use of turf in parks. Director Schull explained that while turf has a higher initial cost, it meets accessibility standards and reduces long-term maintenance needs compared to wood chips.

Councilor Sacco thanked staff for their work and expressed confidence in the department's approach.

Council President Pratt asked when athletic field improvements might occur. Director Schull stated that staff are collaborating with the Tigard-Tualatin School District and finalizing a facilities study. He stated improvements could begin in late 2026.

Council President Pratt asked whether the Byrom Elementary School fields could be utilized for future projects. Director Schull stated that grading issues at the site would make development challenging.

Council President Pratt asked about coordination between the proposed riverfront park and the Downtown Revitalization Project. Director Schull stated that staff are closely coordinating the two projects to ensure the new park complements downtown as a public gathering space.

2. ***Request for Council Presentation.***

Council consensus was reached to allow a future presentation from the Tualatin High School Grad Night Committee.

Councilor Hillier requested that staff bring forward potential funding options for Council consideration.

3. ***Council Meeting Agenda Review, Communications & Roundtable.***

Councilor Sacco stated she attended the Inclusion, Diversity, Equity, and Access (IDEA) Committee meeting.

Councilor Reyes stated she attended the Council Committee on Advisory Appointments (CCAA) meetings.

Councilor Gonzalez stated he attended the ribbon cutting for a local business and the West Linn Chamber of Commerce mixer, where they discussed the Willamette Falls project.

Council President Pratt stated she attended the Greater Portland Inc. Economic Summit, staffed the city booth at the Grange Gathering Market, attended the League of Oregon Cities (LOC) Conference, and participated in the Pumpkin Regatta and Regatta Run. She also attended the Council Committee on Advisory Appointments meetings.

Assistant City Manager Don Hudson presented the Manager's Report. He shared that recruitment for several open positions is underway. He stated that paving and maintenance work throughout the city is progressing as scheduled and that the Basalt Creek trail design phase is advancing. Director Hudson also highlighted recent community engagement efforts, including attendance at fall events and ongoing promotion of preparedness and park projects.

Adjournment

Council President Pratt adjourned the meeting at 6:52 p.m.

Sherilyn Lombos, City Manager

_____ / Nicole Morris, Recording Secretary

_____ / Frank Bubenik, Mayor

TUALATIN CITY COUNCIL

OFFICIAL MEETING MINUTES
FOR OCTOBER 27, 2025

PRESENT: Council President Valerie Pratt, Councilor Maria Reyes, Councilor Cyndy Hillier, Councilor Christen Sacco, Councilor Octavio Gonzalez
ABSENT: Mayor Frank Bubenik, Councilor Bridget Brooks

Call to Order

Council President Pratt called the meeting to order at 7:00 p.m.

Pledge of Allegiance

Announcements

1. Proclamation Declaring October 23-31, 2025 Red Ribbon Week in the City of Tualatin

   Tualatin LEAP Youth Alliance presented information about Red Ribbon Week. Students shared details about upcoming events and activities designed to promote healthy, substance-free lifestyles among youth and families in the community. They highlighted outreach efforts and emphasized the importance of education and awareness in supporting positive choices.

   Councilor Hillier read the proclamation declaring October 23-31, 2025, as Red Ribbon Week in the City of Tualatin.

2. Proclamation Declaring November 2025 as Native American Heritage Month in the City of Tualatin

   Councilor Reyes read the proclamation declaring November 2025 as Native American Heritage Month in the City of Tualatin.

3. New Employee Introduction- Human Resource Assistant Cathie Recker

   Human Resources Director Stacy Ruthrauff introduced Human Resource Assistant Cathie Recker. The Council welcomed her.

4. New Employee Introduction- Finance Accountant Julie Ziurinskas

   Assistant Finance Director Matt Warner introduced Finance Accountant Julie Ziurinskas. The Council welcomed her.

Public Comment

None.

Consent Agenda

Motion to adopt the consent agenda made by Councilor Sacco, Seconded by Councilor Hillier. Voting Yea: Council President Pratt, Councilor Reyes, Councilor Hillier, Councilor Sacco, Councilor Gonzalez

MOTION PASSED

1. Consideration of Approval of the Work Session and Regular Meeting Minutes of September 22, 2025

2. Consideration of Approval of a New Liquor License Application for Bull Mountain Management LLC dba Apex Golf Club

3. Consideration of Approval of a New Liquor License Application for Child Logistics Inc.

4. Consideration of Approval of a New Liquor License Application for PJM LLC dba Lee's Kitchen

5. Consideration of **Resolution No. 5920-25** Authorizing the City Manager to Execute an Intergovernmental Agreement with the Department of Consumer and Business Codes Division and other Municipalities for the Purpose of Providing Building Services, Plan Review Services, or Inspection Services to One Another

6. Consideration of **Resolution No. 5921-25** Authorizing the City Manager to Sign an Intergovernmental Agreement with Metro for the Operation of the Sharps Collection Box Pilot Program

7. Consideration of **Resolution No. 5922-25** Authorizing Amendment No. 1 to the Contract with Consor for Engineering Services for the Water Reservoir & Pump Station at ASR Project

8. Consideration of **Resolution No. 5923-25** Authorizing the City Manager to Apply for and Accept Community Development Block Grant Funds to Install Flashing Beacons for Pedestrian Safety

9. Consideration of **Resolution No. 5925-25** Authorizing the Purchase and Replacement of Tualatin Community Park Playground Equipment and Surface through an Interstate Cooperative Procurement Program

Public Hearings - *Legislative or Other*

1. Consideration of **Ordinance No. 1453-25** Amending Chapter 4-01- Building Codes, of the Tualatin Municipal Code to Adopt State of Oregon Building Codes By Reference

   Council President Pratt opened the hearing in accordance with state law.

   Community Development Director Aquilla Hurd-Ravich and Building Official Samantha Vandagriff presented an ordinance amending Chapter 4-01 of the Tualatin Municipal Code to adopt the State of Oregon Building Codes by reference. Official Vandagriff stated that the Oregon Building Code is updated on a three-year cycle to align with standards and ensure consistency across jurisdictions. She explained that the proposed ordinance adopts the latest state codes with only minimal local amendments, primarily administrative in nature. Official Vandagriff noted that this adoption process allows the city to maintain its certification with the State Building Codes Division

and ensures that plan review and inspection services reflect current safety standards. She added that this year's code updates include provisions related to energy efficiency, structural safety, and accessibility improvements. Official Vandagriff stated that local contractors and builders have been notified of the changes and that staff will continue to provide educational materials and guidance to support implementation.

PUBLIC COMMENT

None.

COUNCIL QUESTIONS

None.

Council President Pratt closed the hearing.

Motion for first reading by title only made by Councilor Sacco, Seconded by Councilor Hillier.
Voting Yea: Council President Pratt, Councilor Reyes, Councilor Hillier, Councilor Sacco, Councilor Gonzalez

MOTION PASSED

Motion for second reading by title only made by Councilor Sacco, Seconded by Councilor Hillier.
Voting Yea: Council President Pratt, Councilor Reyes, Councilor Hillier, Councilor Sacco, Councilor Gonzalez

MOTION PASSED

Motion to adopt Ordinance No. 1453-25 amending chapter 4-01- building codes, of the Tualatin Municipal Code to adopt State of Oregon building codes by reference made by Councilor Sacco, Seconded by Councilor Hillier.
Voting Yea: Council President Pratt, Councilor Reyes, Councilor Hillier, Councilor Sacco, Councilor Gonzalez

MOTION PASSED

General Business

1. Consideration of **Resolution No. 5924-25** Adopting the City of Tualatin Food, Beverage and Apparel Policy for Elected and Appointed City Public Officials

   City Attorney Kevin McConnell presented the City of Tualatin Food, Beverage, and Apparel Policy for elected and appointed public officials. He stated that the Oregon Government Ethics Commission had issued recent clarifications on compensation and benefits for public officials, particularly regarding meals, apparel, and similar items provided by a public agency. Attorney McConnell explained that, historically, the City Council has amended its official compensation package to ensure compliance with state ethics laws. He noted that the Ethics Commission advised that one way to address potential conflicts of interest and provide transparency is to adopt a formal policy specifying when such benefits may be accepted.

Attorney McConnell stated the proposed policy outlines allowable provisions for food and beverages served at official city meetings or events, as well as guidelines for city-issued apparel. He stated that this policy provides clarity and consistency for both elected and appointed officials and protects the City from inadvertent ethics violations.

Motion to adopt Resolution No. 5924-25 adopting the City of Tualatin Food, Beverage and Apparel Policy for elected and appointed City Public Officials made by Councilor Sacco, Seconded by Councilor Hillier.
Voting Yea: Council President Pratt, Councilor Reyes, Councilor Hillier, Councilor Sacco, Councilor Gonzalez

MOTION PASSED

2. Consideration of **Ordinance No. 1452-25** Imposing a 0.3% Privilege Tax on Portland General Electric Company

   Motion to adopt Ordinance No. 1452-25 imposing a 0.3% privilege tax on Portland General Electric Company made by Councilor Sacco, Seconded by Councilor Hillier.
   Voting Yea: Council President Pratt, Councilor Reyes, Councilor Hillier, Councilor Sacco
   Voting Nay: Councilor Gonzalez

   MOTION PASSED

Council Communications

Council President Pratt stated that several residents have expressed concerns regarding the presence of Immigration and Customs Enforcement (ICE) in the area. She reminded the public that the City Council previously adopted Resolution No. 5319-17, declaring the City of Tualatin an Inclusive City. Council President Pratt reaffirmed the City's ongoing commitment to inclusivity, respect, and safety for all residents.

Adjournment

Council President Pratt adjourned the meeting at 7:40 p.m.

Sherilyn Lombos, City Manager

_____ / Nicole Morris, Recording Secretary

_____ / Frank Bubenik, Mayor

CITY OF TUALATIN

Staff Report

TO: Honorable Mayor and Members of the City Council

THROUGH: Sherilyn Lombos, City Manager

FROM: Don Hudson, Assistant City Manager/Finance Director

DATE: November 10, 2025

SUBJECT:
Consideration of Resolution No. 5926-25 to Adopt the City of Tualatin Investment Policy.

RECOMMENDATION:
Staff Recommends that the City Council adopt the attached Investment Policy.

EXECUTIVE SUMMARY:
Oregon Revised Statutes (ORS) 294.135(1)(a) requires local governments investing in securities with maturities longer than 18 months to annually adopt their investment policies. The City previously submitted the City of Tualatin Investment Policy to the Oregon Short Term Fund Board for review and comment, as required by law. The City Council adopted the current policy on October 28, 2024.

Attached is a redline version of the Investment Policy, as well as the recommended changes memo from our investment advisor, Government Portfolio Advisors. The memo explains the proposed changes to our currently adopted investment policy.

OUTCOMES OF DECISION:
Adoption of the City's investment portfolio under State Statute.

ALTERNATIVES TO RECOMMENDATION:
Choose not to approve the Investment Policy and not comply with ORS 294.135

ATTACHMENTS:

- Resolution No. 5926-25
- Exhibit A, Investment Policy
- Memo from Government Portfolio Advisors
- Redline version of Investment Policy

RESOLUTION NO. 5926-25

A RESOLUTION ADOPTING THE CITY OF TUALATIN INVESTMENT POLICY

WHEREAS, Oregon Revised Statutes (ORS) 294.135(1)(a) requires local governments investing in securities with maturities longer than 18 months to annually adopt their investment policies;

WHEREAS, the City invests in securities with maturities longer than 18 months;

WHEREAS, the City previously submitted the City of Tualatin Investment Policy to the Oregon Short Term Fund Board for review and comment;

WHEREAS, the City Council previously adopted the City of Tualatin Investment Policy on October 28, 2024; and

WHEREAS, the City wishes to annually adopt the City of Tualatin Investment Policy in compliance with ORS 294.135(1)(a).

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF TUALATIN, OREGON, that:

Section 1. The Council adopts the City of Tualatin Investment Policy, which is attached as Exhibit A and incorporated by reference.

Section 2. This resolution is effective upon adoption.

INTRODUCED AND ADOPTED this 10th day of November, 2025.

CITY OF TUALATIN, OREGON

BY _____
Mayor

APPROVED AS TO FORM:

BY _____
City Attorney

ATTEST:

BY _____
City Recorder

EXHIBIT A
RESOLUTION NO. 5926-25



INVESTMENT POLICY
2025

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1. INTRODUCTION

The purpose of this Investment Policy is to establish the investment objectives, delegation of authority, standards of prudence, eligible investments and transactions, internal controls, reporting requirements, and safekeeping and custodial procedures necessary for the prudent management and investment of the funds of the City of Tualatin.

2. GOVERNING AUTHORITY

The investment program shall be operated in conformance with federal, state, and other legal requirements. Specifically, this investment policy is written in conformance with ORS 294.035; 294.040; 294.052; 294.135; 294.145 and 294.810. All funds within the scope of this policy are subject to regulations established by the state of Oregon. Any revisions or extensions of these sections of the ORS shall be assumed to be part of this Investment Policy immediately upon being enacted.

This Policy has been adopted by Resolution No. 5926-25 by the City Council of Tualatin, Oregon on November 10, 2025.

3. SCOPE

This policy applies to activities of the City with regards to investing the financial assets of all funds except for funds held in trust for the Pension Portfolio and deferred compensation funds for the employees of the City which have separate rules. Other than bond proceeds or other unusual situations, the total of all funds ranges from $70,000,000 to $110,000,000. This policy provides direction for the following fund types:

1. General Fund
2. Special Revenue Funds
3. Capital Projects Funds
4. Debt Service Funds
5. Enterprise Funds
6. Internal Service Funds
7. Trust and Agency Funds
8. Other Funds

4. OBJECTIVES

The City's principal investment objectives in order of priority are:

4.1 Safety:

- Preservation of capital and protection of investment principal.
- Diversification to avoid incurring unreasonable risks regarding specific security types or individual financial institutions.

4.2 Liquidity:

- Maintenance of sufficient liquidity to meet operating requirements that are reasonably anticipated.

4.3 Yield – Return:

- Attainment of a market value rate of return throughout budgetary and economic cycles.

5. STANDARDS OF CARE

5.1 Delegation of Authority

a. Governing Body: The ultimate fiduciary responsibility and authority for the investment of City funds resides with the City Council. The City hereby designates the Finance Director as the Investment Officer for the City's funds. The Finance Director shall invest City funds in accordance with ORS Chapter 294, Public Financial Administration, and with this Investment Policy. This Policy shall constitute a "written order" from City Council per ORS 294.035.

b. Investment Advisor: Subject to required procurement procedures, the City may engage the support services of outside professionals in regard to its financial program, so long as it can be demonstrated or anticipated that these services produce a net financial advantage or necessary financial protection of the City's resources. External investment advisors shall be subject to Oregon Revised Statutes and the provisions of this Investment Policy. The Advisor shall provide non-discretionary advisory services, which require prior approval from the Finance Director on all transactions.

   In order to optimize total return through active portfolio management, resources shall be allocated to the cash management program. This commitment of resources shall include financial and staffing considerations.

5.2 Prudence:

The standard of prudence to be used, by the Finance Director, in the context of managing the overall portfolio is the prudent person rule which states:

> "Investments will be made with judgment and care, under circumstances then prevailing, which persons of prudence, discretion and intelligence exercise in the management of their own affairs, not for speculation, but for investment, considering the probable safety of their capital as well as the probable income to be derived."

The City's Finance Director (ORS 294.004 (2)) and staff acting in accordance with this Investment Policy, written procedures, and Oregon Revised Statutes 294.035 and 294.040 and exercising due diligence shall be relieved of personal responsibility for an individual security's credit risk or market price change or other loss, provided deviations from expectations are reported and appropriate action is taken to control adverse developments within a timely fashion as defined in this policy.

5.3 Ethics:

Officers and employees involved in the investment process shall refrain from personal activity that could conflict with the proper execution and management of the investment program, or that could impair their ability to make impartial decisions. Employees and investment officials shall disclose any material interests in financial institutions with which they conduct business. Disclosure shall be made to the governing body. They shall further disclose any personal investment positions that could be related to the performance of the investment portfolio. Employees and officers shall refrain from undertaking personal investment transactions with the same individual with whom business is conducted on behalf of the City. Officers and employees shall, at all times, comply with the State of Oregon Government Standards and Practices code of ethics set forth in ORS Chapter 244.

6. AUTHORIZED FINANCIAL INSTITUTIONS

The City shall maintain a list of all authorized financial institutions and dealers that are approved for investment purposes. Any firm is eligible to make an application to the Finance Director and upon due consideration and approval, will be added to the list. Additions and deletions to the list will be made at the City's discretion. There should be in place, proof as to all the necessary credentials and licenses held by employees of the brokers/dealers who will have contact with the City of Tualatin as specified by but not necessarily limited to the Financial Industry Regulatory Authority (FINRA), Securities and Exchange Commission (SEC), etc.

6.1 Broker/Dealers:

The Investment Officer shall determine which broker/dealer firms and registered representatives are authorized for the purposes of investing funds within the scope of this investment policy. A list will be maintained of approved broker/dealer firms and affiliated registered representatives. The following minimum criteria must be met prior to authorizing investment transactions. The Investment Officer may impose more stringent criteria.

a. Broker/Dealer firms must meet the following minimum criteria:
    i. Be registered with the Securities and Exchange Commission (SEC);
    ii. Be registered with the Financial Industry Regulatory Authority (FINRA).
    iii. Provide most recent audited financials.
    iv. Provide FINRA Focus Report filings.

b. Approved broker/dealer employees who execute transactions with the City must meet the following minimum criteria:
    i. Be a registered representative with the Financial Industry Regulatory Authority (FINRA);
    ii. Be licensed by the state of Oregon;
    iii. Provide certification (in writing) of having read; understood; and agreed to comply with the most current version of this investment policy.

c. If the City's investment advisor is contracted to provide securities transactions on behalf of the City, the advisor's broker/dealer list must be provided to the Investment Officer for approval. The Investment Officer can assign the responsibility of

broker/dealer due diligence process to the Advisor, and all licensing information on the counterparties will be maintained by the Advisor and available upon request.

The advisor broker/dealer review should include:

i. FINRA Certification check
ii. Firm Profile
iii. Firm History
iv. Firm Operations
v. Disclosures of Arbitration Awards, Disciplinary and Regulatory Events
vi. State Registration Verification
vii. Financial review of acceptable FINRA capital requirements or letter of credit for clearing settlements.

The advisors must provide the City with any changes to the list prior to transacting on behalf of the City.

6.2 Financial Bank Institutions:

All financial banks that provide bank deposits, certificates of deposits or any other deposit of the bank to the City must either be fully covered by the FDIC or the bank must be a participant of the Public Funds Collateralization Program (PFCP) program. ORS Chapter 295 governs the collateralization of Oregon public funds and provides the statutory requirements for the Public Funds Collateralization Program. Bank depositories are required to pledge collateral against any public funds deposits in excess of deposit insurance amounts. This provides additional protection for public funds in the event of a bank loss. ORS Chapter 295 sets the specific value of the collateral, as well as the types of collateral that are acceptable. ORS Chapter 295 creates a shared liability structure for participating bank depositories, better protecting public funds though still not guaranteeing that all funds are 100% protected.

6.3 Investment Advisors:

An Investment Advisor may be utilized to manage funds and will be selected through a competitive RFP process. The Advisor must meet the following criteria:

a. The investment advisor firm must be registered with the Securities and Exchange Commission (SEC) or licensed by the state of Oregon; (Note: Investment advisor firms with assets under management > $100 million must be registered with the SEC, otherwise the firm must be licensed by the state of Oregon);
b. All investment advisor firm representatives conducting investment transactions on behalf of City must be registered representatives with FINRA;
c. All investment advisor firm representatives conducting investment transactions on behalf of City must be licensed by the state of Oregon;
d. Contract terms will include that the Investment advisor will comply with the City's Investment Policy.

A periodic (at least annual) review of all authorized investment advisors under contract will be conducted by the Finance director to determine their continued eligibility within the portfolio guidelines. The Investment Advisor must notify the City immediately if any of the following issues arise while serving under a City Contract:

a. Pending investigations by securities regulators.
b. Significant changes in net capital.
c. Pending customer arbitration cases.
d. Regulatory enforcement actions.

6.4 Competitive Transactions:

The Finance Director will obtain telephone, faxed or emailed quotes before purchasing or selling an investment. The Finance Director will select the quote which best satisfies the investment objectives of the investment portfolio within the parameters of this policy. The Finance Director and/or the Investment Advisor will maintain a written record of each bidding process including the name and prices offered by each participating financial institution.

In the instance of a security for which there is no readily available competitive bid or offering on the same specific issue, the Investment Officer shall document quotations for comparable or alternative securities.

The City's investment advisor that is providing investment management services must provide documentation of competitive pricing execution on each transaction. The investment advisor will retain documentation and provide upon request**.**

7. SAFEKEEPING AND CUSTODY

7.1 Safekeeping of Securities and Funds:

Securities will be held by an independent third-party safekeeping institution selected by the City in the City' s segregated account. Upon request, the safekeeping institution shall make available a copy of its Statement on Standards for Attestation Engagements (SSAE) No. 16.

All trades of marketable securities will be executed on a delivery vs payment (DVP) basis to ensure that securities are deposited in the City of Tualatin's safekeeping institution prior to the release of funds. The City will have online access through the safekeeping bank for verification of the account holdings and transactions.

7.2 Bank Deposits and Certificates of Deposit:

The City may hold bank deposits or certificates of deposits at banks qualified under ORS 295.

7.3 Accounting Method:

The City shall comply with all required legal provisions and Generally Accepted Accounting Principles (GAAP). The accounting principles are those contained in the pronouncements of authoritative bodies including but not necessarily limited to, the Governmental Accounting Standards Board (GASB); the American Institute of Certified Public Accountants (AICPA); and the Financial Accounting Standards Board (FASB).

7.4 Internal Controls:

The Finance Director shall maintain a system of written internal controls which shall address the following areas of concern:

- Compliance with investment policy constraints and requirements
- Clear delegation of authority
- Segregation of duties and separation of responsibilities for trade execution, accounting, and record keeping
- Written confirmation of transactions and funds transfers
- Timely reconcilement of custodial reports
- Appropriate security for online transactions and access to bank accounts and bank data
- Custodial safekeeping
- Control of collusion
- Review, maintenance and monitoring of security procedures both manual and automated
- Dual authorizations of wire and automated clearing house (ACH) transfers
- Avoidance of physical delivery of securities wherever possible and address control requirements for physical delivery where necessary

An external auditor shall provide an annual independent audit to assure compliance with Oregon state law and City of Tualatin policies and procedures.

8. AUTHORIZED AND SUITABLE INVESTMENTS

8.1 Authorized Investments:

All investments of the City shall be made in accordance with Oregon Revised Statutes: ORS 294.035 (Investment of surplus funds of political subdivisions; approved investments), ORS 294.040 (Restriction on investments under ORS 294.035), ORS 294.135 (Investment maturity dates), ORS 294.145 (Prohibited conduct for Finance Director including not committing to invest funds or sell securities more than 14 business days prior to the anticipated date of settlement), ORS 294.805 to 294.895 (Local Government Investment Pool). Any revisions or extensions of these sections of the ORS must be amended to this policy in order to be allowable. If additional types of securities are considered for investment, per Oregon state statute they will not be eligible for investment until this Policy has been amended and the amended version adopted by City Council. Minimum credit ratings and percentage limitations apply to the time of purchase.

8.2 Suitable Investments:

The City is empowered to invest in the following types of securities:

US Treasury Obligations: US Treasury and other government obligations that carry the full faith and credit guarantee of the United States for the timely payment of principal and interest [ORS Section 294.035(3)(a)].

US Agency Obligations: Senior debenture obligations of US federal agencies and instrumentalities or U.S. government sponsored enterprises (GSE) whose payment is guaranteed by the United States [ORS Section 294.035(3)(a)].

Municipal Debt: Lawfully issued debt obligations of the States of Oregon, California, Idaho and Washington and political subdivisions of those states if the obligations have a long-term rating on the settlement date of AA- or better by S&P or Aa3 or better by Moody's or equivalent rating by any nationally recognized statistical rating organization, or are rated on the settlement date in the highest category for short-term municipal debt by a nationally recognized statistical rating organization [ORS Section 294.035(3)(c)].

Corporate Indebtedness: Corporate indebtedness subject to a valid registration statement on file with the Securities and Exchange Commission or issued under the authority of section 3(a)(2) or 3(a)3 of the Securities Act of 1933, as amended. Corporate indebtedness must be rated on the settlement date AA- or better by S&P or Aa3 or better by Moody's or equivalent rating by any nationally recognized statistical rating organization [ORS Section 294.035(3)(i)].

Commercial Paper: Corporate indebtedness subject to a valid registration statement on file with the Securities and Exchange Commission or issued under the authority of section 3(a)(2) or 3(a)3 of the Securities Act of 1933, as amended. Commercial Paper must be rated A1 by Standard and Poor's or P1 by Moody's or equivalent rating by any nationally recognized statistical rating organization. Issuer constraints for commercial paper combined with corporate notes will be limited by statute to 5% of market value per issuer [ORS Section 294.035(3)(i)].

Certificates of Deposit: Certificates of deposit in insured institutions as defined in ORS 706.008, in credit unions as defined in ORS Section 723.006 or in federal credit unions, if the institution or credit union maintains a head office or a branch in this state [ORS Section 294.035(3)(d)].

Bank Time Deposit/Savings Accounts: Time deposit open accounts or savings accounts in insured institutions as defined in ORS Section 706.008, in credit unions as defined in ORS Section 723.006 or in federal credit unions, if the institution or credit union maintains a head office or a branch in this state [ORS Section 294.035(3)(d)].

Bankers' Acceptance: Banker's acceptances, if the banker's acceptances are: (i) Guaranteed by, and carried on the books of, a qualified financial institution*; (ii) Eligible for discount by the Federal Reserve System; and (iii) Issued by a qualified financial institution whose short-term letter of credit rating is rated in the highest category by one or more nationally recognized statistical rating organizations [ORS Section 294.035(3)(h)].

Local Government Investment Pool: State Treasurer's local short-term investment fund up to the statutory limit per ORS Section 294.810.

*For the purposes of this paragraph, "qualified financial institution" means: (i) A financial institution that is located and licensed to do banking business in the State of Oregon; or (ii) A financial institution that is wholly owned by a financial holding company or a bank holding company that owns a financial institution that is located and licensed to do banking business in the State of Oregon [ORS Section 294.035(3)(h)].

8.3 Collateralization:

Time deposit open accounts, Certificates of Deposit and savings accounts shall be collateralized through the collateral pool for any excess over the amount insured by an agency of the United States government in accordance with ORS 295.015 and ORS 295.018.

9. INVESTMENT PARAMETERS

9.1 Diversification:

The City will diversify the investment portfolio to avoid incurring unreasonable risks, both credit and interest rate risk, inherent in over investing in specific instruments, individual financial institutions or maturities.

Credit risk: is the risk that a security or a portfolio will lose some or all of its value due to a real or perceived change in the ability of the issuer to repay its debt.

Liquidity risk: is the risk that an investment may not be easily marketable or redeemable.

Interest rate risk: longer term investments have the potential to achieve higher returns but are also likely to exhibit higher market value price volatility due to the changes in the general level of interest rates.

Diversification Constraints on Total Holdings

Issue Type	Maximum % Holdings	Maximum % per Issuer	Ratings S&P, Moody's or Equivalent	Maximum Maturity
US Treasury Obligations	100%	None	N/A	5.25 years
US Agency Obligations	100%	35%	N/A	5.25 years
Municipal Obligations (OR, CA, ID, WA)	25%	5%	AA- / Aa3 Short Term*	5.25 years
Corporate Notes	35%**	5%***	AA- / Aa3	5.25 years
Commercial Paper			A1 / P1	270 days
Bank Time Deposits/Savings Accounts	25%	10%	Oregon Public Depository	N/A
Certificates of Deposit	10%	5%	Oregon Public Depository	5.25 years
Banker's Acceptance	25%	5%	A1 / P1	180 days
Oregon Short Term Fund	Maximum allowed per ORS 294.810	None	N/A	N/A

*Short Term Ratings: Moody's- P1/MIG1/VMIG1, S&P - A-1/SP-1, Fitch - F1

**35% maximum combined corporate and commercial paper per ORS.

***Issuer constraints apply to the combined issues in corporate and commercial paper holdings.

9.2 Investment Maturity:

The City will not directly invest in securities with a stated maturity of more than 5.25 years from the date of purchase.

- The maximum weighted maturity of the total portfolio shall not exceed two and a half (2.5) years. This maximum is established to limit the portfolio to excessive price change exposure.
- Liquidity funds will be held in the Oregon Short Term Fund, with a qualified depository institution, or investments maturing in less than six months to provide sufficient liquidity for expected disbursements.
- Core funds will be the defined as the funds in excess of liquidity requirements. The investments in this portion of the portfolio will have maturities between 1 day and 5.25 years and will be only invested based on the diversification parameters listed in 9.1 of this policy.
- Total Portfolio Maturity Constraints:

Maturity Constraints	**Minimum % of Total Portfolio**
Under 30 days	10%
Under 1 year	25%
Under 5.25 years	100%
Maturity Constraints	**Total Portfolio Maximum**
Weighted Average Maturity	2.5 years
Security Structure Constraint	**Maximum % of Total Portfolio**
Callable Agency Securities	25%

9.3 Prohibited Investments:

- The City shall not invest in “144A” private placement securities, this includes commercial paper privately placed under section 4(a)(2) of the Securities Act of 1933
- The City shall not lend securities nor directly participate in a securities lending or reverse repurchase program.
- The City shall not purchase mortgage-backed securities.
- The City will not purchase, per ORS 294.040, any bonds of issuers listed in ORS 294.035(3)(a) to (c) that have a prior default history.
- No commitments to buy or sell securities may be made more than 14 days prior to the anticipated settlement date, or receive a fee other than interest for future deliveries.

10. INVESTMENT OF PROCEEDS FROM DEBT ISSUANCE

Investments of bond proceeds are restricted further and will not include corporate bonds in the dedicated bond proceed portfolio. All other allowable investments including: US Treasury, US Agency and Commercial Paper may be utilized. The investments will be made in a manner to match cash flow expectations based on managed disbursement schedules.

Liquidity for bond proceeds will be managed through the OSTF Pool or Bank deposit balances.

Funds from bond proceeds and amounts held in a bond payment reserve or proceeds fund may be invested pursuant to ORS 294.052. Investments of bond proceeds are typically not invested for resale and maturity matched with expected outflows.

Information will be maintained for arbitrage rebate calculations.

11. INVESTMENT OF RESERVE OR CAPITAL IMPROVEMENTS

Pursuant to ORS 294.135(1)(b), reserve or capital Improvement project monies may be invested in securities exceeding 5.25 years when the funds in question are being accumulated for an anticipated use that will occur more than 18 months after the funds are invested, then, upon the approval of the governing body of the county, municipality, school district or other political subdivision, the maturity of the investment or investments made with the funds may occur when the funds are expected to be used.

12. POLICY COMPLIANCE AND PERFORMANCE STANDARDS

12.1 Compliance Measurement and Procedures:

a. Compliance Report: A compliance report documenting the portfolio versus the investment policy shall be maintained quarterly.
b. Compliance Measurement: Guideline measurements will use market value of investments.
c. Compliance Procedures:

i. If the portfolio falls outside of compliance with adopted investment policy guidelines or is being managed inconsistently with this policy, the Investment Officer shall bring the portfolio back into compliance in a prudent manner and as soon as prudently feasible.

ii. Violations of portfolio guidelines as a result of transactions; actions to bring the portfolio back into compliance and; reasoning for actions taken to bring the portfolio back into compliance shall be documented and reported to the City Council.

iii. Due to fluctuations in the aggregate surplus funds balance, minimum or maximum percentages for a particular issuer, investment type or maturity constraint may be surpassed at a point in time. Securities need not be liquidated to realign the portfolio; however, consideration should be given to this matter when future purchases are made to ensure that appropriate diversification is maintained.

iv. As determined on any date that the security is held within the portfolio. If the credit rating of a security is subsequently downgraded below the minimum rating level for a new investment of that security, the Finance Director shall evaluate the downgrade on a case-by-case basis in order to determine if the security should be held or sold. The Finance Director will apply the general objectives of Safety, Liquidity, Yield and

Legality to make the decision. If the City has hired the services of an Investor Advisor, the Finance Director will act on the recommendation of the Advisor.

12.2 Performance Measurement:

a. The Liquidity Portfolio yields will be compared to the OST Pool rates.

b. The Core Portfolio will be invested into a predetermined structure that will be measured against a selected benchmark portfolio. The structure will be based upon a chosen minimum and maximum effective duration and will have the objective to achieve market rates of returns over long investment horizons. The purpose of the benchmark is to appropriately manage the risk in the portfolio given interest rate cycles. The Core Portfolio is expected to provide similar returns to the benchmark over interest rate cycles, but may underperform or out perform in certain periods. The Core Portfolio will be positioned to first protect principal and then achieve market rates of return. The benchmark used will be a 0-3 year or 0-5 year standard market index and comparisons will be calculated monthly and reported quarterly.

c. When comparing the performance of the City's portfolio, all fees and expenses involved with managing the portfolio shall be included in the computation of the portfolio's rate of return.

d. The mark to market pricing will be calculated monthly and be provided in a monthly report.

13. REPORTING REQUIREMENTS

The Finance Director will retain and provide quarterly investment reports to the City Council in a similar manner as outlined in ORS 208.090. The reports also will be available upon request. Securities holdings and cash balances held in the investment portfolio will be provided on the reports.

The minimum quarterly reporting requirements for total portfolio are as follows:

- Earnings Yield
- Holdings Report (including mark to market)
- Transactions Report
- Weighted Average Maturity or Duration
- Compliance Report

14. INVESTMENT POLICY ADOPTION

This Investment Policy shall be adopted by City Council annually in accordance with ORS 294.135(a). Any significant changes to the policy must be reviewed by the Oregon Short Term-Fund Board prior to submitting to City Council for adoption.

15. GLOSSARY

Accrued Interest: The interest accumulated on a security since the issue date or since the last coupon payment. The buyer of the security pays the market price plus accrued interest.

Agency Securities: See "Federal Agency Securities."

Bankers' Acceptance (BA's): A draft or bill of exchange drawn upon and accepted by a bank. Frequently used to finance shipping of international goods. Used as a short-term credit instrument, bankers' acceptances are traded at a discount from face value as a month market instrument in the secondary market on the basis of the credit quality of the guaranteeing bank.

Basis Point: A basis point is a unit of measure used in finance to describe the percentage change in the value or rate of a financial instrument. One basis point is equivalent to 0.01% (1/100th of a percent) or 0.0001 in decimal form. In most cases, it refers to changes in interest rates and bond yields.

Benchmark: A market index used as a comparative basis for measuring the performance of an investment portfolio. A performance benchmark should represent a close correlation to investment guidelines, risk tolerance and duration of the actual portfolio's investments.

Bond: An interest-bearing security issued by a corporation, government, governmental agency, or other body. It is a form of debt with an interest rate, maturity, and face value, and it is usually secured by specific assets. Most bonds have a maturity of greater than one year and in general, pay interest semiannually.

Broker/Dealer: A person or firm transacting securities business with customers. A "broker" acts as an agent between buyers and sellers, and receives a commission for thee services. A "dealer" buys and sells financial assets from its own portfolio. A dealer takes risk by owning an inventory of securities, whereas a broker merely matches up buyers and sellers.

Call: An option to buy a specific asset at a certain price within a certain period of time.

Callable: A bond or preferred stock that may be redeemed by the issuer before maturity for a call price specified at the time of issuance.

Call Date: The date before maturity on which a bond may be redeemed at the option of the issuer.

Certificate of Deposit (CD): Bank obligation issued by a financial institution generally offering a fixed rate of return (coupon) for a specified period of time (maturity).

Collateral: Securities or other property that a borrower pledges as security for the repayment of a loan. Also refers to securities pledged by a bank to secure deposits of public monies.

Commercial Paper: Short-term, unsecured, negotiable promissory notes issued by a company or financial institution. Issued at a discount and matures at par or face value. Usually a maximum maturity of 270 days, and given a short-term debt rating by one or more NRSROs.

Core Fund: Core funds are defined as operating fund balance which exceeds the City's daily liquidity needs. Core funds are invested out the yield curve to diversify maturity structure in the

overall portfolio. Having longer term investments in a portfolio will stabilize the overall portfolio interest earnings over interest rate cycles.

Corporate Note: A debt instrument issued by a corporation with a maturity of greater than one year and less than ten years.

Coupon Rate: The annual rate of interest that the issuer of a bond promises to pay to the holder of the bond.

Current Maturity: The amount of time left until an obligation matures. For example, a one-year bill issued nine months ago has a current maturity of three months.

Current Yield: The coupon payments on a security as a percentage of the security's market price. In many instances the price should be gross of accrued interest, particularly on instruments where no coupon is left to be paid until maturity.

CUSIP: A CUSIP number identifies securities. CUSIP stands for Committee on Uniform Security Identification Procedures, which was established under the auspices of the American Bankers Association to develop a uniform method of identifying municipal, U.S. government, and corporate securities.

Delivery Versus Payment (DVP): Settlement procedure in which securities are delivered versus payment of cash, but only after cash has been received. Most security transactions, including those through the Fed Securities Wire system and DTC, are done DVP as a protection for both the buyer and seller of securities.

Depository Trust Company (DTC): A firm through which members can use a computer to arrange for securities to be delivered to other members without physical delivery of certificates. A member of the Federal Reserve System and owned mostly by the New York Stock Exchange, the Depository Trust Company uses computerized debit and credit entries. Most corporate securities, commercial paper, CDs and BAs clear through DTC.

Discount Notes: Short term debt obligations issued by Federal Agencies at a discount. Discount notes mature at par and can range in maturity from overnight to one year. Discount Notes typically have very large primary (new issue) and secondary markets.

Federal Agency Security: A debt instrument issued by one of the federal agencies. Federal agencies are considered second in credit quality and liquidity only to U.S. Treasuries.

Federal Agency: Government sponsored/owned entity created by the U.S. Congress, generally for the purpose of acting as a financial intermediary by borrowing in the marketplace and directing proceeds to specific areas of the economy considered to otherwise have restricted access to credit markets.

Federal Farm Credit Bank (FFCB): A Government Sponsored Enterprise (GSE) system that is a network of cooperatively owned lending institutions that provide credit services to farmers, agricultural cooperatives and rural utilities. The FFCBs act as financial intermediaries that borrow money in the capital markets and use the proceeds to make loans and provide other assistance to farmers and farm-affiliated businesses. FFCB debt is not an obligation of, nor is it guaranteed by the U.S. government, although it is considered to have minimal credit risk due to is importance

to the U.S. Financial system and agricultural industry. Also issues notes under it “designated note” program.

Federal Home Loan Bank System (FHLB). A Government Sponsored Enterprise (GSE) system, consisting of wholesale banks (currently twelve district banks) owned by their member banks, which provides correspondent banking services and credit to various financial institutions, financed by the issuance of securities. The principal purpose of the FHLB is to add liquidity to the mortgage markets. Although FHLB does not directly fund mortgages, it provides a stable supply of credit to thrift institutions that make new mortgage loans. FHLB debt is not an obligation of, nor is it guaranteed by the U.S. government, although it is considered to have minimal credit risk due to its importance to the U.S. financial system and housing market. Frequent issuer of discount notes, agency notes and callable agency securities. Also issues notes under its “global note” and “TAP” programs.

Federal Home Loan Mortgage Corporation (FHLMC or "Freddie Mac"). One of the large Federal Agencies. A government sponsored public corporation (GSE) that provides stability and assistance to the secondary market for home mortgages by purchasing first mortgages and participation interests financed by the sale of debt and guaranteed mortgage backed securities. FHLMC debt is not an obligation of, nor is it guaranteed by the U.S. government, although it is considered to have minimal credit risk due to its importance to the U.S. financial system and housing market. Frequent issuer of discount notes, agency notes, callable agency securities and MBS. Also issues notes under its “reference note” program.

Federal National Mortgage Association (FNMA or "Fannie Mae"). One of the large Federal Agencies. A government sponsored public corporation (GSE) that provides liquidity to the residential mortgage market by purchasing mortgage loans from lenders, financed by the issuance of debt securities and MBS (pools of mortgages packaged together as a security). FNMA debt is not an obligation of, nor is it guaranteed by the U.S. government, although it is considered to have minimal credit risk due to its importance to the U.S. financial system and housing market. Frequent issuer of discount notes, agency notes, callable agency securities and MBS. Also issues notes under its “benchmark note” program.

Federal Reserve Bank. One of the 12 distinct banks of the Federal Reserve System.

Federal Reserve System (the Fed). The independent central bank system of the United States that establishes and conducts the nation's monetary policy. This is accomplished in three major ways: (1) raising or lowering bank reserve requirements, (2) raising or lowering the target Fed Funds Rate and Discount Rate, and (3) in open market operations by buying and selling government securities. The Federal Reserve System is made up of twelve Federal Reserve District Banks, their branches, and many national and state banks throughout the nation. It is headed by the seven member Board of Governors known as the “Federal Reserve Board” and headed by its Chairman.

General Obligation Bonds (GOs): Bonds secured by the pledge of the municipal issuer’s full faith and credit, which usually includes unlimited taxing power.

Government Bonds: Securities issued by the federal government; they are obligations of the U.S. Treasury. Also known as “governments.”

Government Sponsored Enterprise (GSE): Privately owned entity subject to federal regulation and supervision, created by the U.S. Congress to reduce the cost of capital for certain borrowing

sectors of the economy such as students, farmers, and homeowners. GSEs carry the implicit backing of the U.S. Government, but they are not direct obligations of the U.S. Government. For this reason, these securities will offer a yield premium over Treasuries. Some consider GSEs to be stealth recipients of corporate welfare. Examples of GSEs include: FHLB, FHLMC, FNMA and FFCB.

Interest: Compensation paid or to be paid for the use of money. The rate of interest is generally expressed as an annual percentage.

Interest Rate: The interest payable each year on borrowed funds, expressed as a percentage of the principal.

Investment Advisor: A company that provides professional advice managing portfolios, investment recommendations and/or research in exchange for a management fee.

Investment Portfolio: A collection of securities held by a bank, individual, institution, or government agency for investment purposes.

Investment Securities: Securities purchased for an investment portfolio, as opposed to those purchased for resale to customers.

Liquidity: The ease at which a security can be bought or sold (converted to cash) in the market. A large number of buyers and sellers and a high volume of trading activity are important components of liquidity.

Liquidity Component: A percentage of the total portfolio that is dedicated to providing liquidity needs for the City.

Mark to Market: Adjustment of an account or portfolio to reflect actual market price rather than book price, purchase price or some other valuation.

Municipals: Securities, usually bonds, issued by a state or its agencies. The interest on "munis" is usually exempt from federal income taxes and state and local income taxes in the state of issuance. Municipal securities may or may not be backed by the issuing agency's taxation powers.

NRSRO: A "Nationally Recognized Statistical Rating Organization." A designated rating organization that the SEC has deemed a strong national presence in the U.S. NRSROs provide credit ratings on corporate and bank debt issues. Only ratings of a NRSRO may be used for the regulatory purposes of rating such as Moody's, S&P, Fitch and Duff & Phelps.

Par Value: The value of a security expressed as a specific dollar amount marked on the face of the security, or the amount of money due at maturity. Par value should not be confused with market value.

Prudent Person Standard: Standard that requires that when investing, reinvesting, purchasing, acquiring, exchanging, selling, or managing public funds, a trustee will act with care, skill, prudence, and diligence under the circumstances the prevailing, including, but not limited to, the general economic conditions and the anticipated needs of the agency, that a prudent person acting in a like capacity and familiarity with those matters would use in the conduct of funds of a like character and with like aims, to safeguard the principal and maintain the liquidity needs of the entity.

Rate of Return: Amount of income received from an investment, expressed as a percentage of the amount invested.

State of Oregon Local Government Investment Pool (OSTF – Oregon Short Term Fund): The OSTF is organized pursuant to ORS 294.805 through 294.895. Participation in the Pool will not exceed the maximum limit annually set by ORS 294.810.

Total Return: Investment performance measured over a period of time that includes coupon interest, interest on interest, and both realized and unrealized gains or losses. Total return includes, therefore, any market value appreciation/deprecation on investments held at period end.

Treasury Bill (T-Bill): An obligation of the U.S. government with a maturity of one year or less. T-bills bear no interest but are sold at a discount.

Treasury Bonds and Notes: Obligations of the U.S. government that bear interest. Notes have maturities of one to ten years; bonds have longer maturities.

Yield: The annual rate of return on an investment, expressed as a percentage of the investment. Income yield is obtained by dividing the current dollar income by the current market price for the security. Net yield, or yield to maturity, is the current income yield minus any premium above par or plus any discount from par in the purchase price, with the adjustment spread over the period from the date of purchase to the date of maturity of the bond.

Yield to Maturity: The average annual yield on a security, assuming it is held to maturity; equals to the rate at which all principal and interest payments would be discounted to produce a present value equal to the purchase price of the bond.

GPA GOVERNMENT PORTFOLIO ADVISORS

MEMO

To: Don Hudson and Matt Warner – City of Tualatin
From: Whitney Maher – Government Portfolio Advisors
Date: September 10, 2025
Re: Investment Policy Review/Update 2025

ORS 294.135(1)(a) requires local governments investing in securities with maturities longer than 18 months to annually adopt their investment policies. The City last reviewed and re-adopted the policy in October 2024. After reviewing the City's policy this year, it is being presented for re-adoption for 2025 to the City Council with the following recommended change(s):

1. **Section 9.1 Diversification** – update title for Diversification Table from "Diversification Constraints on Liquidity and Core funds" to "Diversification Constraints on Total Funds." The City has issued bonds recently and may issue bonds in the future, therefore compliance to the policy is applicable to more than just Core and Liquidity.

2. **Section 9.2 Investment Maturity** – update language regarding liquidity funds to remove "money market instruments" as these are not allowable by statute.

9.2 Investment Maturity:

The City will not directly invest in securities with a stated maturity of more than 5.25 years from the date of purchase.

- The maximum weighted maturity of the total portfolio shall not exceed two and a half (2.5) years. This maximum is established to limit the portfolio to excessive price change exposure.
- Liquidity funds will be held in the Oregon Short Term Fund, with a qualified depository institution, or investments maturing in less than six months to provide sufficient liquidity for expected disbursements.
- Core funds will be the defined as the funds in excess of liquidity requirements. The investments in this portion of the portfolio will have maturities between 1 day and 5.25 years and will be only invested based on the diversification parameters listed in 9.1 of this policy.

3. **Section 12.2 Performance Measurement** – update language to specify portfolios

12.2 Performance Measurement:

a. The Liquidity Portfolio yields will be compared to the OST Pool rates.

b. The Core Portfolio will be invested into a predetermined structure that will be measured against a selected benchmark portfolio. The structure will be based upon a chosen minimum and maximum effective duration and will have the objective to achieve market rates of returns over long investment horizons. The purpose of the benchmark is to appropriately manage the risk in the portfolio given interest rate cycles. The Core Portfolio is expected to provide similar returns to the benchmark over interest rate cycles, but may underperform or out perform in certain periods. The Core Portfolio will be positioned to first protect principal and then achieve market rates of return. The benchmark used will be a 0-3 year or 0-5 year standard market index and comparisons will be calculated monthly and reported quarterly.

6650 SW Redwood Lane, Suite 365
Portland, OR 97224 | Office: 503-248-9973

EXHIBIT A
RESOLUTION NO. 5926-25



INVESTMENT POLICY
2025

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1. INTRODUCTION

The purpose of this Investment Policy is to establish the investment objectives, delegation of authority, standards of prudence, eligible investments and transactions, internal controls, reporting requirements, and safekeeping and custodial procedures necessary for the prudent management and investment of the funds of the City of Tualatin.

2. GOVERNING AUTHORITY

The investment program shall be operated in conformance with federal, state, and other legal requirements. Specifically, this investment policy is written in conformance with ORS 294.035; 294.040; 294.052; 294.135; 294.145 and 294.810. All funds within the scope of this policy are subject to regulations established by the state of Oregon. Any revisions or extensions of these sections of the ORS shall be assumed to be part of this Investment Policy immediately upon being enacted.

This Policy has been adopted by Resolution No. 5926-25 by the City Council of Tualatin, Oregon on November 10, 2025.

3. SCOPE

This policy applies to activities of the City with regards to investing the financial assets of all funds except for funds held in trust for the Pension Portfolio and deferred compensation funds for the employees of the City which have separate rules. Other than bond proceeds or other unusual situations, the total of all funds ranges from $70,000,000 to $110,000,000. This policy provides direction for the following fund types:

1. General Fund
2. Special Revenue Funds
3. Capital Projects Funds
4. Debt Service Funds
5. Enterprise Funds
6. Internal Service Funds
7. Trust and Agency Funds
8. Other Funds

4. OBJECTIVES

The City's principal investment objectives in order of priority are:

4.1 Safety:

- Preservation of capital and protection of investment principal.
- Diversification to avoid incurring unreasonable risks regarding specific security types or individual financial institutions.

4.2 Liquidity:

- Maintenance of sufficient liquidity to meet operating requirements that are reasonably anticipated.

4.3 Yield – Return:

- Attainment of a market value rate of return throughout budgetary and economic cycles.

5. STANDARDS OF CARE

5.1 Delegation of Authority

a. Governing Body: The ultimate fiduciary responsibility and authority for the investment of City funds resides with the City Council. The City hereby designates the Finance Director as the Investment Officer for the City's funds. The Finance Director shall invest City funds in accordance with ORS Chapter 294, Public Financial Administration, and with this Investment Policy. This Policy shall constitute a "written order" from City Council per ORS 294.035.

b. Investment Advisor: Subject to required procurement procedures, the City may engage the support services of outside professionals in regard to its financial program, so long as it can be demonstrated or anticipated that these services produce a net financial advantage or necessary financial protection of the City's resources. External investment advisors shall be subject to Oregon Revised Statutes and the provisions of this Investment Policy. The Advisor shall provide non-discretionary advisory services, which require prior approval from the Finance Director on all transactions.

   In order to optimize total return through active portfolio management, resources shall be allocated to the cash management program. This commitment of resources shall include financial and staffing considerations.

5.2 Prudence:

The standard of prudence to be used, by the Finance Director, in the context of managing the overall portfolio is the prudent person rule which states:

> "Investments will be made with judgment and care, under circumstances then prevailing, which persons of prudence, discretion and intelligence exercise in the management of their own affairs, not for speculation, but for investment, considering the probable safety of their capital as well as the probable income to be derived."

The City's Finance Director (ORS 294.004 (2)) and staff acting in accordance with this Investment Policy, written procedures, and Oregon Revised Statutes 294.035 and 294.040 and exercising due diligence shall be relieved of personal responsibility for an individual security's credit risk or market price change or other loss, provided deviations from expectations are reported and appropriate action is taken to control adverse developments within a timely fashion as defined in this policy.

5.3 Ethics:

Officers and employees involved in the investment process shall refrain from personal activity that could conflict with the proper execution and management of the investment program, or that could impair their ability to make impartial decisions. Employees and investment officials shall disclose any material interests in financial institutions with which they conduct business. Disclosure shall be made to the governing body. They shall further disclose any personal investment positions that could be related to the performance of the investment portfolio. Employees and officers shall refrain from undertaking personal investment transactions with the same individual with whom business is conducted on behalf of the City. Officers and employees shall, at all times, comply with the State of Oregon Government Standards and Practices code of ethics set forth in ORS Chapter 244.

6. AUTHORIZED FINANCIAL INSTITUTIONS

The City shall maintain a list of all authorized financial institutions and dealers that are approved for investment purposes. Any firm is eligible to make an application to the Finance Director and upon due consideration and approval, will be added to the list. Additions and deletions to the list will be made at the City's discretion. There should be in place, proof as to all the necessary credentials and licenses held by employees of the brokers/dealers who will have contact with the City of Tualatin as specified by but not necessarily limited to the Financial Industry Regulatory Authority (FINRA), Securities and Exchange Commission (SEC), etc.

6.1 Broker/Dealers:

The Investment Officer shall determine which broker/dealer firms and registered representatives are authorized for the purposes of investing funds within the scope of this investment policy. A list will be maintained of approved broker/dealer firms and affiliated registered representatives. The following minimum criteria must be met prior to authorizing investment transactions. The Investment Officer may impose more stringent criteria.

a. Broker/Dealer firms must meet the following minimum criteria:
    i. Be registered with the Securities and Exchange Commission (SEC);
    ii. Be registered with the Financial Industry Regulatory Authority (FINRA).
    iii. Provide most recent audited financials.
    iv. Provide FINRA Focus Report filings.

b. Approved broker/dealer employees who execute transactions with the City must meet the following minimum criteria:
    i. Be a registered representative with the Financial Industry Regulatory Authority (FINRA);
    ii. Be licensed by the state of Oregon;
    iii. Provide certification (in writing) of having read; understood; and agreed to comply with the most current version of this investment policy.

c. If the City's investment advisor is contracted to provide securities transactions on behalf of the City, the advisor's broker/dealer list must be provided to the Investment Officer for approval. The Investment Officer can assign the responsibility of

broker/dealer due diligence process to the Advisor, and all licensing information on the counterparties will be maintained by the Advisor and available upon request.

The advisor broker/dealer review should include:

i. FINRA Certification check
ii. Firm Profile
iii. Firm History
iv. Firm Operations
v. Disclosures of Arbitration Awards, Disciplinary and Regulatory Events
vi. State Registration Verification
vii. Financial review of acceptable FINRA capital requirements or letter of credit for clearing settlements.

The advisors must provide the City with any changes to the list prior to transacting on behalf of the City.

6.2 Financial Bank Institutions:

All financial banks that provide bank deposits, certificates of deposits or any other deposit of the bank to the City must either be fully covered by the FDIC or the bank must be a participant of the Public Funds Collateralization Program (PFCP) program. ORS Chapter 295 governs the collateralization of Oregon public funds and provides the statutory requirements for the Public Funds Collateralization Program. Bank depositories are required to pledge collateral against any public funds deposits in excess of deposit insurance amounts. This provides additional protection for public funds in the event of a bank loss. ORS Chapter 295 sets the specific value of the collateral, as well as the types of collateral that are acceptable. ORS Chapter 295 creates a shared liability structure for participating bank depositories, better protecting public funds though still not guaranteeing that all funds are 100% protected.

6.3 Investment Advisors:

An Investment Advisor may be utilized to manage funds and will be selected through a competitive RFP process. The Advisor must meet the following criteria:

a. The investment advisor firm must be registered with the Securities and Exchange Commission (SEC) or licensed by the state of Oregon; (Note: Investment advisor firms with assets under management > $100 million must be registered with the SEC, otherwise the firm must be licensed by the state of Oregon);
b. All investment advisor firm representatives conducting investment transactions on behalf of City must be registered representatives with FINRA;
c. All investment advisor firm representatives conducting investment transactions on behalf of City must be licensed by the state of Oregon;
d. Contract terms will include that the Investment advisor will comply with the City's Investment Policy.

A periodic (at least annual) review of all authorized investment advisors under contract will be conducted by the Finance director to determine their continued eligibility within the portfolio guidelines. The Investment Advisor must notify the City immediately if any of the following issues arise while serving under a City Contract:

a. Pending investigations by securities regulators.
b. Significant changes in net capital.
c. Pending customer arbitration cases.
d. Regulatory enforcement actions.

6.4 Competitive Transactions:

The Finance Director will obtain telephone, faxed or emailed quotes before purchasing or selling an investment. The Finance Director will select the quote which best satisfies the investment objectives of the investment portfolio within the parameters of this policy. The Finance Director and/or the Investment Advisor will maintain a written record of each bidding process including the name and prices offered by each participating financial institution.

In the instance of a security for which there is no readily available competitive bid or offering on the same specific issue, the Investment Officer shall document quotations for comparable or alternative securities.

The City's investment advisor that is providing investment management services must provide documentation of competitive pricing execution on each transaction. The investment advisor will retain documentation and provide upon request**.**

7. SAFEKEEPING AND CUSTODY

7.1 Safekeeping of Securities and Funds:

Securities will be held by an independent third-party safekeeping institution selected by the City in the City' s segregated account. Upon request, the safekeeping institution shall make available a copy of its Statement on Standards for Attestation Engagements (SSAE) No. 16.

All trades of marketable securities will be executed on a delivery vs payment (DVP) basis to ensure that securities are deposited in the City of Tualatin's safekeeping institution prior to the release of funds. The City will have online access through the safekeeping bank for verification of the account holdings and transactions.

7.2 Bank Deposits and Certificates of Deposit:

The City may hold bank deposits or certificates of deposits at banks qualified under ORS 295.

7.3 Accounting Method:

The City shall comply with all required legal provisions and Generally Accepted Accounting Principles (GAAP). The accounting principles are those contained in the pronouncements of authoritative bodies including but not necessarily limited to, the Governmental Accounting Standards Board (GASB); the American Institute of Certified Public Accountants (AICPA); and the Financial Accounting Standards Board (FASB).

7.4 Internal Controls:

The Finance Director shall maintain a system of written internal controls which shall address the following areas of concern:

- Compliance with investment policy constraints and requirements
- Clear delegation of authority
- Segregation of duties and separation of responsibilities for trade execution, accounting, and record keeping
- Written confirmation of transactions and funds transfers
- Timely reconcilement of custodial reports
- Appropriate security for online transactions and access to bank accounts and bank data
- Custodial safekeeping
- Control of collusion
- Review, maintenance and monitoring of security procedures both manual and automated
- Dual authorizations of wire and automated clearing house (ACH) transfers
- Avoidance of physical delivery of securities wherever possible and address control requirements for physical delivery where necessary

An external auditor shall provide an annual independent audit to assure compliance with Oregon state law and City of Tualatin policies and procedures.

8. AUTHORIZED AND SUITABLE INVESTMENTS

8.1 Authorized Investments:

All investments of the City shall be made in accordance with Oregon Revised Statutes: ORS 294.035 (Investment of surplus funds of political subdivisions; approved investments), ORS 294.040 (Restriction on investments under ORS 294.035), ORS 294.135 (Investment maturity dates), ORS 294.145 (Prohibited conduct for Finance Director including not committing to invest funds or sell securities more than 14 business days prior to the anticipated date of settlement), ORS 294.805 to 294.895 (Local Government Investment Pool). Any revisions or extensions of these sections of the ORS must be amended to this policy in order to be allowable. If additional types of securities are considered for investment, per Oregon state statute they will not be eligible for investment until this Policy has been amended and the amended version adopted by City Council. Minimum credit ratings and percentage limitations apply to the time of purchase.

8.2 Suitable Investments:

The City is empowered to invest in the following types of securities:

US Treasury Obligations: US Treasury and other government obligations that carry the full faith and credit guarantee of the United States for the timely payment of principal and interest [ORS Section 294.035(3)(a)].

US Agency Obligations: Senior debenture obligations of US federal agencies and instrumentalities or U.S. government sponsored enterprises (GSE) whose payment is guaranteed by the United States [ORS Section 294.035(3)(a)].

Municipal Debt: Lawfully issued debt obligations of the States of Oregon, California, Idaho and Washington and political subdivisions of those states if the obligations have a long-term rating on the settlement date of AA- or better by S&P or Aa3 or better by Moody's or equivalent rating by any nationally recognized statistical rating organization, or are rated on the settlement date in the highest category for short-term municipal debt by a nationally recognized statistical rating organization [ORS Section 294.035(3)(c)].

Corporate Indebtedness: Corporate indebtedness subject to a valid registration statement on file with the Securities and Exchange Commission or issued under the authority of section 3(a)(2) or 3(a)3 of the Securities Act of 1933, as amended. Corporate indebtedness must be rated on the settlement date AA- or better by S&P or Aa3 or better by Moody's or equivalent rating by any nationally recognized statistical rating organization [ORS Section 294.035(3)(i)].

Commercial Paper: Corporate indebtedness subject to a valid registration statement on file with the Securities and Exchange Commission or issued under the authority of section 3(a)(2) or 3(a)3 of the Securities Act of 1933, as amended. Commercial Paper must be rated A1 by Standard and Poor's or P1 by Moody's or equivalent rating by any nationally recognized statistical rating organization. Issuer constraints for commercial paper combined with corporate notes will be limited by statute to 5% of market value per issuer [ORS Section 294.035(3)(i)].

Certificates of Deposit: Certificates of deposit in insured institutions as defined in ORS 706.008, in credit unions as defined in ORS Section 723.006 or in federal credit unions, if the institution or credit union maintains a head office or a branch in this state [ORS Section 294.035(3)(d)].

Bank Time Deposit/Savings Accounts: Time deposit open accounts or savings accounts in insured institutions as defined in ORS Section 706.008, in credit unions as defined in ORS Section 723.006 or in federal credit unions, if the institution or credit union maintains a head office or a branch in this state [ORS Section 294.035(3)(d)].

Bankers' Acceptance: Banker's acceptances, if the banker's acceptances are: (i) Guaranteed by, and carried on the books of, a qualified financial institution*; (ii) Eligible for discount by the Federal Reserve System; and (iii) Issued by a qualified financial institution whose short-term letter of credit rating is rated in the highest category by one or more nationally recognized statistical rating organizations [ORS Section 294.035(3)(h)].

Local Government Investment Pool: State Treasurer's local short-term investment fund up to the statutory limit per ORS Section 294.810.

*For the purposes of this paragraph, "qualified financial institution" means: (i) A financial institution that is located and licensed to do banking business in the State of Oregon; or (ii) A financial institution that is wholly owned by a financial holding company or a bank holding company that owns a financial institution that is located and licensed to do banking business in the State of Oregon [ORS Section 294.035(3)(h)].

8.3 Collateralization:

Time deposit open accounts, Certificates of Deposit and savings accounts shall be collateralized through the collateral pool for any excess over the amount insured by an agency of the United States government in accordance with ORS 295.015 and ORS 295.018.

9. INVESTMENT PARAMETERS

9.1 Diversification:

The City will diversify the investment portfolio to avoid incurring unreasonable risks, both credit and interest rate risk, inherent in over investing in specific instruments, individual financial institutions or maturities.

Credit risk: is the risk that a security or a portfolio will lose some or all of its value due to a real or perceived change in the ability of the issuer to repay its debt.

Liquidity risk: is the risk that an investment may not be easily marketable or redeemable.

Interest rate risk: longer term investments have the potential to achieve higher returns but are also likely to exhibit higher market value price volatility due to the changes in the general level of interest rates.

Diversification Constraints on Total Holdings ~~– Liquidity and Core Funds~~

Issue Type	Maximum % Holdings	Maximum % per Issuer	Ratings S&P, Moody's or Equivalent	Maximum Maturity
US Treasury Obligations	100%	None	N/A	5.25 years
US Agency Obligations	100%	35%	N/A	5.25 years
Municipal Obligations (OR, CA, ID, WA)	25%	5%	AA- / Aa3 Short Term*	5.25 years
Corporate Notes	35%**	5%***	AA- / Aa3	5.25 years
Commercial Paper			A1 / P1	270 days
Bank Time Deposits/Savings Accounts	25%	10%	Oregon Public Depository	N/A
Certificates of Deposit	10%	5%	Oregon Public Depository	5.25 years
Banker's Acceptance	25%	5%	A1 / P1	180 days
Oregon Short Term Fund	Maximum allowed per ORS 294.810	None	N/A	N/A

*Short Term Ratings: Moody's- P1/MIG1/VMIG1, S&P - A-1/SP-1, Fitch - F1

**35% maximum combined corporate and commercial paper per ORS.

***Issuer constraints apply to the combined issues in corporate and commercial paper holdings.

9.2 Investment Maturity:

The City will not directly invest in securities with a stated maturity of more than 5.25 years from the date of purchase.

- The maximum weighted maturity of the total portfolio shall not exceed two and a half (2.5) years. This maximum is established to limit the portfolio to excessive price change exposure.
- Liquidity funds will be held in the Oregon Short Term Fund, with a qualified depository institution, or investments maturing in less than~~State Pool, Bank Deposits or in money market instruments maturing~~ six months to provide sufficient liquidity for expected disbursements~~ and shorter~~. ~~The liquidity portfolio shall, at a minimum, represent six month budgeted outflows.~~
- Core funds will be the defined as the funds in excess of liquidity requirements. The investments in this portion of the portfolio will have maturities between 1 day and 5.25 years and will be only invested based on the diversification parameters listed in 9.1 of this policy.
- Total Portfolio Maturity Constraints:

Maturity Constraints	**Minimum % of Total Portfolio**
Under 30 days	10%
Under 1 year	25%
Under 5.25 years	100%
Maturity Constraints	**Total Portfolio Maximum**
Weighted Average Maturity	2.5 years
Security Structure Constraint	**Maximum % of Total Portfolio**
Callable Agency Securities	25%

9.3 Prohibited Investments:

- The City shall not invest in "144A" private placement securities, this includes commercial paper privately placed under section 4(a)(2) of the Securities Act of 1933
- The City shall not lend securities nor directly participate in a securities lending or reverse repurchase program.
- The City shall not purchase mortgage-backed securities.
- The City will not purchase, per ORS 294.040, any bonds of issuers listed in ORS 294.035(3)(a) to (c) that have a prior default history.
- No commitments to buy or sell securities may be made more than 14 days prior to the anticipated settlement date, or receive a fee other than interest for future deliveries.

10. INVESTMENT OF PROCEEDS FROM DEBT ISSUANCE

Investments of bond proceeds are restricted further and will not include corporate bonds in the dedicated bond proceed portfolio. All other allowable investments including: US Treasury, US Agency and Commercial Paper may be utilized. The investments will be made in a manner to match cash flow expectations based on managed disbursement schedules.

Liquidity for bond proceeds will be managed through the OSTF Pool or Bank deposit balances.

Funds from bond proceeds and amounts held in a bond payment reserve or proceeds fund may be invested pursuant to ORS 294.052. Investments of bond proceeds are typically not invested for resale and maturity matched with expected outflows.

Information will be maintained for arbitrage rebate calculations.

11. INVESTMENT OF RESERVE OR CAPITAL IMPROVEMENTS

Pursuant to ORS 294.135(1)(b), reserve or capital Improvement project monies may be invested in securities exceeding 5.25 years when the funds in question are being accumulated for an anticipated use that will occur more than 18 months after the funds are invested, then, upon the approval of the governing body of the county, municipality, school district or other political subdivision, the maturity of the investment or investments made with the funds may occur when the funds are expected to be used.

12. POLICY COMPLIANCE AND PERFORMANCE STANDARDS

12.1 Compliance Measurement and Procedures:

a. Compliance Report: A compliance report documenting the portfolio versus the investment policy shall be maintained quarterly.
b. Compliance Measurement: Guideline measurements will use market value of investments.
c. Compliance Procedures:

i. If the portfolio falls outside of compliance with adopted investment policy guidelines or is being managed inconsistently with this policy, the Investment Officer shall bring the portfolio back into compliance in a prudent manner and as soon as prudently feasible.

ii. Violations of portfolio guidelines as a result of transactions; actions to bring the portfolio back into compliance and; reasoning for actions taken to bring the portfolio back into compliance shall be documented and reported to the City Council.

iii. Due to fluctuations in the aggregate surplus funds balance, minimum or maximum percentages for a particular issuer, investment type or maturity constraint may be surpassed at a point in time. Securities need not be liquidated to realign the portfolio; however, consideration should be given to this matter when future purchases are made to ensure that appropriate diversification is maintained.

iv. As determined on any date that the security is held within the portfolio. If the credit rating of a security is subsequently downgraded below the minimum rating level for a new investment of that security, the Finance Director shall evaluate the downgrade on a case-by-case basis in order to determine if the security should be held or sold. The Finance Director will apply the general objectives of Safety, Liquidity, Yield and

Legality to make the decision. If the City has hired the services of an Investor Advisor, the Finance Director will act on the recommendation of the Advisor.

12.2 Performance Measurement:

a. The ~~City~~ Liquidity Portfolio yields will be compared to the OST Pool rates.

b. The Core ~~p~~Portfolio will be invested into a predetermined structure that will be measured against a selected benchmark portfolio. The structure will be based upon a chosen minimum and maximum effective duration and will have the objective to achieve market rates of returns over long investment horizons. The purpose of the benchmark is to appropriately manage the risk in the portfolio given interest rate cycles. The C~~c~~ore P~~p~~ortfolio is expected to provide similar returns to the benchmark over interest rate cycles, but may underperform or out perform in certain periods. The Core P~~p~~ortfolio will be positioned to first protect principal and then achieve market rates of return. The benchmark used will be a 0-3 year or 0-5 year standard market index and comparisons will be calculated monthly and reported quarterly.

c. When comparing the performance of the City's portfolio, all fees and expenses involved with managing the portfolio shall be included in the computation of the portfolio's rate of return.

d. The mark to market pricing will be calculated monthly and be provided in a monthly report.

13. REPORTING REQUIREMENTS

The Finance Director will retain and provide quarterly investment reports to the City Council in a similar manner as outlined in ORS 208.090. The reports also will be available upon request. Securities holdings and cash balances held in the investment portfolio will be provided on the reports.

The minimum quarterly reporting requirements for total portfolio are as follows:

- Earnings Yield
- Holdings Report (including mark to market)
- Transactions Report
- Weighted Average Maturity or Duration
- Compliance Report

14. INVESTMENT POLICY ADOPTION

This Investment Policy shall be adopted by City Council annually in accordance with ORS 294.135(a). Any significant changes to the policy must be reviewed by the Oregon Short Term-Fund Board prior to submitting to City Council for adoption.

15. GLOSSARY

Accrued Interest: The interest accumulated on a security since the issue date or since the last coupon payment. The buyer of the security pays the market price plus accrued interest.

Agency Securities: See "Federal Agency Securities."

Bankers' Acceptance (BA's): A draft or bill of exchange drawn upon and accepted by a bank. Frequently used to finance shipping of international goods. Used as a short-term credit instrument, bankers' acceptances are traded at a discount from face value as a month market instrument in the secondary market on the basis of the credit quality of the guaranteeing bank.

Basis Point: A basis point is a unit of measure used in finance to describe the percentage change in the value or rate of a financial instrument. One basis point is equivalent to 0.01% (1/100th of a percent) or 0.0001 in decimal form. In most cases, it refers to changes in interest rates and bond yields.

Benchmark: A market index used as a comparative basis for measuring the performance of an investment portfolio. A performance benchmark should represent a close correlation to investment guidelines, risk tolerance and duration of the actual portfolio's investments.

Bond: An interest-bearing security issued by a corporation, government, governmental agency, or other body. It is a form of debt with an interest rate, maturity, and face value, and it is usually secured by specific assets. Most bonds have a maturity of greater than one year and in general, pay interest semiannually.

Broker/Dealer: A person or firm transacting securities business with customers. A "broker" acts as an agent between buyers and sellers, and receives a commission for thee services. A "dealer" buys and sells financial assets from its own portfolio. A dealer takes risk by owning an inventory of securities, whereas a broker merely matches up buyers and sellers.

Call: An option to buy a specific asset at a certain price within a certain period of time.

Callable: A bond or preferred stock that may be redeemed by the issuer before maturity for a call price specified at the time of issuance.

Call Date: The date before maturity on which a bond may be redeemed at the option of the issuer.

Certificate of Deposit (CD): Bank obligation issued by a financial institution generally offering a fixed rate of return (coupon) for a specified period of time (maturity).

Collateral: Securities or other property that a borrower pledges as security for the repayment of a loan. Also refers to securities pledged by a bank to secure deposits of public monies.

Commercial Paper: Short-term, unsecured, negotiable promissory notes issued by a company or financial institution. Issued at a discount and matures at par or face value. Usually a maximum maturity of 270 days, and given a short-term debt rating by one or more NRSROs.

Core Fund: Core funds are defined as operating fund balance which exceeds the City's daily liquidity needs. Core funds are invested out the yield curve to diversify maturity structure in the

overall portfolio. Having longer term investments in a portfolio will stabilize the overall portfolio interest earnings over interest rate cycles.

Corporate Note: A debt instrument issued by a corporation with a maturity of greater than one year and less than ten years.

Coupon Rate: The annual rate of interest that the issuer of a bond promises to pay to the holder of the bond.

Current Maturity: The amount of time left until an obligation matures. For example, a one-year bill issued nine months ago has a current maturity of three months.

Current Yield: The coupon payments on a security as a percentage of the security's market price. In many instances the price should be gross of accrued interest, particularly on instruments where no coupon is left to be paid until maturity.

CUSIP: A CUSIP number identifies securities. CUSIP stands for Committee on Uniform Security Identification Procedures, which was established under the auspices of the American Bankers Association to develop a uniform method of identifying municipal, U.S. government, and corporate securities.

Delivery Versus Payment (DVP): Settlement procedure in which securities are delivered versus payment of cash, but only after cash has been received. Most security transactions, including those through the Fed Securities Wire system and DTC, are done DVP as a protection for both the buyer and seller of securities.

Depository Trust Company (DTC): A firm through which members can use a computer to arrange for securities to be delivered to other members without physical delivery of certificates. A member of the Federal Reserve System and owned mostly by the New York Stock Exchange, the Depository Trust Company uses computerized debit and credit entries. Most corporate securities, commercial paper, CDs and BAs clear through DTC.

Discount Notes: Short term debt obligations issued by Federal Agencies at a discount. Discount notes mature at par and can range in maturity from overnight to one year. Discount Notes typically have very large primary (new issue) and secondary markets.

Federal Agency Security: A debt instrument issued by one of the federal agencies. Federal agencies are considered second in credit quality and liquidity only to U.S. Treasuries.

Federal Agency: Government sponsored/owned entity created by the U.S. Congress, generally for the purpose of acting as a financial intermediary by borrowing in the marketplace and directing proceeds to specific areas of the economy considered to otherwise have restricted access to credit markets.

Federal Farm Credit Bank (FFCB): A Government Sponsored Enterprise (GSE) system that is a network of cooperatively owned lending institutions that provide credit services to farmers, agricultural cooperatives and rural utilities. The FFCBs act as financial intermediaries that borrow money in the capital markets and use the proceeds to make loans and provide other assistance to farmers and farm-affiliated businesses. FFCB debt is not an obligation of, nor is it guaranteed by the U.S. government, although it is considered to have minimal credit risk due to is importance

to the U.S. Financial system and agricultural industry. Also issues notes under it “designated note” program.

Federal Home Loan Bank System (FHLB). A Government Sponsored Enterprise (GSE) system, consisting of wholesale banks (currently twelve district banks) owned by their member banks, which provides correspondent banking services and credit to various financial institutions, financed by the issuance of securities. The principal purpose of the FHLB is to add liquidity to the mortgage markets. Although FHLB does not directly fund mortgages, it provides a stable supply of credit to thrift institutions that make new mortgage loans. FHLB debt is not an obligation of, nor is it guaranteed by the U.S. government, although it is considered to have minimal credit risk due to its importance to the U.S. financial system and housing market. Frequent issuer of discount notes, agency notes and callable agency securities. Also issues notes under its “global note” and “TAP” programs.

Federal Home Loan Mortgage Corporation (FHLMC or "Freddie Mac"). One of the large Federal Agencies. A government sponsored public corporation (GSE) that provides stability and assistance to the secondary market for home mortgages by purchasing first mortgages and participation interests financed by the sale of debt and guaranteed mortgage backed securities. FHLMC debt is not an obligation of, nor is it guaranteed by the U.S. government, although it is considered to have minimal credit risk due to its importance to the U.S. financial system and housing market. Frequent issuer of discount notes, agency notes, callable agency securities and MBS. Also issues notes under its “reference note” program.

Federal National Mortgage Association (FNMA or "Fannie Mae"). One of the large Federal Agencies. A government sponsored public corporation (GSE) that provides liquidity to the residential mortgage market by purchasing mortgage loans from lenders, financed by the issuance of debt securities and MBS (pools of mortgages packaged together as a security). FNMA debt is not an obligation of, nor is it guaranteed by the U.S. government, although it is considered to have minimal credit risk due to its importance to the U.S. financial system and housing market. Frequent issuer of discount notes, agency notes, callable agency securities and MBS. Also issues notes under its “benchmark note” program.

Federal Reserve Bank. One of the 12 distinct banks of the Federal Reserve System.

Federal Reserve System (the Fed). The independent central bank system of the United States that establishes and conducts the nation's monetary policy. This is accomplished in three major ways: (1) raising or lowering bank reserve requirements, (2) raising or lowering the target Fed Funds Rate and Discount Rate, and (3) in open market operations by buying and selling government securities. The Federal Reserve System is made up of twelve Federal Reserve District Banks, their branches, and many national and state banks throughout the nation. It is headed by the seven member Board of Governors known as the “Federal Reserve Board” and headed by its Chairman.

General Obligation Bonds (GOs): Bonds secured by the pledge of the municipal issuer’s full faith and credit, which usually includes unlimited taxing power.

Government Bonds: Securities issued by the federal government; they are obligations of the U.S. Treasury. Also known as “governments.”

Government Sponsored Enterprise (GSE): Privately owned entity subject to federal regulation and supervision, created by the U.S. Congress to reduce the cost of capital for certain borrowing

sectors of the economy such as students, farmers, and homeowners. GSEs carry the implicit backing of the U.S. Government, but they are not direct obligations of the U.S. Government. For this reason, these securities will offer a yield premium over Treasuries. Some consider GSEs to be stealth recipients of corporate welfare. Examples of GSEs include: FHLB, FHLMC, FNMA and FFCB.

Interest: Compensation paid or to be paid for the use of money. The rate of interest is generally expressed as an annual percentage.

Interest Rate: The interest payable each year on borrowed funds, expressed as a percentage of the principal.

Investment Advisor: A company that provides professional advice managing portfolios, investment recommendations and/or research in exchange for a management fee.

Investment Portfolio: A collection of securities held by a bank, individual, institution, or government agency for investment purposes.

Investment Securities: Securities purchased for an investment portfolio, as opposed to those purchased for resale to customers.

Liquidity: The ease at which a security can be bought or sold (converted to cash) in the market. A large number of buyers and sellers and a high volume of trading activity are important components of liquidity.

Liquidity Component: A percentage of the total portfolio that is dedicated to providing liquidity needs for the City.

Mark to Market: Adjustment of an account or portfolio to reflect actual market price rather than book price, purchase price or some other valuation.

Municipals: Securities, usually bonds, issued by a state or its agencies. The interest on “munis” is usually exempt from federal income taxes and state and local income taxes in the state of issuance. Municipal securities may or may not be backed by the issuing agency’s taxation powers.

NRSRO: A “Nationally Recognized Statistical Rating Organization.” A designated rating organization that the SEC has deemed a strong national presence in the U.S. NRSROs provide credit ratings on corporate and bank debt issues. Only ratings of a NRSRO may be used for the regulatory purposes of rating such as Moody’s, S&P, Fitch and Duff & Phelps.

Par Value: The value of a security expressed as a specific dollar amount marked on the face of the security, or the amount of money due at maturity. Par value should not be confused with market value.

Prudent Person Standard: Standard that requires that when investing, reinvesting, purchasing, acquiring, exchanging, selling, or managing public funds, a trustee will act with care, skill, prudence, and diligence under the circumstances the prevailing, including, but not limited to, the general economic conditions and the anticipated needs of the agency, that a prudent person acting in a like capacity and familiarity with those matters would use in the conduct of funds of a like character and with like aims, to safeguard the principal and maintain the liquidity needs of the entity.

Rate of Return: Amount of income received from an investment, expressed as a percentage of the amount invested.

State of Oregon Local Government Investment Pool (OSTF – Oregon Short Term Fund): The OSTF is organized pursuant to ORS 294.805 through 294.895. Participation in the Pool will not exceed the maximum limit annually set by ORS 294.810.

Total Return: Investment performance measured over a period of time that includes coupon interest, interest on interest, and both realized and unrealized gains or losses. Total return includes, therefore, any market value appreciation/deprecation on investments held at period end.

Treasury Bill (T-Bill): An obligation of the U.S. government with a maturity of one year or less. T-bills bear no interest but are sold at a discount.

Treasury Bonds and Notes: Obligations of the U.S. government that bear interest. Notes have maturities of one to ten years; bonds have longer maturities.

Yield: The annual rate of return on an investment, expressed as a percentage of the investment. Income yield is obtained by dividing the current dollar income by the current market price for the security. Net yield, or yield to maturity, is the current income yield minus any premium above par or plus any discount from par in the purchase price, with the adjustment spread over the period from the date of purchase to the date of maturity of the bond.

Yield to Maturity: The average annual yield on a security, assuming it is held to maturity; equals to the rate at which all principal and interest payments would be discounted to produce a present value equal to the purchase price of the bond.

CITY OF TUALATIN

Staff Report

TO:	Honorable Mayor and Members of the City Council
THROUGH:	Sherilyn Lombos, City Manager
FROM:	Bates Russell, Information Services Director Kevin McConnell, City Attorney
DATE:	11/10/2025

SUBJECT:
Resolution 5927-25 Approval of a Land Lease Agreement with New Cingular Wireless PCS, LLC (AT&T) for Wireless Communications Equipment at 8930 SW Norwood Road, Tualatin, Oregon

RECOMMENDATION:
Staff recommends that the City Council authorize the City Manager to execute a new Land Lease Agreement with New Cingular Wireless PCS, LLC (AT&T Mobility) for the installation and operation of wireless communication equipment at 8930 SW Norwood Road.

EXECUTIVE SUMMARY:
The City currently leases a portion of property at 8930 SW Norwood Road (Boones & Ibach site) for use as a cellular communications facility. The proposed lease grants AT&T approximately 150 square feet to install and operate telecommunications equipment, including antennas and support structures.

The agreement establishes a five-year initial term with five optional five-year renewals. Rent begins at $1,400 per month. After the first year and each year thereafter, monthly rent will increase by 2 percent over the rent paid during the previous year. The lease ensures that the facility complies with applicable local, state, and federal regulations and provides access for maintenance and operation.

Under this new agreement, AT&T will lease the space directly from the City as required under the provisions of the existing SBA agreement, which provides for separate subleases to wireless carriers. The lease ensures continued cellular service in the area and compliance with all federal, state, and local telecommunications standards.

OUTCOMES OF DECISION:
Approval of this lease will continue to support reliable wireless service in the Tualatin area, generate steady rental income for the City, and maintain City oversight of use, access, and safety on the leased property.

ALTERNATIVES TO RECOMMENDATION:
The Council could choose not to approve the lease. This may delay or prevent improvements to wireless service coverage and reduce lease revenue to the City.

FINANCIAL IMPLICATIONS:
The City will receive $1,400 per month in rent, beginning upon construction commencement, with a 2% increase every year. Additional costs are not anticipated. The tenant is responsible for all installation, maintenance, and utility expenses.

ATTACHMENTS:

-Land Lease Agreement between the City of Tualatin and New Cingular Wireless PCS, LLC

RESOLUTION NO. 5927-25

A RESOLUTION AUTHORIZING THE CITY MANAGER TO EXECUTE A LAND LEASE AGREEMENT BETWEEN THE CITY OF TUALATIN AND NEW CINGULAR WIRELESS PCS, LLC (AT&T MOBILITY) FOR WIRELESS COMMUNICATIONS EQUIPMENT AT 8930 SW NORWOOD ROAD

WHEREAS, the City of Tualatin ("City") owns property located at 8930 SW Norwood Road, Tualatin, Oregon (the "Property"); and

WHEREAS, the Property currently supports a cellular communications facility used by multiple wireless carriers to provide reliable wireless service to the Tualatin community; and

WHEREAS, New Cingular Wireless PCS, LLC ("AT&T Mobility") desires to lease a portion of the Property from the City to install, operate, and maintain telecommunications equipment and supporting structures as part of its wireless communication network; and

WHEREAS, the proposed Land Lease Agreement grants AT&T Mobility approximately 150 square feet for the installation and operation of telecommunications equipment, including antennas and related support facilities; and

WHEREAS, the lease establishes an initial five-year term with five optional five-year renewals, with rent beginning at $1,400 per month and will increase by two (2) percent over the rent paid during the previous year; and

WHEREAS, the lease ensures compliance with all applicable federal, state, and local laws, including telecommunications, safety, and land use regulations, and provides the City continued oversight of the leased property; and

WHEREAS, the City Council finds that approval of this lease will promote the public interest by maintaining high-quality wireless communications service in Tualatin, ensuring safe and responsible site management, and generating consistent rental income for the City.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF TUALATIN, OREGON, AS FOLLOWS:

Section 1. The City Council hereby approves the Land Lease Agreement between the City of Tualatin and New Cingular Wireless PCS, LLC (AT&T Mobility) for wireless communication facilities at 8930 SW Norwood Road.

Section 2. The City Manager is authorized to execute the Land Lease Agreement and any necessary documents to carry out the intent of this Resolution.

Section 3. This Resolution is effective upon adoption.

Adopted by the City Council this 10th day of November, 2025.

CITY OF TUALATIN, OREGON

BY_____
Mayor

APPROVED AS TO FORM

BY_____
City Attorney

ATTEST:

BY_____
City Recorder

Market: PNW
Cell Site Number: PD33
Cell Site Name: Boones & Ibach
Search Ring Name: Boones & Ibach
Fixed Asset Number: 10576570

LAND LEASE AGREEMENT

THIS LAND LEASE AGREEMENT ("**Agreement**"), dated as of the latter of the signature dates below (the "**Effective Date**"), is entered into by The City of Tualatin, an Oregon municipal corporation, having a mailing address of 18880 SW Martinazzi Ave., Tualatin, OR 97062 ("**Landlord**" or "**City**") and New Cingular Wireless PCS, LLC, a Delaware limited liability company, having a mailing address of 1025 Lenox Park Blvd NE, 3rd Floor, Atlanta, GA 30319 ("**Tenant**" or "~~Tenant~~**NCW**").

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BACKGROUND

i) Landlord owns or controls that certain plot, parcel or tract of land, as described on **Exhibit 1,** together with all rights and privileges arising in connection therewith, located at 8930 SW Norwood Road, Tualatin, ~~OR 97062~~, in the County of Washington, State of Oregon 97062 (collectively, the "**Property**"). Landlord desires to grant to ~~Tenant~~ NCW the right to use a portion of the Property in accordance with this Agreement.

Commented [KM1]: Making sure this is correct- Second Amendment to Site Lease With Option has address listed as 8930 SW Norwood Road

Commented [SG2R1]: Corrected

ii) Landlord has a valid Site Lease with Option Agreement dated May 8, 2006, as amended and assigned (collectively, the "**SLA**") with SBA Communications Corporation ("**SBA**") for use of a portion of Landlord's P~~p~~roperty for a cell tower. ~~The~~A true and accurate copy of the SLA, including all amendments and assignments thereto, is attached as **Exhibit A**.

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iii) The provisions of the SLA provide that sublessees of SBA must acquire rights from and pay rent to Landlord by a separate lease agreement.

iv) As set out in ~~Section 2 below~~this Agreement, NCW wishes to install wireless communications equipment on the Property and City is willing to lease space on the Property to NCW therefor.

The parties agree as follows:

~~1.~~ **LEASE OF PREMISES.**

1. Landlord hereby leases to ~~Tenant~~ NCW a certain portion of the Property containing approximately 150 square feet including the air space above such ground space, as described on attached **Exhibit 1**, (the "**Premises**"), for the placement of a Communication Facility in accordance with the terms of this Agreement.

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2. PERMITTED USE. ~~Tenant~~ NCW may use the Premises for the transmission and reception of communications signals and the installation, construction, maintenance, operation, repair, replacement and upgrade of communications fixtures and related equipment, cables, accessories and improvements, which may include a suitable support structure ("**Structure**"), associated antennas, equipment shelters or cabinets and fencing and any other items necessary to the successful and secure use of the Premises (the "**Communication Facility**"), as well as the right to test, survey and review title on the Property; Tenant further has the right but not the obligation to add, modify and/or replace equipment in order to be in compliance with any current or future federal, state or local mandated application, including, but not limited to, emergency 911 communication services, (collectively, the "**Permitted Use**"). Landlord and Tenant agree that any portion of the Communication Facility that may be conceptually described on **Exhibit 1** will not be deemed to limit Tenant's Permitted Use. If **Exhibit 1** includes drawings of the initial installation of the Communication Facility, Landlord's execution of this Agreement will signify Landlord's approval of **Exhibit 1**. For a period of ninety (90) days following the

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start of construction, Landlord grants Tenant, its subtenants, licensees and sublicensees, the right to use such portions of the Landlord's contiguous, adjoining or surrounding property (the "**Surrounding Property**") as may reasonably be required during construction and installation of the Communication Facility. Tenant has the right to install and operate transmission cables from the equipment shelter or cabinet to the antennas, electric lines from the main feed to the equipment shelter or cabinet and communication lines from the Property's main entry point to the equipment shelter or cabinet, install a generator and to make other improvements, alterations, upgrades or additions appropriate for Tenant's Permitted Use~~, including the right to construct a fence around the Premises or equipment~~, install warning signs to make individuals aware of risks, ~~install protective barriers, install any other control measures reasonably required by Tenant's safety procedures or applicable law~~, and undertake any other appropriate means to secure the Premises or equipment at Tenant's expense. Subject to Landlord's prior written consent, Tenant has the right to modify, supplement, replace, upgrade, expand the Communication Facility (including, for example, increasing the number of antennas or adding microwave dishes) or relocate the Communication Facility within the Premises at any time during the Term. Tenant will be allowed to make such alterations to the Property in order to ensure that the Communication Facility complies with all applicable federal, state or local laws, rules or regulations. In the event Tenant desires to modify or upgrade the Communication Facility, in a manner that requires an additional portion of the Property (the "**Additional Premises**") for such modification or upgrade, Landlord ~~agrees to~~may agree to lease to Tenant the Additional Premises, upon the same terms and conditions set forth herein, except that the Rent shall increase, in conjunction with the lease of the Additional Premises by the amount equivalent to the then-current per square foot rental rate charged by Landlord to Tenant times the square footage of the Additional Premises. ~~Landlord agrees to take such actions and enter into and deliver to Tenant such documents as Tenant reasonably requests in order to effect and memorialize the lease of the Additional Premises to Tenant.~~

3. TERM.

(a) The initial lease term will be five (5) years (the "**Initial Term**"), commencing on the Effective Date. The Initial Term will terminate on the fifth (5th) anniversary of the Effective Date.

(b) This Agreement will automatically renew for five (5) additional five (5) year term(s) (each additional five (5) year term shall be defined as an "**Extension Term**"), upon the same terms and conditions set forth herein unless Tenant notifies Landlord in writing of Tenant's intention not to renew this Agreement at least sixty (60) days prior to the expiration of the Initial Term or the then-existing Extension Term.

(c) Unless (i) Landlord or Tenant notifies the other in writing of its intention to terminate this Agreement at least six (6) months prior to the expiration of the final Extension Term, or (ii) the Agreement is terminated as otherwise permitted by this Agreement prior to the end of the final Extension Term, this Agreement shall continue in force upon the same covenants, terms and conditions for a further term of one (1) year, and for annual terms thereafter ("**Annual Term**") until terminated by either party hereto by giving to the other party hereto written notice of its intention to so terminate at least six (6) months prior to the end of any such Annual Term. Monthly rent during such Annual Terms shall be equal to the Rent paid for the last month of the final Extension Term. If Tenant remains in possession of the Premises after the termination of this Agreement, then Tenant will be deemed to be occupying the Premises on a month-to-month basis (the "**Holdover Term**"), subject to the terms and conditions of this Agreement.

(d) The Initial Term, any Extension Terms, any Annual Terms and any Holdover Term are collectively referred to as the "**Term**."

(e) In no event shall the ~~Initial~~ Term of this Agreement ~~or any Extension or Annual Term~~ extend beyond the term of the SLA, which, if not otherwise extended, will expire by its terms on ~~dated May 8, 2006~~ . Notwithstanding anything to the contrary contained in this Agreement, ~~, and any such Term~~ this Agreement shall be coterminous with the SLA~~shall expire as of that date~~.

4. RENT.

(a) Commencing on the first day of the month following the date that Tenant commences construction (the "**Rent Commencement Date**"), Tenant will pay Landlord on or before the fifth (5th) day of each calendar month in advance, One Thousand Four Hundred ~~Dollars~~ and No/100 Dollars ($1,400.00) (the "**Rent**"), at the address set forth above. In any partial month occurring after the Rent Commencement Date, the

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Rent will be prorated. The initial Rent payment will be forwarded by Tenant to Landlord within ninety (90) days after the Rent Commencement Date.

(b) In year two (2) of the Initial Term, and each year thereafter during the Term~~Upon the commencement of each Extension Term~~, the monthly Rent will increase by two ~~percent~~ (2%) over the Rent paid during the previous ~~five (5)~~ year~~term~~.

(c) All charges payable under this Agreement such as utilities and taxes shall be billed by Landlord within one (1) year from the end of the calendar year in which the charges were incurred; any charges beyond such period shall not be billed by Landlord, and shall not be payable by Tenant. The foregoing shall not apply to monthly Rent which is due and payable without a requirement that it be billed by Landlord. The provisions of this subsection shall survive the termination or expiration of this Agreement.

5. APPROVALS.

(a) Landlord agrees that Tenant's ability to use the Premises is contingent upon the suitability of the Premises and Property for the Permitted Use and Tenant's ability to obtain and maintain all governmental licenses, permits, approvals or other relief required of or deemed necessary or appropriate by Tenant for its use of the Premises, including without limitation applications for zoning variances, zoning ordinances, amendments, special use permits, and construction permits (collectively, the "**Government Approvals**"). Landlord authorizes Tenant to prepare, execute and file all required applications to obtain Government Approvals for the Permitted Use and agrees to reasonably assist Tenant with such applications and with obtaining and maintaining the Government Approvals.

(b) Tenant has the right to obtain a title report or commitment for a leasehold title policy from a title insurance company of its choice and to have the Property surveyed by a surveyor of its choice.

(c) Tenant may also perform and obtain, at Tenant's sole cost and expense, soil borings, percolation tests, engineering procedures, environmental investigation or other tests or reports on, over, and under the Property, necessary to determine if Tenant's use of the Premises will be compatible with Tenant's engineering specifications, system, design, operations or Government Approvals.

6. TERMINATION. This Agreement may be terminated, without penalty or further liability, as follows:

(a) by either party on thirty (30) days prior written notice, if the other party remains in default under Section 15~~1~~5 of this Agreement after the applicable cure periods;

(b) by Tenant upon written notice to Landlord, if Tenant is unable to obtain, or maintain, any required approval(s) or the issuance of a license or permit by any agency, board, court or other governmental authority necessary for the construction or operation of the Communication Facility as now or hereafter intended by Tenant; or if Tenant determines, in its sole discretion that the cost of or delay in obtaining or retaining the same is commercially unreasonable;

(c) by Tenant, upon written notice to Landlord, if Tenant determines, in its sole discretion, due to the title report results or survey results, that the condition of the Premises is unsatisfactory for its intended uses;

(d) by Tenant upon written notice to Landlord for any reason or no reason, at any time prior to commencement of construction by Tenant; ~~or~~

(e) by Tenant upon sixty (60) days' prior written notice to Landlord for any reason or no reason, so long as Tenant pays Landlord a termination fee equal to three (3) months' Rent, at the then-current rate, provided, however, that no such termination fee will be payable on account of the termination of this Agreement by Tenant under any termination provision contained in any other Section of this Agreement, including the other subsections of this Section 6~~the following: Section 5 Approvals, Section 6(a) Termination, Section 6(b) Termination, Section 6(c) Termination, Section 6(d) Termination, Section 11(d) Environmental, Section 18 Condemnation or Section 19 Casualty;~~.

(f) by Landlord, upon written notice to Tenant, if Landlord determines in accordance with TMC 6-4-220 that Tenant's use of the Premises constitutes a nuisance which imminently endangers human life or property; ~~or~~

(g) by Landlord, in accordance with the abatement procedures set out at TMC 6-4-170 to 6-4-180, if Tenant fails to abate a nuisance as set out at TMC 6-4-160(2);~~.~~

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(h) by Landlord of federal or state laws, regulations, or guidelines are adopted or interpreted in such a way that the use of the Premises under this Agreement is no longer permitted; or~~.~~

(i) by Tenant upon written notice to Landlord if Tenant's agreement with SBA for use of SBA's communication facilities terminates.

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7. INSURANCE. During the Term, Tenant must maintain a policy or policies of insurance for ~~Comprehensive~~Commercial Automobile ~~and vehicle~~ liability insurance covering claims for injuries to members of the public and/or damages to property of others arising from the use of motor vehicles, including on-site and off-site operations, and owned, non-owned, or hired vehicles, with $2,000,000 combined single limits per accident. In addition. Tenant must maintain a policy or policies of insurance for ~~Comprehensive~~Commercial General Liability Insurance in the amount of ~~not less than~~ $2,000,000 per occurrence and aggregate during the T~~t~~erm of thi~~s~~e Agreement. The insurance must include ~~name~~ the Tualatin Development Commission and the City of Tualatin as additional insureds by endorsement as respects this agreement. Subtenant must submit proof of insurance before commencing its use of Premises.~~will purchase and maintain in full force and effect such general liability policy as Tenant may deem necessary. Said policy of general liability insurance will at a minimum provide a combined single limit of One Million and No/100 Dollars ($1,000,000.00). Notwithstanding the foregoing, Tenant shall have the right to self-insure such general liability coverage.~~

8. INTERFERENCE.

(a) NCW acknowledges that it will not have exclusive use of the Property, portions of which (outside of the Premises) may be leased by others for other purposes. At all times during the T~~t~~erm of this Agreement, NCW agrees to use equipment of a type and tuned to a frequency that will not cause interference to other pre-existing lessees on the Property~~,~~ or the City's communication equipment, and agrees to make no changes in or to its Communication Facility or to its frequencies without prior written consent of Landlord. Prior to or concurrent with the execution of this Agreement, Landlord has provided or will provide Tenant with a list of radio frequency user(s) and frequencies used on the Property as of the Effective Date. Tenant warrants that its use of the Premises will not interfere with those existing radio frequency uses on the Property, as long as the existing radio frequency user(s) operate and continue to operate within their respective frequencies and in accordance with all applicable laws and regulations.

(b) Landlord will make best efforts to ensure future tenants of the Property will install only such equipment that is of the type and frequency which will not cause interference to the operation, use, or location of NCW's Communication Facility located on the Property. ~~not grant, after the Effective Date, a lease, license or any other right to any third party, if the exercise of such grant may in any way adversely affect or interfere with the Communication Facility, the operations of Tenant or the rights of Tenant under this Agreement.~~ Landlord will notify Tenant in writing prior to granting any third party the right to install and operate communications equipment on the Property.

(c) Landlord will make best efforts to ensure ~~not, nor will Landlord permit~~ its employees, tenants, licensees, invitees, agents or independent contractors ~~to~~ will not cause interference ~~in any way with the Communication Facility,~~to the operation~~s of Tenant or the rights of Tenant under this Agreement.~~ use, or location of NCW's Communicaiton Facility located on the Property. Landlord will cause such interference to cease within twenty-four (24) hours after receipt of notice of interference from Tenant. In the event any such interference does not cease within the aforementioned cure period, Landlord shall cease all operations which are suspected of causing interference (except for intermittent testing to determine the cause of such interference) until the interference has been corrected.

(d) For the purposes of this Agreement, "interference" may include, but is not limited to, any use on the Property or Surrounding Property that causes electronic or physical obstruction with, or degradation of, the communications signals from the Communication Facility.

9. INDEMNIFICATION.

(a) Tenant agrees to indemnify, defend and hold Landlord harmless from and against any and all injury, loss, damage or liability~~-~~, costs or expenses in connection with a third party claim (including reasonable attorneys' fees and court costs) arising directly from the installation, use, maintenance, repair or removal of the

Communication Facility or Tenant's breach of any provision of this Agreement, except to the extent attributable to the negligent or intentional act or omission of Landlord, its employees, invitees, agents or independent contractors.

(b) Subject to the limitations set out in the Oregon Constitution, City Charter and Oregon Tort Claims Act (ORS 30.265 through 30.300), Landlord agrees to indemnify, defend and hold Tenant harmless from and against any and all injury, loss, damage or liability~~,~~, costs or expenses in connection with a third party claim (including reasonable attorneys' fees and court costs) arising directly from the actions or failure to act of Landlord, its employees, invitees, agents or independent contractors, or Landlord's material breach of any provision of this Agreement, except to the extent attributable to the negligent or intentional act or omission of Tenant, its employees, agents or independent contractors.

(c) The indemnified party: (i) shall promptly provide the indemnifying party with written notice of any claim, demand, lawsuit, or the like for which it seeks indemnification pursuant to this Section 9 and provide the indemnifying party with copies of any demands, notices, summonses, or legal papers received in connection with such claim, demand, lawsuit, or the like; (ii) shall not settle any such claim, demand, lawsuit, or the like without the prior written consent of the indemnifying party; and (iii) shall fully cooperate with the indemnifying party in the defense of the claim, demand, lawsuit, or the like. A delay in notice shall not relieve the indemnifying party of its indemnity obligation, except (1) to the extent the indemnifying party can show it was prejudiced by the delay; and (2) the indemnifying party shall not be liable for any settlement or litigation expenses incurred before the time when notice is given.

10. WARRANTIES.

(a) Each of Tenant and Landlord (to the extent not a natural person) each acknowledge and represent that it is duly organized, validly existing and in good standing and has the right, power, and authority or capacity, as applicable, to enter into this Agreement and bind itself hereto through the party or individual set forth as signatory for the party below.

(b) Landlord represents, warrants and agrees that: (i) Landlord solely owns the Property as a legal lot in fee simple, or controls the Property by lease or license; (ii) the Property is not and will not be encumbered by any liens, restrictions, mortgages, covenants, conditions, easements, leases, or any other agreements of record or not of record, which would adversely affect Tenant's Permitted Use and enjoyment of the Premises under this Agreement; (iii) ~~then~~ Landlord grants to Tenant sole, actual, quiet and peaceful use, enjoyment and possession of the Premises in accordance with the terms of this Agreement without hindrance or ejection by any persons lawfully claiming under Landlord~~.~~; (iv) and Landlord's execution and performance of this Agreement will not violate any laws, ordinances, covenants or the provisions of any mortgage, lease or other agreement binding on Landlord~~.~~; ~~and (v) if the Property is or becomes encumbered by a deed to secure a debt, mortgage or other security interest, then Landlord will provide promptly to Tenant a mutually agreeable subordination, non-disturbance and attornment agreement executed by Landlord and the holder of such security interest in the form attached hereto as **Exhibit 10(b).**~~

11. ENVIRONMENTAL.

(a) Landlord, to the best of its knowledge, represents and warrants: ~~, except as may be identified in **Exhibit 11** attached to this Agreement,~~ (i) the Property, as of the Effective Date, is free of hazardous substances, including asbestos-containing materials and lead paint, and (ii) the Property has never been subject to any contamination or hazardous conditions resulting in any environmental investigation, inquiry or remediation. Landlord and Tenant agree that each will be responsible for compliance with any and all applicable governmental laws, rules, statutes, regulations, codes, ordinances, or principles of common law regulating or imposing standards of liability or standards of conduct with regard to protection of the environment or worker health and safety, as may now or at any time hereafter be in effect, to the extent such apply to that party's activity conducted in or on the Property.

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(b) Landlord, subject to the limitations set out in the Oregon Constitution, City Charter and Oregon Tort Claims Act (ORS 30.265 through 30.300) and Tenant agree to hold harmless and indemnify the other from, and to assume all duties, responsibilities and liabilities at the sole cost and expense of the indemnifying party for,

payment of penalties, sanctions, forfeitures, losses, costs or damages, and for responding to any action, notice, claim, order, summons, citation, directive, litigation, investigation or proceeding ("**Claims**"), to the extent arising from that party's breach of its obligations or representations under Section 11(a). Landlord agrees to hold harmless and indemnify Tenant from, and to assume all duties, responsibilities and liabilities at the sole cost and expense of Landlord for, payment of penalties, sanctions, forfeitures, losses, costs or damages, and for responding to any Claims, to the extent arising from subsurface or other contamination of the Property with hazardous substances prior to the Effective Date or from such contamination caused by the acts or omissions of Landlord during the Term. Tenant agrees to hold harmless and indemnify Landlord from, and to assume all duties, responsibilities and liabilities at the sole cost and expense of Tenant for, payment of penalties, sanctions, forfeitures, losses, costs or damages, and for responding to any Claims, to the extent arising from hazardous substances brought onto the Property by Tenant.

(c) The indemnification provisions contained in this Section 11 specifically include reasonable costs, expenses and fees incurred in connection with any investigation of Property conditions or any clean-up, remediation, removal or restoration work required by any governmental authority. The provisions of this Section 0~~1~~1 will survive the expiration or termination of this Agreement.

(d) In the event Tenant becomes aware of any hazardous materials on the Property, or any environmental, health or safety condition or matter relating to the Property, that, in Tenant's sole determination, renders the condition of the Premises or Property unsuitable for Tenant's use, or if Tenant believes that the leasing or continued leasing of the Premises would expose Tenant to undue risks of liability to a government agency or other third party, then Tenant will have the right, in addition to any other rights it may have at law or in equity, to terminate this Agreement upon written notice to Landlord.

12. ACCESS.

(a) At all times throughout the Term of this Agreement, Landlord will provide necessary ingress and egress to the Premises to ~~Tenant,~~ Tenant and its employees, agents, and subcontractors, who will have twenty-four (24) hour per day, seven (7) day per week pedestrian and vehicular access ("**Access**") to and over the Property, from an open and improved public road to the Premises, for the installation, maintenance and operation of the Communication Facility and any utilities serving the Premises. Prior to entry on to the Premises, NCW shall provide Landlord at least twenty-four (24) hours prior notice, unless the entry is due to an emergency, in which case NCW shall provide Landlord with immediate notice upon determining the need for entry due to the emergency. ~~As may be described more fully in **Exhibit 1**, Landlord grants to Tenant an easement for such Access and Landlord agrees to provide to Tenant such codes, keys and other instruments necessary for such Access to Tenant. Upon Tenant's request, Landlord will execute a separate recordable easement evidencing this right. Landlord shall execute a letter granting Tenant Access to the Property substantially in the form attached as **Exhibit 12**; upon Tenant's request, Landlord shall execute additional letters during the Term.~~ If Tenant elects to utilize an Unmanned Aircraft System ("**UAS**") in connection with its installation, construction, monitoring, site audits, inspections, maintenance, repair, modification, or alteration activities at a Property, Landlord hereby grants Tenant, or any UAS operator acting on Tenant's behalf, express permission to fly over the applicable Property and Premises, and consents to the use of audio and video navigation and recording in connection with the use of the UAS. ~~Landlord acknowledges that in the event Tenant cannot obtain Access to the Premises, Tenant shall incur significant damage.~~ If Landlord fails to provide the Access granted by this Section 12, such failure shall be a default under this Agreement. ~~In connection with such default, in addition to any other rights or remedies available to Tenant under this Agreement or at law or equity, Landlord shall pay Tenant, as liquidated damages and not as a penalty, $500 per day in consideration of Tenant's damages until Landlord cures such default. Landlord and Tenant agree that Tenant's damages in the event of a denial of Access are difficult, if not impossible, to ascertain, and the liquidated damages set forth above are a reasonable approximation of such damages.~~

~~12.~~ (b) Landlord reserves the right at any time without notice to enter upon the Premises through its designated agents or employees for any purpose necessary, incidental to or connected with the performance of its obligations under this Agreement or in the exercise of its proprietary or governmental functions, except that landlord will not so enter and occupy the Premises as to materially hinder or prevent normal use of the Premises by NCW, without NCW's consent, which will not be unreasonably withheld.

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13. REMOVAL/RESTORATION. All portions of the Communication Facility brought onto the Property by Tenant will be and remain Tenant's personal property and, at Tenant's option, may be removed by Tenant at any time during or after the Term. Landlord covenants and agrees that no part of the Communication Facility constructed, erected or placed on the Premises by Tenant will become, or be considered as being affixed to or a part of, the Property, it being the specific intention of Landlord that all improvements of every kind and nature constructed, erected or placed by Tenant on the Premises will be and remain the property of Tenant and may be removed by Tenant at any time during or after the Term. Tenant will repair any damage to the Property resulting from Tenant's removal activities. Any portions of the Communication Facility that Tenant does not remove within ~~one hundred twenty~~ninety (90~~120~~) days after the later of the end of the Term and cessation of Tenant's operations at the Premises shall be deemed abandoned and owned by Landlord. Notwithstanding the foregoing, Tenant will not be responsible for the replacement of any trees, shrubs or other vegetation.

14. MAINTENANCE/UTILITIES.

(a) Tenant will keep and maintain the Premises in good condition, reasonable wear and tear and damage from the elements excepted. Landlord will maintain and repair the Property and access thereto and all areas of the Premises where Tenant does not have exclusive control, in good and tenantable condition, subject to reasonable wear and tear and damage from the elements. Landlord will be responsible for maintenance of landscaping on the Property, including any landscaping installed by Tenant as a condition of this Agreement or any required permit.

(b) Tenant will be responsible for paying on a monthly or quarterly basis all utilities charges for electricity, telephone service or any other utility used or consumed by Tenant on the Premises. In the event Tenant cannot secure its own metered electrical supply, Tenant will have the right, at its own cost and expense, to sub-meter from Landlord. When sub-metering is required under this Agreement, Landlord will read the meter and provide Tenant with an invoice and usage data on a monthly basis. Tenant shall reimburse Landlord for such utility usage at the same rate charged to Landlord by the utility service provider. Landlord further agrees to provide the usage data and invoice on forms provided by Tenant and to send such forms to such address and/or agent designated by Tenant. Tenant will remit payment within sixty (60) days of receipt of the usage data and required forms. Landlord shall maintain accurate and detailed records of all utility expenses, invoices and payments applicable to Tenant's reimbursement obligations hereunder. Within fifteen (15) days after a request from Tenant, Landlord shall provide copies of such utility billing records to the Tenant in the form of copies of invoices, contracts and cancelled checks. If the utility billing records reflect an overpayment by Tenant, Tenant shall have the right to deduct the amount of such overpayment from any monies due to Landlord from Tenant.

(c) As noted in Section ~~5~~4(c) above, any utility fee recovery by Landlord is limited to a twelve (12) month period. If Tenant submeters electricity from Landlord, Landlord agrees to give Tenant at least twenty-four (24) hours advance notice of any planned interruptions of said electricity. Landlord acknowledges that Tenant provides a communication service which requires electrical power to operate and must operate twenty-four (24) hours per day, seven (7) days per week. If the interruption is for an extended period of time, in Tenant's reasonable determination, Landlord agrees to allow Tenant the right to bring in a temporary source of power for the duration of the interruption. Landlord will not be responsible for interference with, interruption of or failure, beyond the reasonable control of Landlord, of such services to be furnished or supplied by Landlord.

(d) Tenant will have the right to install utilities, at Tenant's expense, and to improve present utilities on the Property and the Premises. Landlord hereby grants to any service company providing utility or similar services, including electric power and telecommunications, to Tenant an easement over the Property, from an open and improved public road to the Premises, and upon the Premises, for the purpose of constructing, operating and maintaining such lines, wires, circuits, and conduits, associated equipment cabinets and such appurtenances thereto, as such service companies may from time to time require in order to provide such services to the Premises. Upon Tenant's or service company's request, Landlord will execute a separate recordable easement evidencing this grant, at no cost to Tenant or the service company.

15. DEFAULT AND RIGHT TO CURE.

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(a) The following will be deemed a default by Tenant and a breach of this Agreement: (i) non-payment of Rent if such Rent remains unpaid for more than thirty (30) days after written notice from Landlord of such failure to pay; or (ii) Tenant's failure to perform any other term or condition under this Agreement within forty-five (45) days after written notice from Landlord specifying the failure. No such failure, however, will be deemed to exist if Tenant has commenced to cure such default within such period and provided that such efforts are prosecuted to completion with reasonable diligence. Delay in curing a default will be excused if due to causes beyond the reasonable control of Tenant. The cure period specified herein shall not apply to a nuisance proceeding under TMC 6-4-160(2) or any health or other nuisance which imminently endangers human life or property as set out at TMC 6-4-220. If Tenant remains in default beyond any applicable cure period, then Landlord will have the right to exercise any and all rights and remedies available to it under law and equity.

(b) The following will be deemed a default by Landlord and a breach of this Agreement: (i) Landlord's failure to provide Access to the Premises as required by Section 12 within twenty-four (24) hours after written notice of such failure; ~~(ii) Landlord's failure to cure an interference problem as required by Section 8 within twenty four (24) hours after written notice of such failure; or~~ (iii) Landlord's failure to perform any term, condition or breach of any warranty or covenant under this Agreement within forty-five (45) days after written notice from Tenant specifying the failure. No such failure, however, will be deemed to exist if Landlord has commenced to cure the default within such period and provided such efforts are prosecuted to completion with reasonable diligence. Delay in curing a default will be excused if due to causes beyond the reasonable control of Landlord. If Landlord remains in default beyond any applicable cure period, Tenant will have: (i) the right to cure Landlord's default and to deduct the costs of such cure from any monies due to Landlord from Tenant, and (ii) any and all other rights available to it under law and equity.

16. ASSIGNMENT/SUBLEASE. Tenant will have the right to assign this Agreement or sublease the Premises and its rights herein, in whole or in part, ~~without Landlord's consent.~~upon receiving Landlord's prior written consent, which Landlord may in its sole discretion withhold; provided Tenant shall have the right to assign its rights in this Agreement, in whole or in part, without Landlord's consent to a Tenant Affiliate (as defined in Section 24(i)). Upon notification to Landlord of such assignment, Tenant will be relieved of all future performance, liabilities and obligations under this Agreement to the extent of such assignment.

17. NOTICES. For Notices of Default to Tenant, notices must be sent to Tenant's Lease Administration Department by email at NoticeIntake@att.com; and to Tenant's Law Department via first class certified or registered mail, return receipt requested or by a nationally recognized overnight courier, postage prepaid, addressed to:~~All notices, requests and demands hereunder will be given by first class certified or registered mail, return receipt requested, or by a nationally recognized overnight courier, postage prepaid, to be effective when properly sent and received, refused or returned undelivered. Notices will be addressed to the parties hereto as follows:~~

~~If to Tenant: New Cingular Wireless PCS, LLC~~
~~Attn: Tower Asset Group – Lease Administration~~
~~Re: Cell Site #: PD33; Cell Site Name: Boones & Ibach (add state abbreviation)~~
~~Fixed Asset #: 10576570~~
~~1025 Lenox Park Blvd NE 3rd Floor~~
~~Atlanta, Georgia 30319~~

~~With a copy to:~~ New Cingular Wireless PCS, LLC
Attn.: Legal Dept – Network Operations
Re: Cell Site #: PD33; Cell Site Name: Boones & Ibach (~~add state abbreviation~~**OR**)
Fixed Asset #: 10576570~~_____~~
208 S. Akard Street
Dallas, TX 75202-4206

All other notices will be sent:

(a) To Tenant's Lease Administration Department by email at NoticeIntake@att.com with the FA#, Cell Site #, and Cell Site Name in the email subject line; and

(b) T~~The copy sent to the Legal Department is an administrative step which alone does not constitute legal notice.~~

~~If t~~o Landlord at:

~~[~~The City of Tualatin
Attn: ~~[~~
18880 SW Martinazzi Ave.
Tualatin, OR 97062~~[~~
~~[~~

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Notices by email to Tenant's Lease Administration Department will be effective on the first calendar day after it was sent unless the sender receives an automated message that the email has not been delivered. Electronic mail shall be sent with a read receipt, but a read receipt shall not be required to establish that notice was given and received. All other notices shall be effective when properly sent and received or refused, unless returned undelivered.

Either party hereto may change the place for the giving of notice to it by thirty (30) days' prior written notice to the other party hereto as provided herein.

18. INTENTIONALLY OMITTED. ~~**18.CONDEMNATION.** In the event Landlord receives notification of any condemnation proceedings affecting the Property, Landlord will provide notice of the proceeding to Tenant within twenty-four (24) hours. If a condemning authority takes all of the Property, or a portion sufficient, in Tenant's sole determination, to render the Premises unsuitable for Tenant, this Agreement will terminate as of the date the title vests in the condemning authority. The parties will each be entitled to pursue their own separate awards in the condemnation proceeds, which for Tenant will include, where applicable, the value of its Communication Facility, moving expenses, prepaid Rent, and business dislocation expenses. Tenant will be entitled to reimbursement for any prepaid Rent on a *pro rata* basis.~~

19. CASUALTY. Landlord will provide notice to Tenant of any casualty or other harm affecting the Property within twenty-four (24) hours of the casualty or other harm. If any part of the Communication Facility or the Property is damaged by casualty or other harm as to render the Premises unsuitable, in Tenant's sole determination, then Tenant may terminate this Agreement by providing written notice to Landlord, which termination will be effective as of the date of such casualty or other harm. Upon such termination, Tenant will be entitled to collect all insurance proceeds payable to Tenant on account thereof and to be reimbursed for any prepaid Rent on a *pro rata* basis. Landlord agrees to permit Tenant to place temporary transmission and reception facilities on the Property, but only until such time as Tenant is able to activate a replacement transmission facility at another location; notwithstanding the termination of this Agreement, such temporary facilities will be governed by all of the terms and conditions of this Agreement, including Rent. If Landlord or Tenant undertakes to rebuild or restore the Premises and/or the Communication Facility, as applicable, Landlord agrees to permit Tenant to place temporary transmission and reception facilities on the Property until the reconstruction of the Premises and/or the Communication Facility is completed. If Landlord determines not to rebuild or restore the Property, Landlord will notify Tenant of such determination within thirty (30) days after the casualty or other harm. ~~If Landlord does not so notify Tenant and Tenant decides not to terminate under this Section 19, then Landlord will promptly rebuild or restore any portion of the Property interfering with or required for Tenant's Permitted Use of the Premises to substantially the same condition as existed before the casualty or other harm. Landlord agrees that the Rent shall be abated until the Property and/or the Premises are rebuilt or restored, unless Tenant places temporary transmission and reception facilities on the Property.~~

20. WAIVER OF LANDLORD'S LIENS. Landlord waives any and all lien rights it may have, statutory or otherwise, concerning the Communication Facility or any portion thereof. The Communication Facility shall be deemed personal property for purposes of this Agreement, regardless of whether any portion is deemed real or personal property under applicable law; Landlord consents to Tenant's right to remove all or any portion of the Communication Facility from time to time in Tenant's sole discretion and without Landlord's consent.

21. TAXES.

(a) Landlord shall be responsible for (i) all taxes and assessments levied upon the lands, improvements and other property of Landlord including any such taxes that may be calculated by a taxing authority using any method, including the income method, (ii) all sales, use, license, value added, documentary, stamp, gross receipts, registration, real estate transfer, conveyance, excise, recording, and other similar taxes and fees imposed in connection with this Agreement, and (iii) all sales, use, license, value added, documentary, stamp, gross receipts, registration, real estate transfer, conveyance, excise, recording, and other similar taxes and fees imposed in connection with a sale of the Property or assignment of Rent payments by Landlord. Tenant shall be responsible for (y) any taxes and assessments attributable to and levied upon Tenant's leasehold improvements on the Premises if and as set forth in this Section 21 and (z) all sales, use, license, value added, documentary, stamp, gross receipts, registration, real estate transfer, conveyance, excise, recording, and other similar taxes and fees imposed in connection with an assignment of this Agreement or sublease by Tenant. Nothing herein shall require Tenant to pay any inheritance, franchise, income, payroll, excise, privilege, rent, capital stock, stamp, documentary, estate or profit tax, or any tax of similar nature, that is or may be imposed upon Landlord.

(b) In the event Landlord receives a notice of assessment with respect to which taxes or assessments are imposed on Tenant's leasehold improvements on the Premises, Landlord shall provide Tenant with copies of each such notice immediately upon receipt, but in no event later than thirty (30) days after the date of such notice of assessment. If Landlord does not provide such notice or notices to Tenant in a timely manner and Tenant's rights with respect to such taxes are prejudiced by the delay, Landlord shall reimburse Tenant for any increased costs directly resulting from the delay and Landlord shall be responsible for payment of the tax or assessment set forth in the notice, and Landlord shall not have the right to reimbursement of such amount from Tenant. If Landlord provides a notice of assessment to Tenant within such time period and requests reimbursement from Tenant as set forth below, then Tenant shall reimburse Landlord for the tax or assessments identified on the notice of assessment on Tenant's leasehold improvements, which has been paid by Landlord. If Landlord seeks reimbursement from Tenant, Landlord shall, no later than thirty (30) days after Landlord's payment of the taxes or assessments for the assessed tax year, provide Tenant with written notice including evidence that Landlord has timely paid same, and Landlord shall provide to Tenant any other documentation reasonably requested by Tenant to allow Tenant to evaluate the payment and to reimburse Landlord.

~~(c)(e) For any tax amount for which Tenant is responsible under this Agreement, Tenant shall have the right to contest, in good faith, the validity or the amount thereof using such administrative, appellate or other proceedings as may be appropriate in the jurisdiction, and may defer payment of such obligations, pay same under protest, or take such other steps as permitted by law. This right shall include the ability to institute any legal, regulatory or informal action in the name of Landlord, Tenant, or both, with respect to the valuation of the Premises. Landlord shall cooperate with respect to the commencement and prosecution of any such proceedings and will execute any documents required therefor. The expense of any such proceedings shall be borne by Tenant and any refunds or rebates secured as a result of Tenant's action shall belong to Tenant, to the extent the amounts were originally paid by Tenant. In the event Tenant notifies Landlord by the due date for assessment of Tenant's intent to contest the assessment, Landlord shall not pay the assessment pending conclusion of the contest, unless required by applicable law.~~ Intentionally Omitted.

~~(d)(d) Landlord shall not split or cause the tax parcel on which the Premises are located to be split, bifurcated, separated or divided without the prior written consent of Tenant.~~ Intentionally Omitted.

~~(e)(e) Tenant shall have the right but not the obligation to pay any taxes due by Landlord hereunder if Landlord fails to timely do so, in addition to any other rights or remedies of Tenant. In the event that Tenant exercises its rights under this Section 21(e) due to such Landlord default, Tenant shall have the right to deduct such tax amounts paid from any monies due to Landlord from Tenant as provided in Section 15(b), provided that~~

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~~Tenant may exercise such right without having provided to Landlord notice and the opportunity to cure per Section 15(b).~~ Intentionally Omitted.

(f) Any tax-related notices shall be sent to Tenant in the manner set forth in Section 17. Promptly after the Effective Date, Landlord shall provide the following address to the taxing authority for the authority's use in the event the authority needs to communicate with Tenant. In the event that Tenant's tax address changes by notice to Landlord, Landlord shall be required to provide Tenant's new tax address to the taxing authority or authorities.

(g) Intentionally Omitted. ~~(g) Notwithstanding anything to the contrary contained in this Section 21, Tenant shall have no obligation to reimburse any tax or assessment for which the Landlord is reimbursed or rebated by a third party.~~

~~22. SALE OF PROPERTY.~~

~~(a) Landlord may sell the Property or a portion thereof to a third party, provided: (i) the sale is made subject to the terms of this Agreement; and (ii) if the sale does not include the assignment of Landlord's full interest in this Agreement, the purchaser must agree to perform, without requiring compensation from Tenant or any subtenant, any obligation of Landlord under this Agreement, including Landlord's obligation to cooperate with Tenant as provided hereunder.~~

22. SALE OF PROPERTY. If Landlord decides to rezone or sell, subdivide or otherwise transfer all or any part of the Premises, or all or any part of the Property, Landlord shall promptly notify Tenant in writing, and such rezoning, sale, subdivision or transfer shall be subject to this Agreement and Tenant's rights hereunder. Within ten (10) days of a change in ownership, transfer or sale of the Property, Landlord or its successor shall send the documents listed below to Tenant. Until Tenant receives all such documents, Tenant's failure to make payments under this Agreement shall not be an event of default and Tenant reserves the right to hold payments due under this Agreement.

i. New deed to Property, Bill of Sale, and/or Transfer Agreement
ii. New IRS Form W-9
iii. Completed and Signed Tenant Payment Direction Form
iv. Full contact information for new Landlord including email(s) & phone number(s)

23. RENTAL STREAM OFFER. If during the Term of this Agreement Landlord receives a bona fide offer from a third-party (other than a lender or a transferee from or successor of a lender) seeking an assignment or transfer of Rent payments associated with this Agreement ("**Rental Stream Offer**"), Landlord shall immediately furnish Tenant with a copy of the Rental Stream Offer. Tenant shall have the right within forty-five (45) days after it receives such copy to match the Rental Stream Offer and agree in writing to match the terms of the Rental Stream Offer. Such writing shall be in the form of a contract substantially similar to the Rental Stream Offer. If Tenant chooses not to exercise this right or fails to provide written notice to Landlord within the forty-five (45) day period, Landlord may assign the right to receive the Rent payments pursuant to the Rental Stream Offer, subject to the terms of this Agreement. If Landlord attempts to assign or transfer Rent payments without complying with this Section, the assignment or transfer shall be void. Notwithstanding anything contained herein to the contrary, the granting of a mortgage, deed of trust, security agreement or an assignment and/or transfer of this Agreement and/or the rental payments hereunder to or by lender (and the corresponding exercise by a lender or its successor or purchaser of any rights under such mortgage, deed of trust, security agreement, assignment and/or transfer, including without limitation the transfer and/or assignment of this Agreement and/or the rental payments to the lender or any thirty party) shall not be deemed a Rental Stream Offer and this Section 23 shall not apply thereto.

~~(b) If Landlord, at any time during the Term of this Agreement, decides to rezone or sell, subdivide or otherwise transfer all or any part of the Premises, or all or any part of the Property or the Surrounding Property, to a purchaser other than Tenant, Landlord shall promptly notify Tenant in writing, and such rezoning, sale, subdivision or transfer shall be subject to this Agreement and Tenant's rights hereunder. In the event of a change in ownership, transfer or sale of the Property, within ten (10) days of such transfer, Landlord or its successor shall send the documents listed below in this Section 22(b) to Tenant. Until Tenant receives all such documents,~~

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~~Tenant's failure to make payments under this Agreement shall not be an event of default and Tenant reserves the right to hold payments due under this Agreement.~~

~~i. Old deed to Property~~
~~ii. New deed to Property~~
~~iii. Bill of Sale or Transfer~~
~~iv. Copy of current Tax Bill~~
~~v. New IRS Form W-9~~
~~vi. Completed and Signed Tenant Payment Direction Form~~
~~vii. Full contact information for new Landlord including phone number(s)~~

~~(c) Landlord agrees not to sell, lease or use any areas of the Property or the Surrounding Property for the installation, operation or maintenance of other wireless communication facilities if such installation, operation or maintenance would interfere with Tenant's Permitted Use or communications equipment as determined by radio propagation tests performed by Tenant in its sole discretion. Landlord or Landlord's prospective purchaser shall reimburse Tenant for any costs and expenses of such testing. If the radio frequency propagation tests demonstrate levels of interference unacceptable to Tenant, Landlord shall be prohibited from selling, leasing or using any areas of the Property or the Surrounding Property for purposes of any installation, operation or maintenance of any other wireless communication facility or equipment.~~

~~(d) The provisions of this Section 22 shall in no way limit or impair the obligations of Landlord under this Agreement, including interference and access obligations.~~

~~23. **RIGHT OF FIRST REFUSAL.** Notwithstanding the provisions contained in Section 22, if at any time after the Effective Date, Landlord receives a bona fide written offer from a third party seeking any sale, conveyance, assignment or transfer, whether in whole or in part, of any property interest in or related to the Premises, including without limitation any offer seeking an assignment or transfer of the Rent payments associated with this Agreement or an offer to purchase an easement with respect to the Premises ("**Offer**"), Landlord shall immediately furnish Tenant with a copy of the Offer. Tenant shall have the right within ninety (90) days after it receives such copy to match the financial terms of the Offer and agree in writing to match such terms of the Offer. Such writing shall be in the form of a contract substantially similar to the Offer but Tenant may assign its rights to a third party. If Tenant chooses not to exercise this right or fails to provide written notice to Landlord within the ninety (90) day period, Landlord may sell, convey, assign or transfer such property interest in or related to the Premises pursuant to the Offer, subject to the terms of this Agreement. If Landlord attempts to sell, convey, assign or transfer such property interest in or related to the Premises without complying with this Section 23, the sale, conveyance, assignment or transfer shall be void. Tenant shall not be responsible for any failure to make payments under this Agreement and reserves the right to hold payments due under this Agreement until Landlord complies with this Section 23. Tenant's failure to exercise the right of first refusal shall not be deemed a waiver of the rights contained in this Section 23 with respect to any future proposed conveyances as described herein.~~

24. MISCELLANEOUS.

(a) **Amendment/Waiver.** This Agreement cannot be amended, modified or revised unless done in writing and signed by Landlord and Tenant. No provision may be waived except in a writing signed by both parties. The failure by a party to enforce any provision of this Agreement or to require performance by the other party will not be construed to be a waiver, or in any way affect the right of either party to enforce such provision thereafter.

(b) **Intentionally Omitted.**~~(b) **Memorandum of Lease.** Contemporaneously with the execution of this Agreement, the parties will execute a recordable Memorandum of Lease substantially in the form attached as **Exhibit 24(b)**. Either party may record this Memorandum of Lease at any time during the Term, in its absolute discretion. Thereafter during the Term, either party will, at any time upon fifteen (15) business days' prior written notice from the other, execute, acknowledge and deliver to the other a recordable Memorandum of Lease.~~

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(c) **Limitation of Liability**. Except for the indemnity obligations set forth in this Agreement, and otherwise notwithstanding anything to the contrary in this Agreement, Tenant and Landlord each waives any claims that each may have against the other with respect to consequential, incidental or special damages, however caused, based on any theory of liability.

(d) **Compliance with Law**. Tenant agrees to comply with all federal, state and local laws, orders, rules and regulations ("**Laws**") applicable to Tenant's use of the Communication Facility on the Property. Landlord agrees to comply with all Laws relating to Landlord's ownership and use of the Property and any improvements on the Property.

(e) **Bind and Benefit.** The terms and conditions contained in this Agreement will run with the Property and bind and inure to the benefit of the parties, their respective heirs, executors, administrators, successors and assigns.

(f) **Entire Agreement.** This Agreement and the exhibits attached hereto, all being a part hereof, constitute the entire agreement of the parties hereto and will supersede all prior offers, negotiations and agreements with respect to the subject matter of this Agreement. Except for **Exhibit A**, the Exhibits are numbered to correspond to the Section wherein they are first referenced. Except as otherwise stated in this Agreement, each party shall bear its own fees and expenses (including the fees and expenses of its agents, brokers, representatives, attorneys, and accountants) incurred in connection with the negotiation, drafting, execution and performance of this Agreement and the transactions it contemplates.

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(g) **Governing Law.** This Agreement will be governed by the laws of the state in which the Premises are located, without regard to conflicts of law.

(h) **Interpretation.** Unless otherwise specified, the following rules of construction and interpretation apply: (i) captions are for convenience and reference only and in no way define or limit the construction of the terms and conditions hereof; (ii) use of the term "including" will be interpreted to mean "including but not limited to"; (iii) whenever a party's consent is required under this Agreement, except as otherwise stated in the Agreement or as same may be duplicative, such consent will not be unreasonably withheld, conditioned or delayed; (iv) exhibits are an integral part of this Agreement and are incorporated by reference into this Agreement; (v) use of the terms "termination" or "expiration" are interchangeable; (vi) reference to a default will take into consideration any applicable notice, grace and cure periods; (vii) to the extent there is any issue with respect to any alleged, perceived or actual ambiguity in this Agreement, the ambiguity shall not be resolved on the basis of who drafted the Agreement; (viii) the singular use of words includes the plural where appropriate; and (ix) if any provision of this Agreement is held invalid, illegal or unenforceable, the remaining provisions of this Agreement shall remain in full force if the overall purpose of the Agreement is not rendered impossible and the original purpose, intent or consideration is not materially impaired.

(i) **Affiliates.** All references to "Tenant" shall be deemed to include any Affiliate of New Cingular Wireless PCS, LLC using the Premises for any Permitted Use or otherwise exercising the rights of Tenant pursuant to this Agreement. "Affiliate" means with respect to a party to this Agreement, any person or entity that (directly or indirectly) controls, is controlled by, or under common control with, that party. "Control" of a person or entity means the power (directly or indirectly) to direct the management or policies of that person or entity, whether through the ownership of voting securities, by contract, by agency or otherwise.

(j) **Survival**. Any provisions of this Agreement relating to indemnification shall survive the termination or expiration hereof. In addition, any terms and conditions contained in this Agreement that by their sense and context are intended to survive the termination or expiration of this Agreement shall so survive.

(k) **Payment Forms.** Notwithstanding any other provision of this Agreement, Tenant shall have no obligation to pay Rent or make any other payment to Landlord unless and until Landlord has delivered to Tenant a current IRS Form W-9, an Electronic Remittance Notification form, and a Payment Direction Form (collectively the "**Payment Forms**"). Landlord shall deliver the Payment Forms to Tenant: (i) upon execution of this Agreement; (ii) upon any change in Landlord's name or address; and (iii) at such other times as may be reasonably requested by Tenant. Upon execution of this Agreement, Landlord shall mail the Payment Forms to Tenant at 1025 Lenox Park Blvd NE 3rd Floor, Atlanta, GA 30319, at which time Tenant shall provide Landlord a supplier/vendor number. Subsequently, Landlord shall either: (1) upload the forms to the AT&T Landlord Portal (https://landlordportal.att.com/); or (2) mail the Payment Forms to the AT&T Tower Asset Group – Lease Administration. The Payment Forms are attached as **Exhibit 24(k)**. To protect Landlord's sensitive information,

Landlord shall not send any of the Payment Forms to Tenant via email. ~~(k) **W-9.** As a condition precedent to payment, Landlord agrees to provide Tenant with a completed IRS Form W-9, or its equivalent, upon execution of this Agreement and at such other times as may be reasonably requested by Tenant, including any change in Landlord's name or address.~~

(l)~~(l) **Execution/No Option.** The submission of this Agreement to any party for examination or consideration does not constitute an offer, reservation of or option for the Premises based on the terms set forth herein. This Agreement will become effective as a binding Agreement only upon the handwritten legal execution, acknowledgment and delivery hereof by Landlord and Tenant. This Agreement may be executed in two (2) or more counterparts, all of which shall be considered one and the same agreement and shall become effective when one or more counterparts have been signed by each of the parties. All parties need not sign the same counterpart.~~ **Intentionally Omitted.**

(m) **Attorneys' Fees.** In the event that any dispute between the parties related to this Agreement should result in litigation, the prevailing party in such litigation shall be entitled to recover from the other party all reasonable fees and expenses of enforcing any right of the prevailing party, including reasonable attorneys' fees and expenses. Prevailing party ~~means the party determined by the court to have most nearly prevailed even if such party did not prevail in all matters~~shall have the meaning as set out in ORS 20.077. This provision will not be construed to entitle any party other than Landlord, Tenant and their respective Affiliates to recover their fees and expenses.

(n) **Intentionally Omitted.**

~~(n) **WAIVER OF JURY TRIAL.** EACH PARTY, TO THE EXTENT PERMITTED BY LAW, KNOWINGLY, VOLUNTARILY AND INTENTIONALLY WAIVES ITS RIGHT TO A TRIAL BY JURY IN ANY ACTION OR PROCEEDING UNDER ANY THEORY OF LIABILITY ARISING OUT OF OR IN ANY WAY CONNECTED WITH THIS AGREEMENT OR THE TRANSACTIONS IT CONTEMPLATES.~~

(o) **No Additional Fees/Incidental Fees.** Unless otherwise specified in this Agreement, all rights and obligations set forth in the Agreement shall be provided by Landlord and/or Tenant, as the case may be, at no additional cost. No unilateral fees or additional costs or expenses are to be applied by either party to the other party, for any task or service including, but not limited to, review of plans, structural analyses, consents, provision of documents or other communications between the parties.

(p) **Further Acts.** Upon request, Landlord will cause to be promptly and duly taken, executed, acknowledged and delivered all such further acts, documents, and assurances as Tenant may request from time to time in order to effectuate, carry out and perform all of the terms, provisions and conditions of this Agreement and all transactions and permitted use contemplated by this Agreement.

[SIGNATURES APPEAR ON NEXT PAGE]

IN WITNESS WHEREOF, the parties have caused this Agreement to be effective as of the Effective Date.

"**LANDLORD**"

The City of Tualatin,
an Oregon municipal corporation ~~[Insert Landlord's Name]~~

~~[Insert Jurisdictional State, and Entity Type]~~

By: _____
Print Name: [_____]
Its: [Insert Title]
Date: [Insert Date]

"**TENANT**"

New Cingular Wireless PCS, LLC,
a Delaware limited liability company

By: AT&T Mobility Corporation
Its: Manager

By: _____
Print Name: Wayne Wooten
Its: Area Manager
Date: [Insert Date]

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~~[ACKNOWLEDGMENTS APPEAR ON NEXT PAGE]~~

TENANT ACKNOWLEDGMENT

STATE OF _____)
_____) ss:
COUNTY OF _____)

On the _____ day of _____, 20___, before me personally appeared _____, and acknowledged under oath that he/she is the _____ of AT&T Mobility Corporation, the Manager of New Cingular Wireless PCS, LLC, the Tenant named in the attached instrument, and as such was authorized to execute this instrument on behalf of the Tenant.

_____
Notary Public: _____
My Commission Expires: _____

LANDLORD ACKNOWLEDGMENT

STATE OF _____)
_____) ss:
COUNTY OF _____)

On the _____ day of _____, 20__ before me, personally appeared _____, who acknowledged under oath, that he/she is the person/officer named in the within instrument, and that he/she executed the same in his/her stated capacity as the voluntary act and deed of the Landlord for the purposes therein contained.

_____
Notary Public: _____
My Commission Expires: _____

EXHIBIT 1

DESCRIPTION OF PROPERTY AND PREMISES

to the Land Lease Agreement dated [Insert Date] , 20 , by and between The City of Tualatin, an Oregon municipal corporation ~~[Insert Landlord's Name] , a [Insert Jurisdictional State, and Entity Type]~~, as Landlord, and New Cingular Wireless PCS, LLC, a Delaware limited liability company, as Tenant.

The Property is legally described as follows:

For APN/Parcel ID(s): R2154937
For Tax Map ID(s): 2S135DA00101

A tract of land situated in the Southeast one-quarter of Section 35, Township 2 South, Range I West of the Willamette Meridian, in the City of Tualatin, County of Washington and State of Oregon, more particularly described as follows:

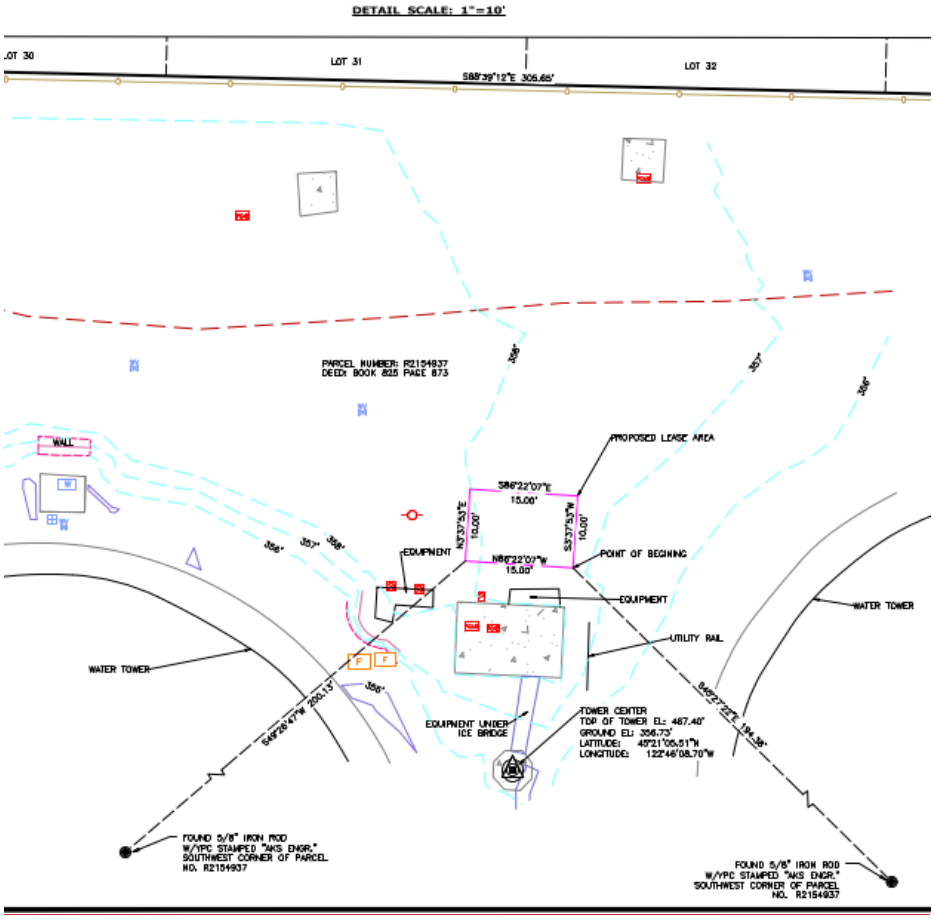
Beginning at the Northeast corner of that tract of land described in Deed to the Sherwood School District No. 88J recorded in Book 804, Page 820, Records of Washington County; thence South along the East line thereof 676.5 feet to the Southeast corner of said tract, and the true point of beginning of the herein described tract; thence continuing South along the East line extended Southerly 200 feet to a point; thence East, parallel with the South line of said school district tract extended Easterly, 300 feet to a point; thence North on a line parallel with the East line of said school district extended Southerly 200 feet to a point; thence West 300 feet to the true point of beginning.

TOGETHER WITH the Easements and Appurtenances as described in instrument recorded July 12, 1971, in Book 825, Page 876, Washington County Deed Records.

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EXHIBIT 1
Page 2 of 2

The Premises are described and/or depicted as follows:



Notes:

1. THIS EXHIBIT MAY BE REPLACED BY A LAND SURVEY AND/OR CONSTRUCTION DRAWINGS OF THE PREMISES ONCE RECEIVED BY TENANT.
2. ANY SETBACK OF THE PREMISES FROM THE PROPERTY'S BOUNDARIES SHALL BE THE DISTANCE REQUIRED BY THE APPLICABLE GOVERNMENT AUTHORITIES.
3. WIDTH OF ACCESS ROAD SHALL BE THE WIDTH REQUIRED BY THE APPLICABLE GOVERNMENT AUTHORITIES, INCLUDING POLICE AND FIRE DEPARTMENTS.
4. THE TYPE, NUMBER AND MOUNTING POSITIONS AND LOCATIONS OF ANTENNAS AND TRANSMISSION LINES ARE ILLUSTRATIVE ONLY. ACTUAL TYPES, NUMBERS AND MOUNTING POSITIONS MAY VARY FROM WHAT IS SHOWN ABOVE.

EXHIBIT A

LANDLORD & SBA SLA
(Page 1 of ___)

to the Land Lease Agreement dated [Insert Date] , 20 , by and between The City of Tualatin, an Oregon municipal corporation, as Landlord, and New Cingular Wireless PCS, LLC, a Delaware limited liability company, as Tenant.

~~**EXHIBIT 10(b)**~~

The SLA, including all amendments and assignments thereto, is attached hereto.

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EXHIBIT 24(k)

IRS FORM W-9, EFT & PDF
(Page 1 of 4)

[IRS FROM W-9 (REVISED MARCH 2024), EFT & PDF APPEAR ON FOLLOWING THREE (3) PAGES]

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Form **W-9**
(Rev. March 2024)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

Go to *www.irs.gov/FormW9* for instructions and the latest information.

Give form to the requester. Do not send to the IRS.

Before you begin. For guidance related to the purpose of Form W-9, see *Purpose of Form*, below.

Print or type. See ***Specific Instructions*** on page 3.

1 Name of entity/individual. An entry is required. (For a sole proprietor or disregarded entity, enter the owner's name on line 1, and enter the business/disregarded entity's name on line 2.)

2 Business name/disregarded entity name, if different from above.

3a Check the appropriate box for federal tax classification of the entity/individual whose name is entered on line 1. Check only **one** of the following seven boxes.

☐ Individual/sole proprietor ☐ C corporation ☐ S corporation ☐ Partnership ☐ Trust/estate

☐ LLC. Enter the tax classification (C = C corporation, S = S corporation, P = Partnership) . . . . .

Note: Check the "LLC" box above and, in the entry space, enter the appropriate code (C, S, or P) for the tax classification of the LLC, unless it is a disregarded entity. A disregarded entity should instead check the appropriate box for the tax classification of its owner.

☐ Other (see instructions)

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):

Exempt payee code (if any)

Exemption from Foreign Account Tax Compliance Act (FATCA) reporting code (if any)

(Applies to accounts maintained outside the United States.)

3b If on line 3a you checked "Partnership" or "Trust/estate," or checked "LLC" and entered "P" as its tax classification, and you are providing this form to a partnership, trust, or estate in which you have an ownership interest, check this box if you have any foreign partners, owners, or beneficiaries. See instructions . . . . . ☐

5 Address (number, street, and apt. or suite no.). See instructions.

Requester's name and address (optional)

6 City, state, and ZIP code

7 List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN*, later.

Note: If the account is in more than one name, see the instructions for line 1. See also *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number

___ – ___ – ____

or

Employer identification number

__ – _____

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and, generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign Here **Signature of U.S. person** **Date**

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to *www.irs.gov/FormW9*.

What's New

Line 3a has been modified to clarify how a disregarded entity completes this line. An LLC that is a disregarded entity should check the appropriate box for the tax classification of its owner. Otherwise, it should check the "LLC" box and enter its appropriate tax classification.

New line 3b has been added to this form. A flow-through entity is required to complete this line to indicate that it has direct or indirect foreign partners, owners, or beneficiaries when it provides the Form W-9 to another flow-through entity in which it has an ownership interest. This change is intended to provide a flow-through entity with information regarding the status of its indirect foreign partners, owners, or beneficiaries, so that it can satisfy any applicable reporting requirements. For example, a partnership that has any indirect foreign partners may be required to complete Schedules K-2 and K-3. See the Partnership Instructions for Schedules K-2 and K-3 (Form 1065).

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS is giving you this form because they

Field Code Changed

AT&T

ELECTRONIC REMITTANCE NOTIFICATION

Please provide the following information to receive email notification of payments issued.

Supplier Name: (Payee)
Supplier Number:
Email Address: (For remittance email)
Contact Phone Number:
Mailing Address:
Bank Name: (attach voided check)
Banking Routing Number: (Must be a 9-digit number)
Bank Account Number: (Please include leading zeros)
Authorized Signature:
Print Name:

In addition to the information populated above, the following information needs to be provided:

(1) Your bank routing number and account number on your bank letterhead

-OR-

(2) A voided copy of the check from the account you would like your funds deposited.

Preferred method of delivery **https://landlordportal.att.com/home**
-OR-
Email forms to g13214@att.com

US Mailing Address:
AT&T Tower Asset Group - Lease Administration
1025 Lenox Park Boulevard NE – 3rd Floor
Atlanta, GA 30319

PAYMENT DIRECTION FORM

☐ New Vendor ☐ New Site Code ☐ Existing Vendor

FA Number:
Lessor / Licensor Name:
Existing Vendor Number
Payee Percentage Payment Share:
Payee Name:
Payment Address:
Contact Phone Number:
Email Address:
Method of Payment:

I hereby authorize AT&T Mobility LLC and/or its subsidiaries to make all recurring and/or non-recurring payments related to the Payee Name and Payment Address (listed above).
This authorization shall remain in effect until it has been modified in an executed agreement or newly submitted payment direction form.

Lessor/Licensor Signature

Date

Print Name

Title

Requests can be submitted via the AT&T Landlord Portal: https://landlordportal.att.com/

Mailing address:
AT&T
Tower Asset Group - Lease Admin
1025 Lenox Park Blvd NE; 3rd Floor
Atlanta, GA 30319-5309

PDF 2.1, revised 04.14.2022

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~~**SUBORDINATION, NON-DISTURBANCE AND ATTORNMENT AGREEMENT**~~

~~[FOLLOWS ON NEXT PAGE]~~

SUBORDINATION, NON-DISTURBANCE AND ATTORNMENT AGREEMENT

THIS SUBORDINATION, NON-DISTURBANCE AND ATTORNMENT AGREEMENT ("Agreement"), dated as of the date below, between [Insert Mortgagee's Name] having its principal office at [Insert Mortgagee's Address], (hereinafter called "**Mortgagee**") and [Insert Landlord's Name], a [Insert Jurisdictional State, and Entity Type] having its principal office/residing at [Insert Landlord's Address] (hereinafter called "**Landlord**"), and New Cingular Wireless PCS, LLC, a Delaware limited liability company, having a mailing address of 1025 Lenox Park Blvd NE 3rd Floor, Atlanta, GA 30319 ("**Tenant**").

RECITALS:

A. Tenant has entered into a certain Option and Lease Agreement dated [Insert Date], 20 , (the "**Lease**") with Landlord, covering property more fully described in **Exhibit 1** attached hereto and made a part hereof (the "**Premises**"); and

B. Landlord has given to Mortgagee a mortgage (the "**Mortgage**") upon property having a street address of [Insert Address] , being identified as Lot in Block in the of [Insert City], [Insert County] County, State of [Insert State] ("**Property**"), a part of which Property contains the Premises; and

C. The Mortgage on the Property is in the original principal sum of [Spell Out Dollar Amount]($) Dollars, which Mortgage has been recorded in the appropriate public office in and for [Insert County] County, [Insert State] ("**Mortgage**"); and

D. Tenant desires to be assured of continued occupancy of the Premises under the terms of the Lease and subject to the terms of this Agreement.

AGREEMENT

NOW, THEREFORE, in consideration of the mutual promises, covenants and agreements herein contained, the receipt and sufficiency of which are hereby acknowledged, the parties hereto, intending to be legally bound hereby, agree as follows:

1. So long as this Agreement will remain in full force and effect, the Lease is and will be subject and subordinate to the lien and effect of the Mortgage insofar as it affects the real property and fixtures of which the Premises forms a part (but not Tenant's trade fixtures and other personal property), and to all renewals, modifications, consolidations, replacements and extensions thereof, to the full extent of the principal sum secured thereby and interest thereon, with the same force and effect as if the Mortgage had been executed, delivered, and duly recorded among the above-mentioned public records, prior to the execution and delivery of the Lease.

2. In the event Mortgagee takes possession of the Premises as mortgagee-in-possession, including but not limited to, by deed in lieu of foreclosure or foreclosure of the Mortgage, Mortgagee agrees not to affect or disturb Tenant's right to possession of the Premises and any of Tenant's other rights under the Lease in the exercise of Mortgagee's rights so long as Tenant is not then in default, after applicable notice and/or grace periods, under any of the terms, covenants, or conditions of the Lease.

3. In the event that Mortgagee succeeds to the interest of Landlord or other landlord under the Lease and/or to title to the Premises, Mortgagee and Tenant hereby agree to be bound to one another under all of the terms, covenants and conditions of the Lease; accordingly, from and after such event, Mortgagee and Tenant will have the same remedies against one another for the breach of an agreement contained in the Lease as

Tenant and Landlord had before Mortgagee succeeded to the interest of Landlord; provided, however, that Mortgagee will not be:

(a) personally liable for any act or omission of any prior landlord (including Landlord); or

(b) bound by any rent or additional rent which Tenant might have paid for more than the payment period as set forth under the Lease (one month, year etc.) in advance to any prior landlord (including Landlord).

4. In the event that Mortgagee or anyone else acquires title to or the right to possession of the Premises upon the foreclosure of the Mortgage, or upon the sale of the Premises by Mortgagee or its successors or assigns after foreclosure or acquisition of title in lieu thereof or otherwise, Tenant agrees not to seek to terminate the Lease by reason thereof, but will remain bound unto the new owner so long as the new owner is bound to Tenant (subject to paragraph 3 above) under all of the terms, covenants and conditions of the Lease.

5. Mortgagee understands, acknowledges and agrees that notwithstanding anything to the contrary contained in the Mortgage and/or any related financing documents, including, without limitation, any UCC-1 financing statements, Mortgagee will acquire no interest in any furniture, equipment, trade fixtures and/or other property installed by Tenant on the Property. Mortgagee hereby expressly waives any interest which Mortgagee may have or acquire with respect to such furniture, equipment, trade fixtures and/or other property of Tenant now, or hereafter, located on or affixed to the Property or any portion thereof and Mortgagee hereby agrees that same do not constitute realty regardless of the manner in which same are attached or affixed to the Property.

6. This Agreement will be binding upon and will extend to and benefit the successors and assigns of the parties hereto and to any assignees or subtenants of Tenant which are permitted under the Lease. The term "Mortgagee", when used in this Agreement will be deemed to include any person or entity which acquires title to or the right to possession of the Premises by, through or under Mortgagee and/or the Mortgage, whether directly or indirectly.

7. This Agreement will be governed by the laws of the state in which the Premises are located, without regard to conflicts of law.

[Remainder of Page Intentionally Blank – Signature Page Follows]

IN WITNESS WHEREOF, the undersigned has caused this Agreement to be executed as of the last signature date below.

LANDLORD: [Insert Landlord's Name]
[Insert Jurisdictional State, and Entity Type]

By: _____
Print Name: [_____]
Its: [Insert Title]
Date: [Insert Date]

TENANT: New Cingular Wireless PCS, LLC,
a Delaware limited liability company

By: AT&T Mobility Corporation
Its: Manager

By: _____
Print Name: [_____]
Its: [Insert Title]
Date: [Insert Date]

MORTGAGEE: [Insert Mortgagee's Name],

By: _____
Print Name: [_____]
Its: [Insert Title]
Date: [Insert Date]

[ACKNOWLEDGMENTS APPEAR ON NEXT PAGE]

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ACKNOWLEDGEMENTS

LANDLORD

STATE OF _____)
_____) ss:
COUNTY OF _____)

On the _____ day of _____, 20___, before me, personally appeared _____, who acknowledged under oath, that he/she is the person/officer named in the within instrument, and that he/she executed the same in his/her stated capacity as the voluntary act and deed of the Landlord for the purposes therein contained.

_____
Notary Public: _____
My Commission Expires: _____

TENANT

STATE OF _____)
_____) ss:
COUNTY OF _____)

On the _____ day of _____, 20___, before me personally appeared _____, who acknowledged under oath that he/she is the _____ of AT&T Mobility Corporation, the Manager of New Cingular Wireless PCS, LLC, the Tenant named in the attached instrument, and as such was authorized to execute this instrument on behalf of the Tenant.

_____
Notary Public: _____
My Commission Expires: _____

MORTGAGEE

STATE OF _____)
_____) ss:
COUNTY OF _____)

On the _____ day of _____, 20___ before me, personally appeared _____, who acknowledged under oath, that he/she is the person/officer named in the within instrument, and that he/she executed the same in his/her stated capacity as the voluntary act and deed of the Mortgagee for the purposes therein contained.

_____
Notary Public: _____
My Commission Expires: _____

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~~**EXHIBIT 1**~~

~~**DESCRIPTION OF PROPERTY AND PREMISES**~~

~~The Property is legally described as follows:~~

~~The Premises is legally described as follows:~~

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~~**EXHIBIT 10(e)(i)**~~

~~**GROUND LEASE**~~

~~[FOLLOWS ON NEXT PAGE]~~

~~(Attach Ground Lease Agreement and all Exhibits and Amendments)~~

~~**EXHIBIT 10(e)(iii)**~~

~~**CONSENT, NON-DISTURBANCE AND ATTORNMENT AGREEMENT**~~

~~[FOLLOWS ON NEXT PAGE]~~

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CONSENT, NON-DISTURBANCE AND ATTORNMENT AGREEMENT

THIS CONSENT, NON-DISTURBANCE AND ATTORNMENT AGREEMENT ("Agreement"), dated as of the date below, by and among [Insert Owner's Name] having an address at [Insert Owner's Address] (hereinafter called "**Owner**") and [Insert Landlord's Name], a [Insert Jurisdictional State, and Entity Type] having its principal office/residing at [Insert Landlord's Address] (hereinafter called "**Landlord**"), and New Cingular Wireless PCS, LLC, a Delaware limited liability company, having a mailing address of 1025 Lenox Park Blvd NE 3rd Floor, Atlanta, GA 30319 (hereinafter called "**Tenant**").

RECITALS:

A. Owner and Landlord have entered into a lease agreement (the "**Ground Lease**"), dated [Insert Date], 20 covering property more fully described on **Exhibit 1** attached hereto and made a part hereof, upon property having a street address of [Insert Address], identified as Tax Map , Lot , being in the City/Town of [Insert City/Town], [Insert County] County, State of [Insert State] ("**Property**"), a part of which Property contains the Premises (as hereinafter defined); and

B. Tenant has entered into a certain lease dated [Insert Date], 20 (the "**Lease**") with Landlord, covering property more fully described in **Exhibit 2** attached hereto and made a part hereof (the "**Premises**"); and

C. Tenant desires to be assured of continued occupancy of the Premises under the terms of the Lease and subject to the terms of this Agreement.

AGREEMENT

NOW, THEREFORE, in consideration of the mutual promises, covenants and agreements herein contained, the receipt and sufficiency of which are hereby acknowledged, the parties hereto, intending to be legally bound hereby, agree as follows:

1. Notwithstanding anything contained in the Ground Lease to the contrary, Owner consents to the subleasing by Landlord of the Premises to Tenant subject to the terms and conditions contained herein. So long as this Agreement remains in full force and effect, the Lease is and will be subject and subordinate to the Ground Lease insofar as it affects the real property and fixtures of which the Premises forms a part (but not Tenant's trade fixtures and other personal property), and to all renewals, modifications, consolidations, replacements and extensions of the Ground Lease.

2. In the event the Ground Lease is terminated or expires or Owner succeeds to the interest of Landlord or any other landlord under the Lease: (a) the Lease shall remain in full force and effect as a direct lease between Owner (and its/their heirs, distributes and assigns) and Tenant; (b) Owner agrees not to affect or disturb Tenant's right to possession of the Premises and any of Tenant's other rights under the Lease so long as Tenant is not then in default of any terms or provisions of the Lease, after applicable notice and/or grace periods; (c) Owner and Tenant hereby agree to be bound to one another under all of the terms, covenants and conditions of the Lease; and (d) notwithstanding any removal or restoration requirements contained in the Ground Lease, Landlord shall transfer ownership of the Structure (as defined in the Lease) to Owner. Accordingly, from and after any such event, Owner and Tenant will have the same remedies against one another for the breach of an agreement contained in the Lease as Tenant and Landlord had before Owner succeeded to the interest of Landlord; provided, however, that Owner will not be personally liable for any act or omission of any prior landlord (including Landlord).

3. Owner understands, acknowledges and agrees that notwithstanding anything to the contrary in this Agreement or otherwise in any other document, Owner will acquire no interest in any equipment, trade fixtures and/or other property installed by Tenant on the Property or Premises. Owner hereby expressly waives any interest which Owner may have or acquire with respect to such equipment, trade fixtures and/or other property of Tenant now, or hereafter, located on or affixed to the Property, Premises or any portion thereof, and Owner hereby agrees that same do not constitute realty regardless of the manner in which same are attached or affixed to the Property or Premises.

4. This Agreement will be binding upon and will extend to and benefit the parties hereto and their respective heirs, distributees, successors and assigns and to any assignees or subtenants of Tenant which are permitted under the Lease. The term "**Owner**," when used in this Agreement, will be

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~~deemed to include any person or entity which acquires title to or the right to possession of the Property by, through or under Owner, whether directly or indirectly.~~

~~5. This Agreement will be governed by the laws of the state in which the Premises are located, without regard to conflicts of law.~~

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IN WITNESS WHEREOF, the undersigned have caused this Agreement to be executed as of the day of , 20 .

LANDLORD: [Insert Landlord's Name]
[Insert Jurisdictional State, and Entity Type]

By:
Print Name: [ ]
Its: [Insert Title]
Date: [Insert Date]

TENANT: New Cingular Wireless PCS, LLC,
a Delaware limited liability company

By: AT&T Mobility Corporation
Its: Manager

By:
Print Name: [ ]
Its: [Insert Title]
Date: [Insert Date]

OWNER: [Insert Owner's Name] ,

By:
Print Name: [ ]
Its: [Insert Title]
Date: [Insert Date]

[ACKNOWLEDGMENTS APPEAR ON NEXT PAGE]

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LANDLORD

STATE OF _____)
_____) ss:
COUNTY OF _____)

On the _____ day of _____, 20___, before me, personally appeared _____, who acknowledged under oath, that he/she is the person/officer named in the within instrument, and that he/she executed the same in his/her stated capacity as the voluntary act and deed of the Landlord for the purposes therein contained.

_____
Notary Public: _____
My Commission Expires: _____

TENANT

STATE OF _____)
_____) ss:
COUNTY OF _____)
On the _____ day of _____, 20___, before me personally appeared _____, who acknowledged under oath that he/she is the _____ of AT&T Mobility Corporation, the Manager of New Cingular Wireless PCS, LLC, the Tenant named in the attached instrument, and as such was authorized to execute this instrument on behalf of the Tenant.

_____
Notary Public: _____
My Commission Expires: _____

OWNER

STATE OF _____)
_____) ss:
COUNTY OF _____)

On the _____ day of _____, 20___ before me, personally appeared _____, who acknowledged under oath, that he/she is the person/officer named in the within instrument, and that he/she executed the same in his/her stated capacity as the voluntary act and deed of the Mortgagee for the purposes therein contained.

_____
Notary Public: _____
My Commission Expires: _____

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~~**EXHIBIT 1**~~
~~(Property)~~

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~~**EXHIBIT 2**~~
~~(Premises)~~

~~**EXHIBIT 11**~~

~~**ENVIRONMENTAL DISCLOSURE**~~

~~Landlord represents and warrants that the Property, as of the Effective Date, is free of hazardous substances except as follows:~~

~~*[INSERT AS APPLICABLE]*~~

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~~**EXHIBIT 12**~~

~~**STANDARD ACCESS LETTER**~~

~~[FOLLOWS ON NEXT PAGE]~~

~~{This Letter Goes On Landlord's Letterhead}~~

~~[Insert Date]~~

~~Building Staff / Security Staff~~
~~[Landlord, Lessee, Licensee]~~
~~[Street Address]~~
~~[City, State, Zip]~~

~~Re: Authorized Access granted to [ ]~~

~~Dear Building and Security Staff,~~

~~Please be advised that we have signed a lease with [ ] permitting [ ] to install, operate and maintain telecommunications equipment at the property. The terms of the lease grant [ ] and its representatives, employees, agents and subcontractors ("representatives") 24 hour per day, 7 day per week access to the leased area.~~

~~To avoid impact on telephone service during the day, [ ] representatives may be seeking access to the property outside of normal business hours. [ ] representatives have been instructed to keep noise levels at a minimum during their visit.~~

~~Please grant the bearer of a copy of this letter access to the property and to leased area. Thank you for your assistance.~~

~~_____~~
~~Landlord Signature~~

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~~**EXHIBIT 24(b)**~~

~~**MEMORANDUM OF LEASE**~~

~~[FOLLOWS ON NEXT PAGE]~~

MEMORANDUM OF LEASE

This Memorandum of Lease is entered into on this day of , 20 , by and between [Insert Landlord's Name] , a [Insert Jurisdictional State, and Entity Type] having its principal office/residing at [Insert Landlord's Address] (hereinafter called "**Landlord**"), and New Cingular Wireless PCS, LLC, a Delaware limited liability company, having a mailing address of 1025 Lenox Park Blvd NE 3rd Floor, Atlanta, GA 30319 ("**Tenant**").

1. Landlord and Tenant entered into a certain Land Lease Agreement ("**Agreement**") on the day of , 20 , for the purpose of installing, operating and maintaining a communication facility and other improvements. All of the foregoing is set forth in the Agreement.

2. The initial lease term will be five (5) years commencing on the Effective Date, with [[Spell It] ( )] successive automatic five (5) year options to renew.

3. The portion of the land being leased to Tenant and associated easements are described in **Exhibit 1** annexed hereto.

4. The Agreement gives Tenant a right of first refusal in the event Landlord receives a bona fide written offer from a third party seeking any sale, conveyance, assignment or transfer, whether in whole or in part, of any property interest in or related to the Premises, including without limitation any offer seeking an assignment or transfer of the Rent payments associated with the Agreement or an offer to purchase an easement with respect to the Premises.

5. This Memorandum of Lease is not intended to amend or modify, and shall not be deemed or construed as amending or modifying, any of the terms, conditions or provisions of the Agreement, all of which are hereby ratified and affirmed. In the event of a conflict between the provisions of this Memorandum of Lease and the provisions of the Agreement, the provisions of the Agreement shall control. The Agreement shall be binding upon and inure to the benefit of the parties and their respective heirs, successors, and assigns, subject to the provisions of the Agreement.

IN WITNESS WHEREOF, the parties have executed this Memorandum of Lease as of the day and year first above written.

LANDLORD:

[Insert Landlord's Name] , a [Insert Jurisdictional State, and Entity Type]

By: _____
Print Name: [ ]
Its: [Insert Title]
Date: [Insert Date]

TENANT:

New Cingular Wireless PCS, LLC,
a Delaware limited liability company

By: AT&T Mobility Corporation
Its: Manager

By: _____
Print Name: [ ]
Its: [Insert Title]
Date: [Insert Date]

[ACKNOWLEDGMENTS APPEAR ON NEXT PAGE]

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TENANT ACKNOWLEDGMENT

STATE OF _____)
_____) ss:
COUNTY OF _____)
On the _____ day of _____, 20___, before me personally appeared _____, and acknowledged under oath that he/she is the _____ of AT&T Mobility Corporation, the Manager of New Cingular Wireless PCS, LLC, the Tenant named in the attached instrument, and as such was authorized to execute this instrument on behalf of the Tenant.

_____
Notary Public: _____
My Commission Expires: _____

LANDLORD ACKNOWLEDGMENT

STATE OF _____)
_____) ss:
COUNTY OF _____)

On the _____ day of _____, 20__ before me, personally appeared _____, who acknowledged under oath, that he/she is the person/officer named in the within instrument, and that he/she executed the same in his/her stated capacity as the voluntary act and deed of the Landlord for the purposes therein contained.

_____
Notary Public: _____
My Commission Expires: _____

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~~**EXHIBIT 1 TO MEMORANDUM OF LEASE**~~

~~**DESCRIPTION OF PROPERTY AND PREMISES**~~

~~Page _____ of _____~~

~~to the Memorandum of Lease dated _____, 20_____, by and between _____ [Insert Landlord's Name] _____, a _____ [Insert Jurisdictional State, and Entity Type] _____, as Landlord, and New Cingular Wireless PCS, LLC, a Delaware limited liability company, as Tenant.~~

~~The Property is legally described as follows:~~

~~The Premises are described and/or depicted as follows:~~

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~~**W-9 FORM**~~

~~[FOLLOWS ON NEXT PAGE]~~

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Form **W-9**
(Rev. October 2018)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

▶ Go to *www.irs.gov/FormW9* for instructions and the latest information.

Give Form to the requester. Do not send to the IRS.

Print or type. See Specific Instructions on page 3.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.

2 Business name/disregarded entity name, if different from above

3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only **one** of the following seven boxes.

☐ Individual/sole proprietor or single-member LLC ☐ C Corporation ☐ S Corporation ☐ Partnership ☐ Trust/estate

☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ▶ _____

Note: Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is another LLC that is **not** disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner.

☐ Other (see instructions) ▶

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):

Exempt payee code (if any) _____

Exemption from FATCA reporting code (if any) _____

(Applies to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.) See instructions.

Requester's name and address (optional)

6 City, state, and ZIP code

7 List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN*, later.

Note: If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number

___ – ___ – ____

or

Employer identification number

___ – _____

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign Here **Signature of U.S. person ▶** **Date ▶**

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to *www.irs.gov/FormW9*.

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding, *later.*



JUST COMPASSION

BE SEEN. BE HEARD. BE KNOWN

HISTORY

- 2010 - Started as a one-a-month meeting
- 2015 - Registered non-profit
- 2016/17 - Tigard center - Beaverton severe weather shelter
- 2020 - 24/7 year round
- 2021/22 - SHS Funding

SERVICES

- Street Outreach
- Shelters - Tigard + Gresham
- Case Management
- Permanent Supportive Housing
- Eviction Prevention
- Safe Parking








YOUR
ACTIONS
MATTER


JUST
COMPASSION
BE SEEN. BE HEARD. BE KNOWN

CITY OF TUALATIN
Staff Report

TO:	Honorable Mayor and Members of the City Council
THROUGH:	Sherilyn Lombos, City Manager
FROM:	Aquilla Hurd-Ravich, Community Development Director Keith Leonard, Associate Planner
DATE:	November 10, 2025

SUBJECT:
Appeal or Request for review of the Architectural Review Board (ARB) September 10, 2025, decision to approve, with conditions, AR24-0002 Lam Research Corporation's TUX Development to construct four buildings on 4 lots located at 11155-11361 SW Leveton Drive (Tax Lots: 2S122AA500 & 800, 2S122A00100, 2S122BA00100) in the Light Manufacturing Park Zone (MP)

ISSUE BEFORE THE COUNCIL:
The Appeal was submitted by Brett Hamilton, Appellant, who provided both written and verbal testimony primarily in opposition to traffic and noise issues that he believes will be caused by the proposed development impacting his property value and quality of life (Exhibit B).

RECOMMENDATION:
Staff recommend that City Council consider the staff report, attachments, and materials submitted into the record and provide direction to staff. A resolution affirming the September 10, 2025, ARB approval of AR24-0002 (Exhibit A) is attached should you choose to affirm the ARB decision and deny the appeal.

EXECUTIVE SUMMARY:
- The hearing is a quasi-judicial procedure.
- All appeals are "de novo" meaning new evidence and argument may be submitted at the appeal hearing.
- AR24-0002 was submitted by Mackenzie, on behalf of LAM Research Corporation on July 7, 2024.
- The subject of appeal is AR24-0002 and the ARBs decision approving AR24-0002 on September 10, 2025.
- The subject property is 75.96-acres located at 11155-11361 SW Leveton Drive. The site is zoned in the Manufacturing Park (MP) Planning District and has frontage along SW Leveton Drive, SW 108th Avenue and SW Tualatin Road.
- On September 25, 2025, an Appeal or Request for Review was submitted by Appellant who provided both written and verbal testimony in opposition to the approval of AR24-0002 primarily due to traffic and noise issues (Exhibit B). Appellants' appeal stated that "without additional conditions of approval related to traffic and noise, this land use decision would negatively impact my property value and quality of life". Specific issues noted in the Appellants' Appeal are:
    - 1 - Land use application does not meet all applicable criteria

        - a - Failure to send notice to CIOs as required by TDC 32.120(5)(b)(iii)
        - b - Violations of Manufacturing Park Zoning and Tualatin Noise Ordinance
        - c - Expanded North 108th Entrance does not meet New Driveway Approach Criteria
    - 2 - Errors made by the Applicant:
        - a - Commitments to hold a second Neighborhood Developer Meeting and then not holding it
        - b - Traffic Impact Analysis did not consider additional employee work shifts
        - c - Claims that Traffic and Noise are beyond the scope of the Architectural Review
        - d - Claims that TDC Chapter 62 is not relevant AR criteria
    - 3 - Errors made by the City of Tualatin:
        - a - Failure to provide the last 3 pages of Lam's noise model to the ARB at their hearing
        - b - Unnecessary delays in releasing Public Records
- All Appellants' written comments have been provided for Council's review (Exhibit C).
- Specific dates of Appellants' written comments that address these issues are September 9, 2024, January 29, 2025, August 8, 13, 18, 27, of 2025, and September 8, 2025.
- Staff have provided responses to each of the appellants' claims in Attachment B.

OUTCOMES OF DECISION:
Affirmation of the Architectural Review Board Decision AR24-0002 will result in the following:

- Uphold the September 10, 2025, Architectural Review Board decision approving AR24-0002 with conditions.
- Confirms that the requirements of TDC 33.020, TDC Chapter 62, 63, 73A-73D, 74 and 75 have been met either outright or with implementation of the Conditions of Approval.
- Appellants' Appeal of AR24-0002 would be denied ending all local appeals.

Reversal of AR24-0002 decision would result in:

- Concurring with the Appellant's appeal of the ARB decision.
- Either an outright denial of the application AR24-0002 or approval with amended conditions and findings as provided by the City Council.

ALTERNATIVES TO RECOMMENDATION:
The City Council may alternately:

- Deny the Appeal and affirm the Architectural Review Boards September 10, 2025, decision approving the application with Conditions.
- If the City Council identifies approval criteria that are not satisfied and is inclined to uphold the appeal, it must continue the proceedings to allow the applicant an opportunity to modify the proposal or recommend conditions of approval that would allow the application to be approved.
- Continue the hearing to a later date.

ATTACHMENTS:

- Attachment A – Presentation
- Attachment B – Memorandum Addressing the Appeal of AR24-0002.
- Attachment C – Resolution Affirming AR24-0002 ARBs Decision
- Exhibit A – AR24-0002 Analysis and Findings
- Exhibit B – Appellants' Appeal Form and Letter Detailing Claims
- Exhibit C – Appellants Public Comments
- Exhibit D – Public Notice
- Exhibit E – Lams' Noise Survey and Model 2025
- Exhibit F – Comments provided to the ARB at the September 10, 2025 Public Hearing
- Exhibit G – Lam's technical findings in response to the Appeal filed in AR 24-0002
- Exhibit H – AR24-0002 Transportation Impact Analysis (TIA)

- Exhibit I – ODOT Review Letter of AR24-0002
- Exhibit J – Pages 5-6 of Applicant's Narrative for AR24-0002

CITY of TUALATIN

Request for Review: Lam Research Expansion

AR24-0002

November 10, 2025

Issue Before Council

Consideration of an appeal filed by appellant, Mr. Brett Hamilton, of the ARBs decision to approve AR24-0002, issued on September 10, 2025.

- **Approval of Appeal = Confirms the Appellants' Appeal**
- **Denial of Appeal = Confirms the ARBs September 10th decision**

CITY of TUALATIN

Subject Site

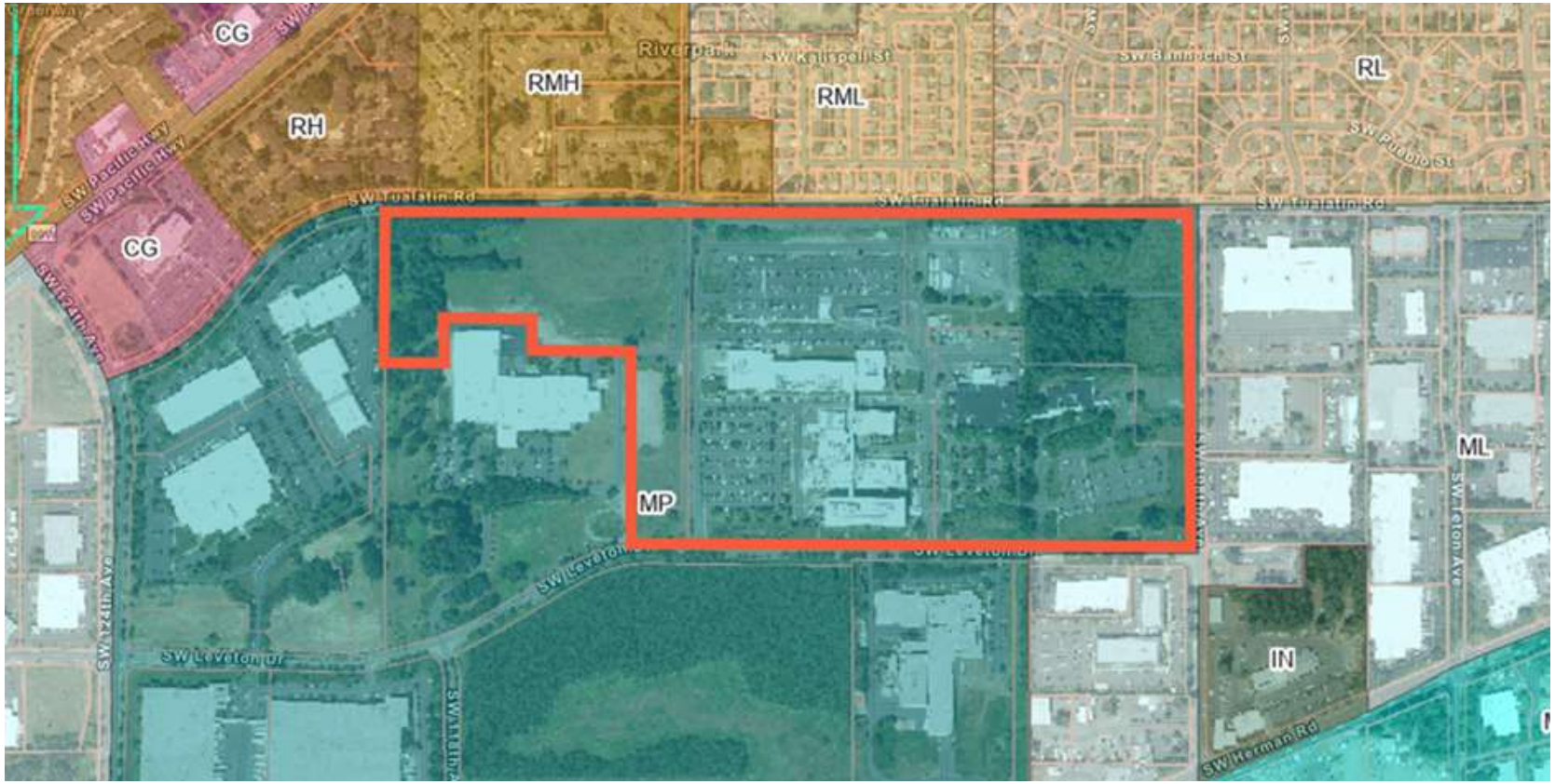
The site is located at 11155-11361 SW Leveton Drive

Comprised of 4 Tax Lots: 2S122AA 500 and 800; 2S122AB 100; 2S122BA 100

- 75.96-acres
- Access to site from SW 108th Avenue and SW Leveton Drive
- Manufacturing Park Zone (MP)

CITY of TUALATIN

Subject Site



CITY of TUALATIN

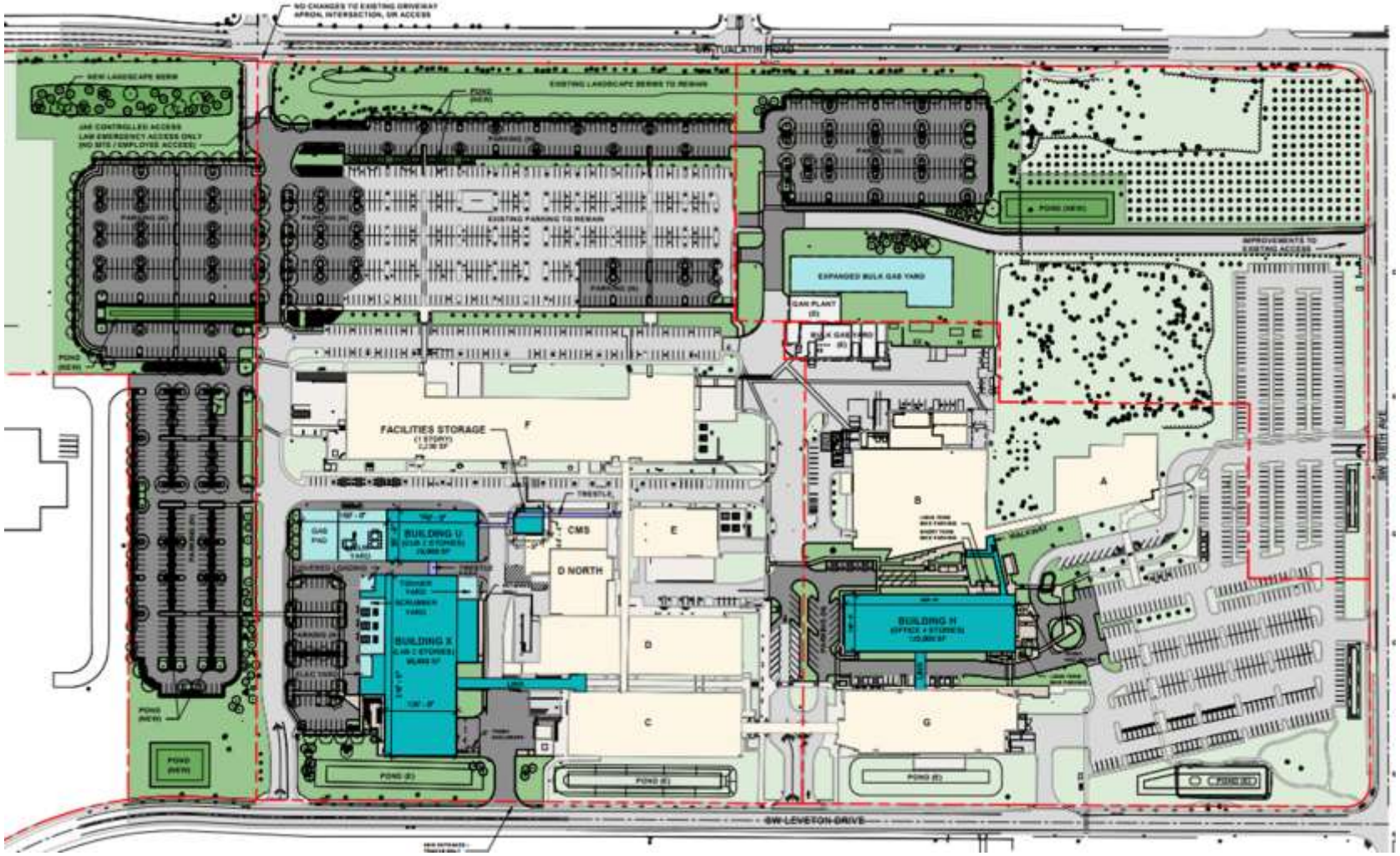
Background

Type III Architectural Review (AR)/Type IV-A Appeal

- AR application submitted on **July 8, 2024**
- Deemed incomplete on **July 24, 2024**
- Deemed complete on **December 16, 2024**
- 1st Notice of Hearing sent **December 16, 2024**
- 2nd Notice of Hearing sent **March 12, 2025**
- 3rd Notice of Hearing sent **May 16, 2025**
- Updated materials submitted on **July 21st & July 22, 2025**
- IMP24-0001 approved by PC on **August 20, 2025**
- Architectural Review Board (ARB) approved AR24-0002 on **September 10, 2025**
- Appellant filed appeal on **September 25, 2025**

CITY of TUALATIN

Project Overview



CITY of TUALATIN

Project Description

The proposed development includes phased construction of:

- A 120,000-square-foot office building,
- A 90,000-square-foot laboratory building,
- A 29,000-square-foot central utilities building, and
- A 2,230-square-foot storage building.

Site Improvements and Access includes:

- Utilizing of the 3 existing driveways from SW 108th Avenue and 3 existing driveways from SW Leveton Drive
- 1 new truck delivery driveway form SW Leveton Drive
- Net increase of 544 parking spaces including demolition of 468 existing stalls to accommodate new construction and the creation of 1,012 new or replacement spaces
- Site Landscaping and Hardscaping
- Stormwater Facilities and other public improvements

CITY of TUALATIN

Architectural Review (TDC 33.020)

Architectural Review for Large Industrial/Commercial Developments: Approval criteria listed in Chapter 73A through 73G, including:

- Site Design Standards
- Landscaping Standards
- Parking Standards
- Waste & Recyclable Management Standards

Conditions of Approval: may implement identified public facilities and services needed to serve the proposed development through Chapters 74 and 75 and noise generated after a development is constructed and operational is regulated through Chapter 63.

CITY of TUALATIN

Appellant's Claims

- Claim 1 - Land use application does not meet all applicable criteria
  - a - Failure to send notice to CIOs as required by TDC 32.120(5)(b)(iii)
  - b - Violations of Manufacturing Park Zoning and Tualatin Noise Ordinance
  - c - Expanded North 108th Entrance does not meet New Driveway Approach Criteria
- Claim 2 - Errors made by the Applicant:
  - a - Commitments to hold a second Neighborhood Developer Meeting and then not holding it
  - b - Traffic Impact Analysis did not consider additional employee work shifts
  - c - Claims that Traffic and Noise are beyond the scope of the Architectural Review
  - d - Claims that TDC Chapter 62 is not relevant AR criteria
- Claim 3 - Errors made by the City of Tualatin:
  - a - Failure to provide the last 3 pages of Lam's noise model to the ARB at their hearing
  - b - Unnecessary delays in releasing Public Records

CITY of TUALATIN

Claim: 1 - Land use application does not meet all applicable criteria

a - Failure to send notice to CIOs as required by TDC 32.120(5)(b)(iii)

Finding:

Because the alleged CIO notice deficiency did not:

- *Affect the completeness of the LAM application under TDC 32.160;*
- *Invalidate the Neighborhood/Developer Meeting under TDC 32.120(5)(d); or*
- *Prejudice the substantial rights of any party—*
- *There is no basis for invalidating the Architectural Review Board's approval of AR24-0002. A CIO representative participated in the early process, and multiple mailed and emailed notices provided ample opportunity—over 268 days—for public comment prior to the ARB hearing on September 10, 2025.*
- Page 7 of the Staff Analysis and Findings (Exhibit A)

CITY of TUALATIN

Claim: 1 - Land use application does not meet all applicable criteria

- b - Violations of Manufacturing Park Zoning and Tualatin Noise Ordinance

Finding:

- *There is an active City code enforcement investigation addressing existing noise from Lam's current facilities. Condition of Approval A25 ensures that any additional development under AR24-0002 will be subject to the same environmental and noise standards upon completion.*
- *Because the alleged noise issue pertains to existing operations and not to the unbuilt TUX project, it does not constitute grounds for invalidating the September 10, 2025, Architectural Review Board approval of AR24-0002.*
- *Condition of Approval A25 "The proposed development must comply with the Environmental Regulations of TDC Chapter 63".*
- Page 25 of the Staff Analysis and Findings and Conditions of Approval (Exhibit A)

CITY of TUALATIN

Claim: 1 - Land use application does not meet all applicable criteria

c - Expanded North 108th Entrance does not meet New Driveway Approach Criteria

Finding:

- *Lam's proposal is to connect a new parking area to the existing drive aisle and driveway that currently exists on SW 108th.*
- *Connecting the north parking lot to an existing driveway does not invalidate the September 10, 2025, ARB decision approving AR24-0002.*
- *It is an assumption on the Appellants part that all employees exiting the Lam Campus will only use the northernmost driveway from 108th Avenue and then turn onto SW Tualatin Road.*
- *Lam is not proposing any new driveways on SW 108th.*
- Pages 55–60 of the Staff Analysis and Findings (Exhibit A)

CITY of TUALATIN

Claim 2 - Errors made by the Applicant

- a - Commitments to hold a second Neighborhood Developer Meeting and then not holding it

Finding:

- *TDC 32.120 – Neighborhood/Developer Meetings describes when a neighborhood/developer meeting is required, timing of the neighborhood/developer meeting after a preapplication meeting is conducted, time and location of meeting, noticing requirements and documents the applicant is required to submit as part of the Architectural Review application.*
- *There is no stated requirement for a second neighborhood/developer meeting. The neighborhood developer meeting was held on June 5, 2024, in accordance with TDC 32.120.*
- Page 9 and 10 of the Staff Analysis and Findings (Exhibit A)

CITY of TUALATIN

Claim 2 - Errors made by the Applicant

- b - Traffic Impact Analysis did not consider additional employee work shifts

Finding:

- *The applicant's traffic study used standard Institute of Transportation Engineers (ITE) published standard rates for this type of development. Staff are unaware of any plans by Lam to have multiple shifts. In accordance with the City's traffic analysis guidelines, the applicant studied the combination of trip generation and street traffic volume with the highest probability of traffic problems developing. If other shift changes were to be made, the shift changes would be at times of the day with lower street traffic volumes, and thus lower potential for traffic problems.*
- Pages 59-61 of the Staff Analysis and Findings (Exhibit A)

CITY of TUALATIN

Claim 2 - Errors made by the Applicant

- c - Claims that Traffic and Noise are beyond the scope of the Architectural Review

Finding:

- *The Architectural Review (AR) process evaluates proposed, unbuilt developments for compliance with applicable standards in TDC Chapters 73A–73G, with related provisions in Chapters 62, 63, 74, and 75.*
- *Under TDC 33.020(6), conditions of approval may be applied to ensure adequate public facilities, address development impacts, and implement code requirements.*
- *A Transportation Impact Analysis reviewed by the City Engineer, DKS Associates, and ODOT found the study met City standards and required no mitigation.*
- *ODOT concurred that all affected intersections meet mobility standards, acknowledged limited capacity for further improvements along OR 99W, and noted that while signal retiming could enhance flow, it is not considered mitigation under ODOT policy.*
- Transportation requirements are located on pages 59-61 and Noise is discussed on Page 25 (Exhibit A)

CITY of TUALATIN

Claim 2 - Errors made by the Applicant

- d - Claims that TDC Chapter 62 is not relevant AR criteria

Finding:

- Chapter 62 Manufacturing Park Zone (MP) is the zoning that is applicable to the review AR24-0002.
- Chapter 62 lists permitted, conditional and limited land uses, limitations on uses and development standards such as setbacks.
- City Staff evaluated the proposed development in light of Chapter 62 and it's unclear how this would be grounds for reversing the ARBs decision approving AR24-0002.
- Pages 22 - 25 of the Staff Analysis and Findings (Exhibit A)

CITY of TUALATIN

Claim 3 - Errors made by the City of Tualatin

- a - Failure to provide the last 3 pages of Lam's noise model to the ARB at their hearing

Finding:

- The Lam TUX Expansion Environmental Noise Model is dated September 10, 2025. The City received this study on Wednesday, September 10, 2025, at 4:42 p.m., the day of the Architectural Review Board (ARB) public hearing.
- A technical printing issue initially caused the fina 3 pages of the 5 page noise model to be omitted.
- There is no requirement in the Tualatin Development Code for a formal "noise model" in either TDC 32.140 Application Submittal of 33.020 (4) Architectural Review Submittal Materials.
- Community members may provide additional written or verbal input up until and during the hearing until the close of the public comment portion of the hearing.
- The timing of the noise model's submission does not constitute an error by the City, nor does it provide grounds to reverse the ARB's approval of AR24-0002.
- The concern raised by the Appellant regarding the timeliness of providing Lam's Noise Model is not an Architectural Review requirement, criterion or a reason to overturn the ARBs decision approving AR24-0002.

CITY of TUALATIN

Claim 3 - Errors made by the City of Tualatin

- b - Unnecessary delays in releasing Public Records

Finding:

- The appellant made two requests for public records, one on July 15th and a second request on July 21, 2025.
- The Deputy City recorder provided a response on July 15th that new materials had not yet been submitted.
- “The City shall respond to all requests as soon as practical and without unreasonable delay within five (5) business days or within five (5) business days will explain why more time is needed for a full response”.
- Lam officially submitted materials on July 21st and 22, 2025.
- Access to the updated application materials were provided the appellant on July 23, 2025.
- The concern raised by the Appellant regarding unnecessary delays in release of public information is not a criterion that is reviewed as part of the Architectural Review process and is not a reason for reversing the approval of AR24-0002.

CITY of TUALATIN

Request for Review/Appeal

- **TDC 32.310 (Request for Review) applies to this process:**
  - Staff has provided Memorandum addressing all claims within the Appellants' appeal
  - The City received additional materials from the Appellant (Brett Hamilton)
  - The City receive additional materials from the Applicant (Lam)
  - No public comments received

CITY of TUALATIN

COUNCIL ACTION

City Council is asked to make a decision on the Appeal or Request for Review of the ARBs September 10, 2025, decision approving AR22-0002 Lam Research Expansion.

Council may:

- *Deny the Appeal and affirm the Architectural Review Boards September 10, 2025, decision approving the application with Conditions;*
  - ***i.e. deny appeal***
- *Reverse the AR24-0002 Decision and adopt a written order that clearly states the basis for the Council's decision; or*
  - ***i.e. approve appeal***
- *If the City Council identifies approval criteria that are not satisfied and is inclined to uphold the appeal, it must continue the proceedings to allow the applicant an opportunity to modify the proposal or recommend conditions of approval that would allow the application to be approved.*

CITY of TUALATIN

CITY of TUALATIN

November 10, 2025

To: City Council

From: Aquilla Hurd-Ravich, Community Development Director
Keith Leonard, Associate Planner
Mike McCarthy, City Engineer

Re: Supplemental Staff Memo – Architectural Review (AR) for Lam Research Corporation located at located at 11155-11361 SW Leveton Drive (Tax Lots: 2S122AA500 & 800, 2S122A00100, 2S122BA00100) in the Light Manufacturing Park Zone (MP).

Subject: AR24-0002 Lam TUX Development - An Appeal or Request for Review of the September 10, 2025, Architectural Review Board decision approving,

I. INTRODUCTION

The city has received an Appeal of a Type III Architectural Review Board decision for AR24-0002 on September 10, 2025, approving, with conditions, the construction of four buildings totaling 241,230 square feet on four lots comprising 75.96 acres in the Manufacturing Park Zone (MP). The staff memorandum will address all stated issues in the appeal (Attachment B). The "Appellant" Brett Hamilton filed an appeal (Exhibit B) on September 25, 2025, within the allotted 14-day appeal period.

II. PROCEDURES AND LEGAL FRAMEWORK

New developments of 50,000 square feet or larger industrial and commercial use properties are subject to a Type III Architectural Review, as described in Tualatin Development Code (TDC) 32.230, following a Quasi-Judicial Review and public hearing before the Architectural Review Board as provided under TDC 33.020. The Lam development proposals has been reviewed as commercial use due to the office component of the proposal. Written notice under 32.230(3) was provided and opportunity to comment both in writing before the hearing and/or orally at the hearing under TDC 32.230 (4)(a) was described in all public notices.

The Appeal is governed by the procedure set out in TDC 32.310, subject to the following limitations:

- An appeal of aa Type III decision may be made by any person who submitted written comments prior to or during the public hearing or provided testimony at the public hearing.
- A Notice of Appeal must be made within 14 calendar days of the date of mailing the written Notice of Decision or Notice of Adoption. The Notice of Appeal must be on forms provided by the City and be accompanied by the appeal fee. The notice of appeal must contain the following:
    - Identification of the decision sought to be appealed, including its assigned case number, the title or caption of the decision, and the decision date; and
    - The name and mailing address of the appellant and a statement establishing the appellant's standing to appeal the decision, including how the appellant is adversely affected by the decision.
- The timely and complete filing of the notice of appeal and payment of the appeal fee are jurisdictional. The City Manager cannot accept a notice of appeal that does not comply with this section.

When reviewing a land use application, the City must approve or deny the request considering only the "standards and criteria" adopted within the TDC and ORS 227.173(1). This means that the Council cannot deny the application for reasons that are not set forth in the relevant approval criteria, which are provided in the ARBs decision AR24-0002. Where the ARB finds that the adopted standards and criteria are satisfied, the application must be approved. TDC 33.020 (c) states "Applications General Development must comply with the applicable standards and objectives in TDC Chapters 73A through 73G. General Architectural Review decision may include conditions of approval that apply restrictions and conditions that:

- Implement identified public facilities and services needed to serve the proposed development;
- Implement identified public facilities and services needed to be altered or increased attributable to the impacts of the proposed development; and
- Implement the requirements of the Tualatin Development Code.

Types of conditions of approval that may be imposed include, but are not limited to:

- *Development Schedule*. A reasonable time schedule placed on construction activities associated with the proposed development, or portion of the development.
- *Dedications*, *Reservation*. Dedication or reservation of land, or the granting of an easement for park, open space, rights-of-way, bicycle or pedestrian paths, Greenway, Natural Area, Other Natural Area, riverbank, the conveyance of title or easements to the City or a non-profit conservation organization, or a homeowners' association.
- *Construction and Maintenance Guarantees*. Security from the property owners in such an amount that will assure compliance with approval granted.

- *Plan Modifications*. Changes in the design or intensity of the proposed development, or in proposed construction methods or practices, necessary to assure compliance with this chapter.
- *Other Approvals*. Evaluation, inspections or approval by other agencies, jurisdictions, public utilities, or consultants, may be required for all or any part of the proposed development.
- *Access Limitation*. The number, location and design of street accesses to a proposed development may be limited or specified where necessary to maintain the capacity of streets to carry traffic safely, provided that sufficient access to the development is maintained.

III. FACTUAL BACKGROUND

The Lam Research campus site consists of a 75.96-acre campus on four lots located at 11155-11361 SW Leveton Drive (Washington County Tax Lots: 2S122AA 500 and 800; 2S122AB 100; 2S122BA 100). The general location of the site is south of SW Tualatin Road, west of SW 108th Avenue and north of SW Leveton Drive. Lam Research also has facilities south of Leveton Road and one building east of SW 108th Avenue. The four subject lots of AR24-0002 are zoned Manufacturing Park (MP).

The site contains several existing buildings and improvements, parking areas and drive aisles, stormwater facilities, walkways, landscaping, and hardscaping. The site is accessed by three driveways from SW 108th Avenue and three accesses from SW Leveton Drive. There is an access on SW Tualatin Road for JAE for deliveries and JAE employees and shared with Lam for emergency access only. This site is in the former Leveton Urban Renewal District. Currently, Lam Building “G”, approved with IMP22-0001/AR22-0006, is under construction and nearing completion in the southeast portion of the site but not depicted in Figure 1. The site slopes gradually from high elevations of 180 to 190 feet along SW Tualatin Road to low elevations of 140 to 160 feet along SW Leveton Drive, approximately a 40 feet elevation change from north to south.

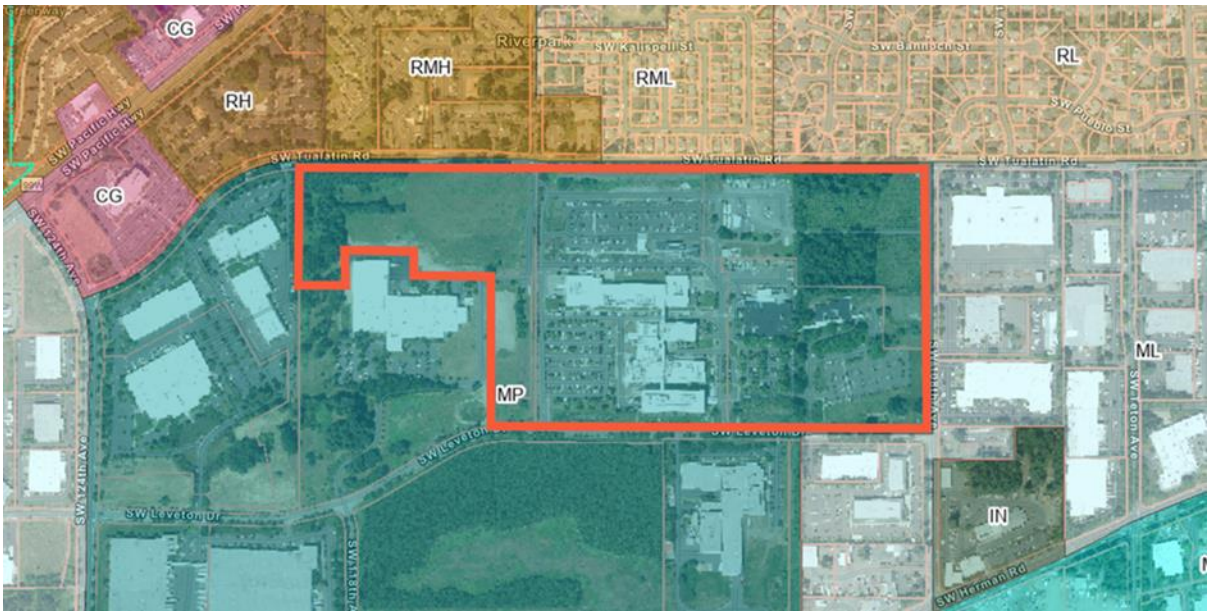


Figure 1: Aerial view of subject site (outlined in red)

IV. PROJECT DESCRIPTION

The original Architectural Review (AR) application, AR24-0002, was submitted on July 8, 2024. The Applicant received approval of their Industrial Master Plan, IMP24-0001, from the Planning Commission on August 20, 2025, and this decision is final. The City deemed the application complete on December 16, 2024. Following that determination, the applicant submitted revised materials that modified the original project design, consistent with the provisions of TDC 32.170 (Revised Applications). The final revised submittal was received on July 29, 2025.

The current application included substantial changes from the July 2024 proposal. Notably, the applicant has eliminated a previously proposed employee access to SW Tualatin Road (the existing access serving JAE and the emergency access for Lam will remain). In addition, the total building area has been reduced from approximately 423,470 square feet to 241,230 square feet.

Public improvements associated with the proposed development include:

- Half-street right-of-way dedication and street improvements along SW Leveton Drive and SW Tualatin Road.
- Dedication of public utility easements along SW 108th Avenue, SW Leveton Drive, and SW Tualatin Road to accommodate water meters, vaults, and onsite water laterals.
- Construction of sidewalk along the northernmost access to SW 108th Avenue and evaluation of other sidewalks for ADA compliance.
- Traffic signal coordination at the intersection of OR 99W and SW Tualatin Road to improve left-turn movements onto SW Tualatin Road.

- Evaluation and installation of street lighting to meet City standards.
- Street tree planting consistent with approved permit plans.

Modifications to existing and construction of new stormwater facilities will ensure compliance with treatment, hydromodification, and detention requirements for all private impervious surfaces.

The proposed development includes construction of:

- A 120,000-square-foot office building,
- A 90,000-square-foot laboratory building,
- A 29,000-square-foot central utilities building, and
- A 2,230-square-foot storage building,

All building construction will be concentrated in the southern and western portions of the campus. The lab and office buildings feature insulated metal panels with smooth and ribbed textures in shades of gray and silver. The lab building includes limited window openings due to its functional requirements. The storage building will utilize painted concrete panels in gray tones, while the office building matches the architectural character of Building G, currently being constructed and nearing completion pursuant to IMP 22-0001 and AR 22-0006. The unoccupied storage building will feature corrugated metal siding and roofing with no windows.

Additional employee parking will be in the northern and western part of the site. The northernmost parking lot will be accessed from the existing northernmost driveway on SW 108th Avenue and existing westernmost driveway from SW Leveton Drive. A new driveway on SW Leveton Drive will be limited to truck traffic only.

The project will result in a net increase of 544 parking spaces. This figure includes demolition of 468 existing stalls to accommodate new construction and the creation of 1,012 new or replacement spaces, including 127 spaces previously approved under AR 22-0006 but not constructed. Associated improvements include new landscaped and hardscaped areas and the installation of stormwater detention ponds.

Along SW Tualatin Road, the applicant proposes to extend the existing landscape berm westward to provide additional voluntary buffering between the site and adjacent uses. The extended landscape berm will be constructed using fill generated from Phase 2 excavations and completed during Phase 3 (see phasing description below).

The applicant proposes a three-phase construction schedule:

- Phase 1: Construction of the office building and northern parking lot within two years of AR 24-0002 approval.
- Phase 2: Construction of the lab, central utilities building, and storage building within four years.
- Phase 3: Expansion of the bulk gas yard and additional parking in the southwestern portion of the site, beginning within six years.

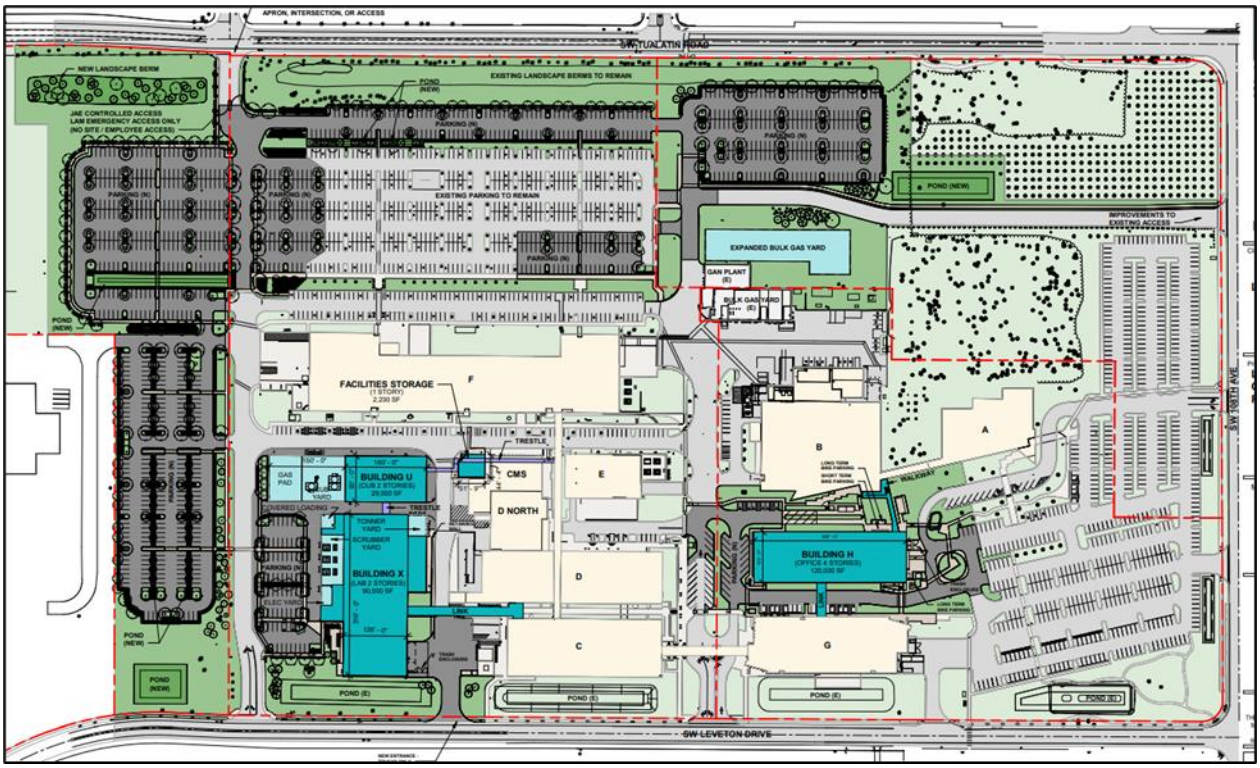


Figure 2: Site Plan (overview, dark gray and blue areas are locations where new development is proposed)

V. APPLICABLE TUALATIN DEVELOPMENT CODE AND MUNICIPAL CODE SECTIONS

The following Chapters of the Tualatin Development Code (TDC) are applicable to the subject project:

- TDC 33.020: Architectural Review
- TDC 33.050: Industrial Master Plan
- TDC 33.110: Tree Removal Permit/Review
- TDC 62: Manufacturing Park (MP) Zone
- TDC 63: Industrial Uses and Utilities and Manufacturing Zones – Environmental Regulations
- TDC 73A: Site Design Standards
- TDC 73B: Landscaping Standards
- TDC 73C: Parking Standards
- TDC 73D: Waste and Recyclables Management Standards
- TDC 74: Public Improvements
- TDC 75: Access

The Architectural Review approval criteria (33.020 (5)) require compliance with the following chapters of the TDC:

- TDC 73A: Site Design Standards
- TDC 73B: Landscaping Standards
- TDC 73C: Parking Standards
- TDC 73D: Waste and Recyclables Management Standards

The remaining chapters, 33.020 , 33.050, 33.110, 62, 74 and 75, have been reviewed to ensure compliance with the Tualatin Development Code and in some cases conditions of approval were added where needed as allowed per TDC 33.020 (6).

VI. DISCUSSION OF ISSUES RAISED BY APPELLANT

The Appellant, submitted an Appeal of the ARB Decision approving AR24-0002 on September 25, 2025, within the 14-day appeals period (Exhibit B). Mr. Hamilton provided both written and oral comments in opposition to the TUX Development Proposal. He stated in his Appeal that "Without additional conditions of approval related to traffic and noise, this land use decision would negatively impact my property value and quality of life. He listed three categories of appeal including 1) Land Use Application does not meet all applicable criteria, 2) Errors by the applicant, and 3) Errors made by the City of Tualatin. These categories of appeal are discussed in more detail below.

1. <u>Land Use Application does not meet all applicable criteria:</u>

a. Failure to send notice to CIOs as required by TDC 32.1205 (b)(iii)

Appellants Claim:
Email Dated January 29, 2025 (Exhibit C)
"A review of project documents reveals that Mackenzie/Lam did not notify any CIO representatives prior to the June 2024 neighborhood developer meeting, as required by Tualatin Development Code 32.120.5 (b)(iii). The code requires an applicant to send notice to CIO representatives via First Class Mail at least 14 days *before* the neighborhood developer meeting. This requirement was not met at the time, nor can it be met retroactively."

Staff Finding:
TDC 32.120(5)(b)(iii) requires applicants to mail notice of Neighborhood/Developer Meetings to all designated representatives of recognized Citizen Involvement Organizations (CIOs) established under TMC Chapter 11-9. While Chapter 11-9 defines the purpose, structure, and communication role of CIOs, it does not specify any procedures or standards related to Neighborhood/Developer Meetings.

Applicable Standards
Under TDC 32.120(5)(d), failure of a property owner to receive notice does not invalidate the Neighborhood/Developer Meeting proceedings. By extension, a failure to notify CIO representatives would likewise not invalidate the meeting. TDC 32.140(1)(h) only

requires the applicant to state whether a CIO was contacted before filing the application and summarize any such contact; it does not impose a standard that would invalidate an application due to lack of CIO notification.

Analysis
In his email from January 29, 2025, Appellant alleged that the applicant's failure to notify CIOs invalidates the LAM application and that staff should deny it. However, under TDC 32.160, staff cannot deny a land-use application on this basis. Staff must instead perform a completeness review. An application becomes void only if the applicant fails to provide missing information within 180 days. LAM's submission contained all required materials and was lawfully deemed complete after the applicant requested the application be deemed complete under ORS 227.178 in December 2024.

The record confirms that LAM held the required Neighborhood/Developer Meeting on June 5, 2024, fulfilling the purpose of TDC 32.120(1). Although notice was not mailed to CIO representatives, surrounding property owners—including the Appellant—did receive notice. The applicant's narrative (Exhibit J Applicant's AR Narrative, pp. 5–6) states that a Riverpark CIO board member, Janine Wilson, attended the meeting, provided input, and was later contacted by the project team on June 10 and 12, 2024. According to the Applicant's narrative, no further response was received from Ms. Wilson.

City Notification Practices
The City does not send out notifications for Neighborhood/Developer Meetings. The City does send out notice of applications and public hearings. For subsequent rescheduled public hearings, the City sent mailed and emailed notices on December 16, 2024 (only email notice to CIOs), March 12, 2025 (email and mailed to CIOs), and May 12, 2025 (email and mailed to CIOs), to all property owners and CIO representatives within 1,000 feet of the site. Historically, only emailed notices were sent to CIOs; in this case, the City exceeded normal practice by sending both mailed postcards and emails.

No provision in Oregon Revised Statutes requires notification of CIOs for local neighborhood meetings; such requirements are strictly local under Tualatin's Development Code.

Conclusion
Because the alleged CIO notice deficiency did not:
1. *Affect the completeness of the LAM application under TDC 32.160;*
2. *Invalidate the Neighborhood/Developer Meeting under TDC 32.120(5)(d); or*
3. *Prejudice the substantial rights of any party—*

There is no basis for invalidating the Architectural Review Board's approval of AR24-0002. A CIO representative participated in the early process, and multiple mailed and emailed public hearing notices provided ample opportunity—over 268 days—for public comment prior to the ARB hearing on September 10, 2025.

Where Addressed in Analysis and Findings:
Page 7 of the Staff Analysis and Findings (Exhibit A)

b. Violations of Manufacturing Park Zoning and Tualatin Noise Ordinance

Appellants Claim:
Appellants' email dated August 12, 2025 (Exhibit C) stated/requested:

- Requested city officials address noise pollution from Lam's campus, which the Appellant stated residents say is affecting their quality of life. He stated that multiple types of noise have been identified, including high-frequency hissing from the gas plant and low rumbles that he claimed are audible across Tualatin Road at night.
- He stated that residents have reported the issue to the City Council, Police Department, and Code Enforcement, but the problem continues.
- He stated that a professional noise study measured levels of 52 dB at night, exceeding the city's 50 dB residential noise limit suggesting that Lam is violating the Tualatin Development Code and Municipal Code.
- The letter states that the noise comes not from construction or trucks but from permanently installed equipment running 24/7.
- Conditions like temperature, wind, and nighttime quiet make the noise especially noticeable, sometimes over a mile away.
- Mr. Hamiliton emphasized that the Manufacturing Park zoning requires industrial uses not to conflict with nearby residential areas, and that Lam's ongoing operations currently do.
- The letter concludes by stating that Lam's operations are currently in conflict with nearby residential areas due to excessive noise. The Appellant requested that the City of Tualatin require Lam to eliminate off-site noise impacts as part of its TUX project before allowing any expansion or additional noise sources.
- He stated that restoring peace and quiet is critical to residents' quality of life and asks the city to hold Lam accountable for demonstrating its ability to comply with local noise regulations.

The Appellants email dated August 13, 2025 (Exhibit C)

- This email contained an attachment from A Acoustics that made the single statement "The sound recorded was 52 dBA and there was sound peak at 175 Hz and 350 Hz".

The Appellants email and attachment dated September 5, 2025 (Exhibit C)

- The Appellant notified City Staff that his public comment email titled "Off-Site Noise Video" included a YouTube link, which the City's internal Mimecast system converted into a restricted link, making it inaccessible to non-Mimecast users. To fix this, he created a one-page PDF preserving the original YouTube link and requested that both the email and PDF be added to the public record and made accessible to all users.

Staff Finding:

Applicable Standards
The purpose statement of the Manufacturing Park Zone (TDC 62.100) provides that permitted uses "must not cause objectionable noise, smoke, odor, dust, noxious gases, vibration, glare, heat, fire hazard, or other wastes emanating from the property" and must not conflict with surrounding residential areas.

TDC 63.051 – Noise further requires that:
"All uses and development must comply with the Oregon State Department of Environmental Quality standards relating to noise and the City of Tualatin noise ordinance, TMC Chapter 6-14."

Accordingly, both existing and future development within the MP zone must comply with DEQ and City noise regulations.

Analysis
Lam's narrative for AR24-0002 stated that all applicable DEQ and City noise restrictions will be met. Multiple public comments raised concerns regarding existing operational noise from the Lam campus. These existing noise issues are currently under investigation by the City's Code Compliance Officer.

To ensure that future development under AR24-0002 also complies with applicable standards, the ARB imposed Condition of Approval A25, which states "The proposed development must comply with the Environmental Regulations of TDC Chapter 63."

Because the proposed TUX development has not yet been constructed, it is not possible to assess noise levels generated by that development. Compliance with Condition A25 will be verified following construction, should operational noise from the TUX project result in substantiated complaints.

The City or ARB cannot enforce TDC 63.051 or TMC 6-14 for a project that is not yet operational. Existing operational noise complaints are being reviewed through the City's standard code enforcement process; any future complaints associated with the TUX project will follow the same process once the project is built and operating.

The Appellants email and video attachment pertaining to the alleged noise issue dated September 5, 2025, was made available and provided in an updated packet to the ARB prior to the hearing on September 10, 2025.

Conclusion
There is an active City code enforcement investigation addressing existing noise from Lam's current facilities. Condition of Approval A25 ensures that any additional development under AR24-0002 will be subject to the same environmental and noise standards upon completion.

Because the alleged noise issue pertains to existing operations and not to the unbuilt TUX project, it does not constitute grounds for invalidating the September 10, 2025, Architectural Review Board approval of AR24-0002.

Where Addressed in Analysis and Findings:
Page 25 of the Staff Analysis and Findings (Attachment A). Condition of Approval A25 will be applicable to the construction and operation under the ARBs approval of AR24-0002, which states "The proposed development must comply with the Environmental Regulations of TDC 63."

c. Expanded North 108th Entrance does not meet New Driveway Approach Criteria

Appellant's Claim
Appellants email Dated December 9, 2024 (Exhibit C)
The appellant argued that Lam Research's proposed Tualatin Road driveway conflicts with the Tualatin Comprehensive Plan 2040 and the Tualatin Development Code (TDC). The appellant's public comment included the following statements:

- The project is not compatible with the TCP 2040 and violates the TDC "in spirit and letter."
- Lam already has six access points (three on 108th Avenue and three on Leveton Drive); therefore, a new driveway on Tualatin Road is unnecessary.
- The TCP 2040 encourages use of existing access points and discourages new ones that negatively affect the community (Goal 8.7, Policy 8.10.1).
- Tualatin Road functions as an arterial and Leveton Drive as a collector, and that the City's reclassification in the 2012–14 TSP update was an attempt to reduce traffic on Tualatin Road.
- Mr. Hamilton cited TDC 75.040(5), which directs that access should be located on the street with the lower functional classification—in this case, 108th Avenue or Leveton Drive, not Tualatin Road.
- The appellant requested that Lam update its Traffic Impact Analysis (TIA) and that no new access be allowed on Tualatin Road.

Appellants' email dated August 18, 2025 (Exhibit C)

- Appellant stated that the proposed new employee entrance on SW 108th Avenue would increase traffic volumes on Tualatin Road and worsen safety concerns.
- He noted that Lam's proposal fails three city driveway criteria from TDC 75.020(5)
    - The proposed driveway approach does not result in result in significant adverse impacts to the vicinity.
    - The proposed driveway approach minimizes impact to the functionality of adjacent streets and intersections.

    - The proposed driveway approach balances the adverse impact to residentially zoned property and the functionality of adjacent streets.
- Appellant stated that Lam's own traffic study noted that Hazelbrook Road onramp to Hwy 99W would not meet performance standards with the added traffic, and the 108th/Tualatin Road intersection already has five times the crash rate of 115th/Tualatin Road intersection.

Staff Finding:

- *Appellants' August 8, 2025, email claimed the "Expanded North 108th entrance does not meet New Driveway Approach Criteria," referencing TDC 75.020, 75.040, and 75.050.*
- *Staff notes the appellant's statement, email dated December 9, 2024, acknowledges the existence of three existing driveways on 108th Avenue, this would include the northernmost driveway that will connect to the future northern parking lot.*
- *Until Lam's July 21, 2025, redesign removed the proposed SW Tualatin Road driveway, 108th Avenue access had not been raised as an issue, in fact, the Appellants' email from December 9, 2024, encouraged the use of the three driveways that access SW 108th Avenue.*
- *The City lacks authority under the TDC to dictate driver routing or prohibit use of existing driveways.*
- *Nothing in the cited TDC sections empowers staff to disallow existing driveway use.*

Conclusion

Lam's proposal is to connect a new parking area to the existing drive aisle and driveway that currently exists on SW 108th. Consequently, connecting the north parking lot to an existing driveway does not invalidate the September 10, 2025, ARB decision approving AR24-0002. It is an assumption on the Appellants part that all employees exiting the Lam Campus will only use the northernmost driveway from 108th Avenue and then turn onto SW Tualatin Road. Lam is not proposing any new driveways on SW 108th.

Where Addressed in Analysis and Findings

Pages 55–60 of the Staff Analysis and Findings (Exhibit A)

2. Errors made by the Applicant:

a. Commitments to hold a second Neighborhood Developer Meeting and then not holding it

Appellants Claim:

The Appellant did not provide a reference or evidence that Lam made this commitment and it is unclear to staff where or when this commitment was made.

Staff Finding:
TDC 32.120 – Neighborhood/Developer Meetings describes when a neighborhood/developer meeting is required, timing of the neighborhood/developer meeting after a preapplication meeting is conducted, time and location of meeting, noticing requirements and documents the applicant is required to submit as part of the Architectural Review application. There is no stated requirement for a second neighborhood/developer meeting. The neighborhood developer meeting was held on June 5, 2024, in accordance with TDC 32.120.

Where Addressed in Analysis and Findings:
Page 9 and 10 of the Staff Analysis and Findings (Exhibit A)

b. Traffic Impact Analysis did not consider additional employee work shifts

Appellants Claim:
The Appellant stated that the Traffic Impact Analysis did not consider additional employee work shifts.

Staff Finding:
The applicant's traffic study used standard Institute of Transportation Engineers (ITE) published standard rates for this type of development. Staff are unaware of any plans by Lam to have multiple shifts. In accordance with the City's traffic analysis guidelines, the applicant studied the combination of trip generation and street traffic volume with the highest probability of traffic problems developing. If other shift changes were to be made, the shift changes would be at times of the day with lower street traffic volumes, and thus lower potential for traffic problems.

Where Addressed in Analysis and Findings:
Pages 59-61 of the Staff Analysis and Findings (Exhibit A)

c. Claims that Traffic and Noise are beyond the scope of the Architectural Review

Appellants Claim:
The public testimony provided by the Appellant at the public hearing on September 10, 2025, is summarized as follows:

The Appellant requested that the Architectural Review Board add two conditions of approval to Lam Research's project:

1. *Traffic Condition:*
    - *Require the north 108th Avenue access gate—which is typically closed—to remain closed to employee traffic, ensuring that Leveton Drive is used to its "highest and best use" for site access.*
    - *He stated that limiting access on 108th would help prevent worsening traffic conditions on Tualatin Road.*

2. *Noise Condition:*
    - *Require that off-site noise be eliminated as part of the project.*
    - *He argued that Lam's noise study was conducted under favorable summer conditions (72–76°F, between midnight and 10 p.m.) that tend to reduce noise impacts, whereas the real problems occur during cold, windy winter conditions.*
    - *He suggested the study timing was chosen to show the lowest possible noise levels, and that the modeled post-project levels (around 50 dB) are at the threshold of the city's noise limits.*

Appellant also criticized Lam's legal counsel, stating their advice to the Board reflects biased advocacy for their client, not neutral analysis. He pointed out that City hearing postcards list TDC Chapter 62 as part of the applicable approval criteria, contradicting Lam's attorney's claim that it is irrelevant.

Appellant concluded by urging the Board to use its authority to prevent further traffic and noise impacts, stating that the City can control available access points even if it cannot dictate driver routes. He likened the situation to fixing code violations during a remodel, arguing Lam should be required to address existing noise issues as part of its project improvements.

Staff Finding:

Traffic

Architectural Review process is used to review proposed, not yet constructed, development applications. The criteria for General Architectural reviews is provided for in TDC 33.020(5)(c). This section of the code states "General Development. Applications for General Development must comply with the applicable standards and objectives in TDC Chapter 73A through 73G." TDC 33.020(6) provides for utilizing conditions of approval in order to meet the requirements of Chapters 73A through 73G. This requires that Chapters 62, 63, 74 and 75 are also applied for analyzing AR24-0002 proposed development compliance with TDC Chapters 73A through 73G.

TDC 33.020 Architectural Review
(6) Conditions of Approval.
(a) Architectural Review decisions may include conditions of approval that apply restrictions and conditions that:
(i) Implement identified public facilities and services needed to serve the proposed development;
(ii) Implement identified public facilities and services needed to be altered or increased attributable to the impacts of the proposed development; and
(iii) Implement the requirements of the Tualatin Development Code.

Traffic is assessed through a Transportation Impact Analysis (TIA). The TIA, Exhibit H, was reviewed by the City Engineer as well as DKS Associates (an outside consultant) and Oregon Department of Transportation. It was determined that the TIA met the requirements of the City and that no mitigation was required. It was noted that signal timing may improve traffic flow but

the actual impact by the proposed development did not warrant any additional mitigation measures. ODOT (Exhibit I) stated the following:

1. *All ODOT intersections are projected to meet ODOT mobility standards in this and previous TIA revisions*
2. *Concurred with the applicant's TIA conclusion that the intersection of Hazelbrook Road and OR 99 and other intersection along OR 99W "are built out to their full capacity, and little can be done to mitigate these queues" at the applicant level.*
3. *The TIA recommended signal retiming, but ODOT policy does not consider signal retiming.*
4. *ODOT notes the long delays at the SW Hazelbrook Road and OR 99 but does not recommend mitigation because it would encourage additional vehicles to travel this route by improving flow which would then discourage drivers from using SW 124th Avenue or to access OR 99.*

Noise

The Applicants' narrative for AR24-0002 stated that all applicable DEQ and City noise restrictions will be met. Multiple public comments raised concerns regarding existing operational noise from the Lam campus. These existing noise issues are currently under investigation by the City's Code Compliance Officer.

To ensure that future development under AR24-0002 also complies with applicable standards, the ARB imposed Condition of Approval A25, which states "The proposed development must comply with the Environmental Regulations of TDC Chapter 63."

Because the proposed TUX development has not yet been constructed, it is not possible to assess noise levels generated by that development. Compliance with Condition A25 will be verified following construction, should operational noise from the TUX project result in substantiated complaints.

The City or ARB cannot enforce TDC 63.051 or TMC 6-14 for a project that is not yet operational. Existing operational noise complaints are being reviewed through the City's standard code enforcement process; any future complaints associated with the TUX project will follow the same process once the project is built and operating.

Conclusion

The Architectural Review (AR) process evaluates proposed, unbuilt developments for compliance with applicable standards in TDC Chapters 73A–73G, with related provisions in Chapters 62, 63, 74, and 75. Under TDC 33.020(6), conditions of approval may be applied to ensure adequate public facilities, address development impacts, and implement code requirements. For AR 24-0002, a Transportation Impact Analysis (Exhibit H) reviewed by the City Engineer, DKS Associates, and ODOT found the study met City standards and required no mitigation. ODOT concurred that all affected intersections meet mobility standards, acknowledged limited capacity for further improvements along OR 99W, and noted that while signal retiming could enhance flow, it is not considered mitigation under ODOT policy.

There is an active City code enforcement investigation addressing existing noise from Lam's current facilities. Condition of Approval A25 ensures that any additional development under AR24-0002 will be subject to the same environmental and noise standards upon completion. Because the alleged noise issue pertains to existing operations and not to the unbuilt TUX project, it does not constitute grounds for invalidating the September 10, 2025, Architectural Review Board approval of AR24-0002.

Where Addressed in Analysis and Findings:
Discussion of transportation requirements are located on pages 59-61 of the Staff Analysis and Findings (Exhibit A). Noise is discussed on Page 25 of the Staff Analysis and Findings and Conditions of Approval (Exhibit A)

Discussion of noise regulations can be found on page 25 of the Staff Analysis and Findings. Condition of Approval A25 will be applicable to the construction and operation under the ARBs approval of AR24-0002, which states "The proposed development must comply with the Environmental Regulations of TDC 63" (Exhibit A).

d. Claims that TDC Chapter 62 is not relevant AR criteria

Appellants Claim:
The Appellant disagreed with Lam's representatives' assertion that Chapter 62 Manufacturing Park Zone is not applicable to the Architectural Review criteria listed in AR 33.020(5).

Staff Finding:
Chapter 62 Manufacturing Park Zone (MP) is the zoning that is applicable to the review AR24-0002. This chapter lists permitted, conditional and limited land uses, limitations on uses and development standards such as setbacks. Chapter 62 was evaluated in the staff's Analysis and Findings (Attachment AX). City Staff evaluated the proposed development in light of Chapter 62 and it's unclear how this would be grounds for reversing the ARBs decision approving AR24-0002.

Where Addressed in Analysis and Findings:
Pages 22 - 25 of the Staff Analysis and Findings (Exhibit A)

3. Errors made by the City of Tualatin:

a. Failure to provide the last 3 pages of Lam's noise model to the ARB at their hearing

Appellants Claim:
Staff did not provide the last 3 pages of Lam's noise model to the ARB at their hearing.

Staff Finding:

The Lam TUX Expansion Environmental Noise Model is dated September 10, 2025. The City received this study on Wednesday, September 10, 2025, at 4:42 p.m., the day of the Architectural Review Board (ARB) public hearing. A technical printing issue initially caused the final three pages of the noise model to be omitted. It should be noted that there is no requirement in the Tualatin Development Code for a formal "noise model" in either TDC 32.140 Application Submittal of 33.020 (4) Architectural Review Submittal Materials.

Staff promptly resolved the printing issue and ensured that all pages were made available to the ARB prior to deliberation and their vote on AR24-0002. This is not a lengthy document, it is a total of 5 pages, mostly graphics and a title page. The sound model was actually in presentation form and easily read in just a few minutes (Exhibit G). This delay did not restrict public comment or limit opportunities for the appellant to raise noise concerns. The Appellant was able to submit both written and verbal testimony regarding noise impacts.

As with all public hearings where public comment is accepted, community members may provide additional written or verbal input up until and during the hearing until the close of the public comment portion of the hearing. The timing of the noise model's submission does not constitute an error by the City, nor does it provide grounds to reverse the ARB's approval of AR24-0002.

The applicant's noise analysis exceeded what is required by the Architectural Review process. The approximate two-hour delay between receipt and distribution of the full report does not represent a procedural defect and is not a basis for appeal.

Where Addressed in Analysis and Findings:
The concern raised by the Appellant regarding the timeliness of providing Lam's Noise Model is not an Architectural Review requirement, criterion or a reason to overturn the ARBs decision approving AR24-0002.

b. Unnecessary delays in releasing Public Records

Appellants Claim:
Email from September 8, 2025 (Exhibit C)
The appellants' letter noted issues with City transparency and accuracy with regard to the TUX land use process. He noted repeated problems, without reference, where the public could not access timely or accurate information from city staff – including misinformation, unnecessary release delays, and a recent case where staff claimed a requested document didn't exist even though the city had possessed it for 20 days.

Staff Finding:
The Appellant made two requests for public records, one on July 15th and a second request on July 21, 2025. On July 22, 2025, the applicant submitted an adjusted site plan for the plan set clarifying the gated area blocking Lam's access to the SW Tualatin Road driveway, missing pages from TVF&R Service Provider Letter, and an updated site plan matching the one provided in the applicant plan set for the TIA. The applicant team officially submitted revised application and

supporting materials on July 21st and July 22, 2025, these materials were provided to the appellant on July 23, 2025. The City's policy for public records request states "The City shall respond to all requests as soon as practical and without unreasonable delay within five (5) business days or within five (5) business days will explain why more time is needed for a full response". The Deputy City recorder provided a response on July 15th that new materials had not yet been submitted.

It's unclear what additional delay's and/or errors were being alleged by the appellant in his appeal.

Where Addressed in Analysis and Findings:
The concern raised by the Appellant regarding unnecessary delays in release of public information is not a criterion that is reviewed as part of the Architectural Review process and is not a reason for reversing the approval of AR24-0002. The Appellant received all updated application materials on July 28, 2025, 13 days after the initial request and seven days after the second request received by City staff.

VII. OPTIONS

Summary of Appellants' Claims
Appellant, a nearby property owner, argues that the ARBs approval should be revisited due to negative impacts on traffic, noise, and neighborhood livability. He claims that the decision did not properly address existing nuisance and safety conditions, lacked proper public notice for the Neighborhood Developer Meeting, did not address traffic concerns, and failed to include environmental noise requirements.

Summary of Staff Response
Staff have provided responses to all the Appellants' claims which staff finds are not based on the Architectural Review Criteria and do not warrant overturning the September 10, 2025 ARB Decision for AR24-0002. An appeal is a formal process that allows an affected party-such as a nearby property owner or applicant to challenge a land use decision made by, in this case, the Architectural Review Board. The purpose of an appeal is to request a review of that decision to determine whether it was made correctly under the applicable land use regulations and procedures. Appeals typically focus on whether the decision complied with local development code standards, comprehensive plan policies, and state land use laws, rather than re-evaluation of the project itself. In this case, it is clear that the staff report and analysis and findings from AR24-0002 demonstrated compliance with the Tualatin Development Code for applicable issues raised as well as both the major issues raised by the Appellant including noise and traffic. There are no factual grounds to reverse the decision of the ARB approving AR24-0002.

The motion options before the City Council on this Appeal include:

1. *Deny the Appeal and affirm the Architectural Review Boards September 10, 2025, decision approving the application with Conditions.*

2. *If the City Council identifies approval criteria that are not satisfied and is inclined to uphold the appeal, it must continue the proceedings to allow the applicant an opportunity to modify the proposal or recommend conditions of approval that would allow the application to be approved.*

3. *Continue the hearing to a later date.*

Attachments and Exhibits

- Attachment A – Presentation
- Attachment B – Memorandum Addressing the Appeal of AR24-0002.
- Attachment C – Resolution Affirming AR24-0002 ARBs Decision
- Exhibit A – AR24-0002 Analysis and Findings
- Exhibit B – Appellants' Appeal Form and Letter Detailing Claims
- Exhibit C – Appellants Public Comments
- Exhibit D – Public Notice
- Exhibit E – Lams' Noise Survey and Model 2025
- Exhibit F – Comments provided to the ARB at the September 10, 2025 Public Hearing
- Exhibit G – Lam's technical findings in response to the Appeal filed in AR 24-0002
- Exhibit H – AR24-0002 Transportation Impact Analysis (TIA)
- Exhibit I - ODOT Review Letter (email) for AR24-0002
- Exhibit J – Pages 5-6 of Applicant's Narrative for AR24-0002

RESOLUTION NO. 5928-25

A RESOLUTION AFFIRMING THE SEPTEMBER 10, 2025, ARCHITECTURAL REVIEW BOARD DECISION APPROVING LAM RESEARCH CAMPUS EXPANSION (AR24-0002) LOCATED AT 11155-11361 SW LEVETON DRIVE; TAX LOTS: 2S122AA 500 and 800; 2S122AB 100; 2S122BA 100.

Whereas a public hearing was held before the City Council of the City of Tualatin on November 10, 2025, upon the request for review submitted by the Brett Hamilton, Appellant, to review the September 10, 2025 Architectural Review Board decision approving AR24-0002 Lam Research Campus Expansion, Applicant, and further described in the Staff Memorandum attached at Attachment X; and

WHEREAS notice of public hearing was given as required by the Tualatin Development Code by mailing a copy of the notice to affected property owners located within 1000 feet of the property, which is evidenced by the Affidavit of Mailing marked Exhibit D attached and incorporated by this reference; and

WHEREAS the Council heard and considered the testimony and evidence presented on behalf of the applicant, the City staff, the appellant, and those appearing at the public hearing; and

WHEREAS after the conclusion of the public hearing the Council vote resulted in denial of the appeal and affirmation of staff's decision as written; and

WHEREAS based upon the evidence and testimony heard and considered by the Council, the Council makes, enters, and adopts as its findings of fact the findings and analysis in the City staff Memorandum, dated November 10, 2025, marked as Attachment B attached and incorporated by reference; and

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF TUALATIN, OREGON, that:

Section 1. The appeal submitted by the Appellant is denied.

Section 2. The Architectural Review Board decision of September 10, 2025 is affirmed as written.

INTRODUCED AND ADOPTED this 10th day of November, 2025.

CITY OF TUALATIN, Oregon

By_____
Mayor

ATTEST:

By_____
City Recorder

ANALYSIS AND FINDINGS

LAM RESEARCH CAMPUS

ARB Hearing: September 10, 2025

Updated September 11, 2025 with Findings and Conditions of Approval which were presented at the Public Hearing and adopted by the Architectural Review Board.

Case #:	AR 24-0002
Project:	Lam Research Corporation Campus
Location:	11155-11361 SW Leveton Drive; Tax Lots: 2S122AA 500 and 800; 2S122AB 100
Representative:	Mackenzie
Owner:	Lam Research Corporation

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Arrangements can be made to provide these materials in alternative formats such as large type or audio recording. Please contact the Planning Division at 503.691.3026 and allow as much lead time as possible.

I. INTRODUCTION

A. Applicable Criteria

The following Chapters of the Tualatin Development Code (TDC) are applicable to the subject project:

- TDC 33.020: Architectural Review
- TDC 33.050: Industrial Master Plan
- TDC 33.110: Tree Removal Permit/Review
- TDC 62: Manufacturing Park (MP) Zone
- TDC 73A: Site Design Standards
- TDC 73B: Landscaping Standards
- TDC 73C: Parking Standards
- TDC 73D: Waste and Recyclables Management Standards
- TDC 74: Public Improvements
- TDC 75: Access

The remaining The Architectural Review approval criteria (33.020 (5)) require compliance with the following chapters of the TDC:

- TDC 73A: Site Design Standards
- TDC 73B: Landscaping Standards
- TDC 73C: Parking Standards
- TDC 73D: Waste and Recyclables Management Standards

The remaining chapters, 33.020 , 33.050, 33.110, 62, 74 and 75, have been reviewed to ensure compliance with the Tualatin Development Code and in some cases conditions of approval were added where needed as allowed per TDC 33.020 (6).

B. Site Description

The Lam Research campus site consists of a 75.96-acre campus on four lots located at 11155 SW Leveton Drive (Washington County Tax Lots: 2S122AA 500 and 800; 2S122AB 100; 2S122BA 100). The general location of the site is south of SW Tualatin Road, west of SW 108th Avenue and north of SW Leveton Drive. Lam Research also has facilities south of Leveton Road and one building east of SW 108th Avenue. The four lots are zoned Manufacturing Park (MP).

The site contains several existing buildings and improvements, parking areas and drive aisles, stormwater facilities, walkways, landscaping, and hardscaping. The site is accessed by three driveways from SW 108th Avenue and three accesses from SW Leveton Drive. There is an access on SW Tualatin Road for JAE for deliveries and JAE employees and shared with Lam for emergency access only. This site is in the former Leveton Urban Renewal District. Currently, Lam Building “G”, approved with IMP22-0001/AR22-0006, is under construction in the southeast portion of the site but not depicted in Figure 1. The site slopes gradually from high elevations of 180 to 190 feet along SW Tualatin Road to low elevations of 140 to 160 feet along SW Leveton Drive, approximately a 40 feet elevation change from

north to south.

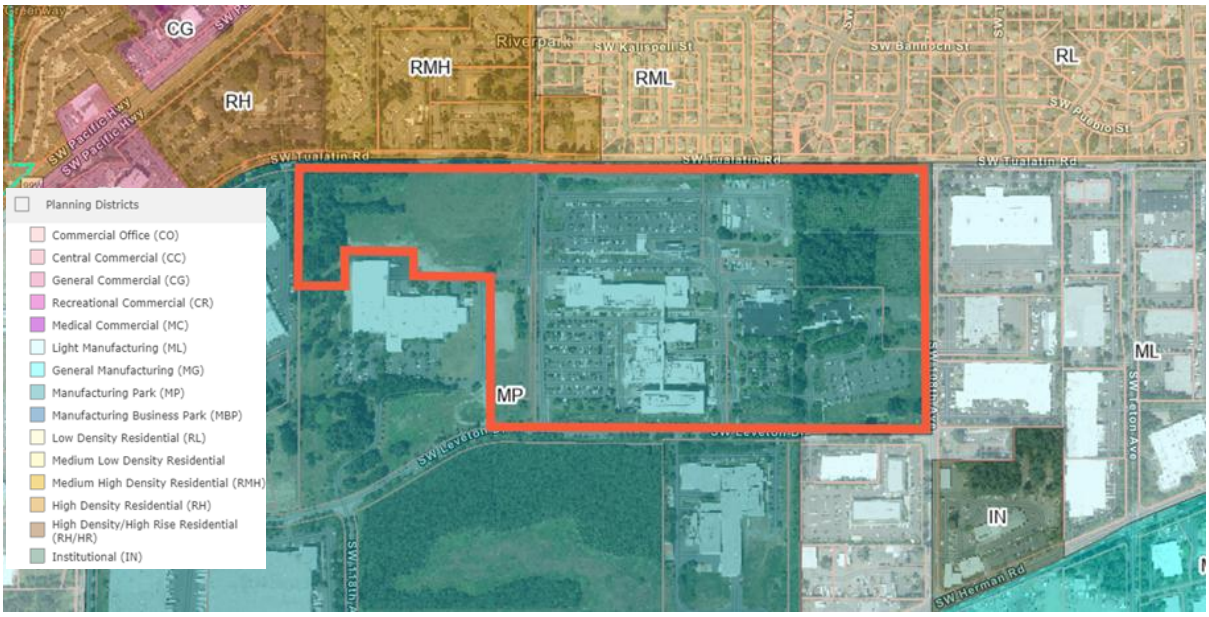


Figure 1: Aerial view of subject site (highlighted)

C. Proposed Project

The original Architectural Review (AR) application was submitted on July 8, 2024. After the application was deemed complete by the City on December 16, 2024, the applicant provided revised materials altering the original project design, as allowed under TDC 32.170 (Revised Applications). The final application materials were provided by the applicant on July 29, 2025. The most significant changes from the July 8, 2024 submittal that are proposed in the current application include the elimination of a previously proposed employee access to SW Tualatin Road (the existing access for JAE and emergency access for Lam would remain) and the size of the proposed building development being reduced from 423,470 square feet to 241,230 square feet. Public improvements associated with the proposed development include half-street right-of-way dedication with street improvements along SW Leveton Drive and SW Tualatin Road. Necessary public utility easements will be dedicated along SW 108th Avenue, SW Leveton Drive and SW Tualatin Road to accommodate water system meters and vaults and onsite water laterals. Sidewalk will be constructed along the northernmost access to SW 108th Avenue to the main campus and other sidewalks will be reviewed and improved where needed to meet ADA specifications. Traffic signals will be coordinated to better facilitate left turn movement from OR 99W to SW Tualatin Road at their intersection with SW 124th Avenue. Street lighting will be evaluated and required to meet City standards. Street trees will be planted as illustrated within approved permit plans. Rerouting of an existing public water main serving the JAE Oregon site will result in conversion of the entire line outside of the public right-of-way to a private water main owned and maintained by JAE. Modification to existing and construction of new stormwater facilities to provide treatment, hydromodification, and detention for all private impervious surfaces will be required. The proposed site plan is shown below in Figure 2 and in greater detail in the application Plan Set (Exhibit A2).

The current proposal includes construction of a new office building (120,000 square feet), lab (90,000 square feet), central utilities building (29,000 square feet), and storage building (2,230 square feet) on the southern portion of the campus adjacent to SW Leveton Drive. There will be parking areas located on the northern portion of the site with all employee traffic being directed to three existing driveways

on SW 108th Avenue and three existing driveways; one new driveway on SW Leveton Drive is proposed for truck-only traffic. Along SW Tualatin Road, the existing landscape berm is proposed to be extended to the west to provide additional voluntary buffering of the site. The applicant proposes a net increase of 544 parking spaces. This consists of demolishing 468 existing spaces to accommodate the proposed new buildings and constructing 1,012 new or replaced parking spaces. Included in the 544 new spaces are 127 spaces that were previously approved for Building "G" through AR 22-0006 but not constructed (later removed through an approved modification). In addition, associated landscaped and hardscaped areas as well as new stormwater detention ponds are proposed.

The development proposal concentrates construction location in the southern and western portion of the site (Exhibit A2). The lab and office buildings proposed designs include insulated metal panels that are smooth and ribbed in texture and colored gray and silver. There will also be a limited number of windows on the lab building due to the function of the lab facility. Architectural features of the storage building include gray, light gray, and dark gray painted concrete panels. The office building is similarly designed and colored to match Building G, which is the building that is currently being constructed under the approval of IMP 22-0001 and AR 22-0006. The storage building will be unoccupied and designed with no windows corrugated metal siding and roof panels.

The applicant's Architectural Review narrative states that three construction phases are planned. Phase 1 would construct the office building and northern parking lot within the initial 2-years of construction after the approval of AR 24-0002. Phase 2 would construct the lab, utility building, storage building within the first four years. Phase 3 would expand the bulk gas yard in the northerly area and parking in the southwestern area of the site with construction starting within 6 -years. The extended landscaped berm includes will be constructed using fill from excavations of that will occur during Phase 2 and would be finished in Phase 3.

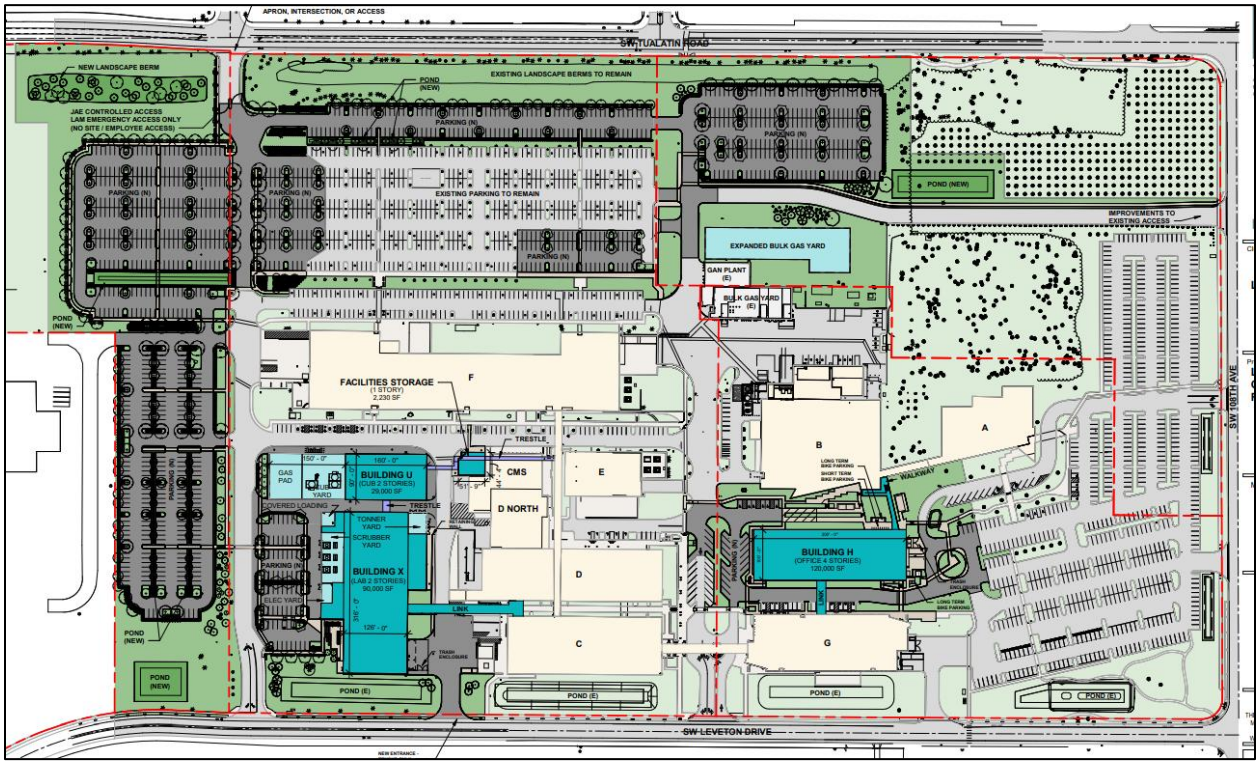


Figure 2: Site Plan (overview, dark gray and blue areas are locations where new development is proposed)

D. Previous Land Use Actions

- IMP24-0001- modification to building setbacks, parking and circulation, building height and parking lot landscaping.
- PLA 23-0004– Property Line Adjustment between Tax Map/Lots 2S122BA00200 and 2S122AB00100
- AR 22-0006 – Lam Building G
- IMP 22-0001 – Lam Building G
- AR 20-0001 – Lam Building D Addition
- AR 16-0010 – Lam Campus Parking Master Plan
- PLA 16-006 – Property Line Adjustment
- AR 15-0029 – Building D Expansion
- PAR 00-04 – Partition
- AR 00-03 – Novellus Phase 1
- IMP 00-01 – Novellus
- AR 89-24 – Oki Semiconductor

E. Surrounding Uses

Surrounding areas indicate a transitional area including industrial and residential use. Adjacent land uses include:

North: Residential Medium-Low Density (RML)
- SW Tualatin Road
- Fox Run Subdivision

South: Manufacturing Park (MP)
- SW Leveton Drive
- Fujimi Corporation

West: Manufacturing Park (MP)
- JAE Corporation

East: Light Manufacturing (ML)
- SW 108th Avenue
- Ascentec Engineering LLC
- Lam Research

F. Exhibit List

Attachment A – Presentation
Attachment B – Analysis and Findings
Attachment C – Written Order
Exhibit A1 - Narrative
Exhibit A2 – Plan Set and Elevations
Exhibit A3 – Tree Assessment Report
Exhibit A4 – Transportation Impact Analysis
Exhibit A5 – Preliminary Stormwater Report
Exhibit A6 – Supporting Documents
Exhibit B – Public Noticing Requirements
Exhibit C – Clean Water Services Memorandum
Exhibit D – IMP 24-0001 Written Order
Exhibit E – Water System Capacity Analysis
Exhibit F – Public Comment
Exhibit G – Map 8-5 Transit Plan
Exhibit H – TDC Figure 73-1 Parking Space Design Standards
Exhibit I – TDC Figure 73-2 Vision Clearance Area
Exhibit J – Map 8-1 Functional Classification and Traffic Signal Plan
Exhibit K – ODOT Lam Review (email dated 7/29/25)

II. FINDINGS

These findings reference the Tualatin Development Code (TDC), unless otherwise noted.

Chapter 32: Procedures

Section 32.010 – Purpose and Applicability.

[…]

(2) Applicability of Review Procedures. All land use and development permit applications and decisions, will be made by using the procedures contained in this Chapter. The procedure "type" assigned to each application governs the decision-making process for that permit or application. There are five types of permit/application procedures as described in subsections (a) through (e) below. Table 32-1 lists the City's land use and development applications and corresponding review procedure(s).

[…]

(c) Type III Procedure (Quasi-Judicial Review – Public Hearing). Type III procedure is used when the standards and criteria require discretion, interpretation, or policy or legal judgment. Quasi-Judicial decisions involve discretion but implement established policy. Type III decisions are made by the Planning Commission or Architectural Review Board and require public notice and a public hearing, with an opportunity for appeal to the City Council.

[…]

(3) Determination of Review Type. Unless specified in Table 32-1, the City Manager will determine whether a permit or application is processed as Type I, II, III, IV-A or IV-B based on the descriptions above. Questions regarding the appropriate procedure will be resolved in favor of the review type providing the widest notice and opportunity to participate. An applicant may choose to elevate a Type I or II application to a higher numbered review type, provided the applicant pays the appropriate fee for the selected review type.

Table 32-1 – Applications Types and Review Procedures

Application / Action	Type	Decision Body*	Appeal Body*	Pre-Application Conference Required	Neighborhood /Developer Mtg Required	Applicable Code Chapter
Architectural Review						
Commercial Buildings 50,000 square feet and larger	**III**	**ARB**	**CC**	**Yes**	**Yes**	**TDC 33.020**
[…]						
*** City Council (CC); Planning Commission (PC); Architectural Review Board (ARB); City Manager or designee (CM); Land Use Board of Appeals (LUBA).**						

Finding:

The proposal is to construct new commercial buildings with the MP zone that are greater than 50,000 square feet. According to Table 32-1, Large Commercial, Industrial, and Multifamily Developments require a Type III review procedure with the Architectural Review Board serving as the Decision Body. The application has been processed according to the applicable code for Type III procedures. This standard is met.

Section 32.030 – Time to Process Applications.

(1) Time Limit - 120-day Rule. The City must take final action on all Type II, Type III, and Type IV-A land use applications, as provided by ORS 227.178, including resolution of all local appeals, within 120 days after the application has been deemed complete under TDC 32.160, unless the applicant provides written request or consent to an extension in compliance with ORS 227.178. (Note: The 120-day rule does not apply to Type IV-B (Legislative Land Use) decisions.)

[…]

Finding:

The subject application was submitted on July 8, 2024. The application was deemed incomplete on July 24, 2024. On December 4, 2024, the applicant submitted additional items, and requested the application be deemed complete. The application was deemed complete on December 16, 2024. The applicant has cumulatively requested a 245-day waiver to the 120-day rule, the maximum allowed under ORS 227.178, making December 16, 2025, the final day by which the City must make a final decision on the application, including all local appeals. No additional extensions are allowed. The Architectural Review Board hearing for AR 24-0002 is scheduled for September 10, 2025. This standard is met.

Section 32.110 – Pre-Application Conference.

(1) Purpose of Pre-Application Conferences. Pre-application conferences are intended to familiarize applicants with the requirements of the TDC; to provide applicants with an opportunity discuss proposed projects in detail with City staff; and to identify approval criteria, standards, and procedures prior to filing a land use application. The pre-application conference is intended to be a tool to assist applicants in navigating the land use process, but is not intended to be an exhaustive review that identifies or resolves all potential issues, and does not bind or preclude the City from enforcing any applicable regulations or from applying regulations in a manner differently than may have been indicated at the time of the pre-application conference.

(2) When Mandatory. Pre-application conferences are mandatory for all land use actions identified as requiring a pre-application conference in Table 32-1. An applicant may voluntarily request a pre-application conference for any land use action even if it is not required.

(3) Timing of Pre-Application Conference. A pre-application conference must be held with City staff before an applicant submits an application and before an applicant conducts a Neighborhood/Developer meeting.

(4) Application Requirements for Pre-Application Conference.

- **(a) Application Form. Pre-application conference requests must be made on forms provided by the City Manager.**
- **(b) Submittal Requirements. Pre-application conference requests must include:**
  - **(i) A completed application form;**
  - **(ii) Payment of the application fee;**
  - **(iii) The information required, if any, for the specific pre-application conference sought; and**
  - **(iv) Any additional information the applicant deems necessary to demonstrate the nature and scope of the proposal in sufficient detail to allow City staff to review and comment.**

(5) Scheduling of Pre-Application Conference. Upon receipt of a complete application, the City Manager will schedule the pre-application conference. The City Manager will coordinate the involvement of city departments, as appropriate, in the pre-application conference. Pre-application conferences are not open to the general public.

(6) Validity Period for Mandatory Pre-Application Conferences; Follow-Up Conferences. A follow-up conference is required for those mandatory pre-application conferences that have previously been held when:

(a) An application relating to the proposed development that was the subject of the pre-application conference has not been submitted within six (6) months of the pre-application conference;

(b) The proposed use, layout, and/or design of the proposal have significantly changed; or

(c) The owner and/or developer of a project changes after the pre-application conference and prior to application submittal.

Finding:

The subject land use action is identified as requiring a pre-application conference in Table 32-1. The applicant participated in a pre-application meeting on June 5, 2024, approximately one month prior to submitting the Architectural Review application. These standards are met.

Section 32.120 – Neighborhood/Developer Meetings.

(1) Purpose. The purpose of this meeting is to provide a means for the applicant and surrounding property owners to meet to review a development proposal and identify issues regarding the proposal so they can be considered prior to the application submittal. The meeting is intended to allow the developer and neighbors to share information and concerns regarding the project. The applicant may consider whether to incorporate solutions to these issues prior to application submittal.

(2) When Mandatory. Neighborhood/developer meetings are mandatory for all land use actions identified in Table 32-1 as requiring a neighborhood/developer meeting. An applicant may voluntarily conduct a neighborhood/developer meeting even if it is not required and may conduct more than one neighborhood/developer meeting at their election.

(3) Timing. A neighborhood/developer meeting must be held after a pre-application meeting with City staff, but before submittal of an application.

(4) Time and Location. Required neighborhood/developer meetings must be held within the city limits of the City of Tualatin at the following times:

(a) If scheduled on a weekday, the meeting must begin no earlier than 6:00 p.m.

(b) If scheduled on a weekend, the meeting must begin between 10:00 a.m. and 6:00 p.m.

(5) Notice Requirements.

(a) The applicant must provide notice of the meeting at least 14 calendar days and no more than 28 calendar days before the meeting. The notice must be by first class mail providing the date, time, and location of the meeting, as well as a brief description of the proposal and its location. The applicant must keep a copy of the notice to be submitted with their land use application.

(b) The applicant must mail notice of a neighborhood/developer meeting to the following persons:

(i) All property owners within 1,000 feet measured from the boundaries of the subject property;

(ii) All property owners within a platted residential subdivision that is located within 1,000 feet of the boundaries of the subject property. The notice area includes the entire subdivision and not just those lots within 1,000 feet. If the residential subdivision is one of two or more individually platted phases sharing a single subdivision name, the notice area need not include the additional phases; and

(iii) All designated representatives of recognized Citizen Involvement Organizations as established in TMC Chapter 11-9.

(c) The City will provide the applicant with labels for mailing for a fee.

(d) Failure of a property owner to receive notice does not invalidate the neighborhood/developer meeting proceedings.

(6) Neighborhood/Developer Sign Posting Requirements. The applicant must provide and post on the subject property, at least 14 calendar days before the meeting. The sign must conform to the design and placement standards established by the City for signs notifying the public of land use actions in TDC 32.150.

(7) Neighborhood/Developer Meeting Requirements. The applicant must have a sign-in sheet for all attendees to provide their name, address, telephone number, and email address and keep a copy of the sign-in sheet to provide with their land use application. The applicant must prepare meeting notes identifying the persons attending, those commenting and the substance of the comments expressed, and the major points that were discussed. The applicant must keep a copy of the meeting notes for submittal with their land use application.

Finding:

The applicant has provided evidence within Exhibit A6 that a Neighborhood/Developer meeting was held on June 5, 2024, after the applicant conducted a Preapplication Conference. The applicant has provided documentation of mailed notification and sign posting as required by this section. The City did receive a comment that pertained to the CIOs not being informed of the Neighborhood/Developer meeting. The applicant's narrative addresses this issue stating "A board member of the Riverpark CIO, Janine Wilson, attended the Neighborhood/Developer Meeting. Ms. Wilson was concerned that residents of the apartment buildings near the Lam campus did not receive notice of the neighborhood meeting and expressed interest in assisting the project team contact those residents for future meetings and public hearings on the proposal. She provided her name and email address to the project team for this purpose. The project team sent emails to Ms. Wilson on June 10 and June 12, 2024, to request coordination but did not receive any response or further communication". A sign-in sheet and notes from the meeting are also included in Exhibit A6. These standards are met.

Section 32.130 – Initiation of Applications.

(1) Type I, Type II, Type III, and Type IV-A Applications. Type I, Type II, Type III, and Type IV-A applications may be submitted by one or more of the following persons:

(a) The owner of the subject property;

(b) The contract purchaser of the subject property, when the application is accompanied by proof of the purchaser's status as such and by the seller's written consent;

(c) A lessee in possession of the property, when the application is accompanied by the owners' written consent; or

(d) The agent of any of the foregoing, when the application is duly authorized in writing by a person authorized to submit an application by paragraphs (a), (b) or (c) of this subsection, and accompanied by proof of the agent's authority.

[…]

Finding:

The application has been signed by a representative of Lam Research Corporation, the owner of the subject site (Exhibit A6). This standard is met.

Section 32.140 – Application Submittal.

(1) Submittal Requirements. Land use applications must be submitted on forms provided by the City. A land use application may not be accepted in partial submittals. All information supplied on the application form and accompanying the application must be complete and correct as to the applicable facts. Unless otherwise specified, all of the following must be submitted to initiate completeness review under TDC 32.160:

(a) A completed application form. The application form must contain, at a minimum, the following information:

(i) The names and addresses of the applicant(s), the owner(s) of the subject property, and any authorized representative(s) thereof;

(ii) The address or location of the subject property and its assessor's map and tax lot number;

(iii) The size of the subject property;

(iv) The comprehensive plan designation and zoning of the subject property;

(v) The type of application(s);

(vi) A brief description of the proposal; and

(vii) Signatures of the applicant(s), owner(s) of the subject property, and/or the duly authorized representative(s) thereof authorizing the filing of the application(s).

(b) A written statement addressing each applicable approval criterion and standard;

(c) Any additional information required under the TDC for the specific land use action sought;

(d) Payment of the applicable application fee(s) pursuant to the most recently adopted fee schedule;

(e) Recorded deed/land sales contract with legal description.

(f) A preliminary title report or other proof of ownership.

(g) For those applications requiring a neighborhood/developer meeting:

(i) The mailing list for the notice;

(ii) A copy of the notice;

(iii) An affidavit of the mailing and posting;

(iv) The original sign-in sheet of participants; and

(v) The meeting notes described in TDC 32.120(7).

(h) A statement as to whether any City-recognized Citizen Involvement Organizations (CIOs) whose boundaries include, or are adjacent to, the subject property were contacted in advance of filing the application and, if so, a summary of the contact. The summary must include the date when contact was made, the form of the contact and who it was with (e.g. phone conversation with neighborhood association chairperson, meeting with land use committee, presentation at neighborhood association meeting), and the result;

(i) Any additional information, as determined by the City Manager, that may be required by another provision, or for any other permit elsewhere, in the TDC, and any other information that may be required to adequately review and analyze the proposed development plan as to its conformance to the applicable criteria;

(2) Application Intake. Each application, when received, must be date-stamped with the date the application was received by the City, and designated with a receipt number and a notation of the staff person who received the application.

(3) Administrative Standards for Applications. The City Manager is authorized to establish administrative standards for application forms and submittals, including but not limited to plan details, information detail and specificity, number of copies, scale, and the form of submittal.

Finding:

The applicant provided certification within Exhibit A6 that signs were placed on site along SW Tualatin Road, SW 108th Road and SW Leveton Drive, in accordance with the requirements of this section. This standard is met.

Section 32.150 - Sign Posting.

(1) When Signs Posted. Signs in conformance with these standards must be posted as follows:

(a) Signs providing notice of an upcoming neighborhood/developer meeting must be posted prior to a required neighborhood/developer meeting in accordance with Section 32.120(6); and

(b) Signs providing notice of a pending land use application must be posted after land use application has been submitted for Type II, III and IV-A applications.

(2) Sign Design Requirements. The applicant must provide and post a sign(s) that conforms to the following standards:

(a) Waterproof sign materials;

(b) Sign face must be no less than eighteen (18) inches by twenty-four (24) inches (18" x 24"); and

(c) Sign text must be at least two (2) inch font.

(3) On-site Placement. The applicant must place one sign on their property along each public street frontage of the subject property. (Example: If a property adjoins four public streets, the applicant must place a sign at each of those public street frontages for a total of four signs). The applicant cannot place the sign within public right of way.

(4) Removal. If a sign providing notice of a pending land use application disappears prior to the final decision date of the subject land use application, the applicant must replace the sign within forty-eight (48) hours of discovery of the disappearance or of receipt of notice from the City of its disappearance, whichever occurs first. The applicant must remove the sign no later than fourteen (14) days after:

(a) The meeting date, in the case of signs providing notice of an upcoming neighborhood/developer meeting; or

(b) The City makes a final decision on the subject land use application, in the case of signs providing notice of a pending land use application.

Finding:

The applicant provided certification within Exhibit A6 that signs in conformance with this section were placed on site in accordance with this section. This standard is met.

Section 32.160 – Completeness Review.

(1) Duration. Except as otherwise provided under ORS 227.178, the City Manager must review an application for completeness within 30 days of its receipt.

(2) Considerations. Determination of completeness will be based upon receipt of the information required under TDC 32.140 and will not be based on opinions as to quality or accuracy. Applications that do not respond to relevant code requirements or standards can be deemed incomplete. A determination that an application is complete indicates only that the application is ready for review on its merits, not that the City will make a favorable decision on the application.

(3) Complete Applications. If an application is determined to be complete, review of the application will commence.

(4) Incomplete Applications. If an application is determined to be incomplete, the City Manager must provide written notice to the applicant identifying the specific information that is missing and allowing the applicant the opportunity to submit the missing information. An application which has

been determined to be incomplete must be deemed complete for purposes of this section upon receipt of:

(a) All of the missing information;

(b) Some of the missing information and written notice from the applicant that no other information will be provided; or

(c) Written notice from the applicant that none of the missing information will be provided.

(5) Vesting. If an application was complete at the time it was first submitted, or if the applicant submits additional required information within 180 days of the date the application was first submitted, approval or denial of the application must be based upon the standards and criteria that were in effect at the time the application was first submitted.

(6) Void Applications. An application is void if the application has been on file with the City for more than 180 days and the applicant has not provided the missing information or otherwise responded, as provided in subsection (4) of this section.

[…]

Finding:

The applicant submitted the subject application on July 8, 2024, which was deemed incomplete on July 24, 2024. On December 4, 2024, the applicant submitted additional materials and requested that the application be deemed complete. The application was formally deemed complete by the City on December 16, 2024. These standards are met.

Section 32.230 – Type III Procedure (Quasi-Judicial Review – Public Hearing).

Type III decisions involve the use of discretion and judgment and are made by the Planning Commission or Architectural Review Board after a public hearing with an opportunity for appeal to the City Council. The decision body for each application type is specified in Table 32-1. A hearing under these procedures provides a forum to apply standards to a specific set of facts to determine whether the facts conform to the applicable criteria and the resulting determination will directly affect only a small number of identifiable persons.

(1) Submittal Requirements. Type III applications must include the submittal information required by TDC 32.140(1).

(2) Determination of Completeness. After receiving an application for filing, the City Manager will review the application will for completeness in accordance with TDC 32.160.

(3) Written Notice of Public Hearing – Type III. Once the application has been deemed complete, the City must mail by regular first class mail Notice of a Public Hearing to the following individuals and agencies no fewer than 20 days before the hearing.

(a) Recipients:

(i) The applicant and, the owners of the subject property;

(ii) All property owners within 1,000 feet measured from the boundaries of the subject property;

(iii) All property owners within a platted residential subdivision that is located within 1,000 feet of the boundaries of the subject property. The notice area includes the entire subdivision and not just those lots within 1,000 feet. If the residential subdivision is one of two or more individually platted phases sharing a single subdivision name, the notice area need not include the additional phases;

(iv) All recognized neighborhood associations within 1,000 feet from the boundaries of the subject property;

(v) All designated representatives of recognized Citizen Involvement Organizations as established in TMC Chapter 11-9;

(vi) Any person who submits a written request to receive a notice;
(vii) Any governmental agency that is entitled to notice under an intergovernmental agreement entered into with the City and any other affected agencies, including but not limited to: school districts; fire district; where the project either adjoins or directly affects a state highway, the Oregon Department of Transportation; and where the project site would access a County road or otherwise be subject to review by the County, then the County; and Clean Water Services; Tri Met; and, ODOT Rail Division and the railroad company if a railroad-highway grade crossing provides or will provide the only access to the subject property. The failure of another agency to respond with written comments on a pending application does not invalidate an action or permit approval made by the City under this Code;
(viii) Utility companies (as applicable); and,
(ix) Members of the decision body identified in Table 32-1.

(b) The Notice of a Public Hearing, at a minimum, must contain all of the following information:
(i) The names of the applicant(s), any representative(s) thereof, and the owner(s) of the subject property;
(ii) The street address if assigned, if no street address has been assigned then Township, Range, Section, Tax Lot or Tax Lot ID;
(iii) The type of application and a concise description of the nature of the land use action;
(iv) A list of the approval criteria by TDC section for the decision and other ordinances or regulations that apply to the application at issue;
(v) Brief summary of the local decision making process for the land use decision being made and a general explanation of the requirements for submission of testimony and the procedure for conduct of hearings;
(vi) The date, time and location of the hearing;
(vii) Disclosure statement indicating that if any person fails to address the relevant approval criteria with enough detail, he or she may not be able to appeal to the Land Use Board of Appeals on that issue, and that only comments on the relevant approval criteria are considered relevant evidence;
(viii) The name of a City representative to contact and the telephone number where additional information may be obtained; and
(ix) Statement that the application and all documents and evidence submitted to the City are in the public record and available for review, and that copies can be obtained at a reasonable cost from the City; and
(x) Statement that a copy of the staff report will be available for inspection at no cost at least seven days prior to the hearing and will be provided at reasonable cost.

(c) Failure of a person or agency to receive a notice, does not invalidate any proceeding in connection with the application, provided the City can demonstrate by affidavit that required notice was given.

Finding:
After submittal and completeness review as required by this section, notice for the Type III public hearing concerning AR 24-0002 was initially mailed by city staff on December 16, 2024, with the Architectural Review Board hearing scheduled on April 2, 2025. Subsequently, the applicant requested additional time to revise their application, and a second hearing notice was sent on March 12, 2025, which rescheduled the Architectural Review Board hearing until June 11, 2025. The applicant made a third and final request to postpone the hearing, and a third public notice was sent on May 16, 2025, which rescheduled the

Architectural Review Board hearing until September 10, 2025 (Exhibit B). Each of the three mailed notices contained the information required by this section. These standards are met.

(4) Conduct of the Hearing - Type III.
The person chairing the hearing must follow the order of proceedings set forth below. These procedures are intended to provide all interested persons a reasonable opportunity to participate in the hearing process and to provide for a full and impartial hearing on the application before the body. Questions concerning the propriety or the conduct of a hearing will be addressed to the chair with a request for a ruling. Rulings from the chair must, to the extent possible, carry out the stated intention of these procedures. A ruling given by the chair on such question may be modified or reversed by a majority of those members of the decision body present and eligible to vote on the application before the body. The procedures to be followed by the chair in the conduct of the hearing are as follows:

(a) At the commencement of the hearing, the person chairing the hearing must state to those in attendance all of the following information and instructions:

(i) The applicable substantive criteria;

(ii) That testimony, arguments and evidence must be directed toward the criteria described in paragraph (i) of this subsection or other criteria in the plan or land use regulation which the person believes to apply to the decision;

(iii) That failure to raise an issue accompanied by statements or evidence sufficient to afford the decision maker and the parties an opportunity to respond to the issue precludes appeal to the State Land Use Board of Appeals based on that issue;

(iv) At the conclusion of the initial evidentiary hearing, the decision body must deliberate and make a decision based on the facts and arguments in the public record; and

(v) Any participant may ask the decision body for an opportunity to present additional relevant evidence or testimony that is within the scope of the hearing; if the decision body grants the request, it will schedule a date to continue the hearing as provided in TDC 32.230(4)(e), or leave the record open for additional written evidence or testimony as provided TDC 32.230(4)(f).

(b) The public is entitled to an impartial decision body as free from potential conflicts of interest and pre-hearing ex parte (outside the hearing) contacts as reasonably possible. Where questions related to ex parte contact are concerned, members of the decision body must follow the guidance for disclosure of ex parte contacts contained in ORS 227.180. Where a real conflict of interest arises, that member or members of the decision body must not participate in the hearing, except where state law provides otherwise. Where the appearance of a conflict of interest is likely, that member or members of the decision body must individually disclose their relationship to the applicant in the public hearing and state whether they are capable of rendering a fair and impartial decision. If they are unable to render a fair and impartial decision, they must be excused from the proceedings.

(c) Presenting and receiving evidence.

(i) The decision body may set reasonable time limits for oral presentations and may limit or exclude cumulative, repetitious, irrelevant, or personally derogatory testimony or evidence;

(ii) No oral testimony will be accepted after the close of the public hearing. Written testimony may be received after the close of the public hearing only as provided by this section; and

(iii) Members of the decision body may visit the property and the surrounding area, and may use information obtained during the site visit to support their decision, if the information

relied upon is disclosed at the beginning of the hearing and an opportunity is provided to dispute the evidence.

(d) The decision body, in making its decision, must consider only facts and arguments in the public hearing record; except that it may take notice of facts not in the hearing record (e.g., local, state, or federal regulations; previous City decisions; case law; staff reports). Upon announcing its intention to take notice of such facts in its deliberations, it must allow persons who previously participated in the hearing to request the hearing record be reopened, as necessary, to present evidence concerning the newly presented facts.

(e) If the decision body decides to continue the hearing, the hearing must be continued to a date that is at least seven days after the date of the first evidentiary hearing (e.g., next regularly scheduled meeting). An opportunity must be provided at the continued hearing for persons to present and respond to new written evidence and oral testimony. If new written evidence is submitted at the continued hearing, any person may request, before the conclusion of the hearing, that the record be left open for at least seven days, so that he or she can submit additional written evidence or arguments in response to the new written evidence. In the interest of time, after the close of the hearing, the decision body may limit additional testimony to arguments and not accept additional evidence.

(f) If the decision body leaves the record open for additional written testimony, the record must be left open for at least seven days after the hearing. Any participant may ask the decision body in writing for an opportunity to respond to new evidence (i.e., information not disclosed during the public hearing) submitted when the record was left open. If such a request is filed, the decision body must reopen the record, as follows:

(i) When the record is reopened to admit new evidence or arguments (testimony), any person may raise new issues that relate to that new evidence or testimony;

(ii) An extension of the hearing or record granted pursuant to this section is subject to the limitations of TDC 32.030, unless the applicant waives his or her right to a final decision being made within the required timeframe; and

(iii) If requested by the applicant, the decision body must grant the applicant at least seven days after the record is closed to all other persons to submit final written arguments, but not evidence, provided the applicant may expressly waive this right.

Finding:

The Architectural Review Board will follow the hearing requirements set forth by this section. These standards will be met.

(5) Notice of Adoption of a Type III Decision.

Notice of Adoption must be provided to the property owner, applicant, and any person who provided testimony at the hearing or in writing. The Type III Notice of Adoption must contain all of the following information:

(a) A description of the applicant's proposal and the City's decision on the proposal, which may be a summary, provided it references the specifics of the proposal and conditions of approval in the public record;

(b) The address or other geographic description of the property proposed for development, including a map of the property in relation to the surrounding area;

(c) A statement that a copy of the decision and complete case file, including findings, conclusions, and conditions of approval, if any, is available for review and how copies can be obtained;

(d) The date the decision becomes final, unless a request for appeal is submitted; and

(e) The notice must include an explanation of rights to appeal the decision to the City Council in accordance with TDC 32.310.

(6) Appeal of a Type III Decision. Appeal of an Architectural Review Board or Planning Commission Type III Decision to the City Council may be made in accordance with TDC 32.310.

(7) Effective Date of a Type III Decision.

(a) The written order is the final decision on the application.

(b) The mailing date is the date of the order certifying its approval by the decision body.

(c) A decision of the Architectural Review Board or Planning Commission is final unless:

(i) a written appeal is received at the City offices within 14 calendar days of the date notice of the final decision is mailed; or

(ii) The City Manager or a member of the City Council requests a review of the decision within 14 calendar days of the date notice of the final decision is mailed.

Finding:

A final decision and any appeal will follow the requirements of this section. These standards will be met.

Chapter 33: Applications and Approval Criteria

[…]

TDC 33.020 Architectural Review

[…]

(5) *Approval Criteria.*

(d) *Large Commercial, Industrial, and Multifamily Development.* Applications for Large Commercial, Industrial, and Multifamily Development must comply with the applicable standards and objectives in TDC Chapter 73A through 73G.

[…]

Finding:

The subject application, which is for a large commercial development that must comply with the standards and objectives in TDC 73A through 73G. These standards are met by findings and conditions of approval for the subject application.

(9) *Permit Expiration.*

Architectural Review decisions (including Minor Architectural Review decisions) expire two (2) years from the effective date unless the applicant has received a building, or grading permit submitted in conjunction with a building permit application, substantial construction has occurred pursuant to the building permit, and an inspection has been performed by a member of the Building Division.

(10) *Extension of Permit Expiration.*

(a) An Architectural Review approval may be extended if the applicant, or successor interest, submits a written request for an extension of time within two (2) years of the effective date.

[…]

(c) Upon receipt of a request for an extension of time, the City will process the extension request as follows:

(i) If the City Manager approved the Architectural Review, then the City Manager will decide the extension request under the Type II procedures in TDC 32.220.

(ii) If the Architectural Review Board (ARB) approved the Architectural Review, then the ARB will decide the extension request under the Type III quasi-judicial procedures in TDC 32.230.

(d) The City must provide notice of the extension request to past recipients of the Architectural Review notice of decision and the applicant must post a sign pursuant to TDC 32.150.

(e) The City Manager or Architectural Review Board, as applicable, may grant the extension of time upon finding the following:

(i) The applicant submitted a written extension request prior to the expiration date;

(ii) There have been no significant changes in any conditions, ordinances, regulations or standards of the City or applicable agencies that affect the previously approved project so as to warrant its resubmittal for Architectural Review;

(iii) If the previously approved application included a special study, the applicant provided a status report includes a letter from a recognized professional that states that conditions have not changed after the original approval and that no new study is warranted; and

(iv) If the site has been neglected so as to allow the site to become blighted, the deciding party must factor this into its decision.

(f) The City Manager or Architectural Review Board, as applicable, may grant or deny the extension request. The decision must be in writing and must be made within sixty (60) days of receipt of the request for extension. If the decision is to grant the extension, the extension can be no more than a single one-year extension.

(g) Upon making the decision, the City must provide notice of the extension decision as provided in TDC 32.220 for Type II decisions made by the City Manager and TDC 32.230 for Type III decisions made by the Architectural Review Board.

Finding:

The proposed application is approved subject to compliance with the above criteria. With recommended Condition of Approval A1, these standards are met.

TDC 33.030. - Permit for New Driveway Approach and Closure Decisions.

All requests for driveway approaches and closures are as provided in TDC 75.020 and TDC 75.030.

Finding:

The standards concerned TDC 75.020 and 75.030 are addressed under TDC 75.

TDC 33.050. - Industrial Master Plans.

(1) *Purpose.* The Industrial Master Plan sets particular standards for development within the Industrial Master Plan Area (defined by such plan), in accordance with the Tualatin Comprehensive Plan, the Southwest Tualatin Concept Plan (SWCP) and the Leveton Tax Increment Plan. Such approved plans are intended to achieve a campus-like setting within an Industrial Master Plan Area, while allowing development to occur independently on a number of smaller parcels within that area. It is the intent of this chapter to provide procedures and criteria for the submission and review of such Industrial Master Plan applications. Development standards approved through a Master Plan process establishes alternative development standards that supersede conflicting provisions in the Tualatin Development Code.

(2) *Applicability.*

(a) An Industrial Master Plan is required for any development in the Manufacturing Business Park (MBP) Zone in a Regionally Significant Industrial Area (RSIA).

For properties in the Regionally Significant Industrial Area (RSIA) of the MBP Zone, lots or parcels may be divided into smaller lots or parcels of 20,000 sq. ft or larger when the Industrial Master Plan identifies at least one lot or parcel of 100 acres in size or larger and one lot or parcel 50 acres in size or larger.

(b) An Industrial Master Plan is optional for any development in the Manufacturing Park (MP) Zone or Manufacturing Business Park (MBP) Zone. An Industrial Master Plan is required to do any of the following:

(i) Modify the requirements for internal circulation, building location and orientation, street frontage, setbacks, building height, or lot size as provided in TDC Chapter 62 for the Manufacturing Park (MP) Zone and TDC Chapter 64 for the Manufacturing Business Park (MBP) Zone; and

(ii) Provide for individual parcels of less than 40 acres in the Manufacturing Park Zone. However, the parcels must not be less than 15 acres north of SW Leveton Drive and five acres south of SW Leveton Drive, unless otherwise provided under TDC 62.050(1).

(c) An Industrial Master Plan must be submitted for the entire Industrial Master Plan Area and include all owners of property within the area.

(3) *Procedure Type.* Industrial Master Plans must be processed in accordance with the Type III review procedures as specified in Chapter 32.

Finding:

The applicant proposed an Industrial Master Plan modification (IMP 24-0001), which was reviewed and approved by the Planning Commission on August 20, 2025. The Conditions of Approval of IMP 24-0001 will apply to the subject Architectural Review approval, and as excerpted below supersede development standards within the MP zone. These criteria are satisfied.

(6) Conditions of Approval.

(a) The Planning Commission may impose, in addition to the regulations and standards expressly specified in this chapter, other conditions found necessary to protect the best interests of the surrounding property or neighborhood or the City as a whole and for compliance with the Metro UGMFP Title IV policies and requirements.

(b) An Industrial Master Plan may be approved based on proposed parcel boundaries; in this case development under the Industrial Master Plan must be conditioned on creation of the proposed parcels through the subdivision or partition process or may be the subject of a concurrent land division application. Partition applications associated with an Industrial Master Plan may be approved by City Council in accordance with TDC 36.230(8).

Finding:

On August 20, 2025, the Planning Commission conducted a Type III quasi-judicial hearing in compliance with the requirements of TDC 32.230 to consider approval of Industrial Master Plan IMP 24-0001 for constructing the improvements requested in AR 24-0002. The Planning Commission unanimously approved IMP 24-0001 with the following conditions.

GENERAL:

1. If future modifications to this Industrial Master Plan are necessary, a new Industrial Master Plan application must be submitted to the City for review.

PUBLIC FACILITIES:

2. Through the Architectural Review Process:
    a. Private Easement declarations must be recorded and/or maintained for cross-access, parking, and utilities (including but not limited to: water, sanitary sewer, storm drainage) that extend across parcels shared under common ownership within the campus, when deemed necessary in accordance with TDC 74.330, and TDC 75.040 (2 & 3).
    b. Utilities must serve individual parcels within the campus, in accordance with the Public Works Construction Code and TDC 74.610, 74.620, and 74.630.

LOCATION, DESIGN, COLOR AND MATERIALS

3. Development proposed through the Architectural Review process must:
    a. Include building material elements consisting of, or complimentary to: masonry, sandstone, architectural metal siding, and window glazing. Color palettes must remain complimentary to earth toned shades.
    b. Meet the modified development standards listed in the table below:

STANDARD	**MODIFIED DEVELOPMENT STANDARDS UNDER IMP 24-0001**
LOT SIZE	
Minimum Lot Size	15 acres
MINIMUM SETBACKS	
Minimum Building Setback for Yards Adjacent to SW Leveton Drive	68 feet
Minimum Building Setback for Yards Adjacent to SW 108th Drive	98 feet
Minimum Building Setback for Yards Adjacent to SW Tualatin Road	Subject to Table 62-2 Development Standards in the MP Zone
Minimum Setback for Side and Rear Yards not Adjacent to Streets or Alleys	0 feet from side and rear yards under common ownership From other lots: Subject to Table 62-2 Development Standards in the MP Zone
Parking and Circulation Areas Adjacent to SW Leveton Drive	50 feet
Parking and Circulation Areas Adjacent to SW 108th Avenue	43 feet
Parking and Circulation Areas Adjacent to SW Tualatin Road	35 feet
Parking and Circulation Areas Adjacent to Private Property Line	0 feet from property lines under common ownership 10 feet from other lots
Fences	Subject to Table 62-2 Development Standards in the MP Zone
STRUCTURE HEIGHT	
Maximum Height	85 feet
Maximum Height Adjacent to Residential District	Subject to Table 62-2 Development Standards in the MP Zone

c. Maintain the earthen berm and landscaping consisting of deciduous street trees, evergreen trees, and shrubs along the northeast frontage of SW Tualatin Road to the driveway adjacent to 115th Avenue.
d. Retain the existing stand of trees behind Building A, or integrate into the parking lot design as deemed appropriate.
e. The version of TDC 73C Parking Standards effective on July 8, 2024 will apply.

Finding:
AR 24-0002 meets the general, public facilities, location, design, color and materials, Landscaping and Chapter 62 standards. Through the recommended Conditions of Approval, these standards will be met.

Section 33.110 Tree Removal Permit/Review
(1) Purpose. To regulate the removal of trees within the City limits other than trees within the public right-of-way which are subject to TDC Chapter 74.
(2) Applicability. No person may remove a tree on private property within the City limits, unless the City grants a tree removal permit, consistent with the provisions of this Section.
[…]
(4) Procedure Type. Tree Removal Permit applications are subject to Type II Review in accordance with TDC Chapter 32. Tree Removal Permit applications submitted with an Architectural Review, Subdivision, or Partition application will be processed in conjunction with the Architectural Review, Subdivision, or Partition decision.

Finding:
The applicant has submitted for tree removal in conjunction with the Architectural Review application. The criteria in TDC 33.110, addressed below, are the basis for approval or denial for tree removal as part of this Architectural Review. These standards are met.

(6) Approval Criteria.
(a) An applicant must satisfactorily demonstrate that at least one of the following criteria are met:
(i) The tree is diseased and:
(A) The disease threatens the structural integrity of the tree; or
(B) The disease permanently and severely diminishes the esthetic value of the tree; or
(C) The continued retention of the tree could result in other trees being infected with a disease that threatens either their structural integrity or esthetic value.
(ii) The tree represents a hazard which may include but not be limited to:
(A) The tree is in danger of falling; or
(B) Substantial portions of the tree are in danger of falling.
(iii) It is necessary to remove the tree to construct proposed improvements based on Architectural Review approval, building permit, or approval of a Subdivision or Partition Review.
(b) If none of the conditions in TDC 33.110(5)(a) are met, the certified arborist must evaluate the condition of each tree.
[…]

Finding:
The applicant's arborist surveyed trees on-site and adjacent to the site. The memorandum, Exhibit A3, describes tree protection, tree removal for the Lam development. Seven hundred and ninety-two (792) trees over 8-inch diameter (DBH) have been inventoried over the last several years. One hundred and

eighty-four (184) trees over 8-inch diameter (DBH) are proposed for removal and 197 trees less than 8-inch DBH are proposed for removal. Two hundred and thirty-nine (239) trees over 8-inch diameter will be retained and protected. Tree protection fencing and limits of construction fencing are recommended to protect existing parking lot and landscape trees from construction impacts. Tree protection measures are identified in the Arborist's memorandum located in Exhibit A3. With recommended Conditions of Approval A14.a. and A15 related to tree removal as well as tree protection, these standards are met.

Chapter 62: Manufacturing Park Zone (MP)

[⋯]

TDC 62.200. - Use Categories.

(1) Use Categories. Table 62-1 lists use categories Permitted Outright (P) or Conditionally Permitted (C) in the MP zone. Use categories may also be designated as Limited (L) and subject to the limitations listed in Table 62-1 and restrictions identified in TDC 62.210. Limitations may restrict the specific type of use, location, size, or other characteristics of the use category. Use categories which are not listed are prohibited within the zone, except for uses which are found by the City Manager or appointee to be of a similar character and to meet the purpose of this zone, as provided in TDC 31.070.
(2)Overlay Zones. Additional uses may be allowed in a particular overlay zone. See the overlay zone Chapters for additional uses.

Table 62-1
Use Categories in the MP Zone

USE CATEGORY	STATUS	LIMITATIONS AND CODE REFERENCES
COMMERCIAL USE CATEGORIES		
Office	**P (L)**	**Permitted uses limited, see TDC 62.210(2).**
INDUSTRIAL USE CATEGORIES		
Light Industrial	**P (L)**	**Permitted uses limited to:** **• Manufacture or assembly of electronic or optical instruments, equipment, devices** **[…]** **• Research and development laboratories.** **[…]**
INFRASTRUCTURE AND UTILITIES CATEGORIES		
Basic Utilities	**P**	**—**

[…]

Finding:
The project area is within the Manufacturing Park (MP) Planning District. Lam designs and manufactures equipment used in the fabrication of semiconductor products. The proposed office building is an accessory use to the permitted Light Manufacturing use subject to limitations found in 62.210(2). As a result, the use limitations found in TDC 62.210(4) do not apply to the accessory uses. Additionally, storage, utility and laboratory buildings are proposed, which are all permitted uses related to Lam Research operations. Lastly, expansion of an existing gas storage yard, which is also an accessory use, is proposed. This standard is met.

TDC 62.210. - Additional Limitations on Uses.

[…]

(2) Offices. Office uses are a permitted as specified below.

(a) Permitted Uses. The following are permitted uses:

(i) Offices for chemical and physical sciences, engineering, cartography, or other research functions;

(ii) Shared service facilities (as defined by TDC 31.060); and

(iii) Corporate, regional, or district headquarter offices if:

(A)The headquarters is for a permitted use in this Code;

(B) The offices occupy at least 20,000 square feet; and

(C)Manufacturing is not conducted, unless the manufacturing is a permitted use in the MP zone.

(b) *Accessory Uses to an Industrial Use.* Office uses accessory to a permitted industrial use are permitted.

(c) *Limited Uses.* Offices located on the same site as a permitted industrial use may be permitted, subject to TDC 62.210(4).

[…]

(5) Outdoor Uses. All uses must be conducted wholly within a completely enclosed building, except as provided by this section.

(a) Permitted Uses. Off-street parking and loading, utility facilities, wireless communication facilities, and outdoor storage occupying less than ten (10) percent of the total site area, are permitted outright as outdoor uses.

[…]

Finding:

The proposed office building will be used for offices and accessory uses associated with the permitted light industrial uses including the manufacturing of electronic instruments or equipment and research and development laboratories. The existing bulk gas storage yard, which is an outdoor storage area, will be expanded less than 10% of the total site. The applicant has not proposed outdoor uses besides off-street parking, loading, and utilities. With recommended Condition of Approval A24 and A14.m., this standard is met.

TDC 62.300. - Development Standards.

Development standards in the MP zone are listed in Table 62-2. Additional standards may apply to some uses and situations, see TDC 62.310.

Finding:

The development standards in Table 62-2 have been modified by the recently approved Industrial Master Plan (IMP 24-0001) and have been illustrated below. These standards are met.

Table 62-2: Development Standards in the MP Zone				
Current MP District Standards			**IMP Modifications**	**Proposed Development**
Minimum Setbacks				
Minimum Building setback for Yards Adjacent to Streets or Alleys,	**100 feet**		**No change to current IMP condition of 68 feet from SW Leveton Drive**	**Approximately 77 feet from SW Leveton Drive and over 500 feet**

North of SW Leveton Drive			**and 98 feet from SW 108th Avenue**	**from SW 108th Avenue.**
Minimum Setback for Side and Rear Yards not Adjacent to Streets or Alleys, north of SW Leveton Drive	**50 feet**	**No minimum setback if adjacent to railroad right-of-way or spur track**	**0 feet from side and rear yards under common ownership.** **From other lots: Subject to Table 62-2 Development Standards in the MP Zone**	**Over 300 feet from west side yard. Over 500 feet from rear yard.**
Parking and Circulation Areas Adjacent to Public Right-of-Way	**50 feet**	**No minimum setback required adjacent to joint access approach in accordance with TDC 73C.**	**No change to current IMP condition of 108 feet from SW Leveton Drive and 43 feet from SW 108th Avenue.**	**59 feet to SW Tualatin Road. 120 feet to SW Leveton Drive.**
Parking and Circulation Areas Adjacent to Private Property Line	**5 - 25 feet**	**Determined through Architectural Review Process.** **No minimum setback required adjacent to joint access approach in accordance with TDC 73C.**	**0 feet from property lines under common ownership.** **10 feet from other lots.**	**10 feet to west property line.**
Fences	**50 feet**	**From public right-of-way.**	**No change.**	**No fencing proposed.**
Structure Height				
Maximum Height	**70 feet**	**May be increased to 85 feet if yards adjacent to structure are not less than a distance equal to one and one-half times the height of the structure.** **Flagpoles may extend to 100 feet.**	**85 feet**	**The proposed lab building will be 70'9" with a setback of 108' to SW Leveton Drive. The proposed office building will have a height of 60' and the CUB will be 54'9".**
Maximum Height Adjacent to Residential District	**28 feet**	**Measured at the required 50-foot or 100-foot setback line, includes flagpoles. The building height**	**No change**	**No structures are proposed within 100' of a property line adjacent to a**

		may extend above 28 feet on a plane beginning at the 50-foot or 100-foot setback line at a slope of 45 degrees extending away from the setback line.		**residential district.**

[…]

Finding:
As noted, above, the Lam campus has an approved Industrial Master Plan (IMP 24-0001), included as Exhibit D, which modified setbacks and maximum building heights as reflected in the table above. These standards are met.

TDC 62.310. - Additional Development Standards.
(1) Industrial Master Plan. Minimum lot size, setbacks, maximum height, and other development standards may be modified by submittal of an Industrial Master Plan application. See TDC 33.050.
[…]

Finding:
As mentioned in the previous finding, the standards in the MP zone, as modified by IMP 24-0001, have been addressed through the applicant's proposal. This standard is met.

Chapter 63: Industrial Uses and Utilities and Manufacturing Zones – Environmental Regulations

Section 63.020 – Applicability.
The regulations of this Chapter apply to:
(1) All industrial uses and utilities, regardless of the Planning District in which they are located, and
(2) All Manufacturing Planning Districts, regardless of the use category
[…]

Finding:
The site is located in the Manufacturing Park (MP) District and the proposal includes industrial uses. Therefore, the noise, vibration, air quality, odor, heat and glare, materials storage, waste disposal, and dangerous substances regulations of this Chapter apply. With recommended Condition of Approval A25, these standards are met.

TDC 63.051. - Noise.
All uses and development must comply with the Oregon State Department of Environmental Quality standards relating to noise and the City of Tualatin noise ordinance in, TMC 6-14.

Finding:
The applicant has stated in their narrative that all noise restrictions of the DEQ and City of Tualatin will be abided by. There were a number of public comments that indicated that the Lam campus is causing noise issues. These issues are currently under investigation by the City. With recommended Condition of Approval A25, this standard is met.

TDC 63.052. - Vibration.

(1) *Restrictions.* All uses and development must not cause or permit ground vibration into the property of another person that exceeds the limits set forth below in this section.

(a) Ground vibration as measured at the boundary of a residential planning district and an industrial planning district must not exceed 0.01 inches per second (0.00025 meters per second) RMS velocity.

(b) Ground vibration as measured at a common property boundary of any two properties within any industrial planning district must not exceed 0.1 inches per second (0.0025 meters per second) RMS velocity.

(2) *Method of Measurement.* Vibration measurement procedures must conform to the methods described in this section and to procedures approved by the Oregon Department of Environmental Quality.

(a) Instrumentation must be capable of measuring RMS value of the vibration velocity over the frequency range of ten to 1,000 hertz.

(b) Measurement values must be recorded for a sufficient period of observation to provide a representative sample.

(c) Attachment of the vibration transducer to the ground must be by magnetic or screw attachment to a steel bar of a minimum of nine inches (22.9 cm.) in length, driven flush with the ground surface.

(3) *Exemptions.* The requirements of TDC 63.052(1) do not apply to:

(a) Vibration resulting from the operation of any equipment or facility of a surface carrier engaged in interstate commerce by railroad;

(b) Vibration resulting from the operation of any road vehicle;

(c) Vibration resulting from construction activities and use of construction equipment; and

(d) Vibration resulting from roadway maintenance and repair equipment.

Finding:

The applicant has stated in their narrative (Exhibit A1), that no uses will cause or permit ground vibration. With recommended Condition of Approval A25, these standards are met.

TDC 63.053 - Air Quality.

(1) *Restrictions.* All uses and development must comply with the most recent air quality standards adopted by the Oregon Department of Environmental Quality. Plans of construction and operations must comply with the recommendations and regulations of the State Department of Environmental Quality.

(2) *Method of Measurement.* All measurements of air pollution must be by the procedures and with equipment approved by the State Department of Environmental Quality or equivalent and acceptable methods or measurement approved by the City. Upon request of the City, persons responsible for a suspected source of air pollution must provide quantitative and qualitative information regarding the discharge that will adequately and accurately describe operation conditions.

Finding:

The applicant has stated in their narrative (Exhibit A1), that the proposed development will comply with the most recent air quality standards adopted by the DEQ. With recommended Condition of Approval A25, these standards are met.

TDC 63.054. - Odors.
All uses and development must not emit odors in such quantities as to create a nuisance condition at any point beyond the subject property line of the emitting use.

Finding:
The applicant has stated in their narrative (Exhibit A1), that the proposed development will comply with odor restrictions as to not create a nuisance condition at any point beyond the Lam campus. With recommended Condition of Approval A25, this standard will be met.

TDC 63.055. - Heat and Glare.
(1)All uses and development must conduct all operations producing heat or glare entirely within an enclosed building.
(2) All uses and development may utilize exterior lighting, but the exterior lighting must be screened, baffled or directed away from residential planning districts.

Finding:
The applicant has stated in their narrative (Exhibit A1) that all operations producing heat and glare will be conducted within a fully enclosed building, and all exterior lighting will be directed away from residential planning districts. With recommended Condition of Approval A25, these standards are met.

TDC 63.056. - Storage and Stored Materials.
(1) All uses and development must store all materials, including wastes, in a manner that will not attract or aid the propagation of insects or rodents, or in any other way create a health or safety hazard.
(2) All uses and development that utilize open storage that would otherwise be visible at the property line must conceal it from view at the abutting property line by a sight obscuring fence not less than six feet high and not accessible to the general public to protect public safety.

Finding:
The applicant has stated in their narrative (Exhibit A1) that all materials, including wastes, will be stored appropriately and will be screened from public view. With recommended Condition of Approval A25, these standards are met.

TDC 63.057. - Liquid or Solid Waste Materials.
All uses and development are prohibited from disposing waste onto the site or into adjacent drainage ditches, creeks or other natural waterways in violation of State of Oregon DEQ standards, Clean Water Services Standards, City Standards, or in a manner that causes harm to wildlife.

Finding:
The applicant has stated in their narrative (Exhibit A1) that no waste will be disposed of onto or within the site or in any way that violates local, state, or federal regulations. With recommended Condition of Approval A25, these standards are met.

TDC 63.058. - Dangerous Substances.
All uses and development are prohibited from the storage, transfer, or processing of hazardous, toxic, or radioactive waste.

Finding:

The applicant has stated in their narrative (Exhibit A1) that no storage, transfer, or processing of hazardous, toxic, or radioactive waste is proposed as part of this development. With recommended Condition of Approval A25, these standards are met.

Chapter 73A: Site Design

TDC 73A.300. - Commercial Design Standards.

The following standards are minimum requirements for commercial development in all zones, except the Mixed-Use Commercial (MCU) zone, which has its own standards:

(1) Walkways. Commercial development must provide walkways as follows:

(a) Walkways must be a minimum of six feet in width;

(b) Walkways must be constructed of asphalt, concrete, pervious concrete, pavers, or grasscrete. Gravel or bark chips are not acceptable;

(c) Walkways must meet ADA standards applicable at time of construction or alteration;

(d) Walkways must be provided between the main building entrances and other on-site buildings, accessways, and sidewalks along the public right-of-way;

(e) Walkways through parking areas, drive aisles, and loading areas must be visibly raised and of a different appearance than the adjacent paved vehicular areas;

(f) Bikeways must be provided that link building entrances and bike facilities on the site with adjoining public right-of-way and accessways; and

(g) Outdoor Recreation Access Routes must be provided between the development's walkway and bikeway circulation system and parks, bikeways and greenways where a bike or pedestrian path is designated.

Finding:

As stated in Exhibit A1 and illustrated in Exhibit A2, walkways throughout the site are a minimum of 6-feet wide and constructed of concrete. The applicant has stated that all new walkways will meet ADA requirements, which will be confirmed during the site plan review phase of the project. Walkways are proposed to go through parking areas and will be constructed of concrete with the parking lot drive aisles and off-street parking spaces being constructed with asphalt. Walkways are located at primary building entrances and connect to the campus walkway system, accessways and sidewalks. Bicycle parking facilities are provided near the entrances to the proposed office building, near sidewalks and drive aisles providing access to the surrounding public rights-of-way. There are no outdoor recreation access routes required for this site. With recommended Condition of Approval A14.b., these standards are met.

[…]

(4) Safety and Security. Commercial development must provide safety and security features as follows:

(a) Locate windows and provide lighting in a manner that enables tenants, employees, and police to watch over pedestrian, parking, and loading areas;

(b) Locate windows and interior lighting to enable surveillance of interior activity from the public right-of-way;

(c) Locate, orient, and select exterior lighting to facilitate surveillance of on-site activities from the public right-of-way without shining into public rights-of-way or fish and wildlife habitat areas;

(d) Provide an identification system which clearly locates buildings and their entries for patrons and emergency services; and

(e) Above ground sewer or water pumping stations, pressure reading stations, water reservoirs, electrical substations, and above ground natural gas pumping stations must provide a minimum six foot tall security fence or wall.

Finding:
As shown in Exhibit A2, the proposed office building has windows along all sides and all floors. The laboratory building will have limited windows due to its function. The storage and utility buildings will not be occupied, and windows are not warranted for safety and security purposes. Where pedestrian, parking, and loading areas are not visible from windows the applicant will utilize closed circuit cameras for ensuring safety and security (Exhibit A1).

Photometric plans demonstrate full cutoff light fixtures have been selected to reduce light pollution from shining into public rights-of-way. No new above ground sewer or water pumping stations, pressure reading stations, water reservoirs, electrical substations, or above ground natural gas pumping stations are proposed. With recommended Condition of Approval A17 to address (d), these standards are met.

(5) Service, Delivery and Screening. Commercial development must provide service, delivery, and screening features as follows:

(a) Above grade and on-grade electrical and mechanical equipment such as transformers, heat pumps and air conditioners must be screened with sight obscuring fences, walls or landscaping;
(b) Outdoor storage must be screened with a sight obscuring fence, wall, berm or dense evergreen landscaping; and
(c) Above ground pumping stations, pressure reading stations, water reservoirs; electrical substations, and above ground natural gas pumping stations must be screened with sight-obscuring fences or walls and landscaping.

Finding:
As shown in Exhibit A2, the rooftop mechanical equipment will be located behind screening walls. The narrative included as Exhibit A1 states "all above grade and roof-mounted mechanical and electrical equipment will be screened with sight obscuring screening". Outdoor storage will consist of two new waste and recycling enclosures that will be screened with an 8-foot wall (Exhibit A2). The existing gas yard will be expanded and screened from public view by dense evergreen landscaping, topography and distance from abutting properties. With recommended Condition of Approval A26, these standards are met.

(6) Adjacent to Transit. Commercial development adjacent to transit must comply with the following:

(a) Development on a transit street designated in TDC Chapter 11 (Figure 11-5) must provide either a transit stop pad on-site, or an on-site or public sidewalk connection to a transit stop along the subject property's frontage on the transit street.
[…]

Finding:
As shown on Comprehensive Plan Map 8-5 (Exhibit G), the subject site is located along the Blue Line shuttle route with a stop located near the main driveway entrance on SW Leveton Drive. Public sidewalks along SW Leveton Drive and SW 108th Avenue connect the campus to this stop. There is no other plan in place for additional transit along either frontage. This standard is met.

Chapter 73B: Landscaping Standards

Section 73B.020 – Landscape Area Standards Minimum Areas by Use and Zone.

Zone	Minimum Area Requirement*	Minimum Area Requirement with dedication for a fish and wildlife habitat*
(5) IN, CN, CO/MR, MC and MP zones—All uses	**25% of the total area to be developed**	**22.5% of the total area to be developed**
**** For properties within the Hedges Creek Wetland Protection District which have signed the "Wetlands Mitigation Agreement," the improved or unimproved wetland buffer area may reduce the required landscaping to 12.5 percent as long as all other landscape requirements are met.***		

[…]

Finding:

The site is not located within the Hedges Creek Wetland Protection District. As shown in Exhibit A2 the proposal will include 279,500 square feet or 45% of the development area being landscaped. This standard is met.

TDC 73B.040. - Additional Minimum Landscaping Requirements for Commercial Uses.

(1) General. In addition to requirements in TDC 73B.020, commercial uses, except those located in the Mixed-Use Commercial (MUC) zone, must comply with the following:

(a) All areas not occupied by buildings, parking spaces, driveways, drive aisles, pedestrian areas, or undisturbed natural areas must be landscaped.

(i) This standard does not apply to areas subject to the Hedges Creek Wetlands Mitigation Agreement.

(b)Minimum 5-foot-wide landscaped area must be located along all building perimeters viewable by the general public from parking lots or the public right-of-way, but the following may be used instead of the 5-foot-wide landscaped area requirement:

(i) Pedestrian amenities such as landscaped plazas and arcades; and

(ii) Areas developed with pavers, bricks, or other surfaces, for exclusive pedestrian use and contain pedestrian amenities, such as benches, tables with umbrellas, children's play areas, shade trees, canopies.

(c) Five-foot wide landscaped area requirement does not apply to:

(i) Loading areas;

(ii) Bicycle parking areas;

(iii) Pedestrian egress/ingress locations; and

(iv) Where the distance along a wall between two vehicle or pedestrian access openings (such as entry doors, garage doors, carports and pedestrian corridors) is less than eight feet.

Finding:

Landscaping is provided in all practicable areas not otherwise occupied by buildings, vehicle areas, or pedestrian amenity areas (Exhibit A1 and A2). The office building will have a 5-foot-wide landscape strip around the perimeter of the building except for loading areas, bicycle parking areas and pedestrian ingress/egress areas of the building. The applicant has stated that the lab building will have landscaping in all areas viewable from the public right-of-way, except pedestrian ingress/egress areas and loading areas. There is an employee parking area west of the lab building that will not be used by the public

therefore the 5-foot-wide building landscaping would not be required. Neither the storage or utility construction will be visible by the public or from the public rights-of-way. As part of the Building "G" office construction permitted under AR 22-0006, a public plaza is constructed east of these buildings and will be utilized by employees. With recommended Conditions of Approval A14.c-d. and A18, this standard is met.

(d) Development that abuts an RL or MP Zone must have landscaping approved through Architectural Review and must provide and perpetually maintain dense, evergreen landscaped buffers between allowed uses and the adjacent RL and MP zones.

Finding:
The subject property is adjacent to the MP zone to the east, west and south. There is RL-zoned property to the north of the Lam property, on the opposite side of SW Tualatin Road, so the RL-zoned property is adjacent to the site (Exhibit A2). In addition, there will be a new parking lot in the northwest portion of the site, which will have a new landscaping berm added. There is a large existing berm along the site's SW Tualatin Road frontage that will be retained and extended to further screen parking areas located in the northerly portion of the site (Exhibit A2). In addition, there will be a new parking lot in the northwest portion of the site, which will have new evergreen perimeter landscaping that will provide additional screening. With recommended Condition of Approval A14.d., this standard will be met.

(2) Manufacturing Park (MP)—Wetland Buffer. Wetland buffer areas up to 50 feet in width may be counted toward the required percentage of site landscaping, subject to the following:
[…]

Finding:
There are no wetlands within the development areas. This section of the TDC is not applicable.

Section 73B.080 – Minimum Landscaping Standards for All Zones.
The following are minimum standards for landscaping for all zones.

(1) Required Landscape Areas	• **Must be designed, constructed, installed, and maintained so that within three years the ground must be covered by living grass or other plant materials.** • **The foliage crown of trees cannot be used to meet this requirement.** • **A maximum of 10% of the landscaped area may be covered with un-vegetated areas of bark chips, rock or stone.** • **Must be installed in accordance with the provisions of the American National Standards Institute ANSI A300 (Part 1) (Latest Edition).** • **Must be controlled by pruning, trimming, or otherwise so that:** • **It will not interfere with designated pedestrian or vehicular access; and** • **It will not constitute a traffic hazard because of reduced visibility.**

Finding:
The density of plantings as shown on Landscape Plans (Exhibit A2) is sufficient to provide full coverage of landscaping within three years. No more than 10% of the landscaped areas will utilize bark chips, rock or stone. All landscaped areas will be installed in accordance with ANSI A300 Part 1 latest addition. These standards are met.

(2) Fences	**Landscape plans that include fences must integrate any fencing into the plan to guide wild animals toward animal crossings under, over, or around transportation corridors.**

Finding:
No fencing is proposed, and there are no established wildlife crossings in the vicinity. This standard is not applicable.

(3) Tree Preservation	• **Trees and other plant materials to be retained must be identified on the landscape plan and grading plan.** **During construction:** o **Must provide above and below ground protection for existing trees and plant materials identified to remain;** o **Trees and plant materials identified for preservation must be protected by chain link or other sturdy fencing placed around the tree at the drip line;** o **If it is necessary to fence within the drip line, such fencing must be specified by a qualified arborist;** o **Top soil storage and construction material storage must not be located within the drip line of trees designated to be preserved;** o **Where site conditions make necessary a grading, building, paving, trenching, boring, digging, or other similar encroachment upon a preserved tree's drip-line area, such grading, paving, trenching, boring, digging, or similar encroachment must only be permitted under the direction of a qualified arborist. Such direction must assure that the health needs of trees within the preserved area can be met; and** o **Tree root ends must not remain exposed.** • **Landscaping under preserved trees must be compatible with the retention and health of the preserved tree.** • **When it is necessary for a preserved tree to be removed in accordance with TDC 33.110 (Tree Removal Permit) the landscaped area surrounding the tree or trees must be maintained and replanted with trees that relate to the present landscape plan, or if there is no landscape plan, then trees that are complementary with existing, landscape materials. Native trees are encouraged** • **100% of the area preserved under any tree or group of trees (Except for impervious surface areas) retained in the landscape plan must apply directly to the percentage of landscaping required for a development**

Finding:
The Arborist Report (Exhibit A3) calls for preserving 373 on-site trees. With recommended Conditions of Approval A14.a. and A15, these standards are met.

(4) Grading	• **After completion of site grading, top-soil is to be restored to exposed cut and fill areas to provide a suitable base for seeding and planting.** • **All planting areas must be graded to provide positive drainage.** • **Soil, water, plant materials, mulch, or other materials must not be allowed to wash across roadways or walkways.** • **Impervious surface drainage must be directed away from pedestrian walkways, dwelling units, buildings, outdoor private and shared areas and landscape areas except where the landscape area is a water quality facility.**

Finding:
The applicant is required to obtain erosion control and grading permit with the city. With recommended Conditions of Approval A2 and A8, these standards are met.

(5) Irrigation	• **Landscaped areas must be irrigated with an automatic underground or drip irrigation system** • **Exceptions: Irrigation requirement does not apply to duplexes and townhouses.**

Finding:
Irrigation is proposed in new landscaping areas as detailed in the Notes on the Landscape Plan (Exhibit A2). This standard is met.

(6) Re-vegetation in Un-landscaped Areas	• **Vegetation must be replanted in all areas where vegetation has been removed or damaged in areas not affected by the landscaping requirements and that are not to be occupied by structures or other improvements,.** • **Plant materials must be watered at intervals sufficient to ensure survival and growth for a minimum of two growing seasons.** • **The use of native plant materials is encouraged to reduce irrigation and maintenance demands.** • **Disturbed soils should be amended to an original or higher level of porosity to regain infiltration and stormwater storage capacity.**

Finding:
The applicant proposes to landscape all areas not otherwise proposed for development. The applicant has stated that plant materials will be watered to ensure growth during at least two growth cycles.

Areas disturbed by construction will have soils amended to original state or increased porosity to improve water infiltration and increase stormwater storage capacity. With recommended Condition of Approval A18, these standards are met.

Section 73B.090 – Minimum Standards Trees and Plants.

The following minimum standards apply to the types of landscaping required to be installed for all zones.

(1) Deciduous Shade Trees	• **One and on-half inch caliper measured six inches above ground;** • **Balled and burlapped; bare root trees will be acceptable to plant during their dormant season;** • **Reach a mature height of 30 feet or more;** • **Cast moderate to dense shade in summer;** • **Live over 60 years;** • **Do well in urban environments, tolerant of pollution and heat, and resistant to drought;** • **Require little maintenance and mechanically strong;** • **Insect- and disease-resistant;** • **Require little pruning; and** • **Barren of fruit production.**
(2) Deciduous Ornamental Trees	• **One and on-half inch caliper measured six inches above ground;** • **balled and burlapped; bare root trees will be acceptable to plant during their dormant season; and** • **Healthy, disease-free, damage-free, well-branched stock, characteristic of the species**
(3) Coniferous Trees	• **5 feet in height above ground;** • **balled and burlapped; bare root trees will be acceptable to plant during their dormant season; and** • **Healthy, disease-free, damage-free, well-branched stock, characteristic of the species.**
(4) Evergreen and Deciduous Shrubs	• **One to five gallon size;** • **Healthy, disease-free, damage-free, well-branched stock, characteristic of the species; and** • **Side of shrub with best foliage must be oriented to public view.**
(5) Groundcovers	• **Fully rooted;** • **Well branched or leafed;** • **Healthy, disease-free, damage-free, well-branched stock, characteristic of the species; and** • **English ivy (Hedera helix) is prohibited.**
(6) Lawns	• **Consist of grasses, including sod, or seeds of acceptable mix within the local landscape industry;** • **100 percent coverage and weed free; and** • **Healthy, disease-free, damage-free, characteristic of the species.**

Finding:

Per the Plant Schedule provided on the Landscape Plan included in Exhibit A2, the standards for groundcover, shrubs, and trees to be planted are met.

Chapter 73C: Parking Standards

The IMP 24-0001 was vested on July 8, 2024 and the parking lot standards in effect on this date will apply to this application.

TDC 73C.010. - Off-Street Parking and Loading Applicability and General Requirements.

[…]

(2) General Requirements. Off-street parking spaces, off-street vanpool and carpool parking spaces, off-street bicycle parking, and off-street loading berths must be as provided as set forth in TDC 73C.100, unless greater requirements are otherwise established by the conditional use permit or the Architectural Review process.

(a) The following apply to property and/or use with respect to the provisions of TDC 73C.100:

(i) The requirements apply to both the existing structure and use, and enlarging a structure or use;

(ii) The floor area is measured by gross floor area of the building primary to the function of the particular use of the property other than space devoted to off-street parking or loading;

[…]

(iv) Calculations to determine the number of required parking spaces and loading berths must be rounded to the nearest whole number;

(v) If the use of a property changes, thereby increasing off-street parking or loading requirements, the increased parking/loading area must be provided prior to commencement of the new use;

(vi) Parking and loading requirements for structures not specifically listed herein must be determined by the City Manager, based upon requirements of comparable uses listed

(vii) When several uses occupy a single structure, the total requirements for off-street parking may be the sum of the requirements of the several uses computed separately or be computed in accordance with TDC 73.370(1)(m), Joint Use Parking;

[…]

(ix) Required parking spaces must be available for the parking of operable passenger automobiles of residents, customers, patrons and employees and must not be used for storage of vehicles or materials or for the parking of trucks used in conducting the business;

(x) Institution of on-street parking, where none is previously provided, must not be done solely for the purpose of relieving crowded parking lots in commercial or industrial zones;

(xi) Required vanpool and carpool parking must meet the 9-foot parking stall standards in Figure 73-1 and be identified with appropriate signage;

[…]

(xiii) If the applicant demonstrates that too many or too few parking spaces are required, applicant may seek a variance from the minimum or maximum by providing evidence that the particular use needs more or less than the amount specified in this Code.

Finding:

The applicant has proposed off-street parking spaces, off-street vanpool and carpool parking spaces, off-street bicycle parking, and off-street loading berths that will comply with TDC 73C.100. With recommended Conditions of Approval A14.e and A 19, these standards are met.

Section 73C.020 – Parking Lot Design Standards.

A parking lot, whether an accessory or principal use, intended for the parking of automobiles or trucks, must comply with the following:

(1) Off-street parking lot design must comply with the dimensional standards set forth in Figure 73-1; […]

(2) Parking lot drive aisles must be constructed of asphalt, concrete, or pervious concrete;

(3) Parking stalls must be constructed of asphalt, concrete, previous concrete, or a pervious surface such as pavers or grasscrete, but not gravel or woody material. Pervious surfaces, are encouraged for parking stalls in or abutting the Natural Resource Protection Overlay District, Other Natural Areas, or in a Clean Water Services Vegetated Corridor;

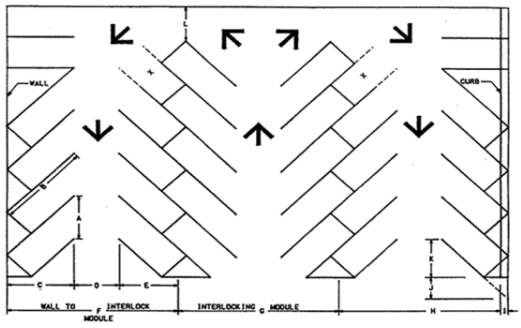
(4) Parking lots must be maintained adequately for all-weather use and drained to avoid water flow across sidewalks;

(5) Parking bumpers or wheel stops or curbing must be provided to prevent cars from encroaching on adjacent landscaped areas, or adjacent pedestrian walkways.

Finding:

As shown on the Site Plan (Exhibit A2), the applicant's proposed off-street parking lot design complies with the dimensional standards set forth in Figure 73-1 (shown below). Most stalls are proposed at 9 feet wide and are either 16 feet long, with landscape overhang spaces will be 18.5 feet long. Drive aisles are proposed between 24 to 30 feet. Both aisles and stalls are proposed to be composed of asphalt. Concrete curbs are also proposed. Wheel stops are proposed for parking stalls adjacent to pedestrian walkways to prevent encroachment. The applicant has proposed new stormwater facilities that will be located near new parking areas. Proposed stormwater drainage will avoid water flow over sidewalks. With recommended Condition of Approval A28, these standards are met.

Tualatin Development Code – Figure 73-1
Parking Space Design Standards for 9-Foot Stalls



Dimension	On Diagram	45°	60°	75°	90°
Stall width parallel to aisle	A	12.7	10.4	9.3	9.0
Stall Length of line	B	25.0	22.0	20.0	18.5
Stall depth to wall	C	17.5	19.0	19.5	18.5
Aisle width between stall lines	D	12.0	16.0	21.0	24.0
Stall depth, interlock	E	15.3	17.5	18.8	18.5
Module, wall to interlock	F	44.8	52.5	61.3	63.0
Module, interlocking	G	42.6	51.0	61.0	63.0
Module, interlocking to curb face	H	42.8	50.2	58.8	60.5
Bumper overhang (typical)	I	2.0	2.3	2.5	2.5
Offset	J	6.3	2.7	0.5	0.0
Setback	K	11.0	8.3	5.0	0.0
Cross aisle, one-way	L	12.0	12.0	12.0	12.0
Cross aisle, two way	-	22.0	22.0	22.0	22.0

X = Stall not accessible in some cases.

Parking Dimensions for Subcompact Parking	45°	60°	75°	90°
Stall Width	7.5	7.5	7.5	7.7
Aisle Width per Stall	10.5	8.7	7.8	7.5
Depth of Stalls at right angle to aisle	16.0	16.7	16.3	15.0
Aisle Width	11.0	14.0	17.4	20.0
Wall-to-Wall module	43.0	47.4	50.0	50.0

Note: These measurements are inadequate for average compacts. Each stall depth should be increased about 1 foot (2 feet total for the module) to accommodate for the usual range of compact sizes.

(6) Disability parking spaces and accessibility must meet ADA standards applicable at time of construction or alteration;
(7) Parking stalls for sub-compact vehicles must not exceed 35 percent of the total parking stalls required by TDC 73C.100. Stalls in excess of the number required by TDC 73C.100 can be sub-compact stalls;

Finding:
The Site Plan (Exhibit A2) illustrates 4 accessible parking spaces will be removed due to construction with 8 new accessible parking spaces being provided. ADA standards will be reviewed in greater detail during building permit review. No compact stalls are included in the proposal. These standards are met.

(8) Groups of more than 4 parking spaces must be so located and served by driveways that their use will require no backing movements or other maneuvering within a street right-of-way other than an alley;
(9) Drives to off-street parking areas must be designed and constructed to facilitate the flow of traffic, provide maximum safety of traffic access and egress, and maximum safety of pedestrians and vehicular traffic on the site;
(10) On-site drive aisles without parking spaces, which provide access to parking areas with regular spaces or with a mix of regular and sub-compact spaces, must have a minimum width of 22 feet for two-way traffic and 12 feet for one-way traffic; When 90 degree stalls are located on both sides of a drive aisle, a minimum of 24 feet of aisle is required. On-site drive aisles without parking spaces, which provide access to parking areas with only sub-compact spaces, must have a minimum width of 20 feet for two-way traffic and 12 feet for one-way traffic;

Finding:
The design of the parking lot will not require movement on the public street. Drive aisles with parking are proposed to be a minimum of 24 feet wide. These standards are met.

(11) Artificial lighting, must be deflected to not shine or create glare in a residential zones, street right-of-way, a Natural Resource Protection Overlay District, Other Natural Areas, or a Clean Water Services Vegetated Corridor;
(12) Parking lot landscaping must be provided pursuant to the requirements of TDC 73C.200; and
(13) Except for parking to serve residential uses, parking areas adjacent to or within residential zones or adjacent to residential uses must be designed to minimize disturbance of residents.

Finding:
As shown on the Site Lighting Plans (Exhibit A2), lighting will primarily be focused on the building entrances, loading, and interior parking areas. There are no areas of Natural Resources Protection Overlay District, other Natural Areas, or a Clean Water Services Vegetated Corridor within the development area. These standards are met.

Section 73C.050 – Bicycle Parking Requirements and Standards.
(1) Requirements. Bicycle parking facilities must include:
(a) Long-term parking that consists of covered, secure stationary racks, lockable enclosures, or rooms in which the bicycle is stored;

(i) Long-term bicycle parking facilities may be provided inside a building in suitable secure and accessible locations.

(b) Short-term parking provided by secure stationary racks (covered or not covered), which accommodate a bicyclist's lock securing the frame and both wheels.

(2) Standards. Bicycle parking must comply with the following:

(a) Each bicycle parking space must be at least six feet long and two feet wide, with overhead clearance in covered areas must be at least seven feet;

(b) A five (5) foot-wide bicycle maneuvering area must be provided beside or between each row of bicycle parking. It must be constructed of concrete, asphalt, or a pervious hard surface such as pavers or grasscrete, and be maintained;

(c) Access to bicycle parking must be provided by an area at least three feet in width. It must be constructed of concrete, asphalt, or a pervious hard surface such as pavers or grasscrete, and be maintained;

(d) Bicycle parking areas and facilities must be identified with appropriate signing as specified in the Manual on Uniform Traffic Control Devices (MUTCD) (latest edition). At a minimum, bicycle parking signs must be located at the main entrance and at the location of the bicycle parking facilities;

(e) Bicycle parking must be located in convenient, secure, and well-lighted locations approved through the Architectural Review process. Lighting, which may be provided, must be deflected to not shine or create glare into street rights-of-way or fish and wildlife habitat areas;

(f) Required bicycle parking spaces must be provided at no cost to the bicyclist, or with only a nominal charge for key deposits, etc. This does not preclude the operation of private for-profit bicycle parking businesses;

[…]

(h) The City Manager or the Architectural Review Board may approve a form of bicycle parking not specified in these provisions but that meets the needs of long-term and/or short-term parking pursuant to Architectural Review.

Finding:

With the proposed additional building square footage, the Lam campus will be approximately 807,730 square feet. Currently, the Lam campus provides 64 short-term and 65 long-term bicycle parking spaces. As shown in Exhibit A2, the applicant proposes a combination of short-term and long-term bike parking areas; however dimensioned details of the bike parking furnishings were not included in the application materials. An additional 18 short-term and 35 long-term bicycle parking spaces will be added to the Lam site. A total of 82 short-term and 100 long-term bicycle parking spaces will be provided for the campus. With recommended Conditions of Approval A14.f. and A19 which will show compliance with standards (a), (b), (c), and (d), these standards are met.

Section 73C.100 – Off-Street Parking Minimum/Maximum Requirements.

USE	MINIMUM MOTOR VEHICLE PARKING	MAXIMUM MOTOR VEHICLE PARKING	BICYCLE PARKING	PERCENTAGE OF BICYCLE PARKING TO BE COVERED
(f) Industrial				
(i) Manufacturing	**1.60 spaces per 1,000 square feet of gross floor area**	**None**	**2 spaces, or 0.10 spaces per 1,000 gross square feet,**	**First five spaces or 30 percent,**

			whichever is greater	**whichever is greater**

Finding:

As previously mentioned under TDC 73C.010, staff finds that the manufacturing rate of 1.6 spaces per 1,000 square feet of gross floor area is acceptable for determining parking requirements for the proposed buildings that support a research and development campus that is primarily dedicated to specialized manufacturing. Exhibit A1 and A2 indicate that 1,012 spaces will be constructed. More specifically, there will be 468 existing spaces removed for construction purposes and reconstructed, and 544 net new spaces will be constructed for a total of 1,012 parking spaces. Included in the 544 new spaces are 127 spaces that were previously approved for Building "G" through AR 22-0006 but not constructed. An analysis of required parking for the proposed use is provided in the table below.

Table 1: Minimum and Proposed Parking by Use

Use	**GFA**	**Minimum Required Parking**	**Proposed Parking**	**Required Bike Parking**	**Required Covered Bike Parking**
Office to support specialized manufacturing	*241,230*	*386*	***1,012***	***24***	***7***

Based on the required parking ratio, 386 parking spaces are required for building construction of 241,230 square feet. The applicant is proposing 35 long-term bicycle parking spaces (covered) and 18 short-term bicycle parking spaces. With recommended Conditions of Approval A 14.e-f, these standards are met.

(2) In addition to the general parking requirements in subsection (1), the following are the minimum number of off-street vanpool and carpool parking for commercial, institutional, and industrial uses.

Number of Required Parking Spaces	**Number of Vanpool or Carpool Spaces**
26 and greater	**1 for each 25 spaces**

Finding:

The proposal is for commercial use which will require a minimum of fifteen vanpool and carpool spaces. As shown in Exhibit A2, 5 carpool spaces will be removed for construction purposes leaving 7 vanpool/carpool spaces for the campus. The 5 spaces will be replaced, and an additional 15 required vanpool/carpool spaces will be provided meeting TDC standards. The new vanpool/carpool parking spaces will be constructed as part of Phase 1. Final design and location of the vanpool/carpool spaces will be reviewed during the building permit review process. With recommended Condition of Approval A14.g., this standard is met.

Section 73C.120 – Off-Street Loading Facilities Minimum Requirements.

(1) The minimum number of off-street loading berths for commercial, industrial, and institutional uses is as follows:

Use	Square Feet of Floor Area	Number of Berths	Dimensions of Berth	Unobstructed Clearance of Berth
Commercial	60,000 and over	3	12 feet × 35 feet	14 feet

(2) Loading berths must not use the public right-of-way as part of the required off-street loading area.
(3) Required loading areas must be screened from public view, public streets, and adjacent properties by means of sight-obscuring landscaping, walls or other means, as approved through the Architectural Review process.
(4) Required loading facilities must be installed prior to final building inspection and must be permanently maintained as a condition of use.
(5) The off-street loading facilities must in all cases be on the same lot or parcel as the structure they are intended to serve. In no case must the required off-street loading spaces be part of the area used to satisfy the off-street parking requirements.
(6) A driveway designed for continuous forward flow of passenger vehicles for the purpose of loading and unloading children must be located on the site of a school or child day care center having a capacity greater than 25 students.

Finding:
The campus site includes several existing buildings and 13 loading dock facilities. As shown in Exhibit A2, the total square footage for this project is 241,230 square feet, which requires 3 loading docks. The applicant is proposing one loading dock for the office building, two for the utility building and one for the lab building for a total of four new loading docks. The proposed loading docks will be approximately 12 feet x 60 feet with 14 feet of vertical clearance. With recommended Condition of Approval A14.g., these standards are met.

Section 73C.130 – Parking Lot Driveway and Walkway Minimum Requirements.
Parking lot driveways and walkways must comply with the following requirements:
[…]
(2)*Commercial Uses.* Ingress and egress for commercial and institutional uses must not be less than the following:

Required Parking Spaces	Minimum Number Required	Minimum Pavement Width	Minimum Pavement Walkways, etc.
Over 250	As required by City Manager	As required by City Manager	As required by City Manager

[…]

Finding:
The Lam Research campus is currently served by three driveways from SW Leveton Drive, three driveways from SW 108th Avenue, and an existing emergency vehicle access from Tualatin Road at 115th. As shown in Exhibit A2, the proposal includes one new driveway located off SW Leveton Drive intended for only trucks. The new driveway will be 36' wide for the first 50' from right-of-way and more than 24' wide (Exhibit A1). No sidewalk is provided near the new truck-only driveway as it is intended use is for truck traffic only. Additional findings are provided in Chapter 75.

(6) Maximum Driveway Widths and Other Requirements.

[…]

(d) There must be a minimum distance of 40 feet between any two adjacent driveways on a single property unless a lesser distance is approved by the City Manager.

(e) Must comply with the distance requirements for access as provided in TDC 75.

(f) Must comply with vision clearance requirements in TDC 75.

Finding:

The proposed SW Leveton Drive truck driveway is located approximately 328 feet east of the existing driveway to the west and 447 feet from the existing driveway to the east. With recommended Condition of Approval A3 standard (e) is met and recommended Condition of Approval A30 standard (f) is met.

TDC 73C.220. - Commercial Parking Lot Landscaping Requirements.

Commercial uses must comply with the following landscaping requirements for parking lots in all zones:

(1) General. Locate landscaping or approved substitute materials in all areas not necessary for vehicular parking and maneuvering.

Finding:

The parking lot contains landscaping in areas not used for vehicle and pedestrian movement. This standard is met.

(2) Clear Zone. Clear zone must be provided for the driver at ends of on-site drive aisles and at driveway entrances, vertically between a maximum of 30 inches and a minimum of eight feet as measured from the ground level.

[…]

Finding:

As shown in the Landscape Plans (Exhibit A2), the proposed plantings will provide for visual clearance at the end of drive aisles and drive entrances. With recommended Condition of Approval A30 related to maintenance, this standard is met.

(3) Perimeter. Minimum five feet in width in all off-street parking and vehicular circulation areas, including loading areas and must comply with the following.

(a) Deciduous trees located not more than 30 feet apart on average as measured on center;

(b) Shrubs or ground cover, planted so as to achieve 90 percent coverage within three years;

(c) Plantings which reach a mature height of 30 inches in three years which provide screening of vehicular headlights year round;

(d) Native trees and shrubs are encouraged; and

(e) Exception: Not required where off-street parking areas on separate lots are adjacent to one another and connected by vehicular access.

Finding:

As shown in the Landscape Plans (Exhibit A2), perimeter landscaping is proposed around all parking, circulation, and loading areas. The narrative, Exhibit A1, states that trees are located less than 30 feet on-center. Confirmation of deciduous trees located not more than 30 feet apart could not be confirmed on the south side of the northernmost SW 108th Avenue. This driveway will be utilized for access to

parking areas to the west, therefore, deciduous trees 30 feet on center are required. With recommended Condition of Approval A14.k., these standards are met.

(4) Landscape Island. Minimum 25 square feet per parking stall must be improved with landscape island areas and must comply with the following:

(a) May be lower than the surrounding parking surface to allow them to receive stormwater run-off and function as water quality facilities as well as parking lot landscaping;
(b) Must be protected from vehicles by curbs, but the curbs may have spaces to allow drainage into the islands;
(c) Islands must be utilized at aisle ends to protect parked vehicles from moving vehicles and emphasize vehicular circulation patterns;
(d) Landscape separation required for every eight continuous spaces in a row.
(e) Must be planted with one deciduous shade trees for every four parking spaces; Required trees must be evenly dispersed throughout the parking lot;
(f) Must be planted with groundcover or shrubs;
(g) Native plant materials are encouraged;
(h) Landscape island areas with trees must be a minimum of five feet in width (from inside of curb to curb);
(i) Required plant material in landscape islands must achieve 90 percent coverage within three years; and
(i) Exceptions: […]

Finding:
No below grade landscape islands are proposed. Landscape islands will be constructed with curbs and stormwater drainage will not being affected. Given that a minimum of 386 parking spaces are required for the proposed use, 9,650 square feet of parking lot landscape island area and 97 trees are required. The applicant has proposed 1,012 total parking spaces, which requires 25,300 square feet of improved landscaped islands. While the application materials are silent on the square footage of parking lot landscaping included in the proposal, there are 399 trees proposed throughout the parking areas. With recommended Condition of Approval A14.j., these standards are met.

(5) Driveway Access. For lots with 12 or more parking spaces, site access from the public street must be defined by:

(a) Landscape area at least five feet in width on each side of the site access;
(b) Landscape area must extend 25 feet from the right-of-way line; and
(c) Exceptions: […]

Finding:
As shown in Exhibit A2, it is unclear if the proposed SW Leveton Drive driveway is flanked by the required five-foot-wide landscape area on each side of the new driveway and extending more than 25 feet from the right-of-way line. With recommended Condition of Approval A14.k., these standards are met.

Chapter 73D: Waste and Recyclables Management Standards

Section 73D.010 – Applicability and Objectives.
(1) Applicability. The requirements of this Chapter apply to all new or expanded:

(a) Common wall residential developments containing five or more units;

[…]

Section 73D.020 - Design Methods.

An applicant required to provide mixed solid waste and source separated recyclables storage areas must comply with one of following methods:

(1) The minimum standards method in TDC 73D.030;

(2) The waste assessment method in TDC 73D.040;

(3) The comprehensive recycling plan method in TDC 73D.050; or

(4) The franchised hauler review method in TDC 73D.060.

Finding:

The applicant proposes to use the Waste Assessment Method (TDC 73D.030) and has verified that the location and configuration of the proposed waste facility and access will satisfy Republic Services in Exhibit A6. As discussed below, these standards are met.

TDC 73D.040. - Waste Assessment Method.

This method tailors the storage area size to a waste assessment and management program for the specific user of a new or expanded building. It is most appropriate when the specific use of a building is known and the type and volume of mixed solid waste to be generated can be estimated.

(1) A waste assessment form must be obtained from the City Manager. The form must be used to estimate the volumes of both mixed solid waste and source separated recyclables generated.

(2) Techniques such as a compactor or cardboard baler may be implemented to minimize the square footage of the storage area.

(3) The plans must identify the size and location of interior, or exterior storage area(s) or both, specialized equipment to be used, and collection schedule required to accommodate the volumes of waste projected in the waste assessment.

(4) The application must demonstrate that the mixed solid waste and source separated recyclable volumes expected to be generated can be stored in less space than required by the Minimum Standards Method. If the application does not demonstrate that the waste assessment method requires less space, the minimum standards method will be required.

Finding:

The applicant has stated that the Waste Assessment Method is appropriate because the proposed development is an expansion of the existing development for a specific user and specific building uses (Exhibit A1). The applicant provided a Service Provider Letter from Republic Services that states the ingress and egress is adequate for container placement and access for trucks (Exhibit A6). The lab will have a waste enclosure located at the southeast corner of the building and a second enclosure will be provided at the northeast corner of the office building (Exhibit A1 and A2). With recommended Condition of Approval A14.l. demonstrating that the development includes an acceptable waste and recyclables management solution, these standards are met.

Section 73D.070 – Location, Design and Access Standards.

The following location, design, and access standards are applicable to all storage areas:

(1) Location Standards.

(a) The storage area for source separated recyclables may be collocated with the storage area for mixed solid waste.

(b) Storage area space requirements can be satisfied with a single location or multiple locations, and can combine both interior and exterior locations.

(c) Exterior storage areas must:

(i) Be located in central and visible locations on the site to enhance security for users;

(ii) Be located in a parking area; and

(iii) Not be located within a required front yard setback or in a yard adjacent to a public or private street.

(2) Design Standards.

(a) The dimensions of the storage area must accommodate containers consistent with current methods of local collection at time of construction or alteration.

(b) Indoor and outdoor storage areas must comply with Oregon Building and Fire Code requirements.

(c) Exterior storage areas must be enclosed by a sight obscuring fence or wall at least 6 feet in height.

(d) Evergreen plants must be placed around the enclosure walls, excluding the gate or entrance openings for common wall, commercial, and institutional developments.

(e) Gate openings for haulers must be a minimum of 10 feet wide and must be capable of being secured in a closed and open position.

(f) Horizontal clearance must be a minimum of 10 feet and a vertical clearance of 8 feet is required if the storage area is covered.

(g) A separate pedestrian access must also be provided in common wall, commercial, and institutional developments.

(h) Exterior storage areas must have either a concrete or asphalt floor surface.

(i) Storage areas and containers must be clearly labeled to indicate the type of material accepted.

Finding:

The applicant has stated that both enclosures will include space for recyclables and mixed solid waste. One of the enclosures will serve and be located on the northeast exterior of the office building and the other enclosure will serve and be located on the southeast exterior of the lab building. According to Exhibit A2, the office building will provide a 13'-6 ¼" by 20 feet enclosure containing two 8 cubic yard receptacles and a 11' by 25' area for a trash compactor. Exhibit A2 illustrates two 8 cubic yards receptacles and an additional 3 cubic yards waste collection and 6 yards of recycling collection being provided for the lab building. An 8' high screening wall matching each building will be provided. Republic Services has reviewed the development proposal and have indicated the plans are sufficient and stated requirements for each enclosure (Exhibit A6). The design of the enclosures will accommodate the containers consistent with the Waste Assessment Method. The Building Division will confirm during the building permit review stage that the Oregon Building and Fire Code requirements are met. The applicant is not planning to utilize evergreen plants for screening due to the industrial nature of the use. Access and gate openings were reviewed by Republic Services and the applicant has stated that the gate openings will be at least 10 feet wide with a minimum horizontal clearance of 10 feet. Because the use is industrial, the applicant is not proposing separate pedestrian access. The storage area will have a surface of either concrete or asphalt and will be reviewed by the Building Division. The applicant has indicated that the storage area and containers will be clearly labeled. With recommended Condition of Approval A14.l., these standards are met.

(3) Access Standards.

(a) Storage areas must be accessible to users at convenient times of the day, and to hauler personnel on the day and approximate time they are scheduled to provide hauler service.

(b) Storage areas must be designed to be easily accessible to hauler trucks and equipment, considering paving, grade, gate clearance and vehicle access.
(c) Storage areas must be accessible to hauler trucks without requiring backing out of a driveway onto a public street. If only a single access point is available to the storage area, adequate turning radius must be provided to allow hauler trucks to safely exit the site in a forward motion.
(d) Storage areas must located so that pedestrian and vehicular traffic movement are not obstructed on site or on public streets adjacent to the site.
(e) The following is an exception to the access standard:
(i) Access may be limited for security reasons.

Finding:
As shown in the applicant's submittal, Republic Services, the applicable waste hauler, has indicated that the dimensions and accessibility of the enclosures meet their service needs (Exhibit A6). These standards are met.

Chapter 74: Public Improvement Requirements

[…]
TDC 74.110. - Phasing of Improvements.

The applicant may build the development in phases. If the development is to be phased the applicant must submit a phasing plan to the City Manager for approval with the development application. The timing and extent or scope of public improvements and the conditions of development must be determined by the City Council on subdivision applications and by the City Manager on other development applications.

Finding:
The applicant's Architectural Review narrative states that three construction phases are planned. Phase 1 will construct the office building and northern parking lot within the initial 2-years of construction after approval of AR 24-0002. Phase 2 will construct the lab, utility building, storage building within the first four years. Phase 3 will expand the bulk gas yard and parking area in the southwestern area of the site with construction starting within 6-years. Staff recommended Condition of Approval A1 will memorialize timing of the phased construction proposed by the applicant.

TDC 74.120 Public Improvements.
(1) Except as specially provided, all public improvements must be installed at the expense of the applicant. All public improvements installed by the applicant must be constructed and guaranteed as to workmanship and material as required by the Public Works Construction Code prior to acceptance by the City. Work must not be undertaken on any public improvement until after the construction plans have been approved by the City Manager and a Public Works Permit issued and the required fees paid.

Finding:
All public improvements will be installed by the applicant at their expense after approval of plans and issued Erosion Control, Water Quality, and Public Works Permits. With recommended Conditions of Approval A11, A12, and A16 this standard is met.

TDC 74.130 Private Improvements.

All private improvements must be installed at the expense of the applicant. The property owner must retain maintenance responsibilities over all private improvements.

Finding:
All private improvements will be installed by the applicant at their expense and will require prior approval of plans and building permits. With recommended Conditions of Approval A11, A12, and A16 this standard is met.

TDC 74.140 Construction Timing.
(1) All the public improvements required under this chapter must be completed and accepted by the City prior to the issuance of a Certificate of Occupancy.
(2) All private improvements required under this Chapter must be approved by the City prior to the issuance of a Certificate of Occupancy.

Finding:
The applicant will need to complete and obtain City acceptance of all public and private improvements proposed and modified by conditions of approval prior to receiving a Certificate of Occupancy. With recommended Condition of Approval A16 this standard is met.

[…]
TDC 74.210 Minimum Street Right-of-Way Widths.
The width of streets in feet shall not be less than the width required to accommodate a street improvement needed to mitigate the impact of a proposed development. In cases where a street is required to be improved according to the standards of the TDC, the width of the right-of-way shall not be less than the minimums indicated in TDC Chapter 74, Public Improvement Requirements, Figures 74-2A through 74-2G.
(2) For development applications other than subdivisions and partitions, wherever existing or future streets adjacent to property proposed for development are of inadequate right-of-way width, the additional right-of-way necessary to comply with TDC Chapter 74, Public Improvement Requirements, Figures 74-2A through 74-2G of the Tualatin Community Plan must be dedicated to the City for use by the public prior to issuance of any building permit for the proposed development. This right-of-way dedication must be for the full width of the property abutting the roadway and, if required by the City Manager, additional dedications must be provided for slope and utility easements if deemed necessary.

Finding:
The proposal is adjacent to SW 108th Avenue, SW Leveton Drive, and SW Tualatin Road. Required dedication of right-of-way and construction of public street surface infrastructure will benefit this development's expected addition of bicycle, pedestrian, and vehicular trips utilizing streets and sidewalks. Final plans will include a minimum of half-street right-of-way dedications to preferred cross-sections along with improvements within SW Leveton Drive and SW Tualatin Road meeting the requirements of the City of Tualatin. With recommended Conditions of Approval A3, A11, and A16 this standard is met.

TDC 74.320. - Slope Easements.
(1) The applicant must obtain and convey to the City any slope easements determined by the City Manager to be necessary adjacent to the proposed development site to support the street

improvements in the public right-of-way or accessway or utility improvements required to be constructed by the applicant.
[…]
(3) For all other development applications, a slope easement dedication must be submitted to the City Manager; building permits must not be issued for the development prior to acceptance of the easement by the City.

Finding:
Any required slope easements necessary to support SW 108th Avenue, SW Leveton Drive, and SW Tualatin Road will be granted to the City. With recommended Conditions of Approval A3, A11, and A16 this standard is met.

TDC 74.330. - Utility Easements.
(1) Utility easements for water, sanitary sewer and storm drainage facilities, telephone, television cable, gas, electric lines and other public utilities must be granted to the City.
[…]
(4) For development applications other than subdivisions and partitions, and for both on-site and off-site easement areas, a utility easement must be granted to the City; building permits must not be issued for the development prior to acceptance of the easement by the City. The City may elect to exercise eminent domain and condemn necessary off-site public utility easements at the applicant's request and expense. The City Council must determine when condemnation proceedings are to be used.
(5) The width of the public utility easement must meet the requirements of the Public Works Construction Code. All subdivisions and partitions must have a 6-foot public utility easement adjacent to the street and a 5-foot public utility easement adjacent to all side and rear lot lines. Other easements may be required as determined by the City Manager.

Finding:
Any required public slope and/or utility easements will be granted to the City. The public utility easement width will be 8-feet-wide adjacent to the final dedicated rights-of-way of SW 108th Avenue, SW Leveton Drive, and SW Tualatin Road. Additional width of public utility easement will include accommodation of the water system meters and vaults and onsite water laterals to meet the Public Works Construction Code. With recommended Conditions of Approval A3, A4, A5, A6, and A11 these standards are met.

TDC 74.420 Street Improvements.
When an applicant proposes to develop land adjacent to an existing or proposed street, including land which has been excluded under TDC 74.220, the applicant should be responsible for the improvements to the adjacent existing or proposed street that will bring the improvement of the street into conformance with the Transportation Plan (TDC Chapter 11), TDC 74.425 (Street Design Standards), and the City' s Public Works Construction Code, subject to the following provisions:
(1) For any development proposed within the City, roadway facilities within the right-of-way described in TDC 74.210 must be improved to standards as set out in the Public Works Construction Code.
(2) The required improvements may include the rebuilding or the reconstruction of any existing facilities located within the right-of-way adjacent to the proposed development to bring the facilities into compliance with the Public Works Construction Code.

(3) The required improvements may include the construction or rebuilding of off-site improvements which are identified to mitigate the impact of the development.
(4) Where development abuts an existing street, the improvement required must apply only to that portion of the street right-of-way located between the property line of the parcel proposed for development and the centerline of the right-of-way, plus any additional pavement beyond the centerline deemed necessary by the City Manager to ensure a smooth transition between a new improvement and the existing roadway (half-street improvement). Additional right-of-way and street improvements and off-site right-of-way and street improvements may be required by the City to mitigate the impact of the development. The new pavement must connect to the existing pavement at the ends of the section being improved by tapering in accordance with the Public Works Construction Code.
(5)If additional improvements are required as part of the Access Management Plan of the City, TDC Chapter 75, the improvements must be required in the same manner as the half-street improvement requirements.
(6) All required street improvements must include curbs, sidewalks with appropriate buffering, storm drainage, street lights, street signs, street trees, and, where designated, bikeways and transit facilities.
[…]
(8) For development applications other than subdivisions and partitions, all street improvements required by this section must be completed and accepted by the City prior to the issuance of a Certificate of Occupancy.
[…]
(10) Streets within, or partially within, a proposed development site must be graded for the entire right-of-way width and constructed and surfaced in accordance with the Public Works Construction Code.
(11) Existing streets which abut the proposed development site must be graded, constructed, reconstructed, surfaced or repaired as necessary in accordance with the Public Works Construction Code and TDC Chapter 11, Transportation Plan, and TDC 74.425 (Street Design Standards).
[…]
(14) The applicant must construct any required street improvements adjacent to parcels excluded from development, as set forth in TDC 74.220 of this chapter.
[…]
(17) Intersections should be improved to operate at a level of service of at least D and E for signalized and unsignalized intersections, respectively.
[…]

Finding:
A Transportation Impact Analysis from Mackenzie was submitted. The City Engineer and an independent consultant have reviewed this traffic analysis, found it to be in substantial conformance with Tualatin's Traffic Study Requirements, and agree with its conclusions. The applicant will construct a new access approximately 400 feet to the east of westernmost access to SW Leveton Drive. Sidewalk will be added along the northernmost access to SW 108th Avenue to the main campus. Sidewalks along SW Leveton Drive, SW 108th Ave, and SW Tualatin Road will be reviewed and improved where needed to bring them into compliance with ADA (PROWAG) specifications. Additionally, the City Engineer has reviewed the proposal against the above requirements. Required dedication of right-of-way and construction of public street surface infrastructure will mitigate this development's expected addition of bicycle, pedestrian,

and vehicular trips utilizing streets and sidewalks. With recommended Conditions of Approval A3, A11, and A16 these standards are met.

TDC 74.425 Street Design Standards.

(1) Street design standards are based on the functional and operational characteristics of streets such as travel volume, capacity, operating speed, and safety. They are necessary to ensure that the system of streets, as it develops, will be capable of safely and efficiently serving the traveling public while also accommodating the orderly development of adjacent lands.

(2) The proposed street design standards are shown in Figures 72A through 72G. The typical roadway cross sections comprise the following elements: right-of-way, number of travel lanes, bicycle and pedestrian facilities, and other amenities such as landscape strips. These figures are intended for planning purposes for new road construction, as well as for those locations where it is physically and economically feasible to improve existing streets.

[…]

(4) All streets must be designed and constructed according to the preferred standard. The City Manager may reduce the requirements of the preferred standard based on specific site conditions, but in no event will the requirement be less than the minimum standard. The City Manager must take into consideration the following factors when deciding whether the site conditions warrant a reduction of the preferred standard:

(a)Arterials:

(i)Whether adequate right-of-way exists;

(ii)Impacts to properties adjacent to right-of-way;

(iii)Current and future vehicle traffic at the location; and

(iv)Amount of heavy vehicles (buses and trucks).

(b) Collectors:

(i) Whether adequate right-of-way exists;

(ii) Impacts to properties adjacent to right-of-way;

(iii) Amount of heavy vehicles (buses and trucks); and

(iv) Proximity to property zoned manufacturing or industrial.

[...]

Finding:

The proposal is adjacent to SW 108th Avenue, SW Leveton Drive, and SW Tualatin Road. These roads are designated as a Minor Collector, Minor Arterial, and Major Collector, respectively, on Tualatin Comprehensive Plan Map 8-1: Tualatin Functional Classification Plan and Traffic Signal Plan. A Transportation Impact Analysis from Mackenzie did not recommend additional improvements greater than the planned cross-sections. Prior to occupancy these streets will meet or will be improved to meet City Standards as determined by the City Engineer. With recommended Conditions of Approval A3, A11, and A16 these standards are met.

TDC 74.440 Streets, Traffic Study Required.

(1) The City Manager may require a traffic study to be provided by the applicant and furnished to the City as part of the development approval process as provided by this Code, when the City Manager determines that such a study is necessary in connection with a proposed development project in order to:

(a) Assure that the existing or proposed transportation facilities in the vicinity of the proposed development are capable of accommodating the amount of traffic that is expected to be generated by the proposed development, and/or
(b) Assure that the internal traffic circulation of the proposed development will not result in conflicts between on-site parking movements and/or on-site loading movements and/or on-site traffic movements, or impact traffic on the adjacent streets.

(2) The required traffic study must be completed prior to the approval of the development application.

(3) The traffic study must include, at a minimum:
(a) an analysis of the existing situation, including the level of service on adjacent and impacted facilities.
(b) an analysis of any existing safety deficiencies.
(c) proposed trip generation and distribution for the proposed development.
(d) projected levels of service on adjacent and impacted facilities.
(e) recommendation of necessary improvements to ensure an acceptable level of service for roadways and a level of service of at least D and E for signalized and unsignalized intersections respectively, after the future traffic impacts are considered.
(f) The City Manager will determine which facilities are impacted and need to be included in the study.
(g) The study must be conducted by a registered engineer.

(4) The applicant must implement all or a portion of the improvements called for in the traffic study as determined by the City Manager.

Finding:

A Transportation Impact Analysis and TIA Supplemental Letter from Mackenzie evaluated the following:

1. Three new buildings are proposed in both the southeast and at the southwest portions of the Lam campus in Tualatin, Oregon.

2. This project includes a four-story office building with an area of up to 120,000 square feet (SF) in the southeast portion of the campus and a two-story utility building with approximately 29,000 SF and a laboratory building with approximately 85,000 SF in the southwest portion of the campus.

3. At full occupancy, the proposed campus expansion is estimated to generate an additional 244 AM peak hour, 233 PM peak hour, and 2036 daily trips.

4. A safety review, capacity analysis, and queuing analysis was conducted for intersections meeting City thresholds for traffic study - all City intersections within a 1/4-mile of the project site, all ODOT facilities anticipated to be impacted by 50 or more peak hour trips, and intersections of concern as noted by ODOT or the City.

5. No study area intersections were found to have a crash rate higher than 1.0 for the five-year crash data from 2019 through 2023, nor were significant patterns found that could be addressed by improvements to the intersections.

6. All public street intersections but one are projected to meet City of Tualatin and ODOT mobility standards with the proposed project. The intersection of SW Hazelbrook Road/OR 99W experiences long delays in the PM peak hour for vehicles turning right onto OR 99W, but capacity improvements are not recommended at this location.

7. Queuing for study area intersections is currently estimated to be accommodated by existing storage areas.

Mackenzie's recommended improvements include:

- *A. Coordinate traffic signals to facilitate left turn movements from OR 99W to SW Tualatin Road at their intersections with SW 124th Avenue. This will minimize the queue lengths and delays for southbound left turns on SW 124th Avenue and avoid potential spill back to OR 99W.*

- *B. Trim vegetation at the site access locations as needed to provide the recommended intersection sight distances*

The City Engineer and an independent consultant have reviewed the traffic study provided by the applicant, found it to be in substantial conformance with Tualatin's Traffic Study Requirements, and agree with its conclusions.

ODOT's response (Exhibit K) summarizes:

- *"ODOT concurs with the findings of the TIA that all ODOT intersections are projected to meet ODOT mobility standards following completion of both phases of the project in 2030.*
- *Given that this has not been shown to present safety or operation issues for northbound traffic on OR 99W, ODOT concurs that "mitigation is not recommended [at Hazelbrook] because it would encourage vehicles to travel this route from SW Tualatin Road instead of using SW 124th Avenue to access OR 99W northbound."*
- *ODOT has noted that "no further analysis of state highway facilities is required".*

With recommended Conditions of Approval A3, A11, and A16 these standards are met.

[…]

TDC 74.470 Street Lights.
(1) Street light poles and luminaries must be installed in accordance with the Public Works Construction Code.
(2) The applicant must submit a street lighting plan for all interior and exterior streets on the proposed development site prior to issuance of a Public Works Permit.

Finding:
The applicant will evaluate street lighting levels in accordance with City standards. Street lights will be installed as needed to meet these standards. A maintenance fee will be paid for those installed. With recommended Conditions of Approval A3, A11, and A16, this standard is met.

[…]
TDC 74.485. - Street Trees.
[…]
(2) In nonresidential subdivisions and partitions street trees must be planted by the owners of the individual lots as development occurs.
(3) The Street Tree Ordinance specifies the species of tree which is to be planted and the spacing between trees.

Finding:
The applicant will plant street trees as shown within approved permit plans. Many large mature trees exist along the property frontage of SW Tualatin Road and will remain and serve the function of street trees. With recommended Conditions of Approval A3, A11, and A16 this standard is met.

TDC 74.610 Water Service.
(1) Water lines must be installed to serve each property in accordance with the Public Works Construction Code. Water line construction plans must be submitted to the City Manager for review and approval prior to construction.
[…]
(3) As set forth is TDC Chapter 12, Water Service, the City has three water service levels. All development applicants must be required to connect the proposed development site to the service level in which the development site is located. If the development site is located on a boundary line between two service levels the applicant must be required to connect to the service level with the higher reservoir elevation. The applicant may also be required to install or provide pressure reducing valves to supply appropriate water pressure to the properties in the proposed development site.

TMC 3-3-040 - Separate Services Required.
(1) Except as authorized by the City Engineer, a separate service and meter to supply regular water service or fire protection service shall be required for each building, residential unit or structure served. For the purposes of this section, trailer parks and multi-family residences of more than four dwelling units shall constitute a single unit unless the City Engineer determines that separate services are required.
(2) For nonresidential uses, separate meters shall be provided for each structure. Separate meters shall also be provided to each buildable lot or parcel on which water service is or will be provided.

Finding:
Lam Research Corporation's proposed rerouting of the existing public water main serving the JAE Oregon site will result in conversion of the entire line outside of public right-of-way to a private water main owned and maintained by JAE. One adequately sized private meter at SW Tualatin Road right-of way and a private domestic line will connect to existing lines on the JAE lot connecting past existing meters. The existing meters will be decommissioned.

If needed to obtain additional fire flow volumes in the future, JAE may obtain permits to loop this line over their lot with installation of a fire vault prior to connection to the public main in SW Leveton Drive.

Lam's proposed water services will be directly connected to public mains within adjacent public rights-of-way.

With recommended Conditions of Approval A5, A6, A11, and A16 standards of TMC 3-3-040 (1) and (2) and TDC 74.610 (1) and (3) are met.

TDC 74.620 Sanitary Sewer Service.

(1) Sanitary sewer lines must be installed to serve each property in accordance with the Public Works Construction Code. Sanitary sewer construction plans and calculations must be submitted to the City Manager for review and approval prior to construction.

[…]

TMC 3-2-060 - Use of Public Sewers Required.

[…]

(3) The owner of all buildings situated within the City and abutting on a street, sewer easement, alley or right-of-way in which there is located a public sanitary sewer of the City is required at his or her expense to connect such building directly with the proper public sewer, either by gravity or with approved pumping facilities, in accordance with this ordinance, within 90 days after the date of official notice to do so; provided that the public sewer is available to or on the property and/or at a property line of the property and the structures or buildings are within 300 feet of the public sewer.

[…]

Finding:

New and modified buildings and structures will include separate laterals connecting to public mains within SW Leveton Drive. Downstream conveyance capacity will be confirmed or upgraded. With recommended Conditions of Approval A4, A11, and A16 standards of TDC 74.620 (1) and TMC 3-2-060 (3) are met.

TDC 74.630 Storm Drainage System.

(1) Storm drainage lines must be installed to serve each property in accordance with City standards and Clean Water Services standards. Storm drainage construction plans and calculations must be submitted to the City Manager for review and approval prior to construction.

(2) The storm drainage calculations must confirm that adequate capacity exists to serve the site. The discharge from the development must be analyzed in accordance with the City's Storm and Surface Water Regulations and Clean Water Services standards.

[…]

TDC 74.640 Grading.

(1) Development sites must be graded to minimize the impact of storm water runoff onto adjacent properties and to allow adjacent properties to drain as they did before the new development.

(2) A development applicant must submit a grading plan showing that all lots in all portions of the development will be served by gravity drainage from the building crawl spaces; and that this development will not affect the drainage on adjacent properties. The City Manager may require the applicant to remove all excess material from the development site.

TDC 74.650 Water Quality, Storm Water Detention and Erosion Control.

The applicant must comply with the water quality, storm water detention and erosion control requirements in the Surface Water Management Ordinance. If required:

[…]

(2) On all other development applications, prior to issuance of any building permit, the applicant must arrange to construct a permanent on-site water quality facility and storm water detention facility and submit a design and calculations indicating that the requirements of the Surface Water Management Ordinance will be met and obtain a Stormwater Connection Permit from Clean Water Services.
(3) For on-site private and regional non-residential public facilities, the applicant must submit a stormwater facility agreement, which will include an operation and maintenance plan provided by the City, for the water quality facility for the City's review and approval. The applicant must submit an erosion control plan prior to issuance of a Public Works Permit. No construction or disturbing of the site must occur until the erosion control plan is approved by the City and the required measures are in place and approved by the City.

Finding:
The Civil Storm Drainage Overall Plan illustrates capturing stormwater runoff from the site's developed areas for each lot to private stormwater facilities on each lot with conveyance to the public stormwater system in SW 108th Avenue and SW Leveton Drive either directly or via private easements. The submitted Preliminary Stormwater Drainage Report prepared by Mackenzie includes modifying existing and construction of new stormwater facilities to provide treatment, hydromodification, and detention for all private impervious areas. Modified public impervious areas within SW 108th Avenue right-of-way continue to flow south towards a public stormwater facility on the west side of SW 108th Avenue north of the intersection with SW Leveton Drive which could be confirmed adequate or enlarged to ensure adequate capacity. Modified public impervious areas within SW Leveton Drive and SW Tualatin Road rights-of-way may require public stormwater Low Impact Development Approaches (LIDA) to provide stormwater management.

Final plans and stormwater calculations will demonstrate that the development has direct access by gravity to the public stormwater system with adequate infiltration and/or downstream capacity in accordance with City of Tualatin and Clean Water Service standards.

The site disturbance is approximately 14.4 acres. Erosion and sediment control plans and permit applications conforming to the requirements of the City of Tualatin, CWS, and Oregon Department of Environmental Quality will be provided with the construction permit submittal documents. The applicant will obtain an erosion control permit from the City of Tualatin for disturbance greater than 500 square feet. In addition, these plans must be sufficient to obtain a National Pollution Discharge Elimination System (NPDES) 1200-CN Stormwater Discharge Permit from Clean Water Services as an agent of Oregon Department of Environmental Quality if between 1 and 5 acres of disturbance or a National Pollution Discharge Elimination System (NPDES) 1200-C Construction Erosion Control permit from Oregon DEQ for over 5 acres.

A Clean Water Services' Service Provider Letter and Memorandum were received. After land use decision issuance, the applicant will submit final plans complying with the Service Provider Letter conditions and CWS Memorandum that are sufficient to obtain a Stormwater Connection Permit Authorization Letter from Clean Water Services in accordance with TDC 74.650(2) and CWS D&CS 3.01.2(d). With recommended Conditions of Approval A7, A8, A9, A10, A11, and A16 these standards are met.

TDC 74.660 Underground.
(1) All utility lines including, but not limited to, those required for gas, electric, communication, lighting and cable television services and related facilities must be placed underground. Surface-

mounted transformers, surface-mounted connection boxes and meter cabinets may be placed above ground. Temporary utility service facilities, high capacity electric and communication feeder lines, and utility transmission lines operating at 50,000 volts or above may be placed above ground. The applicant must make all necessary arrangements with all utility companies to provide the underground services. The City reserves the right to approve the location of all surface-mounted transformers.
(2) Any existing overhead utilities may not be upgraded to serve any proposed development. If existing overhead utilities are not adequate to serve the proposed development, the applicant must, at their own expense, provide an underground system. The applicant must be responsible for obtaining any off-site deeds and/or easements necessary to provide utility service to this site; the deeds and/or easements must be submitted to the City Manager for acceptance by the City prior to issuance of the Public Works Permit.

TDC 74.670. - Existing Structures.
(1) Any existing structures requested to be retained by the applicant on a proposed development site must be connected to all available City utilities at the expense of the applicant.
(2) The applicant must convert any existing overhead utilities serving existing structures to underground utilities, at the expense of the applicant.
(3) The applicant must be responsible for continuing all required street improvements adjacent to the existing structure, within the boundaries of the proposed development site.
[…]

Finding:
The applicant will construct a new access approximately 400 feet to the east of the westernmost access to SW Leveton Drive. The northernmost access to SW 108th Avenue will be widened with private sidewalk on the north side to the main campus. The improvements will extend adjacent to all legal lots associated with this project along SW 108th Avenue, SW Leveton Drive, and SW Tualatin Road including compliance with ADA/PROWAG driveways, ramps and sidewalks and undergrounding of overhead utilities as approved by the City Engineer. With recommended Conditions of Approval A3, A11, A13, and A16 these standards are met.

Chapter 75 Access Management

[…]

TDC 75.020. - Permit for New Driveway Approach
(1) Applicability. A driveway approach permit must be obtained prior to constructing, relocating, reconstructing, enlarging, or altering any driveway approach.
(2) Exceptions. A driveway approach permit is not required for:
- **(a) The construction, relocation, reconstruction, enlargement, or alteration of any driveway approach that requires a state highway access permit; or**
- **(b) The construction, relocation, reconstruction, enlargement or alteration of any driveway approach that is part of the construction of a publicly or privately engineered public improvement project.**

(3) Procedure Type. A Driveway Approach Permit is processed as a Type II procedure under TDC 32.220 (Type II).
(4) Submittal Requirements. In addition to the application materials required by TDC 32.140 (Application Submittal), the following application materials are also required:

(a) A site plan, of a size and form and in the number of copies meeting the standards established by the City Manager, containing the following information:

(i)The location and dimensions of the proposed driveway approach;

(ii)The relationship to nearest street intersection and adjacent driveway approaches;

(iii)Topographic conditions;

(iv)The location of all utilities;

(v)The location of any existing or proposed buildings, structures, or vehicular use areas;

(vi)The location of any trees and vegetation adjacent to the location of the proposed driveway approach that are required to be protected pursuant to TDC Chapter 73B or 73C; and

(vii)The location of any street trees adjacent to the location of the proposed driveway approach.

(b) Identification of the uses or activities served, or proposed to be served, by the driveway approach; and

(c) Any other information, as determined by the City Manager, which may be required to adequately review and analyze the proposed driveway approach for conformance with the applicable criteria.

(5) Criteria. A Driveway Approach Permit must be granted if:

(a) The proposed driveway approach meets the standards of this Chapter and the Public Works Construction Code;

(b) No site conditions prevent placing the driveway approach in the required location;

(c) The number of driveway approaches onto an arterial are minimized;

(d) The proposed driveway approach, where possible:

(i) Is shared with an adjacent property; or

(ii) Takes access from the lowest classification of street abutting the property;

(e) The proposed driveway approach meets vision clearance standards;

(f) The proposed driveway approach does not create traffic hazards and provides for safe turning movements and access;

(g) The proposed driveway approach does not result in significant adverse impacts to the vicinity;

(g) The proposed driveway approach minimizes impact to the functionality of adjacent streets and intersections; and

(i)The proposed driveway approach balances the adverse impacts to residentially zoned property and the functionality of adjacent streets.

(6) Effective Date. The effective date of a Driveway Approach Permit approval is the date the notice of decision is mailed.

(7) Permit Expiration. A Driveway Approach Permit approval expires one year from the effective date, unless the driveway approach is constructed within the one-year period in accordance with the approval decision and City standards.

[…]

<u>TDC 75.040. - Driveway Approach Requirements</u>

(1)The provision and maintenance of driveway approaches from private property to the public streets as stipulated in this Code are continuing requirements for the use of any structure or parcel of real property in the City of Tualatin. No building or other permit may be issued until scale plans are presented that show how the driveway approach requirement is to be fulfilled. If the owner or

occupant of a lot or building changes the use to which the lot or building is put, thereby increasing driveway approach requirements, it is unlawful and a violation of this code to begin or maintain such altered use until the required increase in driveway approach is authorized by the City.

(2) Owners of two or more uses, structures, or parcels of land may agree to utilize jointly the same driveway approach when the combined driveway approach of both uses, structures, or parcels of land satisfies their combined requirements as designated in this code; provided that satisfactory legal evidence is presented to the City Attorney in the form of deeds, easements, leases or contracts to establish joint use. Copies of said deeds, easements, leases or contracts must be placed on permanent file with the City Recorder.

(3) Joint and Cross Access.

(a) Adjacent commercial uses may be required to provide cross access drive and pedestrian access to allow circulation between sites.

(b) A system of joint use driveways and cross access easements may be required and may incorporate the following:

(i) A continuous service drive or cross access corridor extending the entire length of each block served to provide for driveway separation consistent with the access management classification system and standards;

(ii) A design speed of ten mph and a maximum width of 24 feet to accommodate two-way travel aisles designated to accommodate automobiles, service vehicles, and loading vehicles;

(iii) Stub-outs and other design features to make it visually obvious that the abutting properties may be tied in to provide cross access via a service drive; and

(iv) An unified access and circulation system plan for coordinated or shared parking areas.

(c) Pursuant to this section, property owners may be required to:

(i) Record an easement with the deed allowing cross access to and from other properties served by the joint use driveways and cross access or service drive;

(ii) Record an agreement with the deed that remaining access rights along the roadway will be dedicated to the city and pre-existing driveways will be closed and eliminated after construction of the joint-use driveway;

(iii) Record a joint maintenance agreement with the deed defining maintenance responsibilities of property owners; and(iv)If subsection(i) through (iii) above involve access to the state highway system or county road system, ODOT or the county must be contacted and must approve changes to subsection(i) through (iii) above prior to any changes.

(iv) If subsection(i) through (iii) above involve access to the state highway system or county road system, ODOT or the county must be contacted and must approve changes to subsection(i) through (iii) above prior to any changes.

(4) Requirements for Development on Less than the Entire Site.

(a) To promote unified access and circulation systems, lots and parcels under the same ownership or consolidated for the purposes of development and comprised of more than one building site must be reviewed as one unit in relation to the access standards. The number of access points permitted must be the minimum number necessary to provide reasonable access to these properties, not the maximum available for that frontage. All necessary easements, agreements, and stipulations must be met. This must also apply to phased development plans. The owner and all lessees within the affected area must comply with the access requirements.

(b) All access must be internalized using the shared circulation system of the principal commercial development or retail center. Driveways should be designed to avoid queuing across surrounding parking and driving aisles.

(5) Lots that front on more than one street may be required to locate motor vehicle accesses on the street with the lower functional classification as determined by the City Manager.
(6) Except as provided in TDC 53.100, all driveway approach must connect directly with public streets.
(7) To afford safe pedestrian access and egress for properties within the City, a sidewalk must be constructed along all street frontage, prior to use or occupancy of the building or structure proposed for said property. The sidewalks required by this section must be constructed to City standards, except in the case of streets with inadequate right-of-way width or where the final street design and grade have not been established, in which case the sidewalks must be constructed to a design and in a manner approved by the City Manager. Sidewalks approved by the City Manager may include temporary sidewalks and sidewalks constructed on private property; provided, however, that such sidewalks must provide continuity with sidewalks of adjoining commercial developments existing or proposed. When a sidewalk is to adjoin a future street improvement, the sidewalk construction must include construction of the curb and gutter section to grades and alignment established by the City Manager.
(8) The standards set forth in this Code are minimum standards for driveway approaches, and may be increased through the Architectural Review process in any particular instance where the standards provided herein are deemed insufficient to protect the public health, safety, and general welfare.
(9) Minimum driveway approach width for uses are as provided in Table 75-1 (Driveway Approach Width):

TABLE 75-1
Driveway Approach Width

Use	Minimum Driveway Approach Width	Maximum Driveway Approach Width
Commercial	1-99 Parking Spaces = 32 feet 100-249 Parking Spaces = two approaches each 32 feet	Over 250 Parking Spaces = As required by the City Manager, but not exceeding 40 feet.
Industrial	36 feet	Over 250 Parking Spaces = As Required by the City Manager, but not exceeding 40 feet

(10) Driveway Approach Separation. There must be a minimum distance of 40 feet between any two adjacent driveways on a single property unless a lesser distance is approved by the City Manager.
(11) Distance between Driveways and Intersections. Except for single-family dwellings, duplexes, townhouses, triplexes, quadplexes, and cottage clusters, the minimum distance between driveways and intersections must be as provided below. Distances listed must be measured from the stop bar at the intersection.

(a) At the intersection of collector or arterial streets, driveways must be located a minimum of 150 feet from the intersection.
(b) At the intersection of two local streets, driveways must be located a minimum of 30 feet from the intersection.
(c) If the subject property is not of sufficient width to allow for the separation between driveway and intersection as provided, the driveway must be constructed as far from the intersection as possible, while still maintaining the 5-foot setback between the driveway and property line.
(d) When considering a driveway approach permit, the City Manager may approve the location of a driveway closer than 150 feet from the intersection of collector or arterial streets, based on written findings of fact in support of the decision.

(12) Vision Clearance Area.

[…]

(b) Collector Streets. A vision clearance area for all collector/arterial street intersections, collector/arterial street and local street intersections, and collector/arterial street and railroad intersections must be that triangular area formed by the right-of-way lines along such lots and a straight line joining the right-of-way lines at points which are 25 feet from the intersection point of the right-of-way lines, as measured along such lines. Where a driveway intersects with a collector/arterial street, the distance measured along the driveway line for the triangular area must be ten feet (see Figure 73-2 for illustration).

(c) Vertical Height Restriction. Except for items associated with utilities or publicly owned structures such as poles and signs and existing street trees, no vehicular parking, hedge, planting, fence, wall structure, or temporary or permanent physical obstruction must be permitted between 30 inches and eight feet above the established height of the curb in the clear vision area (see Figure 73-2 for illustration).

TDC 75.050. - Access Limited Roadways.

(1) This section applies to all developments, permit approvals, land use approvals, partitions, subdivisions, or any other actions taken by the City pertaining to property abutting any road or street listed in TDC 75.050(2). In addition, any property not abutted by a road or street listed in subsection (2), but having access to an arterial by any easement or prescriptive right, must be treated as if the property did abut the arterial and this Chapter applies.

(2)The following Freeways and Arterials are access limited roadways:

[…]

(n) Leveton Drive from 108th Avenue to 124th Avenue;

(o) 108th Avenue from Leveton Drive to Herman Road;

[…]

(3) This Chapter takes precedence over any other TDC chapter and over any other ordinance of the City when considering any development, land use approval or other proposal for property abutting an arterial or any property having an access right to an arterial.

(4)The City may act on its own initiative to protect the public safety and control access on arterials or any street to be included by TDC 75.030, consistent with its authority as the City Road Authority.

[…]

TDC 75.140. - Existing Streets Access Standards.

The following list describes in detail the freeways and arterials as defined in TDC 75.050 with respect to access. Recommendations are made for future changes in accesses and location of future accesses. These recommendations are examples of possible solutions and shall not be construed as limiting the City's authority to change or impose different conditions if additional studies result in different recommendations from those listed below.

[…]

(15) LEVETON DRIVE.

(a) 108th Avenue to 118th Avenue.

(i) On the north side of Leveton Drive, JAE (2S122B 200) shall align a driveway across from 118th Avenue and be permitted a second driveway approximately 50 feet from their east property line. Novellus (2S122AA 500 and 2S122AB 100) shall be permitted

three driveways located approximately 25 feet and 950 feet from the west property line for Tax Lot 100 and 600 feet west of 108th Avenue for Tax Lot 500.

Finding:
The plans illustrate multiple existing accesses: three to SW 108th Avenue, three to SW Leveton Drive, and one emergency vehicle access for Lam to SW Tualatin Road opposing SW 115th Avenue. A new access is proposed approximately 400 feet to the east of the westernmost access to SW Leveton Drive. A new private sidewalk is planned connecting the northern SW 108th Avenue access to the main campus. These accesses were evaluated within the Transportation Impact Analysis prepared by Mackenzie. With recommended Conditions of Approval A3, A11, and A16 these standards are met.

III. RECOMMENDATION

Based on the application materials and analysis and findings presented above, staff finds that the applicable criteria have been met relative to AR 24-0002, and therefore recommend approval of this application with the following conditions of approval:

GENERAL:

A1. This Architectural Review approval expires two years after the date of issuance unless a building, or grading permit submitted in conjunction with a building permit application, has been issued and substantial construction pursuant thereto has taken place and an inspection performed by a member of the Building Division, or an extension is granted under the terms of Section 33.020(10) or most current revision of the TDC. Three construction phases are planned as provided by Section 74.110. Phase 1 will construct the office building, northern parking lot and associated site improvements within the initial 2-years of construction. Phase 2 will construct the lab, utility building, storage building and associated site improvements within the first four years. Phase 3 will expand the bulk gas yard, parking area in the southwestern area of the site and associated site improvements within 6-years.

PRIOR TO ISSUANCE OF EROSION CONTROL, PUBLIC WORKS, AND WATER QUALITY PERMITS:

Submit to the Engineering Division via eTrakit for review and approval:

A2. For Phases I, II, and III the applicant must apply for Engineering Erosion Control and applicable Public Works and Water Quality permits:

- a. Apply using eTrakit. With the initial Engineering permit(s) application(s) include:
  - i. One combined set of 22”x34” plans:
    1. Using NAVD 1988; and,
    2. Attaching one plan set including all applicable Engineering permits to one Engineering permit; and,
    3. Adding notes on other Engineering permits stating which application includes the attached plan set; and,
  - ii. Per the fee schedule:
    1. Fee payment for an Erosion Control permit ; and,

2. Initial deposit payments and cost estimates for each Water Quality and Public Works permit; and,

b. Deliver two 22”x34” hard copies of the combined Engineering permit plan sets to:

City of Tualatin
Attn: Engineering Division c/o Principal Engineer
10699 SW Herman Road
Tualatin, OR 97062

A2.1. All conditions of approval subject to Engineering Division Review shall be interpreted and applied consistent with the principles of nexus and proportionality, and may be modified by the City Engineer so that the Engineering Division and applicant can work through design concerns at the time of engineering permit submittal.

A3. For each Phase: The applicant must obtain City approval of Final Street Improvement Plans for SW 108th Avenue, SW Leveton Drive, and SW Tualatin Road adjacent to all lots associated with the proposed Phase of development in accordance with applicable sections of Tualatin Development Code (TDC) 74 and 75 and Public Works Construction Code (PWCC) that show:

a. Plan and profile of public street cross-sections and utilities 100 feet minimum beyond site frontage and further as needed to demonstrate consistent horizontal and vertical alignments or improvements as needed; and,
b. The boundaries and nature of private access and all public access and utility easements:
    i. Existing with recorded document numbers; and,
    ii. Proposed; and,
c. Dedication of:
    i. Right-of-way:
        1. Totaling 37 feet from the platted centerline for SW Leveton Drive and SW Tualatin Road. The City Engineer may approve Public Access Easements to replace portions of the standard required right-of-way dedication in locations where right-of-way dedication where there is a conflict with minimum setbacks as determined within the Industrial Master Plan (IMP24-0001); and,
        2. Any additional necessary to accommodate any final accepted future public stormwater LIDA management or other public improvement; and,
    ii. Public utility easements:
        1. A minimum of 8-feet-wide adjacent to rights-of-way of SW Leveton Drive and SW Tualatin Road; and,
        2. Required by PGE to:
            a. Encompass poles and guy wires; and,
            b. Surround underground vaults; and,
            c. Access infrastructure; and,
d. Construction including:

i. Full depth reconstruction to the centerline for SW Tualatin Road or as otherwise approved by the City Engineer (such as a full-width 2" grind and inlay of the existing asphalt pavement, and restriping); and,
ii. Retrofit or repair of any areas of sidewalk or crosswalk along the subject property frontage that do not meet PROWAG standards; and,
iii. Any final accepted future public stormwater LIDA management; and,

e. Existing remaining driveway approaches and sidewalks:
i. Within compliance of ADA/PROWAG standards; or,
ii. Proposed maintenance to bring into compliance; and,

f. All modified and proposed driveways with a width between 32 and 40 feet wide measured at right-of-way or as otherwise approved by the City Engineer to enable safe turning movements; and,

g. Turning movement diagrams proving all existing and proposed driveways operate without adverse impact to public rights-of-way as determined by the City Engineer with:
i. Identification of any driveways privately restricted for specific passenger vehicles or truck use, proposed private signage necessary to control movement, and a circulation plan; and,
ii. Onsite signage and maintenance plan for onsite signage as approved by the City Engineer; and,
iii. Existing and proposed curb radii able to accommodate associated vehicular movements or propose a radius allowing turning movements for the widest path design vehicle (such as a WB-67 truck), associated curb, and sidewalk ramps consisting of reinforced concrete meeting PROWAG and as approved by the City Engineer; and,

h. Replacement of concrete doweled panels within SW 108th Avenue and SW Leveton Drive impacted by construction as determined by the City Engineer; and,

i. Street illumination meeting City standards using equipment from PGE's Option A list:
i. Identifying standards are met; or,
ii. Show the location of proposed streetlight poles, fixtures, and any streetlight footings and grounding material (may include the ground rod and copper wire) for the streetlight pole and/or junction box needed to meet the standards and submit:
1. City approved streetlight design layout to the PGE Lighting Design Project Manager; and,
2. Payment to cover the City's cost per Street Light Rate Schedule 95, Option A; and,

j. Undergrounding of overhead utilities in accordance with TDC 74.660; and,

A4. For each Phase : The applicant must obtain City approval of Final Sanitary Sewer System Plans for all lots associated with the proposed Phase of development in accordance with Tualatin Development Code (TDC) 74.620, Tualatin Municipal Code (TMC) 3-2, and Public Works Construction Code (PWCC) that show:

a. The boundaries of existing private and public sanitary sewer easements with recorded document numbers; and,

b. Downstream sanitary sewer capacity calculations assuring adequacy of public mains or including upgrades; and,
c. If approved by the City Engineer, a deed restriction enabling future construction of a private sanitary sewer gravity service from TLID 2S122BA00100 crossing one adjacent lot to connect to the public sanitary sewer mains within SW Leveton Drive; and,
d. Separate laterals for each new or modified building's or structure's service in accordance with TMC 3-2-060 (3), or as approved by the City Engineer; and,
e. Location of the lines, grade, materials, and other details; and,
f. Cleanouts adjacent to right-of-way; and,

A5. For each Phase: The applicant must obtain City approval of Final Water System Plans for all lots associated with the proposed Phase of development in accordance with Tualatin Development Code (TDC) 74.610, Tualatin Municipal Code (TMC) 3-3, and Public Works Construction Code (PWCC) that show:
a. The boundaries of existing public water easements with recorded document numbers; and,
b. Proposed ten-foot-wide public water or utility easements outside existing public easements for all portions of water laterals to and surrounding any meter, reduced pressure backflow prevention, and fire vault by five feet; and,
c. Separate laterals to the main with gate valves for each:
    i. Domestic service for each building or structure served in accordance with TMC 3-3-060; and,
    ii. Fire protection service and appropriate backflow device for each building or structure served; and,
d. Separate, appropriately-sized water meters per domestic lateral located within the planter strip or City Engineer approved alternate location with:
    i. Reduced Pressure Backflow Assembly (RPBA) for all domestic laterals; and,
    ii. Irrigation after a domestic meter and RPBA serving the planter strip adjacent to this development; and,
e. A separate lateral, valve, meter, and RPBA for any proposed public stormwater LIDA; and,

A6. For Phase I obtain City approval of Plans which show:
a. The boundaries of existing public water easements with recorded document numbers; and,
b. Conversion of the existing 12-inch diameter public water main extending south from SW Tualatin Road right-of-way at the intersection with SW 115th Avenue within a public easement to a privately-owned and maintained line serving fire flow to the JAE Oregon's lot, 11555 SW Leveton Drive, TLID 2S122BA00200 with a fire vault with Double Check Detector Assembly adjacent to SW Tualatin Road right-of-way; and,
c. A metered private domestic water service adequately sized to serve JAE Oregon's lot from the 16-inch public water main in SW Tualatin Rd connecting to the existing private lines after JAE Oregon's existing water meters including:
    i. A gate valve; and,

ii. Within the public utility easement adjacent to SW Tualatin Road right-of-way and surrounded by 5-feet of public utility easement a:
1. Meter; and,
2. Reduced Pressure Backflow Assembly (RPBA); and,

d. Decommissioning of JAE's two existing 2-inch diameter water meters; and,
e. A private water easement over the rerouted and any existing portions of the water line to remain on Lam Research Corporation's lots:
i. TLID 2S122BA00100; and,
ii. 11355 SW Leveton Drive 2S122AB00100; and,
f. Lam Research Corporation's domestic and fire services directly connected to public water mains within adjacent public right-of-ways; and,
g. Separate water meters per domestic lateral located within the planter strip or City Engineer approved alternate location with:
i. Reduced Pressure Backflow Assembly (RPBA) for all domestic laterals; and,
ii. Irrigation after a domestic meter and RPBA serving the planter strip adjacent to this development; and,
h. A separate lateral, valve, meter, and RPBA for any proposed public stormwater LIDA; and,
i. Submit:
i. A copy of a private water easement for the benefit of JAE Oregon's lot, 11555 SW Leveton Drive, TLID 2S122BA00200, for the rerouted and any remaining portions of the water line to remain; and past public right-of-way over Lam Research Corporation's lots:
1. TLID 2S122BA00100; and,
2. 11355 SW Leveton Drive 2S122AB00100; and,
ii. Owner signed non-remonstrative agreements enabling the City to process a Vacation of the existing public water easement over:
1. JAE Oregon's lot, 11555 SW Leveton Drive, TLID 2S122BA00200; and,
2. Lam Research Corporation's lots:
a. TLID 2S122BA00100; and,
b. 11355 SW Leveton Drive 2S122AB00100; and,

A7. For each Phase : For all lots associated with the proposed Phase of development the applicant must obtain City approval of :
a. Final Stormwater System Calculations and Plans in accordance with Tualatin Development Code (TDC) 74.630 and 74.650, Tualatin Municipal Code (TMC) 3-5-200 through 3-5-430, Public Works Construction Code (PWCC), and Clean Water Services' (CWS) Design & Construction Standards (D&CS) Chapter 4 stamped by an Oregon registered, professional engineer in accordance with TMC 3-5-390(1) that:
i. Addresses runoff from all new and modified private and public impervious areas:
1. Showing:

a. Gravity flow five feet from the outside of the established line of the building to the public stormwater system or as otherwise approved by the City Engineer in accordance with CWS D&CS 1.03.39 and 5.09.3(a) (1) and (4); and,
b. Private stormwater facilities per lot:
    i. Connecting directly to public mains in accordance with CWS D&CS 5.09.3; or,
    ii. If approved by the City Engineer, a deed restriction enabling future construction of a private stormwater gravity service from (No address) TLID 2S122BA00100 crossing one adjacent lot to connect to the public stormwater mains within SW Leveton Drive as approved by the City Engineer; and.
c. Public stormwater LIDA within right-of-way or within easements; and,

2. Confirms the capacities of stormwater facilities for quality, quantity, and hydromodification to include new and modified impervious area within:
    a. Existing and proposed private per lot; and,
    b. Proposed public addressing right-of-way; and,

ii. Provides a downstream analysis and include solutions within final plans:
    1. For at least ¼ mile downstream from the release from the private development through the public stormwater system in accordance with CWS D&CS 2.04.2(m.3); and,
    2. Including but not limited to observable downstream impacts to structures; and,

iii. In accordance with TDC 74.650(2) and CWS D&CS 3.01.2(d), complies with:
    1. The submitted Clean Water Services' Service Provider Letter CWS File Number dated June 16, 2024 conditions to obtain a Stormwater Connection Permit Authorization Letter, and
    2. Requirements stated within the Clean Water Services' Memorandum dated January 6, 2025; and,

iv. Submit:
    1. Financial assurance for construction performance in accordance with TMC 3-390(3), PWCC 102.14.00, and amount per CWS D&CS 2.07 Table 2-1; and,
    2. A copy of the recorded private stormwater facilities agreement in accordance with TMC 3-5-390(4) and CWS D&CS 2.08.2:
        a. Clarifying the party responsible for maintenance of the constructed portions of stormwater systems and any existing infrastructure; and,
        b. The agreement must provide reference to all new and existing stormwater treatment, hydromodification, and detention facilities; and,

v. For existing private stormwater facilities, the applicant must address deficient facilities and bring them into compliance with the standard(s) under which they were approved.

A8. For each Phase: The applicant must obtain City approval of Final Erosion Control Plans for all lots associated with the proposed Phase of development in accordance with Tualatin Development Code (TDC) 74.640, Tualatin Municipal Code (TMC) 3-5-050 and 3-5-060, Public Works Construction Code (PWCC), and Clean Water Services' (CWS) Design & Construction Standards (D&CS) Chapters 2 and 6 that minimize the impact of stormwater from the development to adjacent properties; and,

A9. For Phase I obtain City approval of plans sufficient to:
- a. Amend the existing issued 1200-C associated with AR22-0006; or,
- b. Obtain a National Pollution Discharge Elimination System (NPDES) 1200-C Construction Erosion Control permit from Oregon DEQ; and,

A10. For Phases II and III obtain City approval of plans sufficient to:
- a. Amend an actively maintained National Pollution Discharge Elimination System (NPDES) 1200-C Construction Erosion Control permit previously obtained from Oregon DEQ; or,
- b. Obtain a National Pollution Discharge Elimination System (NPDES) 1200-C Construction Erosion Control permit from Oregon DEQ if the previously obtained 1200-C permit from DEQ expired.

PRIOR TO ISSUANCE OF BUILDING PERMIT:

Submit to eTrakit for review and approval:

A11. For each Phase : The applicant must submit copies of recorded documents for all lots associated with the proposed Phase of development in accordance with Public Works Construction Code (PWCC) and Tualatin Development Code (TDC) 74.210, 74.330, 74.350, and 75.040 which show the City Engineer approved:
- a. Dedication of right-of-way for SW Leveton Drive and SW Tualatin Road; and,
- b. Applicable slope easements for SW Tualatin Road; and,
- c. Public utility easements:
  - i. Adjacent to SW Leveton Drive; and,
  - ii. Any additional to:
    1. Encompass portions of private system from the public main to and surrounding domestic meters and fire vaults; and,
    2. Adequately surround and maintain PGE or other utility infrastructure; and,
- d. Applicable private deed restrictions and access, sanitary sewer, stormwater, and utility easements.

A12. For Phases I, II, and III: The applicant must obtain:
- a. Confirmation of approval from DEQ of an amended active 1200-C NPDES permit or a new permit; and,

b. Erosion Control and applicable Public Works and Water Quality Permits from the City of Tualatin.

A13. If a Public Utility with a current Franchise agreement or Rights-of-Way License (PWCC 100 definitions) from Tualatin requires an applicant to participate in the process of obtaining a Franchise (PWCC 102.1.3 and 207 Public Utility) Permit, the applicant must perform in accordance with TDC 74.660 and 670, PWCC 207, TMC 03-06.

A14. The applicant shall provide Final Site Plan Set and Final Color Architectural Elevations (in .pdf format), meeting the TDC requirements in effect on July 8, 2024,for each of the three phases of construction that are in substantial conformance to the submitted plans for this Architectural Review and demonstrate:

a. Trees identified in Tree Assessment Report (Exhibit A3) must be identified on the landscaping and grading plan, consistent with TDC 73B.080(3). Tree protection fencing and other Lam Research – Architectural Review preservation measures recommended by the Arborist should also be specified on the grading plan.
b. Walkways that are a minimum of 6 feet in width; constructed of asphalt, concrete, pervious concrete, pavers, or grasscrete; and meet ADA standards at time of construction, consistent with TDC 73A.300(1).
c. All areas not occupied by buildings, parking spaces, driveways, drive aisles, pedestrian areas must be landscaped in compliance with TDC 73B.040.
d. A final landscaping plan must demonstrate the existing and proposed berm will be maintained with dense plantings including evergreen trees and shrubs that provide a buffer between the RL and MP zoned areas in compliance with TDC 73B.040(1)(d).
e. A minimum of 386 parking spaces at an applied rate of 1.6 spaces per 1,000 square feet of gross floor area, consistent with TDC 73C.010(2)(a)(iv).
f. Details to demonstrate that proposed bicycle parking meets the standards of TDC 73C.050(2)(a)-(c), and that a minimum of 24 short-term and 7 long-term bicycle parking spaces are provided, in conformance with TDC 73C.100(1).
g. A minimum of 15 vanpool or carpool parking spaces, consistent with TDC 73C.100(2).
h. A minimum of 3 loading facilities that are a no less than 12 feet wide x 35 feet long with an unobstructed height of 14 feet, consistent with TDC 73C.120.
i. A final landscaping plan must demonstrate compliance with 73C.220 (3).
j. In accordance with TDC Chapter 73C, a minimum landscape island area of 25 square feet per parking stall is required and parking lot landscaping must comply with the following:
    i. May be lower than the surrounding parking surface to allow them to receive stormwater run-off and function as water quality facilities as well as parking lot landscaping;
    ii. Landscape separation that is a minimum of five feet in width is required for every eight contiguous parking spaces in a row;
    iii. Must be protected from vehicles by curbs, but the curbs may have spaces to allow drainage into the islands;
    iv. Must be planted with one deciduous shade trees for every four parking spaces, with required trees evenly dispersed throughout the parking lot;
    v. Must be planted with groundcover or shrubs;
    vi. Native plant materials are encouraged; and

k. Landscaping plan must demonstrate compliance with required driveway landscaping for the new SW Leveton Drive driveway per 73C.220(5).
l. Demonstrate that an adequate waste and recyclables management solution is provided in compliance with TDC 73D.040 Waste Assessment Method. These facilities must comply with the location, design, and access standards in TDC 73D.070.
m. In accordance with TDC 62.210(5)(a) demonstrates that outdoor storage occupying less than ten (10) percent of the total site area, are permitted outright as outdoor uses.

DURING CONSTRUCTION ACTIVITY:

A15. The applicant must install tree protection fencing consistent with the Tree Assessment Report submitted as Exhibit A3 and Section 73B.080(3). Please contact the Planning Division to schedule an inspection with a minimum of 48 hours' notice. Where site conditions make grading or other similar encroachment upon a preserved tree's drip-line area, such grading or similar encroachment must only be permitted under the direction of a qualified arborist.

PRIOR TO ISSUANCE OF CERTIFICATE OF OCCUPANCY AND/OR CERTIFICATE OF COMPLETION FOR EACH PHASE OF DEVELOPMENT:

Submit to the Engineering Division via eTrakit for review and approval):

A16. For all lots associated with the proposed Phase of development the applicant must:
a. Complete all the private and public improvements as shown on the approved permit plans. All improvements must be constructed and guaranteed as to workmanship and material and also be accepted by the City in accordance with Tualatin Development Code (TDC) 74.120 and 74.140; and,
b. Submit an approved final erosion control inspection report to the Engineering division; and,
c. Submit pdf as-builts of the Engineering division permits along with maintenance bonds and complete any final fees for public improvements.

A17. Provide an identification system which clearly locates buildings and their entries for patrons and emergency services, pursuant to TDC 73A.300(4)(d). Building identification approved by TVF&R must be placed in a position that is plainly legible and visible from the street fronting the property. Numbers must contrast with their background, be a minimum of 4 inches high, and have a minimum stroke width of 1/2 inch.

A18. Areas impacted by grading and all areas not occupied by buildings, parking spaces, driveways, drive aisles, pedestrian areas, or undisturbed natural areas must be landscaped, pursuant to TDC 73B.040(1)(a).

A19. The applicant must install required vanpool and carpool signage, pursuant to TDC 73C.010(2)(a)(xi) and bicycle parking signage per MUTCD standards, pursuant to TDC 73C.050(2)(d).

A20. The applicant must construct proposed buildings and all site improvements as illustrated on the approved Final Site Plan and Final Color Architectural Elevations. The applicant must contact the

Planning Division for a site inspection at least 72 hours prior to requesting a certificate of occupancy. This inspection is separate from inspection(s) done by the Building Division.

A21. The applicant must complete all the private stormwater and public improvements as shown on the approved permit plans. All improvements must also be accepted by the City in accordance with Tualatin Development Code (TDC) 74.120.

A22. The applicant must submit paper and electronic as-builts of the Engineering permits along with maintenance bonds and any final fees for public and water quality improvements.

PRIOR TO APPLYING FOR A VACATION OF THE PUBLIC WATER EASEMENT WITHIN THIS DEVELOPMENT

A23. The applicant must obtain a certificate of occupancy and/or completion for Phase I.

THE FOLLOWING ITEMS APPLY TO THE SITE IN AN ON-GOING MANNER:

A24. All uses must be conducted within a completely enclosed building, except Off-street parking and loading, utility facilities, wireless communication facilities, and outdoor storage occupying less than ten (10) percent of the total site area, are permitted outright as outdoor uses.

A25. The proposed development must comply with the Environmental Regulations of TDC 63.

A26. All mechanical and electrical equipment must be screened in accordance with TDC 73A.300(5). Prior to approval of an electrical or mechanical permit, the applicant or property owner must submit scaled elevations illustrating that above-grade or on-grade equipment will be screened by parapet, sight-obscuring fence, landscaping, or other method.

A27. All sign permits require separate sign permit approval per TDC Chapter 38. This approval does not constitute sign permit approval.

A28. All site, building exterior, and landscaping improvements approved through the AR process must be continually maintained, so as to remain substantially similar to original approval through the AR process, except as permitted under TDC 33.020(7) (Modifications to Previously Approved Final Architectural Review Decisions).

A29. All parking spaces shall be continuously maintained in compliance with the dimensional standards specified in TDC Figure 73-1 (Exhibit H).

A30. No vehicular parking, hedge, planting, fence, wall structure, or temporary/permanent physical obstruction is permitted between 30 inches and eight feet above the established height of the curb in the vision clearance area specified in TDC Figure 73-2 (Exhibit I).

CITY of TUALATIN

Notice of Appeal
(Request for Review)

A Notice of Appeal for land use decisions must be received by the Community Development Department by 5pm on the deadline listed in the decision, in order for the appeal to be valid. Only the applicant, or parties who have submitted comments during the comment period or applicable hearing may appeal a decision.

Note that appeals are limited to Type II and III land use application decisions. Type I decisions are final at the local level and may only be appealed to Circuit Court through a writ of review process under state law. Type IV decisions may only be appealed to the Land Use Board of Appeals.

The following information is required for proper filing of a Notice of Appeal per TDC 32.310; please include all information.

Project Information		
Case Number:AR 24-0002		
Project Title:LAM Research - TUX Development		
Decision Date:9/10/2025		
Party Requesting the Appeal		
Name:Brett Hamilton		
Mailing Address:11430 SW Kalispell Street		
City:Tualatin	State:OR	ZIP:97062
Phone:503-803-7609	Email:brett@simple.be	
Describe your relationship to the project (e.g., applicant, neighbor) and standing to appeal the decision, including whether you submitted comments during the applicable comment period and how you would be adversely affected by the decision: I am a neighbor to the project and live near the project. I have standing to appeal the decision by the Architectural Re		
Property Owner		
Appellant Signature: 		Date:9/25/2025

Please see the current fee schedule for applicable appeal fees.

Office Use		
Case. No.	Date Received:	Received By:
Fee:	Receipt No.	

Brett Hamilton
11430 SW Kalispell Street
Tualatin Oregon 97062
brett@simple.be
503-803-7609

September 25, 2025

City of Tualatin
Community Development Planning Division
10699 SW Herman Road
Tualatin Oregon 97062

Appeal Request regarding AR 24-0002 Lam Research Corporation's TUX Proposal

Dear Tualatin City Council,

As a neighbor and nearby property owner who provided written comments and verbal testimony at the hearing, I am requesting a review of the Architectural Review Board's land use decision on AR 24-0002. Without additional conditions of approval related to traffic and noise, this land use decision would negatively impact my property value and quality of life. I believe that the ARB decision should be revisited in light of existing noise nuisance conditions, adverse traffic congestion and safety impacts, failure to meet application criteria, failure to provide proper notice, plus new environmental noise modeling data that was released during the ARB hearing. Grounds for this appeal include, but are not limited to, the following:

Land use application does not meet all applicable criteria:

- Failure to send notice to CIOs as required by TDC 32.120.5 (b)(iii)
- Violations of Manufacturing Park Zoning and Tualatin Noise Ordinance
- Expanded North 108th Entrance does not meet New Driveway Approach Criteria

Errors made by the Applicant:

- Commitments to hold a second Neighborhood Developer Meeting and then not holding it
- Traffic Impact Analysis did not consider additional employee work shifts
- Claims that Traffic and Noise are beyond the scope of the Architectural Review
- Claims that TDC Chapter 62 is not relevant AR criteria

Errors made by the City of Tualatin:

- Failure to provide the last 3 pages of Lam's noise model to the ARB at their hearing
- Unnecessary delays in releasing Public Records

Please feel free to reach out if you have any questions.

Sincerely,



Brett Hamilton

From: Brett Hamilton <brett@simple.be>
Sent: Tuesday, September 10, 2024 2:26 PM
To: Council; Ext - Planning
Subject: Lam and Tualatin Road

Dear Tualatin City Council and Tualatin Planning Department:

I am strongly opposed to Lam Research adding a new entrance on Tualatin Road at SW 115th Avenue. Tualatin Road provides the main access to our residential neighborhoods and is already overloaded with cut-through commuter traffic. Leveton Drive, on the other hand, was built for industrial traffic and has plenty of unused capacity already available.

Lam currently has a driveway that connects Leveton Drive straight to the parking lots on the north side of their campus, but the proposed site expansion would eliminate that driveway. This is unacceptable. Lam's new site plan needs to include a usable driveway that connects their main parking lots directly to Leveton Drive.

The last thing Tualatin Road needs is a thousand more cars per day, especially when a better alternative already exists. We are asking the City Council and City Staff to get creative and find a solution to this problem that does not involve adding more traffic to Tualatin Road.

Use Leveton Drive. Save Tualatin Road.

Thank You!
Brett Hamilton

From: Steve Fine
Subject: RE: Tualatin Road
Date: November 7, 2024 at 4:56:28 PM PST
To: Brett Hamilton

Dear Mr. Hamilton,

I received your e-mail below regarding the TUX project. We are excited to expand Lam Research's presence in Tualatin, bringing new jobs and economic impact to the community. We also recognize the importance of community feedback.

Thank you for sharing your input about Tualatin Road. We are currently working with the City of Tualatin and the Department of Transportation to address relevant traffic issues. There will be several public meetings in connection with Lam's land use application to capture feedback from the community.

I appreciate your acknowledgement of Lam's reputation as a good neighbor and responsible member of the community. We are committed to following the City's process to finalize a plan for our project that works for the City, the community, and Lam. In keeping with this approach, please address future communications about traffic considerations to the City of Tualatin.

Regards,
Steve Fine
Chief Communication Officer, Lam Research

From: Brett Hamilton
Sent: Thursday, October 24, 2024 2:54:59 PM
To: Archer, Tim CEO
Cc: Bettinger, Doug; Charles, Audrey; Fernandes, Neil; Fine, Steve; Gottscho, Richard; Harter, Ava; Hassett, Mary; Lord, Pat; Vahedi, Vahid; Varadarajan, Sesha
Subject: Tualatin Road

Dear Mr. Archer,

I live near the Lam Research campus in Tualatin Oregon, and on behalf of my neighbors, would like to ask for your assistance in resolving a problem posed by Lam's TUX expansion. We have not been able to resolve this issue locally.

Lam's proposal includes a new employee entrance on Tualatin Road, and this would add a significant amount of traffic to our local roadway network. The community is strongly opposed to this new entrance, and we have been asking Lam's planners for months to change the site layout to use Leveton Drive instead.

Leveton Drive, on the south side of Lam's campus, was built for industrial traffic, has plenty of unused capacity already available, and currently carries 3 entrances to Lam's campus. Lam's current proposal would eliminate the main driveway that connects Leveton Drive to the parking lots on the north side of campus. This is the crux of the issue.

Traffic is already the number one complaint for residents here in Tualatin, and Lam's proposal threatens to make this problem even worse. Historically, Lam has been a responsible member of our community and has a reputation for being a good neighbor, but the current proposal, and the way it is being pursued, puts that corporate reputation at risk. We believe that the current site plan is not in the best interests of either Lam's shareholders or the Tualatin community, and we ask that Lam change course in order to avoid a conflict.

Our community is highly motivated to find a solution that meets the needs of both Lam and the surrounding neighborhoods. We have outlined our concerns on the Save Tualatin Road website and would like an opportunity to work with Lam so that your expansion is a success.

http://www.tualatinroad.org/

Thank you for your consideration on this matter.

Brett Hamilton

From: Mike McCarthy
Sent: Thursday, November 21, 2024 7:29 AM
To: Keith Leonard
Cc: Steve Koper
Subject: Fwd: Traffic Study

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Keith

Forgot to cc you on this

Sent from my iPhone

Begin forwarded message:

> **From:** Mike McCarthy <mmccarthy@tualatin.gov>
> **Date:** November 21, 2024 at 12:13:33 AM PST
> **To:** Steve Koper <skoper@tualatin.gov>, Joel Rabinovitz <joel.rabinovitz@dksassociates.com>
> **Cc:** Abby McFetridge <Amcfetridge@tualatin.gov>, Kim McMillan <kmcmillan@tualatin.gov>
> **Subject: Fwd: Traffic Study**
>
> Hi Steve and Joel
>
> What are your thoughts on the request below and how it would fit with typical best practices for this type of traffic study and land use case?
>
> Thanks
> Mike
>
> Sent from my iPhone
>
> Begin forwarded message:
>
> > **From:** Brett Hamilton <brett@simple.be>
> > **Date:** November 20, 2024 at 9:16:36 PM PST
> > **To:** Mike McCarthy <mmccarthy@tualatin.gov>
> > **Cc:** Steve Koper <skoper@tualatin.gov>
> > **Subject: Traffic Study**

Dear Mr. McCarthy,

Thanks for presenting at the Riverpark CIO meeting last night and taking questions from the community. Last week you mentioned Lam waiting to submit their traffic study based on the outcome of the CIO meeting, and I'd like to share with you some of the comments and suggestions I've received from the community about what residents and property owners would like to see included in the traffic study:

1) Because the proposed entrance on 115th would be shared jointly with Lam and JAE, and available for use by future development and expansion at those properties, we would like to see traffic projections based on both the Lam and JAE parcels being fully developed at the density that Lam is currently using for the TUX project, including with 70% of trips using Tualatin Road and 30% of trips using Leveton Drive.

2) Because the Lam and JAE parcels contain manufacturing activity, and manufacturing capacity can be increased by adding a second shift (and/or moving to 24 hour operations) the traffic impacts could be double what is currently being modeled, and shift change would present unique challenges where groups of vehicles are coming and going at the same time, rather than just one group filling up or emptying the site.

3) Combining points 1 and 2, the traffic delays on Tualatin Road could reasonably make the Jurgens / Hazelbrook bypass a quicker route to 99W, and the resulting traffic increase would be significantly higher than the projections shown last night. We would like the traffic modeling to take into account predictable time-saving driver behavior, and automated mapping / navigation software route selection algorithms. Once Google Maps finds out the bypass is quicker, it will send people the quicker way.

Basically the community wants to see the traffic model look at the maximum future impact of this entrance on Tualatin Road, not just the best case scenario of only Lam's TUX project. The future impacts of a new entrance on Tualatin Road are bigger than one project, and the city needs to look further out into the future before opening up this access point on Tualatin Road, because as we know, once it is built it will be used.

Beyond the traffic study, we would also like to see the full project budget for the concrete construction of Leveton Drive back in the day when it built / improved, and we would like to see the city staff report that analyzed the expenditure, specifically how the increased expense of concrete over asphalt was justified.

Thank you for your consideration and your work on this project.

Regards, Brett Hamilton

From: Brett Hamilton <brett@simple.be>
Sent: Monday, December 9, 2024 3:16 PM
To: Sherilyn Lombos; Ext - Planning
Cc: Council; Ext - Engineering Exterrnal Email
Subject: Lam's Proposal and Tualatin Code

Dear City of Tualatin,

While researching the traffic impacts from Lam's TUX project, members of the community have discovered that Lam's proposal is not compatible with the Tualatin Comprehensive Plan 2040, and it would violate the Tualatin Development Code, both in spirit and letter.

For the reasons outlined below, we are asking the Tualatin Planning Department to consider Lam's proposed entrance on Tualatin Road to not be approvable, and we ask the City Manager to use her authority to have the proposed entrance removed from the TUX project site plan so that alternative access can be designed.

SITE CIRCULATION

Existing driveways provide sufficient access points to the Lam Campus as a whole. Lam currently has 6 other access points. 3 on 108th and 3 on Leveton Drive. Adding a new access point on Tualatin Road is unnecessary.

Lam is responsible for designing reasonable site circulation. A lack of good site circulation is not a valid reason to add an additional driveway onto the street network.

The Tualatin Comprehensive Plan 2040 strongly supports the use of existing access points, rather than creating new ones, especially when a new access point would have negative impacts to the community. "Consider transportation options that make the best use of the existing network" (Goal 8.7)

SPIRIT OF THE LAW

Tualatin Road is currently functioning as an arterial, it was previously classified as an arterial, and it has the traffic volume of an arterial. Leveton Drive is currently functioning as a collector, it was previously classified as a collector, and it has the current traffic volume of a collector.

During the 2012-14 TSP update, the functional classifications of these streets were reversed in a failed attempt by the city to reduce the amount of traffic on Tualatin Road and encourage more trips to use Leveton Drive. While we appreciate the intent of this reversal, the impact is now exactly opposite of what was intended, and we ask that this reversal be deemed a mistake. We ask the city to remedy this mistake by restoring the correct functional classifications to their appropriate streets. Lam should not be allowed to rely on a classification error to put a new entrance on a road that, based on current conditions, should not have a new entrance.

If the streets were classified correctly, Lam Research would not be able to add an employee entrance on Tualatin Road because it would be an arterial. "No new driveways or streets on arterial roadways within the City, except where noted in the TDC, usually when no alternative access is available." (TCP 2040 POLICY 8.10.1)

LETTER OF THE LAW

The Tualatin Development Code says “Lots that front on more than one street may be required to locate motor vehicle accesses on the street with the lower functional classification as determined by the City Manager.” TDC 75.040 (5) Currently the TSP shows 108th classified as a minor collector and Tualatin Road a major collector. Based on this, access should be provided from 108th not Tualatin Road.

Lam’s proposed entrance on Tualatin Road fails four of the new driveway approach criteria in TDC 75.020.5: "(d)(ii) Takes access from the lowest classification of street abutting the property … (g) The proposed driveway approach does not result in significant adverse impacts to the vicinity; (h) The proposed driveway approach minimizes impact to the functionality of adjacent streets and intersections; and (i) The proposed driveway approach balances the adverse impacts to residentially zoned property and the functionality of adjacent streets."

Tualatin Development Code 75.140.15 (a) grants the specific locations for Lam's three driveways on the north side of Leveton Drive. The applicant's proposal to relocate one of the three driveways is not compliant with the development code.

No matter which way you slice it, Tualatin Road is the worst option for carrying Lam’s new entrance and additional traffic volume. We ask the City Manager to use her discretion and require access from the most appropriate road which, by any metric, is Leveton Drive.

PROPOSED TRAFFIC SIGNAL

The proposed entrance on Tualatin Road would create the need for a new traffic signal on Tualatin Road which would have many negative impacts on the community. These impacts justify rejection of the proposed access. If Lam were to take access from Leveton Drive, no new traffic signal would be needed.

The community provided overwhelming feedback during the TSP update this summer about this issue and we asked that the proposed traffic signal be removed from the TSP. The city should take this feedback into account and "Conduct the planning process with adequate input and feedback from citizens in each affected neighborhood” (TCP 2040 Goal 8.7)

CONSIDER SAFETY

The Tualatin TSP Existing Conditions Report shows Tualatin Road and 115th Ave having higher Pedestrian Level of Traffic Stress than Leveton Drive and 108th Ave. (Figure 23) Adding more traffic to Tualatin Road and 115th Ave will degrade pedestrian safety even further.

Tualatin Road between 124th and 115th has higher concentration of collisions than Leveton and 108th, with a history of serious injury collision while Leveton does not. (Figure 31) Adding more traffic onto Tualatin Road and 115th will increase the traffic exposure and likely result in worse safety outcomes.

Tualatin Road has a history of collisions involving pedestrians and bicycles while Leveton and 108th do not. (Figure 32) Adding more traffic to Tualatin Road will likely make this safety issue worse.

Converting a driveway to full access or signalizing a driveway would likely increase traffic crashes. Per CMF ClearingHouse, changing driveway type to full access has a crash modification factor (CMF) of 2.25, and signalizing a driveway has a CMF of 3.98, which means that the two measures will likely increase traffic crashes by a factor of 2.25 and 3.98 respectively.

Lam's traffic study also does not identify the locations of school bus routes at Hazelbrook Middle School or the potential impacts to school bus traffic. Student safety is one of the most important issues in our community, but so far it has been ignored in this process.

Also, the safety and congestion impacts from Lam's proposal would be most concentrated on Tualatin Road between 115th and 124th which abuts a residential area with traditionally disadvantaged demographics and income limited apartments. This is not equitable.

BYPASS ROUTE

The route from Hazelbrook Road going west and turning right onto Hwy 99W is a "hidden" route that can bypass the traffic congestion at the west end of Tualatin Road. Adding a signal at 115th and Tualatin Road will encourage more cars to take this bypass. The potential impact of this new traffic pattern imposes significant safety concerns to communities all along the route. These impacts were not addressed in the traffic study.

SUMMARY

We urge the city to consider all the above concerns and require the applicant (Lam) to revise their site development plan accordingly. We believe that the current proposal does not meet Tualatin's planning rules, and that the City Manager should use her authority to bring Lam's proposal into compliance. No new roadway access on Tualatin Road.

Thank You,
Brett Hamilton

From: Brett Hamilton <brett@simple.be>
Sent: Wednesday, January 29, 2025 8:25 AM
To: Council; Ext - Planning; Ext - Engineering Exterrnal Email
Cc: Sherilyn Lombos; Megan George; Steve Koper; Keith Leonard; Mike McCarthy
Subject: CIO Notice Requirement

Dear City of Tualatin,

A review of project documents reveals that Mackenzie/Lam did not notify any CIO representatives prior to the June 2024 neighborhood developer meeting, as required by Tualatin Development Code 32.120.5 (b)(iii). The code requires an applicant to send notice to CIO representatives via First Class Mail at least 14 days *before* the neighborhood developer meeting. This requirement was not met at the time, nor can it be met retroactively.

Lam and Mackenzie have been through the Tualatin land use review process before and they know the requirements. In 2022, Suzannah Stanley, Mackenzie Planner, demonstrated that she is very familiar with the CIO notification section. On pages 29-32 of Lam's IMP 22-0001 application, Ms. Stanley is on the record arguing that this notice requirement does not apply to Lam:

"We did not contact any City-recognized CIOs.
Please use this statement in your completeness checklist."
(Page 29) http://www.tualatinroad.org/files/LAM2022081201.pdf

If the City of Tualatin allows Mackenzie and Lam to repeatedly and flagrantly violate notice requirements, the legitimacy of the CIO program will be compromised.

At the June neighborhood developer meeting, Mackenzie said that "the project team is open to continue discussing topics of concern with neighbors" (see meeting minutes #13) however, repeated attempts by the community to open a dialogue with Lam and Mackenzie have been met with refusal and stonewalling. Lam's Chief Communication Officer, Steve Fine, clarified their position in his November 2024 email:

"We are committed to following the City's process to finalize a plan for our project that works for the City, the community, and Lam. In keeping with this approach, please address future communications about traffic considerations to the City of Tualatin."

Because Mackenzie and Lam have not followed proper notice procedure, we hereby ask the City of Tualatin to deny Lam's current land use application so that the applicant can reset and start over.

Thank you for your consideration.

-Brett Hamilton

From: Brett Hamilton <brett@simple.be>
Sent: Wednesday, March 5, 2025 9:15 PM
To: Council
Cc: Ext - Planning; Megan George; Keith Leonard; Steve Koper; Sherilyn Lombos
Subject: Lam Hearing Schedule

Dear City Council,

Over the past week, members of the community have been canvassing neighborhoods to get word out regarding Lam's upcoming hearings. Each day during our canvas we checked the city website to make sure the schedule had not changed. Today, we learned that Lam requested a postponement a week ago. This was not announced to the public and the city website has still not been updated. As a result, all the flyers we distributed have obsolete dates.

The first hearing was scheduled for two weeks from tonight. Many residents are still planning to attend based on that original date, and unfortunately we do not have an efficient way to reach all of them in time, but the City does.

We are asking the City of Tualatin to provide updates to the community right now explaining that the hearings have been postponed at the request of the applicant. There is no need to wait for new hearing dates to be confirmed before letting the public know that the old dates are now obsolete. Due to the short time frame, we believe that three methods will be necessary now to reach all interested parties in time:

1) Update the city website.
2) Send an email update to each person who has provided public comment.
3) Mail a postcard to every household in the Riverpark CIO.

We ask for your assistance in keeping the community up to date on this very important issue.

Sincerely,
Brett Hamilton

From: Brett Hamilton
Subject: Lam Noise Impacts
Date: August 12, 2025 at 9:50 AM
To: Keith Leonard kleonard@tualatin.gov, Tualatin Planning planning@tualatin.gov
Cc: City Council council@tualatin.gov, Outreach outreach@tualatinroad.org

Dear Tualatin Planning Commission and Architectural Review Board,

Thank you for your dedication and service to the community, and for your work to protect our quality of life. While development and corporate activities are essential to the vitality of our city, residential land uses must also be protected, both from an economic standpoint (property values) and from a quality of life standpoint (mental and physical health). In keeping with this mission, we are asking for your help in resolving Lam's noise pollution problem.

Multiple noise signatures have been identified emanating from Lam's campus, including clear tones that pulse, two-toned harmonics, and a low rumble that sounds like an old bomber airplane. The most distinctive sound is the high-frequency hiss from Lam's gas plant, clearly audible across Tualatin Road most nights.

We have brought this issue to the attention of the City Council, Police Department, Code Enforcement, Riverpark CIO, and Lam. Despite repeated requests for a solution, no meaningful changes have been made. When Tualatin's police officers have driven onto the Lam campus to investigate noise complaints, they have been chased down by Lam's security guards and asked to leave.

The Tualatin Noise Ordinance (1361-13) sets a city-wide limit of 50dB at night for residential areas, and the Tualatin Development Code (62.100) places even stricter limits on Manufacturing Park (MP) zoning, stating that "Such permitted uses must not cause objectionable noise". A noise study performed earlier this year at night by a licensed acoustical enginneer measured noise levels of 52dB at a private residence across the street from Lam's gas plant. Therefore, Lam's offsite noise impacts are in violation of both the Tualatin Development Code and the Tualatin Municipal Code.

Lam's noise pollution problem is not caused by daytime construction, backup beepers, or truck horns, but rather, by permanently-installed equipment that is part of Lam's physical plant. This equipment runs 24/7 and generates sound continuously. The sounds are most noticeable at night when background noise is low, and the location of sound impacts can vary depending on atmospheric conditions, especially temperature and wind direction. During southerly winds, Lam's noise signature can be heard more than a mile away.

Manufacturing Park (MP) zoning serves as a buffer between heavy industry and residential areas. MP zoning calls for "limiting uses to those that are of a nature so as to not conflict with other industrial uses or surrounding residential areas." (TDC 62.100) Please consider this letter as evidence that Lam's operations are, in fact, currently conflicting with surrounding residential areas.

In order to bring Lam's facility into compliance with the Tualatin Code, I request that Lam's off-site noise impacts be eliminated as part of the TUX project. It is absolutely critical to our quality of life that peace and quiet be restored to our neighborhoods. We ask the City of Tualatin to require Lam to prove their ability to eliminate offsite noise before approving the addition of any new noise sources on campus.

Thank you for your consideration,
Brett Hamilton

From: Brett Hamilton <brett@simple.be>
Sent: Tuesday, August 12, 2025 11:39 AM
To: Keith Leonard; Ext - Planning
Cc: Council
Subject: Lam Noise Documentation
Attachments: WCC2025081201.pdf; STR2025081202.pdf

Dear Tualatin Planning Commission and Architectural Review Board,

Please find attached the following documentation for Lam's upcoming land use hearings:

1) Record of noise complaints that I reported to Washington County Non-Emergency dispatch during late 2024.

2) Text messages to and from Chad Oyler, Director of Environmental, Health, and Safety at Lam Research, Tualatin Oregon from January 2023 through February 2025.

Sincerely, Brett Hamilton

Text Message • SMS
Jan 27, 2023 at 4:17 PM

Hi Chad, Brett here (neighbor on Kalispell Street. The noise profile is pretty strong right now.

we've noticed it most nights this week. it's been pretty consistent.

Is it the ~500hz sound or the hissing?

the hissing and the low ~250hz are consistent. the ~500hz has been intermittent and mostly not present

500hz is audible now. comes and goes

512Hz very clearly audible now

Do you have an idea of about how long it lasts for? I have someone checking it out now.

This really helps so I appreciate the info!

i think it's all the time.

just depends on the wind if we hear it at the house or not

wind is out of the south at 5mph right now which seems ideal for the sound to carry

Got it. That helps too

thanks!

one more signature, the 512 Hz tone fades in and out at about 145 beats per minute. pulsing. maybe some kind or harmonic with an enclosure?

Jan 27, 2023 at 5:57 PM

That's quite a ripple. Our team has some things they are going to zero in on. Thank you. I'll check in with you next week. If anything changes, new sounds or

are going to zero in on. Thank you. I'll check in with you next week. If anything changes, new sounds or something let me know

Sounds good. Thanks to you and your team for working on this. Much appreciated. Will do. Have a great weekend.

Feb 9, 2023 at 9:00 AM

Ok I have an update. We are going to make a change to our nitrogen plant in the next 2 weeks. We believe this will quiet it down quite a bit. We are also going to be planting trees along our berm to grow into a sound barrier. I know that is a long term solution but everything helps.

I'll let you know when the plant modification is done and we'll monitor afterwards.

Feb 9, 2023 at 1:31 PM

Thanks Chad for the update that sounds great. Do you think the nitrogen plant is involved with all of the sounds we've ID'd or just the hissing?

Feb 9, 2023 at 3:20 PM

I'm hoping both. It is the only distinguishable sound we can detect.

Mar 2, 2023 at 9:54 AM

Good morning. The 512Hz sound has been pretty loud Tuesday night. and last night through to this morning.

i'm guessing due to cold temps and south wind

Mar 3, 2023 at 7:55 AM

Good morning. I wasn't able to meet with the facilities person in status of the work they have been doing. I should he able to connect with him today.

Mar 23, 2023 at 10:15 AM

Good Morning Chad. We've got a really solid noise

Good Morning Chad. We've got a really solid noise signature today. Probably due to wind from the south at 16 mph.

Mar 23, 2023 at 11:46 AM

Possibly. We are still working on the plant but I think the big noise improvements are done at this point. We still plan to do the additional trees but that'll is long term. I'll have facilities look into a sound wall where we generate nitrogen.

It does seem to be really tied to wind carrying sound though huh.

For today how long would you say?

I think it is just where we make nitrogen but if there are truck offloads happening we need to take different steps they only make elevated noise at the end of the offload for a few min.

Today I first noticed it around 9am. I think that was when the wind picked up this morning. It's been continuous since then. I don't think trees will reduce the impact if the source of the sound is up high like a roof top air handler. There are lots of trees between us and the facility. I think it's going over/through them.

But yes it seems very much a wind direction issue.

All of the sounds we're hearing from the facility seem to be continuously generated.

It's is possible at some point I'd love to pinpoint the source of the noise because it might not be what we think it is

The only way I can think to do that is, on a day when we can her the sound clearly, to turn off a suspected source and see if the sound stops or not.

if the sound continues then we know that wasn't the source. and can turn it back on right away

source. and can turn it back on right away

but i imagine some of the suspected sources are things that •need• to run all the time

Mar 23, 2023 at 3:50 PM

They do. air systems and the nitrogen plant are in part to support safety requirements. Shutting them down is a major thing.

Do you work typical business hours? Maybe we can meet to review together with our facilities manager.

Typical hours yes but I work from home and my schedule is very flexible.

I'd be glad to meet.

Ok. I'll see what works best on our end

Apr 12, 2023 at 9:06 AM

Hi Chad, We heard a new sound last night, a low frequency rumble. We first noticed it around 8pm. I took a midnight drive to locate it, and it's coming from Lam. Any equipment changes in the past few days that might explain it?

Nothing that I'm aware of. Was it more than a few minutes. I need to set up our meeting. I'll confirm time this week.

Thanks. For sure it was continuous from at 11:20pm till 12:30am when I fell asleep. We heard it earlier, just not sure if it was continuous then.

Apr 12, 2023 at 10:55 AM

Are you available at 1pm on monday?

at 1:10

Apr 12, 2023 at 2:34 PM

Ok. Let's plan to meet here at our lobby then. I'll

Ok. Let's plan to meet here at our lobby then. I'll confirm the time with our facilities manager.

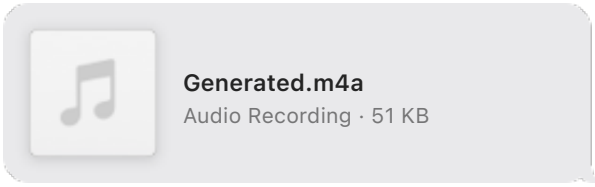
Apr 12, 2023 at 4:03 PM

Sounds good. Thanks.

Apr 18, 2023 at 9:05 AM

Hi Chad, Thanks for meeting with my yesterday. I'm glad to get a better sense of what is going on. I was wrong about the beat frequency of the 512 Hz tone. I measured it last night, it's not 5 beats a second, but more like 1.95 Hz or 117 beats per minute.

Here's a tone I generated online that's pretty close to what we hear.



Not Delivered

Oh shoot. The audio file didn't go through. I'll upload it to the web and send you the URL

No worries. It will be interesting to hear what you hear at your house

turns out the audio file is really small, so i just attached it to an email.

Ok

Apr 26, 2023 at 3:02 PM

Hi Brett, we were able to idle our nitrogen plant today for a few days to do some work. Let me know if you hear the same sound. I'll let you know when it comes back on.

oh super. will do. thanks!

.

Apr 27, 2023 at 7:39 AM

Well that was a shorter time frame than I had expected. It is back up and running now.

ok. was it up amd running last night?

Yes it was back up around 10pm. I originally thought it would be offline for a few days.

that's consistent with what i heard. the wind was from the north yesterday eve so it was quiet at our house. i went out just after 10pm to drive downwind and take a listen. heard the same sounds as typical, but the scrubber fans were slightly higher freq than normally are.

thanka for letting me know about the idle

May 4, 2023 at 9:21 AM

Good Morning. We've had our windows open the past few days and have noticed a clean 520Hz tone with a beat frequency around once every two seconds. One time it was so loud my wife asked "Is that an alarm?"

Ok. I don't know of anything unusual over the past few days but I'll check.

Thanks. I'm guessing it's the scrubber fans running slightly faster than they have in the past?

May 14, 2023 at 11:19 PM

Hi Chad, Sorry to bug you at night. There is a new loud constant tone. About 350Hz. Sounds like by the nitrogen plant. Just started a few minutes ago

Loudest thing we've ever heard from Lam.

I think it stopped

May 15, 2023 at 5:45 AM

May 15, 2023 at 5:45 AM

I woke up at 5:30 to a different but similar noise 343Hz confirmed just now it's coming from the nitrogen plant area.

Interesting. I'll check what was going on last night.

Thanks

May 16, 2023 at 10:02 AM

We are putting in some noise mitigation next week. We'll see what it does. But I think every improvement helps.

That sounds great. Thank you!

Curious was there something different going on Sunday night, or was it just a bad night for sound?

May 18, 2023 at 6:35 AM

Good Morning. There's a super clear 522 Hz tone with a slow, irregular beat this morning. South wind 4mph. I think it woke me up. Windows are open. Surprised how loud it is in warm weather too. Sounds a bit like an alarm clock. Probably is the scrubber fans.

I'm going to head over through the neighborhood and see what I hear. Thanks for the heads up.

Thanks to you too!

interestingly it's easier to hear inside than outside. maybe because less background noise inside? for some reason the tone is less audible inside now than it was earlier.

I'm going to datalog the fans and N2 plant again now that we are through a bunch of work on the N2 system. I hear it. But I think given the intensity, it may still be the N2. When I get close to the scrubber fans then back out to the property line I can't hear them with my ears. Or maybe the N2 system is just drowning it out. I can

Or maybe the N2 system is just drowning it out. I can hear that anywhere on the north side.

Oh interesting. Thanks!

it's audible in my back yard intermittently. both the N2 sounds and the other tone

Jun 8, 2023 at 8:26 PM

We've got an audible 510 Hz tone with a beat in our backyard right now. Comes and goes. Plus some N2 sounds. The 510 tone was pretty loud last night and this morning.

Jun 8, 2023 at 9:34 PM

Ok I was going to check with you yesterday
Our newest N2 compressor has been down for a while. It just came back up yesterday.

We have new trees in around it. I'm looking at other effective sound dampening methods.

Interesting. Thanks.

Jun 23, 2023 at 10:00 AM

We have a clear 517Hz tone today with a beat. Audible upstairs, downstairs, and in the back yard.

Sep 11, 2023 at 8:30 AM

Hi Chad, as the weather cools down, the 520Hz tone with a beat is becoming louder again. We realized what it reminds us of: a digital beeping alarm clock. Not the kind of thing you want to hear at night when you are trying to go to sleep.

No it's not. I know it's not a fast solution but we are looking implementing more sound prevention to reduce as much sound from being heard off site as possible. We will improve this.

Sep 11, 2023 at 4:04 PM

Sep 11, 2023 at 4:04 PM

Thanks for your understanding and for your efforts towards improvements.

Dec 4, 2023 at 9:35 AM

Hi Chad, I hope you are well. We had a loud weekend here. Friday night especially so, wind was from the south over 10mph, so that doesn't help. There is a new primary frequency at 175Hz and a harmonic at 354Hz. The 175Hz seems louder than anything we've heard previously. I compared to the sounds onsite Sunday morning and they matched. Have there been any changes that could explain this?

Dec 4, 2023 at 11:47 AM

Hi Brett, Im not aware of any changes but will investigate. We are still planning improved sound reduction. Did you notice where it was strongest.

off the NE corner of building D

kinda lined up with that alley between buildings E and D

That is odd. We've modified our system a few months ago to minimize how much we run chillers. That should result in reduced noise, not more. How did the nitrogen gas plant sound?

Oh interesting. The 175Hz sound has been pretty constant since Friday, but not sure how much of that is due to a steady wind pattern. The nitrogen gas plant sounds like white noise when onsite, which is good, and I don't think it carries too far. I wasn't listening for it across the street tho, cuz it's not what we're hearing at our house. I'll give it a listen from our neighborhood entry next time I'm out.

Jan 19, 2024 at 1:49 PM

Hi Chad, The neighbors who live near Grimm's Fuel Compost are trying to get the word out about a Metro license renewal and a public comments period that is

license renewal and a public comments period that is open. Wondering if it would be possible for us to put up some yard signs on Lam property on 124th between Tualatin Road and Highway 99 until the end of the month?

Jan 19, 2024 at 3:54 PM

Hi Brett. That isn't our property it is owned by another company. We just lease a few floors.

Ok, Good to know! Thanks.

Mar 4, 2024 at 9:03 AM

Hi Chad, The sound has been loud the past few days. This weekend was probably the worst sofar. Could hear it throughout our house. The pulsing 350Hz tone woke me up both mornings. It was going day and night. Kept me awake last night. Wind was steady out of the south the whole time I think.

Hi Brett. It is amazing what wind does for sound. Aside from the trees planted, we are pulling sound protection into our construction designs. It is in progress but moves slowly.

Apr 25, 2024 at 5:04 PM

Hi Chad, Just a head's up that the 520 Hz tone is loud enough that I'm hearing it in my garage. Ground level, no windows.

Is it still happening or was it for a set period of time?

It was audible for most of the afternoon. I've got some water running right now so can't tell if it's still going or not.

It's still going now.

the sound that is.

Ok I'm investigating

Ok I'm investigating

Thanks.

Apr 30, 2024 at 9:48 AM

It's been loud over the weekend plus yesterday and today. Probably because the wind is steady from the south at 10+ mph and chilly?

Yeah the wind definitely affects it. I haven't found anything different. I will be happy when we get new sound screens uo

Up

Tue, Dec 3 at 9:32 AM

Hi Chad, We were hearing some new harmonics last night, including a really low frequency around 47Hz. I think it's the first time we've heard that low frequency. Wondering if anything has changed onsite that might explain this? There were four harmonics. Each was about one octave lower than the next. 347/170/84/47Hz

Tue, Dec 3 at 11:59 AM

That's interesting. How long did the low frequencies last for? No changes that would do that. I don't think we have anything big enough to push that low a frequency that far.

Not sure how long it lasted. We noticed it around 10:30pm until falling asleep around 11:15pm.

Any recent changes that could account for the other, higher, harmonic frequencies?

Tue, Dec 3 at 2:00 PM

I am checking to see if anything has happened that I'm not aware of. But nothing obvious or significant.

Ok. Thanks!

Thu, Jan 30 at 8:38 AM

Thu, Jan 30 at 8:38 AM

Hi Chad. We've noticed a major decrease in sound the past couple weeks but it's back last night and today. any changes onsite that could explain it, or just the weather?

Hi Brett. I've been traveling all week but am checking with the team on site.

Thu, Jan 30 at 11:55 AM

I think it might have been a wind shift. Wind has been N and NW recently (including last night) but today it's from the South. I wonder if the local actual wind last night was different than what the weather app said. Any clues from on site?

No, we haven't had any change in operations.

Ok thanks.

Fri, Jan 31 at 9:54 AM

Just an update. Today the wind is South 180° at 8 mph gusting to 26. The fan noise is so loud I can hear it in my garage with the doors closed.

Fri, Jan 31 at 3:37 PM

That's unusual. I'll ask facilities to see if something is changing. We have every parameter monitored so of something was off we would know right away.

Tue, Feb 4 at 8:52 AM

The low frequency 88Hz was back last night along with its 344Hz harmonic, both of which we have heard together before.

Tue, Feb 4 at 11:56 AM

Hmm. I did double check with facilities. They confirmed no changes and everything is running normally.

Washington County Consolidated Communications Agency
5900 NE Pinefarm Court, Hillsboro, Oregon 97124
503-690-4911 ext 3280

CERTIFICATE OF AUTHENTICITY

Pursuant to the State of Oregon public records laws and administrative rules, the following public records were compiled and/or reproduced on 12/27/2024 as requested by and released to:

Name: Brett Hamilton
Agency:
Street Address: 11430 SW Kalispell St
City, State Zip: Tualatin, OR 97062
Phone: 503 803 7609
Email: brett@simple.be

~ PUBLIC RECORDS ~

Request Type: Other Search Report
Delivery Method: Email - electronic pdf file & mp3
Reference #:

Record Type	CAD Incident# Search Criteria	Inc. Date	Audio Description	Begin Time/Date	End Time/Date	Search Results
Other Search Report	503 803 7609			10/27/2024	12/6/2024	6

1 - Total Records

The public records listed above are certified to be a true and accurate copy of the original. WCCCA is a public safety answering point (PSAP) for emergency calls originating within a 9-1-1 service area and recognized by the State of Oregon.

Regarding telephone calls: At the date and time reference above, a telephone call was processed by WCCCA or made by WCCCA. During the full duration of the call, the call was recorded by a digital logging recorder.

Regarding radio traffic: At the date and time referenced above, radio traffic was processed by WCCCA. The radio traffic was relayed via WCCCA's emergency communications radio system. During the full duration of the radio traffic, the radio traffic was recorded by a digital logging recorder.

The operator of the Equature DSS digital logging recorder was competent to transfer the recording to the format provided. If any redactions were made to the recordings to protect confidential data obtained from the Oregon Law Enforcement Data Systems (LEDS) or Protected Health Information, the redactions would be indicated by a steady digital tone placed on the recording. Otherwise, the public record provided accurately reflects the original call and no changes, additions, or deletions were made.

The public record provided is an accurate rendition of the telephone call and/or radio traffic placed at the time and date set forth above.

Date Received: 12/6/2024
Date Completed: 12/27/2024
Request Number: 24-2888
Request Status: COMPLETED

Processed By: Krista Tate

Phone History

Search Parameter: 5038037609

IncidentNumber	Problem	ResponseDate	CallerPhone	CallBackPhone	Address	City	Name	Disposition
WP243010290	NOI - NOISE COMPLAINT	10/27/2024 09:49:05		503-803-7609	11361 Sw Leveton Dr	TUALATIN	BRETT HAMILTON	W1 - ASSIGNMENT COMPLETED
WP243060035	NOI - NOISE COMPLAINT	11/01/2024 01:00:04		503-803-7609	11361 Sw Leveton Dr	TUALATIN	BRETT HAMILTON	W1 - ASSIGNMENT COMPLETED
WP243160888	NOI - NOISE COMPLAINT	11/11/2024 20:24:56		503-803-7609	11361 Sw Leveton Dr	TUALATIN	BRETT HAMILTON	W1 - ASSIGNMENT COMPLETED
WP243210830	NOI - NOISE COMPLAINT	11/16/2024 20:41:50		503-803-7609	11361 Sw Leveton Dr	TUALATIN	HAMILTON, BRETT	W1 - ASSIGNMENT COMPLETED
WP243220790	NOI - NOISE COMPLAINT	11/17/2024 20:57:11		503-803-7609	11361 Sw Leveton Dr	TUALATIN	BRETT HAMILTON	W1 - ASSIGNMENT COMPLETED
WP243220867	FOL - FOLLOW UP	11/17/2024 22:55:06		503 803 7609	11361 Sw Leveton Dr	TUALATIN	BRETT HAMILTON	W3 - PERSON ADVISED/REFERRED

From: Brett Hamilton <brett@simple.be>
Sent: Wednesday, August 13, 2025 11:02 AM
To: Keith Leonard; Ext - Planning
Cc: Council
Subject: Lam Noise Study
Attachments: STR2025081301.pdf

Dear Tualatin Planning Commission and Architectural Review Board,

In preparation for the upcoming TUX project land use hearings, please find attached the acoustical engineer's report on the sound impact from Lam Research on a nearby residential property.

Sincerely, Brett Hamilton

A ACOUSTICS
9324 SW CAMILLE TER.
PORTLAND, OR. 97223 - 7043
(503) 977 - 2690
elki@aacoustics.com
www.acousticalengineering.net

August 13, 2025

Brett Hamilton
11430 SW Kalispell St
Tualatin OR 97062
Brett Hamilton <brett@simple.be>
503-803-7609

Re: Evaluation of sound impact from the Lam Research plant at Deborah Anderson Home located on 11045 SW Tualatin Road Tualatin Oregon 97062.

At the request of Brett Hamilton*, A Acoustics* visited the Deborah Anderson home on 10:00 PM March 30, 2025 to evaluate the plant noise. Please see Google site map below with the red dot showing the sound recording location.



Sound Pressure Level (SPL) Recording
The following instruments were used for the recordings:

- Precision sound level meter and analyzer, General Radio Precision Sound Level Meter (SLM) and analyzer (Type, I) Model 1982 Serial #0657982
- Sound level calibrator, ACO Pacific, Inc., Model 511E
- Marantz Professional Solid-State Recorder MPD660

The recording was made with General Radio and recorded in Marantz Recorder. The Sound Pressure level meter was calibrated on the site with a hand-held calibrator before the readings were made.

The sound data was analyzed using SpectraPlus-SC software.

During the recording it was drizzling with no wind. We analyze the data when there was no traffic on SW Tualatin Road.

Finding
The sound recorded was 52 dBA and there was sound peak at 175 Hz and 350 Hz.

Please call me if you have any question.

Sincerely,

A ACOUSTICS



EIki M. Lahav P.E.

From: Brett Hamilton <brett@simple.be>
Sent: Monday, August 18, 2025 3:34 PM
To: Keith Leonard; Ext - Planning
Cc: Council; Outreach
Subject: Lam 108th Ave Proposed Entrance

Dear Tualatin Planning Commission and Architectural Review Board,

Thank you for the opportunity to comment on Lam's updated TUX proposal. While I appreciate the work that has been done to eliminate the employee entrance on Tualatin Road at SW 115th Ave and maintain the Leveton driveway, I am opposed to the addition of a new employee entrance on SW 108th Avenue, as it would increase peak traffic volumes on Tualatin Road.

Lam's proposed entrance on 108th fails three of the new driveway approach criteria in TDC 75.020.5: "(g) The proposed driveway approach does not result in significant adverse impacts to the vicinity; (h) The proposed driveway approach minimizes impact to the functionality of adjacent streets and intersections; and (i) The proposed driveway approach balances the adverse impacts to residentially zoned property and the functionality of adjacent streets."

Lam's traffic study shows that the Hazelbrook Road onramp to Hwy 99W will fail to meet performance standards after adding the additional traffic volumes from this proposed 108th entrance.

Lam's traffic study also shows that the 108th / Tualatin Road intersection has 5X the crash rate of 115th / Tualatin Road despite carrying much less traffic. Adding more traffic at 108th will increase this crash rate even further.

NO new employee access on 108th
NO added traffic on Tualatin Road
Use Leveton Drive and Herman Road

Thank you for your consideration.

From: Brett Hamilton <brett@simple.be>
Sent: Wednesday, August 27, 2025 2:00 PM
To: Keith Leonard; Ext - Planning
Cc: Council; Outreach
Subject: Lam Traffic Impacts

Dear Tualatin Architectural Review Board,

Thank you for the opportunity to comment on Lam's updated TUX site plan, specifically the proposed expansion of the 108th Avenue north access point which is currently gated. Opening this gate to allow employee access would add traffic to Tualatin Road, making it more difficult for residents to enter and exit our neighborhoods. Peak traffic volume on Tualatin Road is already a major problem, and I would ask the city to take steps to reduce, not increase, traffic volumes on Tualatin Road.

Approved in 2023, Lam's Building G project is still under construction, and the full traffic impact of its two new parking lots on 108th has not yet been felt, but is already baked in. I am opposed to opening another access on 108th, and I respectfully request that Lam's existing 108th north access remain in its current configuration: closed to employee traffic but available for emergency and utility use.

For the majority of Riverpark residents, Tualatin Road is our ONLY option for local access. We do not have an alternate route, but Lam does: Leveton Drive. It has a higher speed limit and lower traffic volume than Tualatin Road. Leveton is a better route for Lam's trips.

SITE CIRCULATION

Lam's updated site plan shows a primary employee driveway connecting the north parking lots directly to Leveton Drive, providing more than adequate roadway access for these employees. Connecting these same parking lots to 108th is redundant and unnecessary, and would create unintended negative impacts in the surrounding neighborhoods.

Lam's site plan shows 6 other access points: 4 on Leveton Drive and 2 on 108th. Lam is responsible for designing reasonable site circulation. A lack of good site circulation is not a valid reason to open yet another access point.

DRIVEWAY CRITERIA

Lam's traffic study shows that the Hazelbrook Road on-ramp to Hwy 99W will fail to meet performance standards after adding the additional traffic volume from the proposed 108th entrance.

This proposed entrance fails three of the driveway approach criteria in TDC 75.020.5: "(g) The proposed driveway approach does not result in significant adverse impacts to the vicinity; (h)

The proposed driveway approach minimizes impact to the functionality of adjacent streets and intersections; and (i) The proposed driveway approach balances the adverse impacts to residentially zoned property and the functionality of adjacent streets."

PLANNING GOALS

The Tualatin Comprehensive Plan 2040 asks us to "Consider transportation options that make the best use of the existing network." (Goal 8.7) Leveton Drive has a massive amount of unused capacity available and is currently under-utilized especially during peak traffic times. The highest and best use for Leveton Drive is to carry ALL of Lam's added site trips. It is unreasonable to put more strain on Tualatin Road (and its residents) when Leveton is sitting there mostly empty.

SCOPE OF IMPACT

The full impact of an expanded 108th access would extend well beyond the TUX project. Lam's latest site plan shows an abundance of open space available for future development, and based on current trends, Lam will continue to expand and build out their campus.

It is also common for semiconductor facilities to run multiple shifts, in order to double or triple their production capacity without expanding the physical plant. Adding shifts (and the accompanying traffic volume) would not require an Architectural Review, Industrial Master Plan update, or Conditional Use Permit. The potential for significantly increased intensity of use should be anticipated now and addressed during the current land use review cycle.

The Tualatin Planning Commission was advised to not consider ANY traffic or noise impacts during their IMP hearing, and was told that these concerns would be handled by the Architectural Review Board.

When measuring the traffic impact of Lam's proposed entrance, it is appropriate and justified to look at not only the impact from Lam's TUX project, but also look at the total anticipated impact from future developments that could use this entrance. At the IMP hearing, one of Lam's advocates mentioned that "this project has been part of Lam's master plan for quite some time." In order to evaluate the full impact of Lam's current proposal, it would be helpful to see how this entrance would interact with future projects, and how it fits into Lam's overall campus master plan.

ROAD SAFETY

An expansion at 108th would provide Lam's north parking lots with access to Tualatin Road. The intersection of 108th and Tualatin Road already has an elevated crash rate, and adding more traffic here would increase the risk of injury, not only for those who choose to turn here, but also for each person who travels along this section of Tualatin Road.

STUDENT SAFETY

The proposed expansion on 108th would also add traffic to 115th Avenue, which many students cross on foot each day going to and from school. Compared to existing conditions, the current TUX proposal represents a decrease in student safety, and that is a step in the wrong direction.

Lam's traffic study also does not identify the locations of school bus routes or the potential impacts to school bus traffic. Student safety is one of the most important issues in our community, but so far it has been ignored in this process.

JUSTICE AND EQUITY

Although the negative traffic impacts from 108th would be felt along the entire length of Tualatin Road, these impacts would be most concentrated between 108th and 124th Avenues, an area which includes more than 600 high-density housing units, traditionally disadvantaged demographics, and income-limited apartments. Putting more traffic stress on these populations is not equitable, especially when a better alternative is available on the other side of Lam's campus.

PUBLIC FUNDS

Lam Research received $22 million in taxpayer-funded CHIPS Act grant funds to help pay for the TUX expansion. Any project built with taxpayer funds should be designed so that it does not harm the community.

ECONOMIC IMPACT

The total value of residential real estate located between the Tualatin River and Tualatin Road is well over $500 million. This tax base must be protected. The best economic solution would be for Lam to grow in a way that does not interfere with surrounding residential land uses. The current decision before you does not need to be a conflict between Lam and the surrounding community. With good site design and smart planning, this project can be a win-win.

Keeping the 108th north access in its current configuration and utilizing Leveton for all of Lam's new site trips is a solution that will allow Lam's campus to grow long into the future while protecting the quality of life and property values of the taxpayers who live along Tualatin Road.

Thank you for your consideration,
Brett Hamilton

From: Brett Hamilton <brett@simple.be>
Sent: Friday, September 5, 2025 6:38 AM
To: Keith Leonard; Lindsey Hagerman
Cc: Council; Ext - Planning
Subject: Lam Off-Site Noise Video
Attachments: LamOffSiteNoise.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Dear Keith and Lindsey,

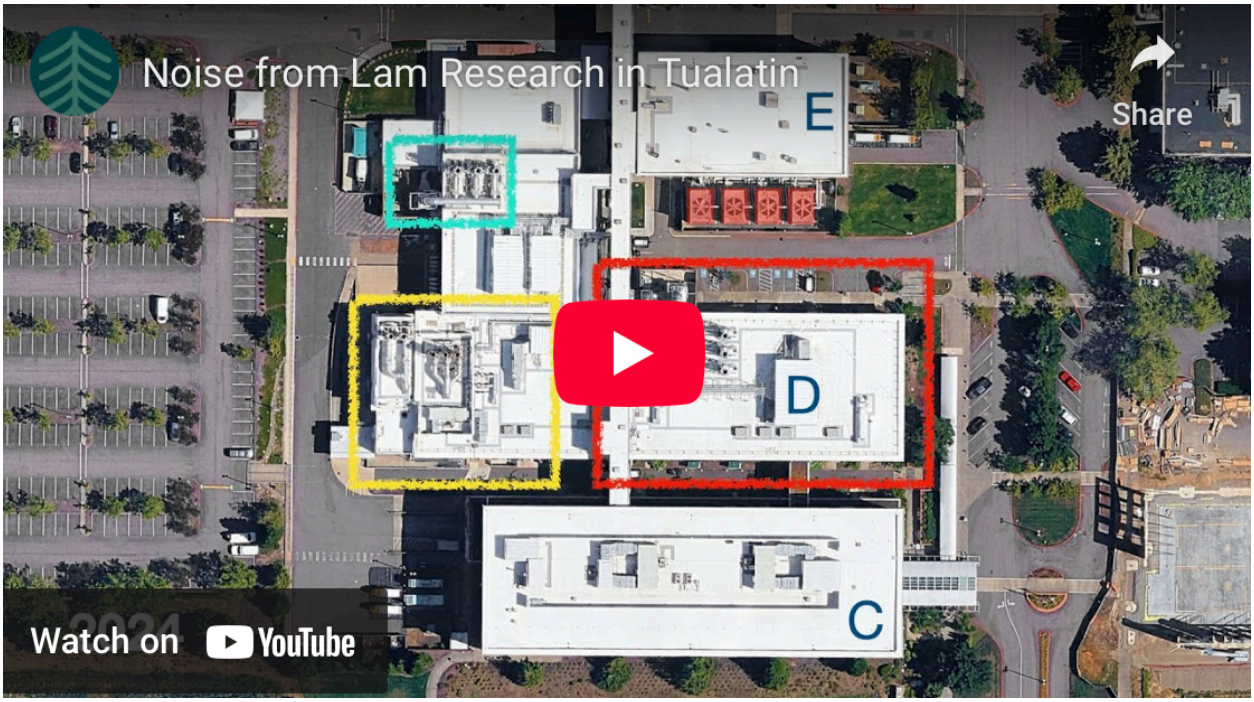
When my public comment "Lam Off-Site Noise Video" email was added to the ARB TUX hearing packet, it looks like YouTube link was converted by your internal security software into a Mimecast link, making it inaccessible to users and devices who are not enrolled in Mimecast. In order to remedy this, I've created a one-page PDF file for the packet. This should preserve the link and make it accessible to all users. Please add this email (and the attached PDF file) to the public record.

Thank you. -Brett Hamilton

Dear Tualatin Architectural Review Board,

In order to save time at the upcoming Lam TUX hearing, and to prevent technical difficulties, I've converted my off-site noise presentation into a video and posted it on YouTube to be part of the public record. I would ask that this email be included in the hearing packet.

https://youtu.be/lyzioqzFeXw



Sincerely,
Brett Hamilton

From: Brett Hamilton <brett@simple.be>
Sent: Monday, September 8, 2025 11:52 AM
To: Ext - Planning; Keith Leonard
Cc: Council; Outreach
Subject: Lam TUX Public Records Issue
Attachments: EmailChainPRR.pdf

Dear City of Tualatin,

Over the past year during the TUX land use process, there have been a number of occasions where it was difficult for the public to get timely and accurate information from the City regarding Lam's application and/or hearings, due to misinformation, unnecessary delays in releasing information, and, in this latest example, staff claiming that the requested information did not exist when in fact the city already had custody of the document for 20 days. Please add this email (and the attached PDF file) to the public record.

Sincerely,
Brett Hamilton

Initial Public Records Request:

Submitted at 05:45am on July 15, 2025
by Brett Hamilton

Document Information:
Lam's latest revised land use application for TUX project

City Response:

From: "Nicole J. Morris" <NMorris@tualatin.gov>
Subject: RE: Public Records Request- Hamilton
Date: July 15, 2025 at 11:16:57 AM PDT
To: "brett@simple.be" <brett@simple.be>

Brett,

There are no new application materials that have been submitted at this time. Once the submittal has been made the project page on the city's website will be updates with them.

Thanks,

Nicole Morris, MMC
Deputy City Recorder/
Records Manager
Phone: 503.691.3011

First Request for Clarification:

From: Brett Hamilton <brett@simple.be>
Sent: Tuesday, July 15, 2025 11:28 AM
To: Mike McCarthy <mmccarthy@tualatin.gov>
Cc: Nicole J. Morris <NMorris@tualatin.gov>
Subject: Re: Public Records Request- Hamilton

Dear Mike,

After the City Council meeting last night I thought you said that Lam had submitted an updated site plan, and that you had seen it? Did I misunderstand something?

Thanks, -Brett

City's Response:

From: "Nicole J. Morris" <NMorris@tualatin.gov>
Subject: RE: Public Records Request- Hamilton
Date: July 15, 2025 at 12:13:47 PM PDT
To: Brett Hamilton <brett@simple.be>,
Mike McCarthy <mmccarthy@tualatin.gov>

Brett,

I double checked and you misunderstood. We do not have any new submittals.

Nicole Morris, MMC
Deputy City Recorder/
Records Manager
Phone: 503.691.3011

Second Request for Clarification:

From: Brett Hamilton brett@simple.be
Subject: Re: Public Records Request- Hamilton
Date: July 15, 2025 at 12:22 PM
To: Nicole Morris NMorris@tualatin.gov
Cc: Mike McCarthy mmccarthy@tualatin.gov

Thanks Nicole,

That's really strange. I asked Mike last night if I could request a copy of this new site plan via public records request and he answered in the affirmative. He said the city was just waiting on a revised traffic study.

Does the city have *any* updated version of a proposed site plan from Lam? Maybe not an official submittal but like a rough draft or outline? Mike also mentioned a "scoping document". Does that exist? Mike mentioned that the Lab building will be smaller but that it does not change the number of employees.

Does the City have anything in writing from Lam or MacKenzie regarding a new site plan? The latest thing I have is an email from Suzannah Stanley dated April 24, 2025.

-Brett

Subsequent Public Records Request:

Submitted at 09:34am on July 21, 2025
by Brett Hamilton

List of all email messages (including Date / Time / Subject) to and/or from sstanley@mcknze.com from April 23, 2025 to July 21, 2025. This is not a request for the message content (Body or Attachments). Thank you.

City's Response:

From: "Nicole J. Morris" <NMorris@tualatin.gov>
Subject: Follow-Up
Date: July 23, 2025 at 10:50:48 AM PDT
To: Brett Hamilton <brett@simple.be>

Brett,

I wanted to follow-up on some questions you have last week. The new materials are available now. Our planning division sent me the below. Mike also sent me the attached email regarding the traffic scoping that I thought you may want. I did receive your request for the email list and I am still working on that and will be in touch soon.

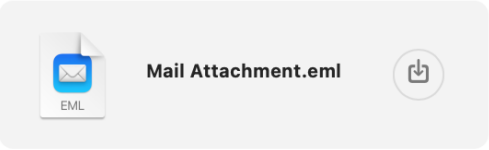
IMP 24-0001 - https://www.tualatinoregon.gov/planning/lam-research-industrial-master-plan-imp24-0001
Updated items include:

- Applicant Narrative
- Plan Set and Elevations
- IMP Proposed Modifications
- Supporting Documents (title report)

AR 24-0002 – https://www.tualatinoregon.gov/planning/lam-research-tux-development-ar24-0002
Updated items include:

- Applicant Narrative
- Plan Set and Elevations
- Traffic Impact Analysis
- Preliminary Stormwater Report
- Tree Assessment Report
- Supporting Documents (TVF&R review and title report)

Nicole Morris, MMC
Deputy City Recorder/
Records Manager
Phone: 503.691.3011



Mail Attachment:

From: Brent Ahrend
Subject: Tualatin Exp Lab/CUB/Bldg H
Date: June 25, 2025 at 1:23:51 PM PDT
To: Mike McCarthy, Steve Koper, Kim McMillan, Abby McFetridge, Tony Doran, Hayden Ausland
Cc: Bill Bezio, Mike Rueter, Nicole Burrell, Suzannah Stanley, Megan Diaz, Clara Layton, "Majid, Jen Otterness", Michael Halvorson, "McEvers, Stefanie", "Nonamaker, Danielle", "Roessler, Paul", "Fosler, Todd", Joel Rabinovitz, Garth Appanaitis

Mike,

Please see the attached scoping letter for the updated Lam TUX site plan. Our traffic analysis will be based on this updated scoping.

We understand you will forward this to Washington County and ODOT staff for their review and input.

Let us know if you have any questions.

Thanks,
Brent Ahrend PE
Transportation Planning
D 971-346-3781 C 503-705-7554
Associate Principal
Professional Licenses & Certifications

Mackenzie.
ARCHITECTURE § INTERIORS § STRUCTURAL ENGINEERING
CIVIL ENGINEERING § LAND USE PLANNING § LANDSCAPE ARCHITECTURE
Disclaimer PORTLAND, OR | VANCOUVER, WA | SEATTLE, WA | SACRAMENTO, CA

Attachment:
00LTR-City of Tualatin-LAM SMP Update TIA Scoping-250625.pdf

From: Brett Hamilton <brett@simple.be>
Sent: Friday, October 31, 2025 10:21 AM
To: Council
Cc: Keith Leonard; Ext - Planning
Subject: Video Evidence
Attachments: VideoEvidence.pdf

Dear Tualatin City Council, In preparation for the upcoming Lam TUX hearing, attached please find two new videos regarding traffic and noise for your review. Thank you for your consideration. -Brett Hamilton

Video Evidence

Traffic Volume Comparison

Relative traffic volumes on Tualatin Road and Leveton Drive
https://youtu.be/-hor8y_fL6Q



Lam Noise Recording

Audio recoding of noise signatures from Lam Research
https://youtu.be/JfeCxwXmQbc



CITY of TUALATIN

AFFIDAVIT OF MAILING

STATE OF OREGON)

) ss

COUNTY OF WASHINGTON)

I, Lindsey Hagerman being first duly sworn, depose and say:

That on the October day of 10 I served upon the persons shown on Exhibit A, attached hereto and by this reference incorporated herein, a copy of a Notice of Hearing/Application/Decision marked Exhibit B, attached hereto and by this reference incorporated herein, by mailing to them a true and correct copy of the original hereof. I further certify that the addresses reflect information received from the relevant party or agency, and that said envelopes were placed in the United States Mail at Tualatin, Oregon, prepared to receive postage administered by city staff.

Dated this October 10 of, 2025

Lindsey Hagerman
Signature

SUBSCRIBED AND SWORN to before me this 10th day of October, 2025

OFFICIAL STAMP
CORTNEY RAE KAMMERER COX
NOTARY PUBLIC - OREGON
COMMISSION NO. 1039640
MY COMMISSION EXPIRES AUGUST 14, 2027

Cortney Rae Kammerer Cox
Notary Public for Oregon

My commission expires: August 14, 2027

RE: AR24-0002 Notice of Appeal

Public Noticing

To ensure privacy both email and mailing addresses have been removed. Please contact 503-691-3026 for additional information.

Exhibit B.

NOTICE OF PUBLIC HEARING AND OPPORTUNITY TO COMMENT

NOTICE IS HEREBY GIVEN that a public hearing before the City Council will be held:

Monday, November 10, 2025 at 7 pm
Tualatin City Services Building
10699 SW Herman Road

To view the application materials visit:
www.tualatinoregon.gov/projects

Request for Review of AR24-0002 — "Lam Research TUX Development"

TO PROVIDE COMMENTS:
Email: kleonard@tualatin.gov

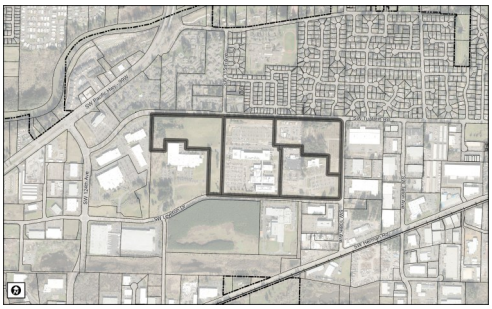
Mail: Planning Division
Attn: Keith Leonard
10699 SW Herman Road
Tualatin, OR 97062

To attend the hearing, there are two options:

- **Attend in person at the Tualatin City Services Building.**
- **Zoom Teleconference.** Details at: www.tualatinoregon.gov/citycouncil/council-meetings

An Appeal or Request for Review of the September 10, 2025, Architectural Review Board decision approving AR24-0002, with conditions, the construction of four buildings on 4 lots totaling 75.96 acres in the Manufacturing Park Zone (MP). The Appeal was submitted by Brett Hamilton who provided both written and verbal testimony in opposition to traffic and noise issues impacting his property value and quality of life. AR24-0002 was submitted by Mackenzie, on behalf of LAM Research Corporation.

- **Site Address:** 11155-11361 SW Leveton Drive (Tax Lots: 2S122AA500 & 800, 2S122A00100, 2S122BA00100)



- **Criteria**: Tualatin Development Code (TDC) Chapters 32, 33, 62, 63, 73A-D, 74 and 75.
- **Application materials** are public record and are available for review. Copies can be viewed online or obtained at a reasonable cost, by contacting the Planning Division.
- **Staff report materials** will be available for inspection at no cost, at least seven days prior to the hearing. Copies can be obtained for a reasonable cost.

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www.tualatinoregon.gov/projects

Request for Review of AR24-0002 — "Lam Research TUX Development"

TO PROVIDE COMMENTS:
Email: kleonard@tualatin.gov

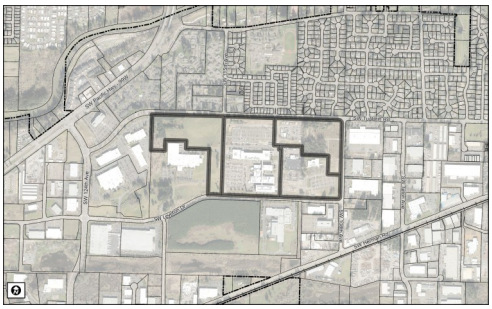
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- **Individuals wishing to comment** may do so via email (kleonard@tualatin.gov) or in writing to the Planning Division prior to the hearing and/or present written and/or verbal testimony at the City Council hearing prior to the close of the written record. Comments should address the identified approval criteria or those criteria that the person commenting believes apply.
- **The public hearing process** begins with a staff presentation, followed by testimony by proponents, testimony by opponents, and rebuttal. Individual testimony may be limited. At the conclusion of the hearing, the City Council will deliberate and make a decision based on the facts and arguments in the public record. Before the hearing is closed, a participant may request that the record remain open for at least seven days after the hearing.
- **Everyone is invited to attend the hearing and comment** on the application's approval criteria. Failure of an issue to be raised in the hearing, in person, or by letter, or failure to provide sufficient specificity to afford the decision maker an opportunity to respond to the issue precludes appeal to the State Land Use Board of Appeals (LUBA) based on that issue. The failure of the applicant to raise constitutional or other issues relating to proposed conditions of approval with sufficient specificity to the decision maker to respond to the issue precludes an action for damages in circuit court.
- A copy of the staff report, exhibits, and findings will be available one week before the hearing at: https://www.tualatinoregon.gov/citycouncil.

For additional information contact:
Keith Leonard, Associate Planner: kleonard@tualatin.gov or 503-691-3029

- **Individuals wishing to comment** may do so via email (kleonard@tualatin.gov) or in writing to the Planning Division prior to the hearing and/or present written and/or verbal testimony at the City Council hearing prior to the close of the written record. Comments should address the identified approval criteria or those criteria that the person commenting believes apply.
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10699 SW Herman Rd, Tualatin, Oregon 97062 TualatinOregon.gov

Lam Research

2025 Site Noise Survey

Tualatin, OR

PRESENTED TO:

Mackenzie

BEST VIEWED IN COLOR

Prepared by: **Steven Lank**
Steven.lank@colingordon.com

Vice President
Colin Gordon Associates
1350 Old Bayshore Hwy, Suite 799
Burlingame, CA 94010 USA
Phone: (415) 570-0350
www.colingordon.com

CGA Project No. P25171
September 9, 2025

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1. Introduction

Colin Gordon Associates (CGA) conducted a noise survey along the north edge of the Lam Research campus in Tualatin, OR. The purpose of this survey was to document the current background noise levels along adjacent sensitive property lines, to help assess whether the site was currently in compliance with applicable noise ordinance requirements.

2. Measurement Conditions

The Lam site is bounded on the north by a high traffic road (SW Tualatin Rd), with residential housing on the opposite side of the road directly to the north. Colin Gordon Associates (CGA) visited the site on the evening of 4 September 2025 between 10:00 PM and 12:00 AM to conduct noise measurements along these sensitive property lines to the north.

Measurements were conducted while standing on the sidewalk on the north side of SW Tualatin Road, directly adjacent to the residential properties along this road. Our measurement Locations 1 through 6 are shown overlaid on a satellite image of the Lam property and surrounding environment in **Figure 1**. Measurement locations were selected to represent the range of background noise levels experienced by the residential properties along the road. This includes Location 4, which is on the sidewalk directly adjacent to 11045 SW Tualatin Road – where we understand that previous noise measurements were conducted earlier this year by others.[1]

Throughout our visit, the noise levels in the area were dominated by noise generated by vehicles traveling on SW Tualatin Road most of the time. Passing vehicles were audible and generated noise levels that exceeded the typical background levels at the measurement locations for around 10 to 15 seconds after they had disappeared from view to the east or west of the measurement location. Since the purpose of our study was to evaluate the noise from the Lam plant sources, we conducted measurements during time periods when vehicles on SW Tualatin Road were *not audible*. Cars passed by very frequently, which limited the time windows for documenting the background levels without local traffic present to around 2 to 3 minutes at each location.

In the absence of traffic noise from SW Tualatin Road, the dominant audible noise source was crickets – which generated continuous high frequency noise that was distinctly audible at all locations. At Locations 3 through 5, on the eastern side of the Lam site, there was also audible continuous lower frequency noise originating from the Lam plant. Noise from more distant traffic was also audible during our measurement periods.

Temperatures during our measurements ranged from around 72 to 76 degrees, with low winds, some clouds, and no precipitation.

[1] S. Lank, "Lam Research Tualatin Site – Comments on A Acoustics Noise Survey Report," dated 3 September 2025 and submitted to Mackenzie

Figure 1: Measurement Locations



3. Noise Performance Standards

The Tualatin Development Code notes the following with respect to noise:[2]

All uses and development must comply with the Oregon State Department of Environmental Quality standards relating to noise and the City of Tualatin noise ordinance in, TMC 6-14.

The applicable standards contained within both of the City of Tualatin and Department of Environmental Quality (DEQ) standards are summarized below, and are discussed in further detail in **Appendix A**.

City of Tualatin Noise Ordinance (10:00pm to 7:00am): 50 dBA

Oregon DEQ standards (10:00pm to 7:00am):	**L_1:**	**60 dBA**
	L_{10}:	**55 dBA**
	L_{50}:	**50 dBA**

For the purpose of this study, we consider these to apply mainly to continuously operating noise sources within the Lam Research Campus, as we understand that this has been the focus of recent complaints from nearby neighbors.

The Oregon DEQ standards are defined in the form of statistical noise levels, or centile levels, which represent the noise levels that were exceeded for a certain percentage of the time during the measurement period. For a given measurement, the various centile levels can be quite different, due to the influence of transient noise sources. The DEQ requirements specifically reference the L_1, L_{10}, and L_{50} levels – which are the noise levels exceeded for 1%, 10%, and 50% of the measurement period, which in this case was defined as "any one hour". For example, for an L_{50} level of 68 dBA, this means that for 50% of the time during the period measured, the noise level was at least 68 dBA.

In a given measurement, these various noise level metrics can be controlled by a variety of sources. The L_1 metric is usually driven by loud intermittent sources such as a passing motorcycle or a dog bark. In other words, a very loud source that only happens for a short time over the measurement duration. The L_{50}, which would be the noise level exceeded for 30 minutes of an hourlong measurement, typically represents the impact of intermittent but fairly frequent activities, such as aircraft (if near an airport) or vehicle traffic. In this case however, since we intentionally selected measurement periods where the most dominant transient noise source (local vehicle traffic on SW Tualatin Rd.) did not have a substantial impact, the difference in these various metrics is expected to be fairly small.

The City of Tualatin ordinance does not specify a noise metric, nor does it specify the measurement duration, that is to be used to assess noise levels for evidence of a noise violation. We therefore assume that the noise should be assessed using the metric and measurement duration that is most appropriate for determining the noise generated by the particular source of concern in each case.

---

[2] TDC 63.051 Noise

Another commonly used metric is the L_{90}, which is the noise level exceeded for 90% of the time. This metric is often used to assess the contribution from noise sources that are present and stable throughout the measurement period – such as continuously operating mechanical equipment. It represents the continuous background noise level caused by those equipment. The L_{90} is exceeded when there are transient events such as traffic noise.

Ordinances in many other municipalities have also been defined in terms of the maximum allowable L_{eq}, or equivalent energy noise level – which is defined as the constant noise level that would result in the same total sound energy produced by the measured time-varying noise over a given period of time. It can be considered as an "energy average" of the noise levels over the measurement interval. The L_{eq} levels can be quite sensitive to the impact from loud short term transient noises due to the logarithmic nature of the decibel scale.

Since the "Octave Bands and Audible Discrete Tones" portion of the Oregon DEQ requirements are described as being applied only at the discretion of the Director, it is unclear whether they are applicable in this case. Results presented in comparison to these standards should be considered for reference only, unless the City confirms that they are applicable in this case. If applicable, for the purposes of this study we will assume that they are only relevant with respect to noise generated by continuously operating noise sources located on the Lam campus.

4. Measurement Methodologies and Instruments

Measurements were conducted using instrumentation and methodologies that are in conformance with the requirements in the City of Tualatin and DEQ standards, as we understand them.

4.1 Measurement Instrumentation

Measurements were conducted with the following set of equipment:

Table 1: Measurement Instrumentation

Equipment Description	Make	Model
Type 1 Sound Level Meter	Larson Davis	831C
Acoustic Calibrator	Larson Davis	CAL200

This equipment was used together with the associated calibration systems, cables, connectors, etc. The annual calibration of the measurement instruments uses reference standards traceable to the US National Institute of Standards and Technology (NIST). The calibration was verified in the field at the time of measurement.

4.2 Noise Measurement Methodology

Overall A-weighted and unweighted octave band and one-third octave band sound pressure levels were measured with the Larson Davis Type 1 sound level meter, using the "slow" integration time setting (1 second). Measurements in each case were conducted over the course of 1.5 to 3 minutes, at times where there was no audible traffic noise from SW Tualatin Rd. – as discussed above. For each measurement, the sound level meter logged the L_{eq} as well as various statistical noise metrics

(L_n), as discussed above. We will present the L_1, L_{10} and L_{50} values, which are the metrics referenced by the Oregon DEQ standards, as well as the L_{90} values, which best represent the background noise controlled by continuous noise sources. The L_{50} levels will be used for the octave band and one-third octave band results, since the DEQ frequency requirements (if applicable) are described as applying to the "median" levels.

Note that, due to typically expected variance in acoustical measurements and equipment, measured differences of 1 dB or less are generally not considered meaningful.

5. Noise Measurement Results

Table 2 below shows the measured L_{90}, L_{50}, L_{10}, L_1, and L_{eq} at each location.

Table 2 Summary of Measured Background Noise Levels
Night of Thursday, September 4th, 2025

Location	Time	Sound Pressure Level (dBA)				
		L_1	L_{10}	L_{50}	L_{90}	L_{eq}
1	22:50	46	45	44	44	44
2	22:39	46	46	45	45	45
3	23:05	50	49	48	47	48
4	23:15	50	49	49	48	49
5	23:31	50	50	50	49	50
6	23:34	48	47	47	47	47

The measured unweighted L_{50} levels are shown as a function of frequency in both octave bands and one-third octave bands in **Figure 2** and **Figure 3** below. We have the following comments on these results:

- The noise levels measured (without SW Tualatin Rd traffic sources) at all locations in all metrics are at or below 50 dBA maximum allowable limit in the City of Tualatin and Oregon DEQ requirements.
- There is minimal difference between the different statistical metrics at each location, and minimal difference between these metrics and the L_{eq}. This is as expected, given that our measurements intentionally avoided time periods where traffic on SW Tualatin Rd. was audible.
- The measured noise levels are highest at Locations 4 and 5 – where both Lam plant sources as well as cricket noise was audibly louder compared to the west side of the site. The influence from both of these sources is evident in **Figures 2 and 3**, with the increases at 2 kHz and above driven by cricket noise while the increases at around 500 Hz and below likely driven by plant sources.
- The levels measured in the 2 kHz octave band/2.5 kHz one-third octave band are the primary driver of the overall A-weighted levels at all locations. This indicates that the overall background noise levels would be lower in the absence of cricket noise.

- The levels around 2 kHz exceed the Oregon DEQ requirements for noise levels in octave bands at Locations 3 through 6, and the one-third octave band requirements at Locations 1 and 2. However, DEQ noise control regulations for industry and commerce would not be considered applicable to cricket noise.

This concludes our report.

***

Figure 2: Measured Noise Levels, Octave Bands

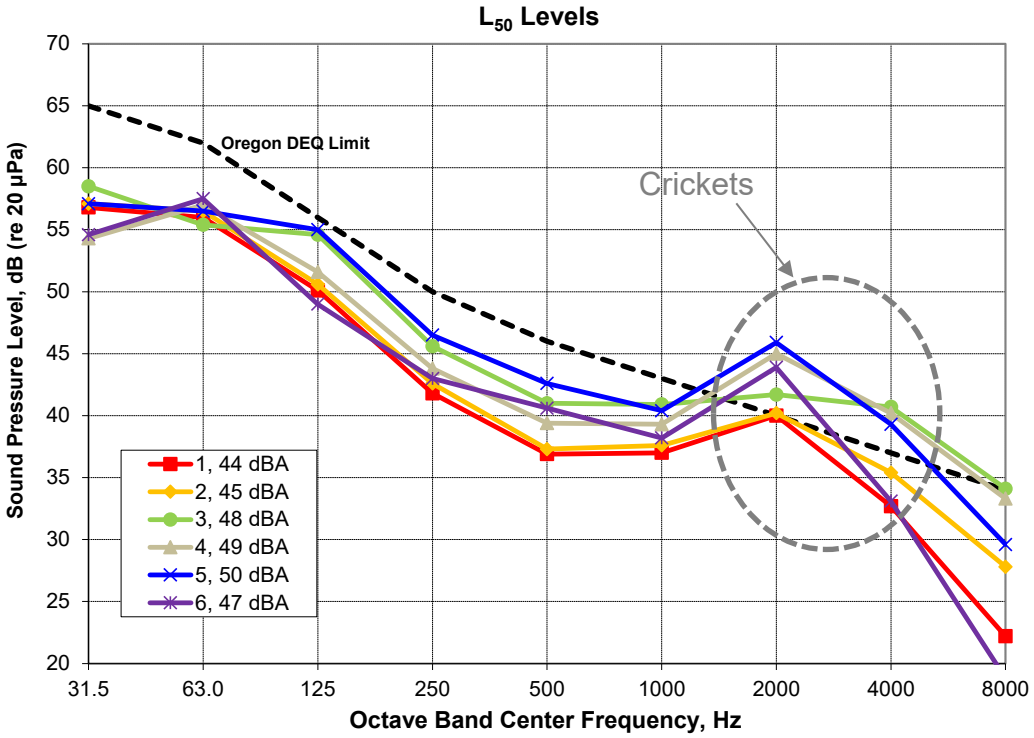
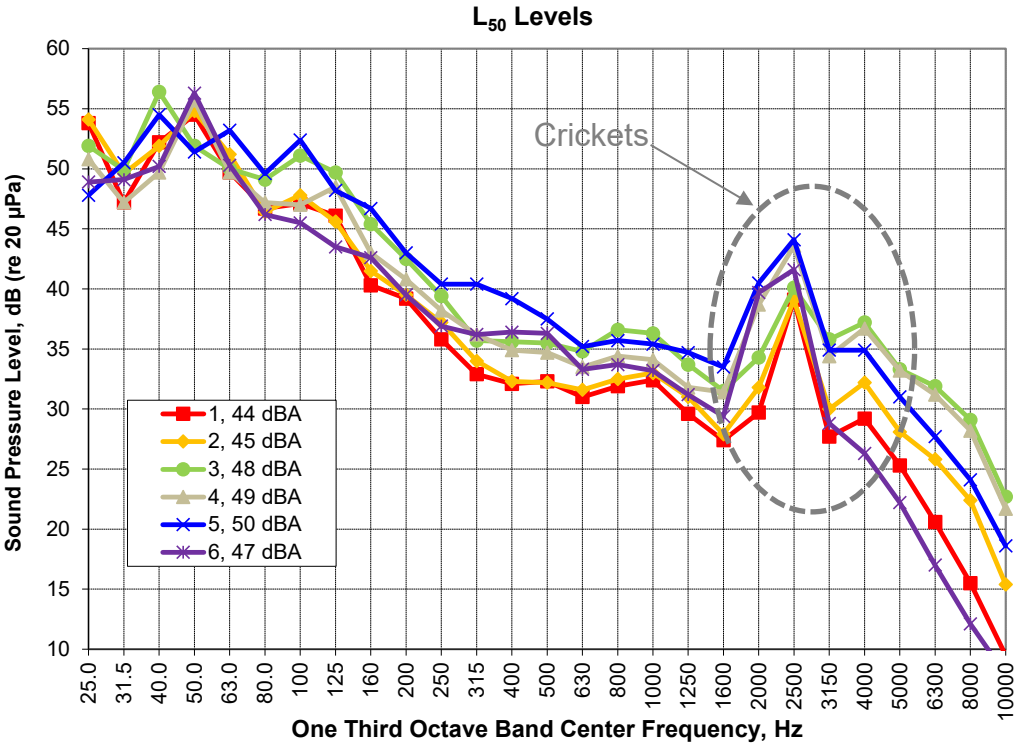


Figure 3: Measured Noise Levels, One-Third Octave Bands



Appendix A – Discussion of Applicable Noise Standards

City of Tualatin Noise Ordinance

Chapter 6-14-050 of the City of Tualatin Municipal Code notes:[3] -

No person shall knowingly create, permit, or assist in the creation or continuance of any noise from any sound source that exceeds the following decibel levels, measured from the property line of the recipient property:

1. *Where the recipient property is a noise sensitive property:*
    a. *Fifty decibels at any time between 10:00 p.m. and 7:00 a.m. the following day, or*
    b. *Seventy decibels at any time between 7:00 a.m. and 10:00 p.m.*
2. *Any other property:*
    a. *Sixty decibels between 10:00 pm. and 7:00 a.m. the following day; or*
    b. *Eighty decibels at any time between 7:00 a.m. and 10:00 p.m.*

Subsection 6-14-020 defines a Noise Sensitive Property as a

> *real property normally used for sleeping, or any real property used as a school, daycare facility, place of worship, hospital, or public library.*

Subsection 6-14-060 lists exceptions to the above noise limits, including the following exception for industrial sites in 6-14-060(4):[4]

> *Industrial, Agricultural, Construction and Demolition.* Sounds caused by industrial, agricultural, construction, or demolition activities when performed during the hours of 7:00 a.m. to 6:00 p.m., seven days a week or otherwise under a permit issued by the City or other governmental authority with jurisdiction;

The residential areas north of the campus qualify as Noise Sensitive Properties and therefore noise sources impacting these properties are understood to be held to a 50 dBA[5] limit between 10:00 PM and 7:00 AM the following morning. Due to the exception for industrial activities, we assume that the 70 dBA daytime limit applies to sources associated with the Lam plant between 6:00 PM and 10:00 PM only.

Unlike most noise ordinances, the City of Tualatin ordinance does not specify a specific noise metric (e.g., L_{eq}, L_{50}, L_{90}, etc.), nor does it specify the measurement duration, that is to be used to assess noise levels for evidence of a noise violation. The ordinance only notes that the decibel level requirements apply to "any sound source." This is critical, since measured noise levels can vary considerably (20 dBA or more) depending upon the specific metric and measurement duration utilized. We therefore assume that the noise should be assessed using the metric and

---

[3]https://library.municode.com/or/tualatin/codes/city_charter_and_municipal_code_?nodeId=TUALATIN_MUNICIPAL_CODE_TIT6GEOFNU_CH6-14NOOR_TMC_6-14-050EXDELE

[4]https://library.municode.com/or/tualatin/codes/city_charter_and_municipal_code_?nodeId=TUALATIN_MUNICIPAL_CODE_TIT6GEOFNU_CH6-14NOOR_TMC_6-14-060EX

[5] Section TMC 6-14-110 requires a sound level meter with an A-weighted scale, and therefore the limits are assumed to be defined in A-weighted decibels (dBA). This is typical for environmental noise regulations, as the A weighting adjusts the frequency spectrum of the measured noise based on the typical frequency response of human hearing.

measurement duration that is most appropriate for determining the noise generated by the particular source of concern in each case.

Oregon Department of Environmental Quality (DEQ) Standards

Section 340-035-0035 Oregon DEQ Standards[6] contains Noise Control Regulations for Industry and Commerce. This Section contains the following requirements for new sources[7] located on previously used sites (340-034-0035.1.b.A):

> *New Sources Located on Previously Used Sites: No person owning or controlling a new industrial or commercial noise source located on a previously used industrial or commercial site shall cause or permit the operation of that noise source if the statistical noise levels generated by that new source and measured at an appropriate measurement point, specified in subsection (3)(b) of this rule, exceed the levels specified in Table 8, except as otherwise provided in these rules.*

Table 8 from the regulations is extracted below:

OAR 340-035-0035
Table 8
New Industrial and Commercial Noise Source Standards
Allowable Statistical Noise Levels in Any One Hour

7:00 a.m. – 10:00 p.m.	10:00 p.m. – 7:00 a.m.
L_{50} – 55 dBA	L_{50} – 50 dBA
L_{10} – 60 dBA	L_{10} – 55 dBA
L_1 – 75 dBA	L_1 – 60 dBA

Subsection (3)(b) states the following:

> *Unless otherwise specified, the appropriate measurement point shall be that point on the noise sensitive property, described below, which is further from the noise sources:*
>
> *(A) 25 feet (7.6 meters) toward the noise source from that point on the noise sensitive building nearest the noise sources;*
>
> *(B) That point on the noise sensitive property line nearest the noise source*

Given the distance between the residences and any fixed sources on the Lam campus are well above 25 feet, we will assume that these requirements apply at the property line of the residences.

Unlike the City of Tulatin Noise Ordiance, the aforementioned Oregon DEQ Standards clearly indicate the noise metrics: L_1, L_{10}, L_{50}; and the measurement interval: "*Allowable Statistical Noise Level in Any One Hour*".

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[6] https://secure.sos.state.or.us/oard/displayDivisionRules.action?selectedDivision=1455
[7] For the purpose of this regulation, anything constructed after 1975 would appear to be considered "new." See Section 340-035-0015.17

Additionally, the DEQ Standards include the following rules with respect to the frequency content of noise in subsection (1)(e), which may be applied as the discretion of the Director (emphasis added):

> *Octave Bands and Audible Discrete Tones.* ***When the Director has reasonable cause to believe that the requirements of subsection (1)(a), (b), or (c) of this rule do not adequately protect the health, safety, or welfare of the public as provided for in ORS Chapter 467, the Department may require the noise source to meet the following rules****:*
>
> > *(A) Octave Bands. No person owning or controlling an industrial or commercial noise source shall cause or permit the operation of that noise source if such operation generates a median octave band sound pressure level which, as measured at an appropriate measurement point, specified in subsection (3)(b) of this rule, exceeds applicable levels specified in Table 10.*
> >
> > *(B) One-third Octave Band. No person owning or controlling an industrial or commercial noise source shall cause or permit the operation of that noise source if such operation generates a median one-third octave band sound pressure level which, as measured at an appropriate measurement point, specified in subsection (3)(b) of this rule, and in a one-third octave band at a preferred frequency, exceeds the arithmetic average of the median sound pressure levels of the two adjacent one-third octave bands by:*
> >
> > > *(i) 5 dB for such one-third octave band with a center frequency from 500 Hertz to 10,000 Hertz, inclusive. Provided: Such one-third octave band sound pressure level exceeds the sound pressure level of each adjacent one-third octave band; or*
> > >
> > > *(ii) 8 dB for such one-third octave band with a center frequency from 160 Hertz to 400 Hertz, inclusive. Provided: Such one-third octave band sound pressure level exceeds the sound pressure level of each adjacent one-third octave band; or*
> > >
> > > *(iii) 15 dB for such one-third octave band with a center frequency from 25 Hertz to 125 Hertz, inclusive. Provided: Such one-third octave band sound pressure level exceeds the sound pressure level of each adjacent one-third octave band;*
> > >
> > > *(iv) This rule shall not apply to audible discrete tones having a one-third octave band sound pressure level 10 dB or more below the allowable sound pressure levels specified in Table 10 for the octave band which contains such one-third octave band.*

Table 10 is extracted below:

OAR 340-035-0035
Table 10
Median Octave Band Standards
For Industrial and Commercial Noise Sources
Allowable Octave Band Sound Pressure Levels

Octave Band Frequency (Hz)	7:00 a.m. – 10:00 p.m.	10:00 p.m. – 7:00 a.m.
31.5	68	65
63	65	62
125	61	56
250	55	50
500	52	46
1000	49	43
2000	46	40
4000	43	37
8000	40	34

The Oregon DEQ requirements do not contain a similar daytime exception for industrial use, however subsection (6)(c) notes that the Department may authorize exemptions for:

> *Those industrial or commercial noise sources whose statistical noise levels at the appropriate measurement point are exceeded by any noise source external to the industrial or commercial noise sources in question*

Discussion

For the purpose of this study, we consider the limits City of Tualatin and Oregon DEQ limits discussed above to apply mainly to continuously operating noise sources within the Lam Research Campus, as we understand that this has been the focus of recent complaints from nearby neighbors. Such sources would include continuously operating rooftop fans, cooling towers, and outdoor compressors and pumps. The reality is that there are other noise sources on and off of the campus that can affect the property line noise levels. These include traffic, construction, and noise from other nearby facilities. The ideal time to measure noise impacts from continuously operating sources on the campus is very late in the evening and into early morning when other transient noise sources are typically less impactful.

The Oregon DEQ standards are defined in the form of statistical noise levels, or centile levels, which represent the noise levels that were exceeded for a certain percentage of the time during the measurement period. For a given measurement, the various centile levels can be quite different, due to the influence of transient noise sources. The DEQ requirements specifically reference the L_1, L_{10}, and L_{50} levels – which are the noise levels exceeded for 1%, 10%, and 50% of the measurement period. For example, for an L_{50} level of 68 dBA, this means that for 50% of the time during the period measured, the noise level was at least 68 dBA.

In a given measurement, these various noise level metrics will often be controlled by a variety of sources. The L_1 metric is usually driven by loud intermittent sources such as a passing motorcycle or a dog bark. In other words, a very loud source that only happens for a short time over the measurement duration. The L_{50}, which would be the noise level exceeded for 30 minutes of an hourlong measurement, typically represents the impact of intermittent but fairly frequent activities, such as air (if near an airport) or vehicle traffic. Another commonly used metric is the L_{90}, which is the noise level exceeded for 90% of the time. This metric is commonly used to assess the contribution from noise sources that are present and stable throughout the measurement period – such as continuously operating mechanical equipment. It represents the continuous background noise level caused by those equipment. The L90 is exceeded when there are transient events such as traffic noise.

Ordinances in many other municipalities have also been defined in terms of the maximum allowable L_{eq}, or equivalent energy noise level – which is defined as the constant noise level that would result in the same total sound energy produced by the measured time-varying noise over a given period of time. It can be considered as an "energy average" of the noise levels over the measurement interval. The L_{eq} levels can be quite sensitive to the impact from loud short term transient noises due to the logarithmic nature of the decibel scale.

Since the "Octave Bands and Audible Discrete Tones" portion of the Oregon DEQ requirements are described as being applied only at the discretion of the Director, it is unclear whether they are applicable in this case. Results presented in comparison to these standards should be considered for reference only, unless the City confirms that they are applicable in this case. If applicable, for the purposes of this study we will assume that they are only relevant with respect to noise generated by continuously operating noise sources located on the Lam campus.

Appendix B – CGA Firm Information

FIRM DESCRIPTION

Colin Gordon Associates, founded in 1990, provides specialized consulting services in acoustics and vibration control. The company has grown steadily from a one-person firm to an experienced organization offering services world-wide. Currently the staff numbers fourteen employees, including support personnel, offering both breadth and a desirable degree of redundancy. Staff members include technical experts in architectural acoustics and noise control, industrial and environmental noise studies, structural dynamics and building vibration, computer modeling techniques, and dynamic measurements.

The firm is recognized nationally and internationally for its work in the design of low- vibration and low-noise environments for technological buildings. CGA serves a wide variety of organizations in the tech sector, including university research laboratories, the semiconductor and optoelectronics industries, the biotech, pharma, and healthcare communities, as well as the cutting-edge areas associated with nanotechnology. CGA provides to these sectors a selection of services ranging from sophisticated vibration and noise control to solutions of more conventional problems that may arise.

The firm also works extensively in the more traditional areas of building and environmental noise and vibration studies. The control of noise and vibration in buildings poses some unique problems ranging from the selection of design criteria to the development of design details and specifications for structural and mechanical systems. On many projects, the company serves as a member of the architect/engineer design team. On others, the company acts individually and directly with the owner.

CGA is based in a single office in Northern California as well as having several employees working remotely in various locations throughout the United States. The firm routinely provides services throughout the western hemisphere, the Middle East, Europe, and Asia.

Staff members have published extensively; a list of publications is available at the firm's website (*www.colingordon.com*). Collectively and individually, the staff of Colin Gordon Associates has a proven record of success in developing cost-effective solutions for a wide variety of noise and vibration problems.



Steven Lank

Acoustics and Vibration Consultant

Role at Firm
Vice President, Senior Consultant

Contact Information
415.570.0350
slank@colingordon.com

Work Location
Portland, OR

Education
BS Mechanical Engineering, University of Virginia

Certification / Licenses
LEED AP

Member
National Council of Acoustical Consultant (NCAC)
Acoustical Society of America (ASA)
Institute of Noise Control Engineering (INCE)

Work History
2010 - Present
Consultant, then Senior Consultant, then Vice President, Colin Gordon Associates

2001-2010
Timber Truss Housing Systems

1999-2000
Facilities Planning and Construction at the University of Virginia Health Sciences Center

Steven Lank has over 25 years of experience in the construction industry, and has been with Colin Gordon Associates since 2010. At CGA, his work has focused upon noise and vibration control for buildings of all types, including technology facilities, university laboratories, healthcare, office, and industrial facilities. His contributions involve environmental noise measurements and modeling, HVAC noise analysis, room acoustics and speech privacy, structural dynamic analysis and evaluation, mechanical vibration control, and construction noise and vibration control and monitoring. He also oversees CGA's efforts in sustainable design, including LEED certification, as well as the firm's in-house instrumentation laboratory. He is a member of CGA's team of computer modelers, addressing environmental and room acoustics and HVAC noise modeling, as well as structural and groundborne vibration. He has provide acoustics and vibration consulting support, measurements, and diagnostic evaluations on hundreds of projects, including many projects focused on environmental noise assessments, measurements, modeling, and mitigation designs.

Steven regularly engages in research activities related to acoustics, noise, and vibration control, and has published a number of technical papers. He has also served on multiple committees related to acoustic standards and guidelines, including for the International Standards Organization (ISO) and Facilities Guidelines Institute for the Design of Healthcare Facilities (FGI).

Prior to joining Colin Gordon Associates, Steven worked as a Project Engineer for Facilities Planning and Construction at the University of Virginia Health Sciences Center, where he oversaw and assisted with multiple lab and hospital renovation projects, and as a structural designer for Timber Truss Housing Systems, where he provided layout and design of support structures for roof and floor systems in residential and commercial construction projects. He obtained his B.S. in Mechanical Engineering at the University of Virginia in 2001, where he completed his undergraduate thesis on frequency analysis of guitar woods for the purpose of characterizing sound.

Lam TUX Expansion Environmental Noise Model

Presented to Mackenzie

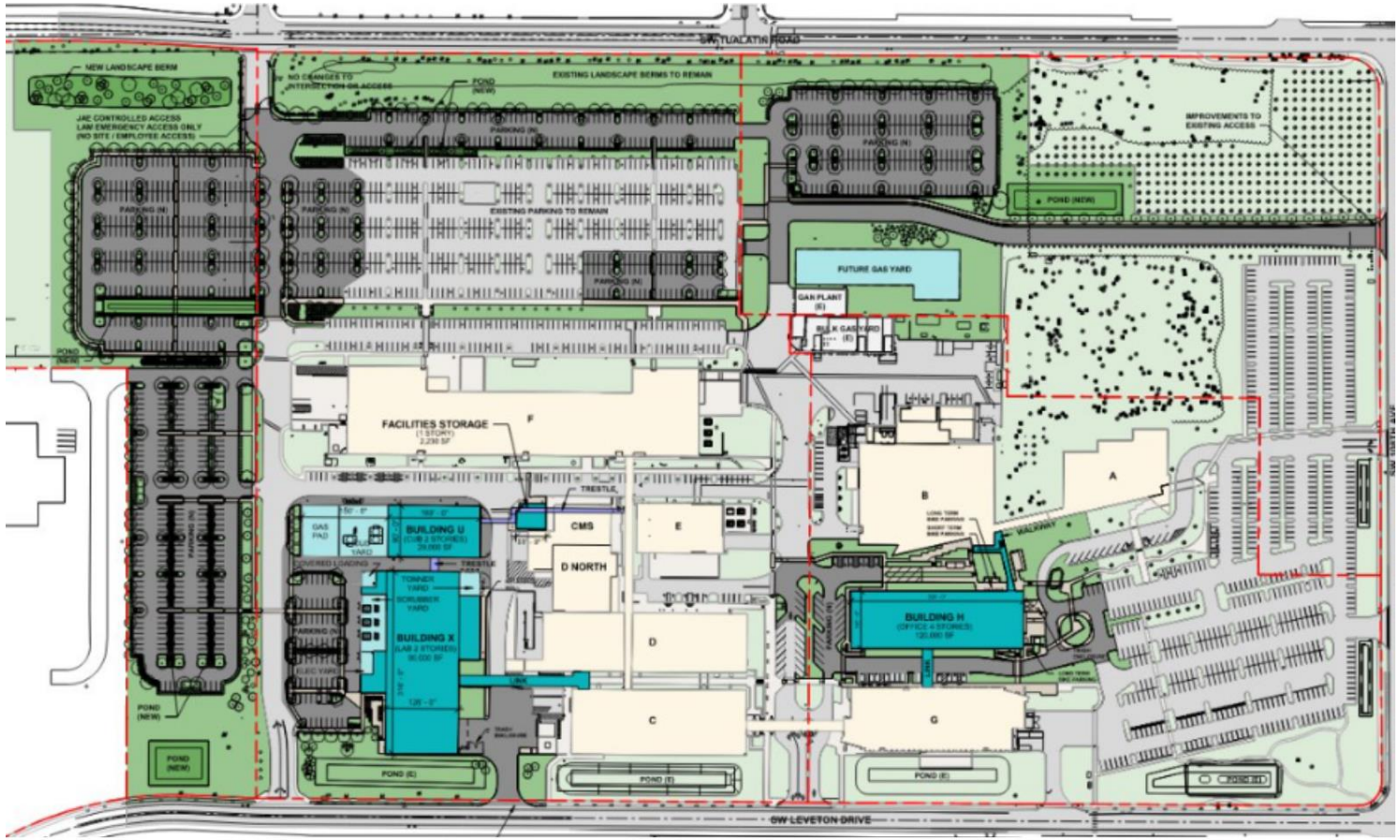
CGA Project P25171
10 September 2025

Colin Gordon Associates

Overview

A preliminary environmental noise model was constructed to evaluate the noise impact from major exterior noise sources associated with the new Building X and U facilities on the Lam Tualatin campus.

The noise impacts were evaluated using a computer noise model of the Lam campus, based on layout and information on proposed new major exterior mechanical equipment provided by the design team. Noise modeling was conducted per ISO 9613-2, the industry standard for calculating noise propagation from industrial sources such as these.



Colin Gordon Associates

Noise Sources Included in the Model

Only the following sources associated with Buildings U and X are included in the model.

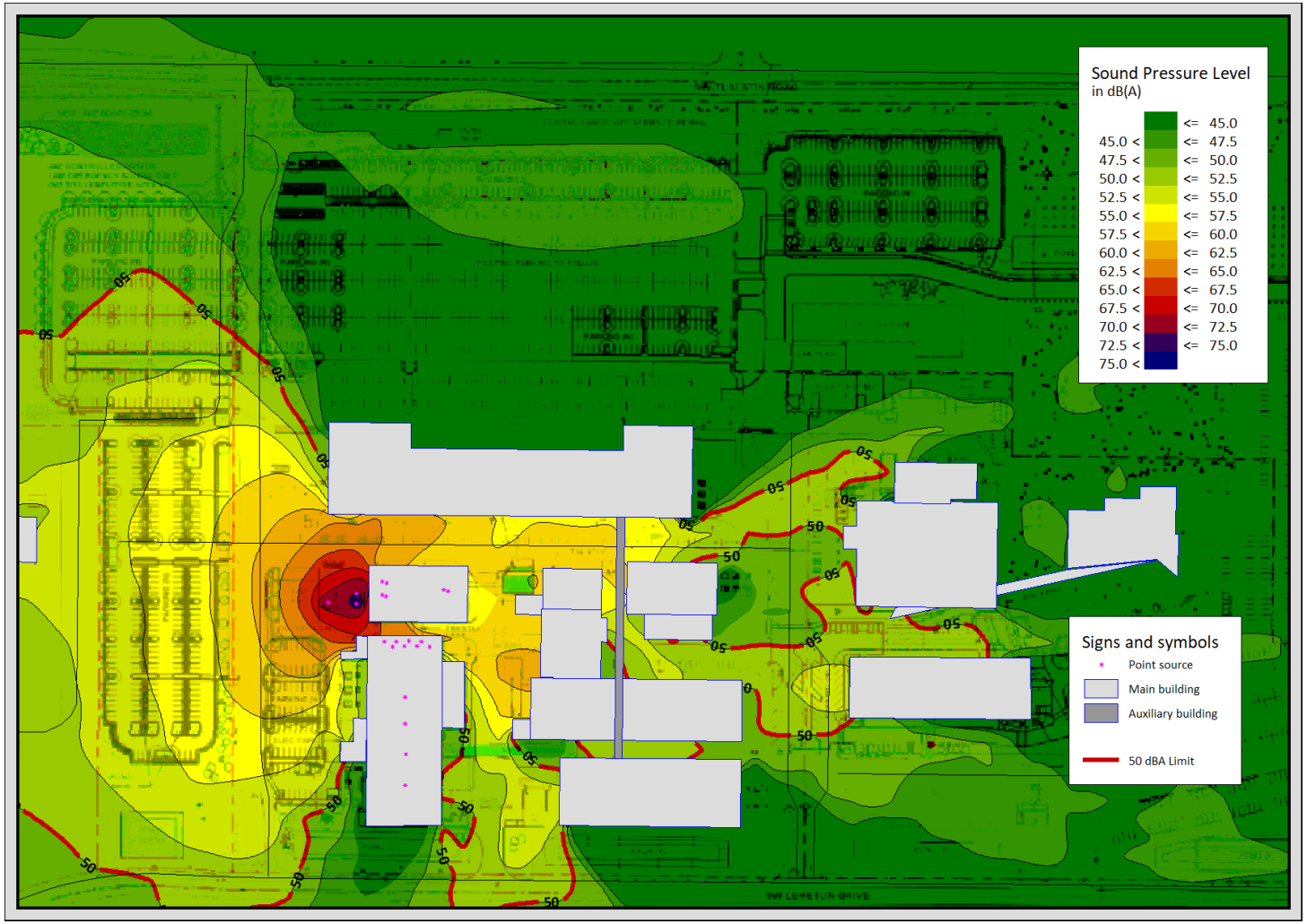
- Building X Rooftop Scrubbed Exhaust Fans
  - Noise radiating from fan casing and exiting the top of the exhaust stack
- Building X 50 kcfm Makeup Air Handling Units
- Building U Exhaust Fans
- Building U Cooling Towers

No existing sources, other sources that may be planned for TUX, or sources associated with other planned developments are included in the predictive model. Noise from traffic, construction, and other transient noise is also not included.

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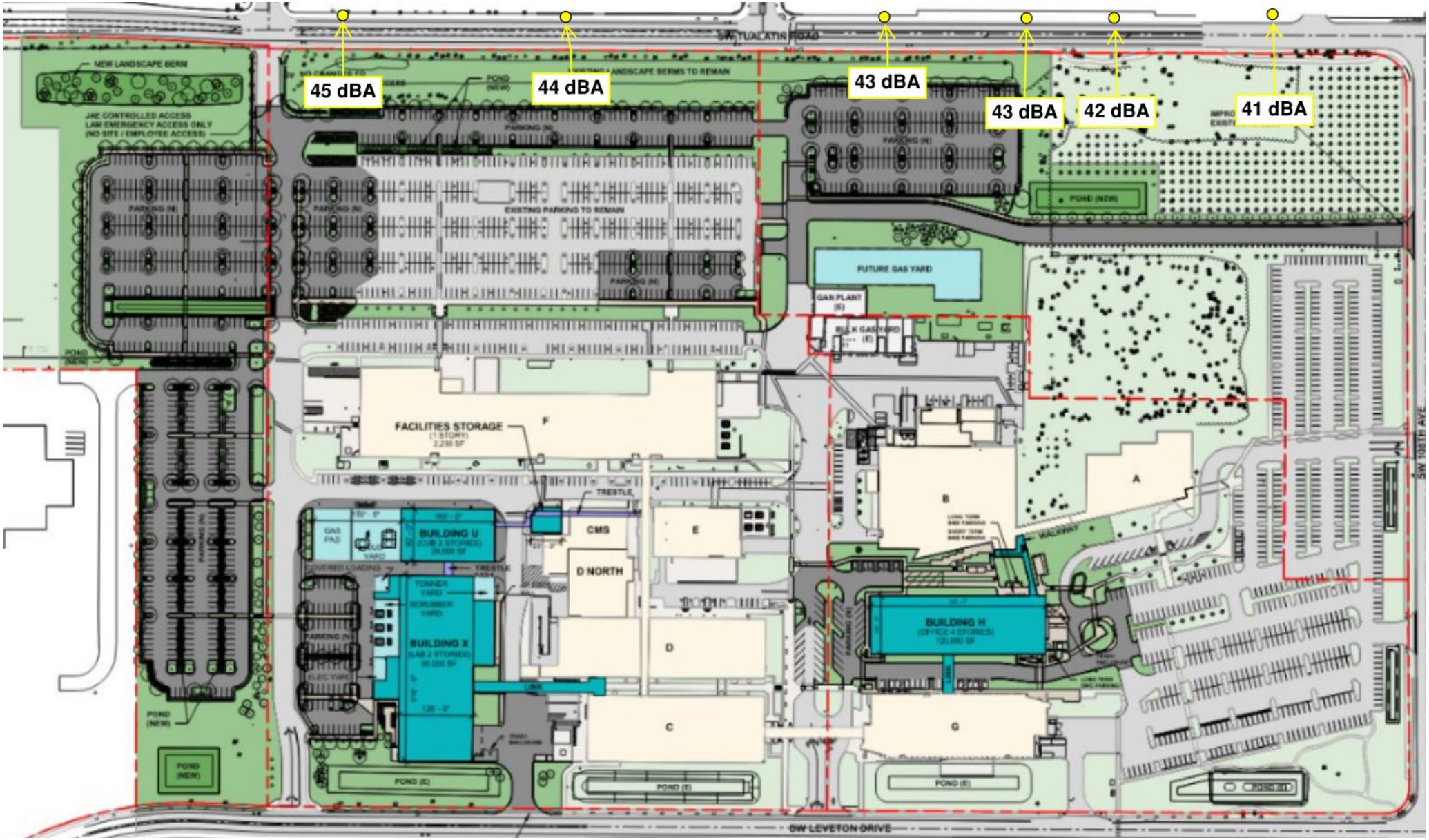
Predicted Noise Contours From New Equipment

- The contour map shows the predicted noise levels that will be generated by the new TUX sources. Predicted contours are generated at 5 feet above ground level
- The City of Tualatin Ordinance Limit of 50 dBA, which is applicable at noise-sensitive property lines, is shown as a bold contour.
- The noise levels due to the new sources are predicted to be well below 50 dBA at all points along the north property line.



Colin Gordon Associates

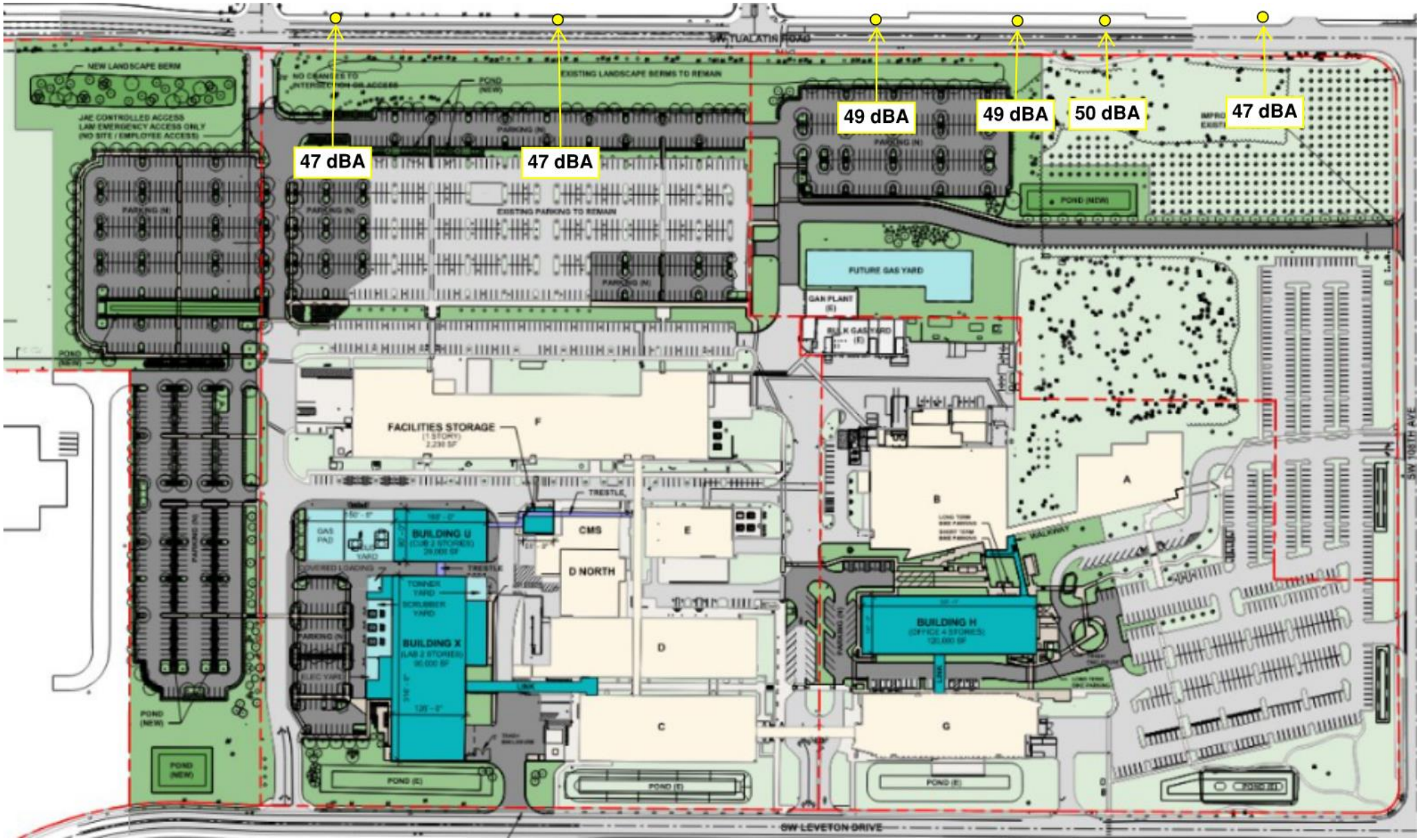
Predicted Noise Levels from New Equipment



Colin Gordon Associates

Predicted Total Overall Noise Levels

(Predicted Levels + Current levels per CGA's 9/4/25 Survey, incl. cricket noise)



Colin Gordon Associates

September 10, 2025

Dear Tualatin Architectural Review Board,

As a coalition of business organizations and employers from across the Portland Metropolitan region, we write to express our strong and united support for Lam Research's Architectural Review application.

Lam Research has long been a global leader in semiconductor innovation, with its equipment playing a critical role in the production of nearly every computer chip in use today. Since establishing its presence in Tualatin in 2002, Lam has grown to become the city's largest employer, with more than 3,800 full-time employees and contractors. Beyond its economic contributions, Lam has demonstrated a deep commitment to the community—supporting STEM education, expanding opportunities for underserved youth, and helping families access affordable housing.

Throughout the planning and public hearing process, Lam has been a collaborative and transparent partner to both the City of Tualatin and Washington County. The proposed expansion represents a transformative opportunity for our region—one that should not be jeopardized by unfounded opposition. Failing to advance this project would send a discouraging message to companies seeking to invest in Oregon: that we prioritize resistance over progress, even when the stakes involve career pathways, homeownership, and long-term economic vitality.

In a time of economic uncertainty, approving Lam Research's Architectural Review application is a vote for stability, growth, and resilience. This $1 billion investment will generate hundreds of millions in new economic activity, create approximately 600 high-paying jobs, and strengthen Oregon's position in the global technology sector.

The ripple effects of this expansion will be felt throughout our communities. New employees will contribute to the local economy by purchasing homes, paying taxes, shopping at local businesses, enrolling their children in neighborhood schools, and participating in civic life. Lam's continued presence will amplify prosperity across the region.

We respectfully urge your support and approval of Lam Research's Architectural Review application. This project is not just an expansion—it is a strategic investment in the future of Tualatin, Washington County, and the entire state of Oregon.

Thank you for your consideration.

Sincerely,
On behalf of the undersigned business organizations and employers

Building Owners & Managers Association of Oregon (BOMA)
Commercial Association of Brokers, Oregon and Southwest Washington
Home Building Association of Greater Portland
NAIOP, Commercial Real Estate Development Association, Oregon Chapter
Oregon Smart Growth
Portland Metropolitan Association of Realtors
Portland Metro Chamber
Technology Association of Oregon (TAO)
Westside Economic Alliance (WEA)

From: Steven Klein <steven.klein@kidder.com>
Sent: Tuesday, September 9, 2025 10:19 AM
To: Ext - Planning
Cc: Council
Subject: Testimony in SUPPORT of LAM Research Expansion

Dear Tualatin Architectural Review Board,

I would like to express strong support for Lam Research and its proposed expansion in Tualatin. Lam Research is not only a global leader in semiconductor manufacturing, but also one of the most significant employers and community partners in Tualatin and Washington County.

The proposed Expansion Project represents nearly a $1 billion potential investment in our region. The benefits of this project will be felt across this region and the state of Oregon: creating hundreds of millions of dollars in new economic activity, generating an estimated 600 local high-paying jobs, and strengthening Oregon's economy in an uncertain time.

This investment will directly support local schools, parks, public safety, and libraries through significant property tax contributions. Also providing resources for road maintenance and traffic improvements.

Lam Research has been a strong community partner to Tualatin and Washington County throughout the planning and public hearing process. It is time to let them move ahead with this expansion.

I respectfully urge you to approve Lam Research's Industrial Master Plan application. This project is more than an expansion of a facility, it is an investment in the future of Tualatin, Washington County, and Oregon.

Thank you for your consideration.

Steven Klein

503.221.2260

From: Shoaib Tareen <stareen1@me.com>
Sent: Tuesday, September 9, 2025 1:39 PM
To: Ext - Planning
Cc: Council
Subject: Testimony in SUPPORT of LAM Research Expansion



Dear Tualatin Architectural Review Board,

I would like to express strong support for Lam Research and its proposed expansion in Tualatin. Lam Research is not only a global leader in semiconductor manufacturing, but also one of the most significant employers and community partners in Tualatin and Washington County.

The proposed Expansion Project represents nearly a $1 billion potential investment in our region. The benefits of this project will be felt across this region and the state of Oregon: creating hundreds of millions of dollars in new economic activity, generating an estimated 600 local high-paying jobs, and strengthening Oregon's economy in an uncertain time.

This investment will directly support local schools, parks, public safety, and libraries through significant property tax contributions. Also providing resources for road maintenance and traffic improvements.

Lam Research has been a strong community partner to Tualatin and Washington County throughout the planning and public hearing process. It is time to let them move ahead with this expansion.

I respectfully urge you to approve Lam Research's Industrial Master Plan application. This project is more than an expansion of a facility, it is an investment in the future of Tualatin, Washington County, and Oregon.

Thank you for your consideration.

Shoaib Tareen
President
503.919.9925
Shocat Inc.

10450 SW Manhasset Drive,
Tualatin, OR 97062

From: Rennie Dunn <rennie@apexcre.com>
Sent: Tuesday, September 9, 2025 9:50 AM
To: Ext - Planning
Cc: Council
Subject: Testimony in SUPPORT of LAM Research Expansion

Dear Tualatin Architectural Review Board,

I would like to express strong support for Lam Research and its proposed expansion in Tualatin. Lam Research is not only a global leader in semiconductor manufacturing, but also one of the most significant employers and community partners in Tualatin and Washington County.

The proposed Expansion Project represents nearly a $1 billion potential investment in our region. The benefits of this project will be felt across this region and the state of Oregon: creating hundreds of millions of dollars in new economic activity, generating an estimated 600 local high-paying jobs, and strengthening Oregon's economy in an uncertain time.

This investment will directly support local schools, parks, public safety, and libraries through significant property tax contributions. Also providing resources for road maintenance and traffic improvements.

Lam Research has been a strong community partner to Tualatin and Washington County throughout the planning and public hearing process. It is time to let them move ahead with this expansion.

I respectfully urge you to approve Lam Research's Industrial Master Plan application. This project is more than an expansion of a facility, it is an investment in the future of Tualatin, Washington County, and Oregon.

Thank you for your consideration.

Rennie E. Dunn, SIOR

Director

Apex Real Estate Partners

---

415 NW 11th Avenue

Portland OR 97209

p: 503.595.2845 c: 503.853.2141 f: 503.595.2669

www.apexcre.com

Outlook

Testimony in SUPPORT of LAM Research Industrial Architectural Review Application

From Paige Tisdale <paige.tisdale@outlook.com>
Date Tue 9/9/2025 11:59 PM
To Ext - Planning <Planning@tualatin.gov>
Cc Council <council@tualatin.gov>

Dear Tualatin Architectural Review Board,

I would like to express strong support for Lam Research and its architectural review application. Lam Research is not only a global leader in semiconductor manufacturing, but also one of the most significant employers and community partners in Tualatin and Washington County.

The proposed Expansion Project represents nearly a $1 billion potential investment in our region. The benefits of this project will be felt across this region and the state of Oregon: creating hundreds of millions of dollars in new economic activity, generating an estimated 600 local high-paying jobs, and strengthening Oregon's economy in an uncertain time.

This investment will directly support local schools, parks, public safety, and libraries through significant property tax contributions. Also providing resources for road maintenance and traffic improvements.

Lam Research has been a strong community partner to Tualatin and Washington County throughout the planning and public hearing process. It is time to let them move ahead with this expansion.

I respectfully urge you to approve Lam Research's Architectural Review application. This project is more than an expansion of a facility, it is an investment in the future of Tualatin, Washington County, and Oregon.

Thank you for your consideration.

Paige Tisdale, CBRE

From:	Nicholas Diamond <ndiamond@capacitycommercial.com>
Sent:	Tuesday, September 9, 2025 11:41 AM
To:	Ext - Planning
Cc:	Council
Subject:	Testimony in SUPPORT of LAM Research Expansion

Dear Tualatin Architectural Review Board,

I would like to express strong support for Lam Research and its proposed expansion in Tualatin. Lam Research is not only a global leader in semiconductor manufacturing, but also one of the most significant employers and community partners in Tualatin and Washington County.

The proposed Expansion Project represents nearly a $1 billion potential investment in our region. The benefits of this project will be felt across this region and the state of Oregon: creating hundreds of millions of dollars in new economic activity, generating an estimated 600 local high-paying jobs, and strengthening Oregon's economy in an uncertain time.

This investment will directly support local schools, parks, public safety, and libraries through significant property tax contributions. Also providing resources for road maintenance and traffic improvements.

Lam Research has been a strong community partner to Tualatin and Washington County throughout the planning and public hearing process. It is time to let them move ahead with this expansion.

I respectfully urge you to approve Lam Research's Industrial Master Plan application. This project is more than an expansion of a facility, it is an investment in the future of Tualatin, Washington County, and Oregon.

Thank you for your consideration.

Nicholas Diamond
Principal

o:503.222.2655
c:503.887.8344
ndiamond@capacitycommercial.com

805 SW Broadway, Suite 600
Portland, OR 97205

From: Mike Nye <Mike@capacitycommercial.com>
Sent: Tuesday, September 9, 2025 12:22 PM
To: Ext - Planning
Cc: Council
Subject: Testimony in SUPPORT of LAM Research Expansion

Dear Tualatin Architectural Review Board,

I would like to express strong support for Lam Research and its proposed expansion in Tualatin. Lam Research is not only a global leader in semiconductor manufacturing, but also one of the most significant employers and community partners in Tualatin and Washington County.

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Thank you for your consideration.

Mike Nye, SIOR
Principal

o:503.542.4345
c:503.307.8877
mike@capacitycommercial.com

capacitycommercial.com
805 SW Broadway, Suite 600

Portland, OR 97205

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From: Mert Meeker <mert@mbmproperties.com>
Sent: Tuesday, September 9, 2025 9:52 AM
To: Ext - Planning
Cc: Council
Subject: Testimony in SUPPORT of LAM Research Expansion

This message needs your attention

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Thank you for your consideration.

Merton B. Meeker

President

MBM Properties, Inc.

mert@mbmproperties.com

From: McCoy Doerrie <McCoy@capacitycommercial.com>
Sent: Tuesday, September 9, 2025 12:24 PM
To: Ext - Planning
Cc: Council
Subject: Testimony in SUPPORT of LAM Research Expansion

Dear Tualatin Architectural Review Board,

I would like to express strong support for Lam Research and its proposed expansion in Tualatin. Lam Research is not only a global leader in semiconductor manufacturing, but also one of the most significant employers and community partners in Tualatin and Washington County.

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Thank you for your consideration.

McCoy Doerrie, SIOR
Senior Vice President

o:503.517.7120
c:503.523.7751
mccoy@capacitycommercial.com

capacitycommercial.com
805 SW Broadway, Suite 600
Portland, OR 97205

Outlook

Testimony in SUPPORT of LAM Research Industrial Architectural Review Application

From Maureen Jackson <Maureen@pacific-community.com>
Date Wed 9/10/2025 2:30 PM
To Ext - Planning <Planning@tualatin.gov>
Cc Council <council@tualatin.gov>

Dear Tualatin Architectural Review Board,

I would like to express strong support for Lam Research and its architectural review application. Lam Research is not only a global leader in semiconductor manufacturing, but also one of the most significant employers and community partners in Tualatin and Washington County.

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I respectfully urge you to approve Lam Research's Architectural Review application. This project is more than an expansion of a facility, it is an investment in the future of Tualatin, Washington County, and Oregon.

Thank you for your consideration.

Maureen Jackson, AICP
Associate Project Manager

PACIFIC COMMUNITY DESIGN

12564 SW Main Street Tigard, OR 97223
Office: 503.941.9484

From: Mark Childs <markc@capacitycommercial.com>
Sent: Tuesday, September 9, 2025 12:06 PM
To: Ext - Planning
Cc: Council
Subject: Testimony in SUPPORT of LAM Research Expansion



Dear Tualatin Architectural Review Board,

I would like to express strong support for Lam Research and its proposed expansion in Tualatin. Lam Research is not only a global leader in semiconductor manufacturing, but also one of the most significant employers and community partners in Tualatin and Washington County.

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Thank you for your consideration.

Mark Childs

Principal

Capacity Commercial Group

805 SW Broadway, #600

Portland, OR 97205

Outlook

Testimony in SUPPORT of LAM Research Expansion

From Laura Gentry <lgentry@capacitycommercial.com>
Date Tue 9/9/2025 5:07 PM
To Ext - Planning <Planning@tualatin.gov>
Cc Council <council@tualatin.gov>

Dear Tualatin Architectural Review Board,

I would like to express strong support for Lam Research and its proposed expansion in Tualatin. Lam Research is not only a global leader in semiconductor manufacturing, but also one of the most significant employers and community partners in Tualatin and Washington County.

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Lam Research has been a strong community partner to Tualatin and Washington County throughout the planning and public hearing process. It is time to let them move ahead with this expansion.

I respectfully urge you to approve Lam Research's Industrial Master Plan application. This project is more than an expansion of a facility, it is an investment in the future of Tualatin, Washington County, and Oregon.

Thank you for your consideration.

Laura Gentry, CPM®

Senior Vice President

o: 503.542.2897
c: 503.572.8134
lgentry@capacitycommercial.com

capacitycommercial.com
ceg-pm.com
805 SW Broadway, Suite 600
Portland, OR 97205



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Outlook

Testimony in SUPPORT of LAM Research Expansion

From Laura Gentry <lgentry@capacitycommercial.com>
Date Tue 9/9/2025 5:07 PM
To Ext - Planning <Planning@tualatin.gov>
Cc Council <council@tualatin.gov>

Dear Tualatin Architectural Review Board,

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Thank you for your consideration.

Laura Gentry, CPM®

Senior Vice President

o: 503.542.2897
c: 503.572.8134
lgentry@capacitycommercial.com

capacitycommercial.com
ccg-pm.com
805 SW Broadway, Suite 600
Portland, OR 97205



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Outlook

Testimony in SUPPORT of LAM Research Expansion

From Kirra Krussman, CCIM <kirra@capacitycommercial.com>
Date Tue 9/9/2025 1:06 PM
To Ext - Planning <Planning@tualatin.gov>
Cc Council <council@tualatin.gov>

1 attachment (5 KB)
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Dear Tualatin Architectural Review Board,

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I respectfully urge you to approve Lam Research's Industrial Master Plan application. This project is more than an expansion of a facility, it is an investment in the future of Tualatin, Washington County, and Oregon.

Thank you for your consideration.

Sincerely,

Kirra Krussman, CCIM
Senior Associate Broker

o:503-326-9000
c:503-517-2171
kirra@capacitycommercial.com

capacitycommercial.com
805 SW Broadway, Suite 600
Portland, OR 97205

Oregon Agency Discosure
Washington Agency Disclosure

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Book time to meet with me

Outlook

Testimony in SUPPORT of LAM Research Expansion

From Medvec, John <John.Medvec@skanska.com>
Date Tue 9/9/2025 4:39 PM
To Ext - Planning <Planning@tualatin.gov>
Cc Council <council@tualatin.gov>

Dear Tualatin Architectural Review Board,

I live in Apache Woods near SW Teton and Siletz drive. As a Tualatin resident, I would like to express strong support for Lam Research and its proposed expansion in Tualatin. Lam Research is not only a global leader in semiconductor manufacturing, but also one of the most significant employers and community partners in Tualatin and Washington County.

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Thank you for your consideration.

John Medvec AIA DBIA LEED® AP BD+C
Sr Design Integration Manager
Skanska USA Building Inc.
(he/him)

1010 NW Flanders St., Suite 500
Portland, OR 97209, United States
Mobile +1 503 310 9929
Fax +1 503 382 0901
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From: John Howorth <john.howorth@3j-consulting.com>
Sent: Tuesday, September 9, 2025 1:15 PM
To: Ext - Planning
Subject: Testimony in SUPPORT of LAM Research Expansion (AR 24-0002)



Dear Tualatin ARB,

As a previous ARB member I am writing in support of the Lam Research's Industrial Master Plan application. Given the economics of our region it is important to recognize the investment being made here in Tualatin and the Portland Metro area. As you review the application for the architectural features, I urge you to find a way to an approval that makes sense and addresses the rational concerns of the community.

We can't be putting burdensome conditions or denying private industry to the detriment of the community. Oregon needs the revenues to continue the good work the state endeavors to do.

Thank you for your consideration.

John Howorth, PE | President | **3J Consulting**
O: 503.946.9365 | D: 971.251.8377 | C: 503.577.8176

9600 SW Nimbus Ave, Suite 100 | Beaverton, OR 97008
Civil Engineering | Water Resources | Community Planning
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Outlook

Testimony in SUPPORT of LAM Research Expansion

From John Fettig <JFettig@capacitycommercial.com>
Date Tue 9/9/2025 2:06 PM
To Ext - Planning <Planning@tualatin.gov>
Cc Council <council@tualatin.gov>

Dear Tualatin Architectural Review Board,

After 40 years of helping new and existing companies grow their business, by leasing or owning in the City of Tualatin, I have seen first-hand the positive impact of a large employer moving to or expanding within the Tualatin area. The new employment opportunities, security and career growth from the company will have a positive ripple effect for surrounding industrial and commercial, service-based companies, which is huge.

I would like to express strong support for Lam Research and its proposed expansion in Tualatin. Lam Research is not only a global leader in semiconductor manufacturing, but also one of the most significant employers and community partners in Tualatin and Washington County.

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Regards,

John Fettig
Principal
Capacity Commercial Group
805 SW Broadway
Suite 600
Portland, OR. 97205

From: Ramey, Jessica <Jessica.Ramey@jll.com>
Sent: Tuesday, September 9, 2025 9:20 AM
To: Ext - Planning
Cc: Council
Subject: Testimony in SUPPORT of LAM Research Expansion

Dear Tualatin Architectural Review Board,

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Thank you for your consideration.

Jessica Ramey
Jones Lang LaSalle Brokerage, Inc.

Sent from my iPad

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Jones Lang LaSalle

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Outlook

Testimony in SUPPORT of LAM Research Expansion

From Jason VanAbrams <jason@capacitycommercial.com>
Date Tue 9/9/2025 2:41 PM
To Ext - Planning <Planning@tualatin.gov>
Cc Council <council@tualatin.gov>

Dear Tualatin Architectural Review Board,

I would like to express strong support for Lam Research and its proposed expansion in Tualatin. Lam Research is not only a global leader in semiconductor manufacturing, but also one of the most significant employers and community partners in Tualatin and Washington County.

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Thank you for your consideration.

Jason VanAbrams
Senior Associate Broker

o:503.467.0935
c:503.314.1099
jason@capacitycommercial.com

805 SW Broadway, Suite 600
Portland, OR 97205

capacitycommercial.com

Outlook

Testimony in SUPPORT of LAM Research Industrial Architectural Review Application

From Gregg Wilkey <g.wilkey@alliant-systems.com>
Date Wed 9/10/2025 11:48 AM
To Ext - Planning <Planning@tualatin.gov>
Cc Council <council@tualatin.gov>

Dear Tualatin Architectural Review Board,

I would like to express strong support for Lam Research and its architectural review application. Lam Research is not only a global leader in semiconductor manufacturing, but also one of the most significant employers and community partners in Tualatin and Washington County.

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Thank you for your consideration.

Gregg Wilkey

ALLIANT_SYSTEMS_LOGO_2016 - SMALL

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Gregg Wilkey | Electrical Account Executive
E-mail: g.wilkey@alliant-systems.com
C: 971.464.1135
351 NW 12th Ave, Portland, OR 97209
Engineering | Construction | Controls | Electrical | HVAC & Plumbing Service
CCB No.153420

From: Frank Pulver <frankpulver@pulverandleever.com>
Sent: Tuesday, September 9, 2025 2:06 PM
To: Ext - Planning
Cc: Council
Subject: Testimony in SUPPORT of LAM Research Expansion



Dear Tualatin Architectural Review Board,

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Thank you for your consideration.

From: Donald M. Ossey <Don@capacitycommercial.com>
Sent: Tuesday, September 9, 2025 12:16 PM
To: Ext - Planning
Cc: Council; Mark Childs
Subject: Testimony in SUPPORT of LAM Research Expansion

Dear Tualatin Architectural Review Board,

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Thank you for your consideration.

Don Ossey, SIOR
Founding Principal
Capacity Commercial Group

Don Ossey, SIOR
Principal

o:503.542.4344
c:503.781.4008
don@capacitycommercial.com

From: Daniel Helm <dhelm@capacitycommercial.com>
Sent: Tuesday, September 9, 2025 12:21 PM
To: Ext - Planning
Cc: Council
Subject: Testimony in SUPPORT of LAM Research Expansion

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Daniel Helm, SIOR
Senior Vice President
Capacity Commercial Group
805 SW Broadway, Suite 600
Portland, OR 97205
503-542-2899 O

503-789-5750 C

Outlook

Testimony in SUPPORT of LAM Research Expansion

From Danelle Hauther <danelle.hauther@tigard-or.gov>
Date Tue 9/9/2025 3:57 PM
To Ext - Planning <Planning@tualatin.gov>
Cc Council <council@tualatin.gov>

1 attachment (3 KB)
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Dear Tualatin Architectural Review Board,

I would like to express strong support for Lam Research and its proposed expansion in Tualatin. Lam Research is not only a global leader in semiconductor manufacturing, but also one of the most significant employers and community partners in Tualatin and Washington County.

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I respectfully urge you to approve Lam Research's Industrial Master Plan application. This project is more than an expansion of a facility, it is an investment in the future of Tualatin, Washington County, and Oregon.

Thank you for your consideration.

CITY OF Tigard

Danelle Hauther (she/her)
Economic Development Manager

City of Tigard | Community Development

Danelle.Hauther@tigard-or.gov

TigardEconomicDevelopment@tigard-or.gov

Mobile/Text: 503-477-1324

Office Direct: 503-718-2567

13125 SW Hall Boulevard, Tigard OR 97223 | tigard-or.gov

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Outlook

Testimony in SUPPORT of LAM Research Expansion

From CLAYTON MADEY <claytonmadey@icloud.com>
Date Tue 9/9/2025 9:51 AM
To Ext - Planning <Planning@tualatin.gov>
Cc Council <council@tualatin.gov>

Dear Tualatin Architectural Review Board,

I would like to express strong support for Lam Research and its proposed expansion in Tualatin. Lam Research is not only a global leader in semiconductor manufacturing, but also one of the most significant employers and community partners in Tualatin and Washington County.

The proposed Expansion Project represents nearly a $1 billion potential investment in our region. The benefits of this project will be felt across this region and the state of Oregon: creating hundreds of millions of dollars in new economic activity, generating an estimated 600 local high-paying jobs, and strengthening Oregon's economy in an uncertain time.

This investment will directly support local schools, parks, public safety, and libraries through significant property tax contributions. Also providing resources for road maintenance and traffic improvements.

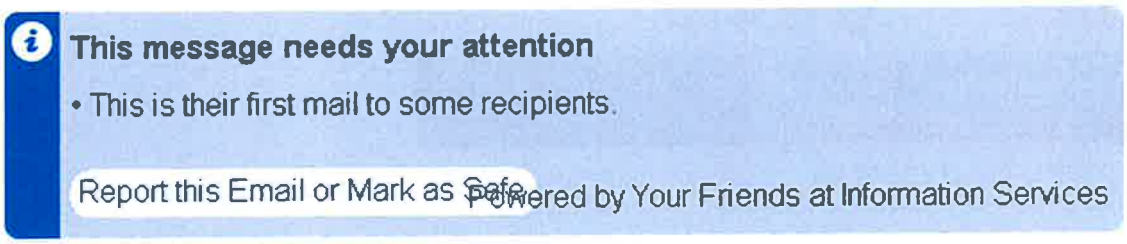
Lam Research has been a strong community partner to Tualatin and Washington County throughout the planning and public hearing process. It is time to let them move ahead with this expansion.

I respectfully urge you to approve Lam Research's Industrial Master Plan application. This project is more than an expansion of a facility, it is an investment in the future of Tualatin, Washington County, and Oregon.

Thank you for your consideration.

Clayton

From: Chris McInroe <cmcinroe@perlo.biz>
Sent: Monday, September 8, 2025 6:21 PM
To: Ext - Planning
Cc: Council
Subject: Testimony in SUPPORT of LAM Research Expansion



Dear Tualatin Architectural Review Board,

I would like to express strong support for Lam Research and its proposed expansion in Tualatin. Lam Research has been a great partner to Perlo over the last decade and continuing to support Lam Research will have direct and indirect impacts on our community. As a Tualatin based company, we understand the importance of supporting this effort.

The proposed Expansion Project represents nearly a $1 billion potential investment in our region. The benefits of this project will be felt across this region and the state of Oregon: creating hundreds of millions of dollars in new economic activity, generating an estimated 600 local high-paying jobs, hundreds if not thousands of construction jobs, and strengthening Oregon's economy in an uncertain time. While other companies have found reason to leave our City and State, Lam Research has doubled down locally, we need more companies like this.

This investment will directly support local schools, parks, public safety, and libraries through significant property tax contributions. Also providing resources for road maintenance and traffic improvements.

I respectfully urge you to approve Lam Research's Industrial Master Plan application. This project is more than an expansion of a facility, it is an investment in the future of Tualatin, Washington County, and Oregon.

Thank you for your consideration.

Chris McInroe
Vice President I Partner
P: 503.624.2090 | **C:** 503.367.6596
E: cmcinroe@perlo.biz

11450 SW Amu Street | Tualatin, OR 97062
www.perlo.biz

perlo CONSTRUCTION



From: Chris Kappes <chris@capacitycommercial.com>
Sent: Tuesday, September 9, 2025 1:02 PM
To: Ext - Planning
Cc: Council
Subject: Testimony in SUPPORT of LAM Research Expansion

Dear Tualatin Architectural Review Board,

I would like to express strong support for Lam Research and its proposed expansion in Tualatin. Lam Research is not only a global leader in semiconductor manufacturing, but also one of the most significant employers and community partners in Tualatin and Washington County.

The proposed Expansion Project represents nearly a $1 billion potential investment in our region. The benefits of this project will be felt across this region and the state of Oregon: creating hundreds of millions of dollars in new economic activity, generating an estimated 600 local high-paying jobs, and strengthening Oregon's economy in an uncertain time.

This investment will directly support local schools, parks, public safety, and libraries through significant property tax contributions. Also providing resources for road maintenance and traffic improvements.

Lam Research has been a strong community partner to Tualatin and Washington County throughout the planning and public hearing process. It is time to let them move ahead with this expansion.

I respectfully urge you to approve Lam Research's Industrial Master Plan application. This project is more than an expansion of a facility, it is an investment in the future of Tualatin, Washington County, and Oregon.

Thank you for your consideration.

Thank you,

Chris.

Christopher Kappes
Associate Industrial Broker

o: (503) 517-7127
c: (971) 295-3495
Chris@capacitycommercial.com

Kappes-Houser Team Website
Link to my Bio
capacitycommercial.com
805 SW Broadway, Suite 600
Portland, OR 97205

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OREGON AGENCY DISCLOSURE FORM

WASHINGTON AGENCY DISCLOSURE FORM

Insert your name, organization and address here]

Stoel Rives LLP

October 24, 2025

Dana L. Krawczuk
760 SW Ninth Avenue, Suite 3000
Portland, OR 97205
D. 503.294.9218
dana.krawczuk@stoel.com

City Council
City of Tualatin
18880 SW Martinazzi Ave,
Tualatin, OR 97062

RE: City Council Appeal of Architectural Review for Lam Research Corporation's TUX Facility (AR 24-0002)

Dear Mayor Bubenik and City Councilors:

On September 10, 2025, the Tualatin Architectural Review Board ("ARB") unanimously approved application AR24-002 for Type III Architectural Review ("AR") of Lam Research Corporation's ("Lam") Tux Project ("Project"). The ARB found that the Project meets the AR approval criteria specified in Tualatin Development Code ("TDC") 33.020. On September 25, 2025, Brett Hamilton ("Appellant") appealed ARB's approval of AR24-0002 (the "Appeal"). Lam respectfully requests that the City Council deny the Appeal and uphold ARB's approval of AR24-0002 for the reasons detailed below.

Broadly, the Appeal raises issues with respect to the City's compliance with procedural requirements; the existing facility's compliance with the City's Noise Ordinance at Tualatin Municipal Code, Chapter 6-14 ("Noise Ordinance"); and the analysis of the Project's traffic impacts. Based upon the TDC and evidence in the record, the City Council should deny the Appeal and uphold approval of AR on the basis that:

- Appellant has not alleged any procedural errors demonstrating prejudice to Appellant's substantial rights;
- Compliance with the Noise Ordinance is not a criterion for AR approval;
- The Project demonstrates compliance with all applicable criteria;
- The 108th Avenue entrance does not require a new driveway approach permit; and
- The Project's traffic impact study (the "Traffic Study")[1] complies with TDC 74.440.

I. Project Background

Lam Research designs and builds the tools used to make computer chips. Lam is Oregon's largest semiconductor equipment company, with a strong presence in the state for more than 20 years. The Tualatin campus plays a key role in the creation of new technologies needed in a time of rising semiconductor manufacturing complexity. The Project will enable Lam to expand its

[1] The Traffic Study is included in Staff Report AR24-0002, Exhibit A4.

R&D operations and add 600 jobs in Tualatin that help develop the technology chipmakers need for their most critical applications. The Project is funded in part by the Oregon CHIPS Act, which supports the expansion and modernization of the state's semiconductor manufacturing and research.

The Project includes: construction of an office building, research laboratory, central utilities building, and a small storage building, totaling 241,230 square feet; expansion of an existing bulk gas storage yard; and associated landscaping, parking, and public/site improvements on a 75.96-acre site zoned Manufacturing Park ("MP"). The Project is subject to the recently approved Industrial Master Plan IMP24-0001 ("IMP"), which is final and effective.

The original design of the Project included new employee access on SW Tualatin Road. Based upon community feedback, Lam redesigned the Project and removed the new employee access on to SW Tualatin Road. As revised, and approved by the ARB, the Project includes only one new driveway—a truck access on SW Leveton Drive. Employee traffic will use the existing six driveways, including three on SW 108th Avene and three on SW Leveton. As a result, the Project is expected to add only 25 new trips to SW Tualatin Road to the west of SW 108th Avenue during the morning peak hour, and 23 new trips in the afternoon peak hour, which is a de minimis amount of traffic on a Major Collector roadway.

This Project has been the subject of robust public participation at every stage. Several members of the community, including Appellant, participated in the June 5, 2024 Neighborhood Developer Meeting. The City of Tualatin ("City") sent out a Notice of Hearings and Opportunity to Comment on the application on December 16, 2024. The City also sent two Notices of Rescheduled Hearings and Extended Opportunity to Comment on March 11, 2025 and on May 9, 2025. The Applicant posted signs on the site as notice for all of the potential and actual hearing dates. Members of the public, including Appellant, submitted myriad public comments on the Project and testified at the ARB hearing on September 10, 2025. The de novo City Council hearing to consider this Appeal is scheduled for November 10, 2025.

II. Legal Considerations

The application at issue in this Appeal is for *Architectural* Review, which has a very limited scope and purpose—it primarily evaluates the exterior appearance and design quality of proposed development, with criteria that address design standards for buildings, parking areas, and landscaping. The design-oriented nature of AR review is why the body that reviews AR applications, the Architectural Review Board, is the only City board or commission whose membership requires professional registration, such as Registered Architect, Registered Landscape Architect or Engineer.

Architectural Review for this Project requires findings of consistency with the applicable standards and objectives at TDC Chapter 73A through 73G.[2] The limited scope of Architectural Review is important because the issues raised in the Appeal are not relevant to the Architectural Review criteria.

When considering the Appeal, we encourage the City Council to be guided by the standards that the Oregon Land Use Board of Appeals ("LUBA") would apply when reviewing the City's final AR decision. A land use decision, such as the AR approval, will be affirmed and upheld by LUBA unless the Appellant can demonstrate one of the following:[3]

- Procedural error that impacts Appellant's substantial rights;
- Noncompliance with the applicable approval criteria;
- Inadequate findings of compliance with TDC Chapter 73A through 73G; or
- The decision is not supported by substantial evidence.

Appellant's grounds for the Appeal do not meet any of these thresholds, so the Appeal should be denied, and the Project's AR should be approved.

III. Analysis

A. Procedural and Public Participation Issues

Four of Appellant's grounds for the Appeal implicate procedural issues. None are grounds for denial of AR.

To justify reversal of a land use decision for procedural error, the Appellant "must demonstrate both procedural error and prejudice to its substantial rights."[4] "Under ORS 197.835(9)(a)(B), the 'substantial rights' of parties that may be prejudiced by failure to follow required procedures are 'the rights to an adequate opportunity to prepare and submit their case and a full and fair hearing.'"[5] This standard is sometimes referred to as the "no harm, no foul" rule.

Appellant has not alleged, nor based upon the evidence in the record could he demonstrate, that any of the purported procedural errors prejudiced his substantial rights, as he was afforded ample opportunity to prepare and present this Appeal for a full and fair hearing. The adequacy of Appellant's opportunity to prepare for and participate in the process is evidenced by the extent

[2] TDC 33.020(5)(d).
[3] ORS 197.835
[4] See e.g., *Mason v. Linn County*, 13 Or LUBA 1, 4 (1984), *aff'd in part, rev'd and rem'd on other grounds*, *Mason v. Mountain River Estates*, 73 Or App 334, 698 P2d 529 (1985); see also ORS 197.835(9)(a)(B); OAR 661-010-0071.
[5] *Families for a Quarry Free Neighborhood v. Lane County,* 64 Or LUBA 297, 302 (2011), citing *Muller v. Polk County*, 16 Or LUBA 771, 775 (1988).

and frequency of his engagement with the Project at every stage, culminating in this Appeal, which provides for a de novo hearing. For example, the record shows that:

- Appellant received mailed notice of and participated at the neighborhood developer meeting.[6]
- Appellant received mailed notice of and participated in the ARB hearing.[7]
- Appellant submitted several public comments in advance of the ARB hearing on the application.[8]
- Appellant filed this Appeal and will presumably participate in the City Council hearing.

We have addressed each of Appellant's procedural grounds for denial in detail below.

i. TDC 32.120.5(b)(iii) Does Not Provide Grounds for Denial.

Appellant alleges a "[f]ailure to send notice to CIOs as required by TDC 32.120.5(b)(iii)." This code section requires that, for *neighborhood/developer meetings*, not the public hearing where the application is considered, the Applicant provide timely written notice via first class mail to "[a]ll designated representatives of recognized Citizen Involvement Organizations." Even if the Applicant failed to meet TDC 32.120.5(b)(iii)'s neighborhood meeting notice requirements, it does not justify denial of the AR.

While the Appellant has not alleged prejudice, there are several reasons that there is no basis to find that the Appellant has been prejudiced.[9] Appellant's error relates to notice for a neighborhood/developer meeting, which occurred prior to application submittal—this noticing does not impact the actual opportunity to participate in the AR hearing. Appellant did not allege that he failed to receive any required notice. Appellant participated in the AR public hearing and he will presumably participate in the hearing to consider the Appeal that he filed. The volume and specificity of Appellant's written, video and verbal testimony demonstrates that he had an opportunity to prepare for and participate in all hearings. Since Appellant received notice of and had ample opportunity to prepare for all hearings in this matter, there is no prejudice.

As noted above, Appellant did not allege that he personally did not receive a required notice. Appellant may not raise this issue on behalf of the CIOs because only the person or entity that is directly harmed by a procedural error (e.g. was supposed to receive notice and did not) may raise

[6] Staff Report AR24-0002, Exhibit A6: Supplemental Information, pp. 39, 53.
[7] Staff Report AR24-0002, Exhibit B: Public Noticing.
[8] Staff Report AR24-0002, Exhibit F: Public Comments, pp. 35-38, 39, 256-57, 258, 259-60, 262, 263-74, 512-17, 559-60, 744-46, 748-51.
[9] *Skrepetos v. Jackson County*, 29 Or LUBA 193 (1995)(failure to provide notice of hearings to persons other than petitioners does not prejudice petitioners' substantial rights if petitioners received notice of the local government hearings and participated in them), *Thomas v. Wasco County*, 30 Or LUBA 142 (1995)(failure to comply with applicable notice requirements is reversible only if the defect prejudices a petitioner's substantial rights); *Bauer v. City of Portland*, 38 Or LUBA 432, 436 (2000)(), *Cape v. City of Beaverton*, 40 Or LUBA 78, 85 (failure to provide notice was not prejudicial where petitioner nonetheless appeared at the approval hearing and present comments).

this issue; a party that did not itself experience the notice error cannot raise it on behalf of another.[10]

Even assuming that the CIOs take issue with the lack of mail notice, there is no substantial prejudice to the CIOs. The CIOs received mailed notice of the actual land use process. The lack of mailed notice for the preliminary neighborhood developer meeting is harmless error—attendance at the neighbor meeting has no bearing on the rights of a party to participate in the actual land use approval process via the public hearing.

ii. No Second Neighborhood/Developer Meeting Was Required.

Appellant alleges a procedural error because the Applicant made "[c]ommitments to hold a second Neighborhood Developer Meeting," but the Applicant did not hold a second meeting. This is not a procedural error because there is no applicable local or state requirement for such second meeting.[11] Rather, holding a second meeting is entirely at the discretion of the Applicant: "An applicant may voluntarily conduct a neighborhood/developer meeting even if it is not required and may conduct more than one neighborhood/developer meeting at their election." TDC 32.120 (2). Even if holding a second neighbor meeting were a requirement of the code, Appellant does not indicate how it could have prejudiced his substantial rights—Appellant still participated in the public hearing process.

iii. The Missing Noise Model Pages Do Not Prejudice Appellant and Are Irrelevant to AR Approval Criteria.

Appellant alleges that the City's "[f]ailure to provide the last 3 pages of Lam's noise model to the ARB at their hearing" is a procedural error. The inadvertent omission of three pages of the noise model at the ARB approval stage does not prejudice Appellant's substantial rights and therefore does not justify denying the AR.

First, as detailed in Section B, the noise generated by the existing facility is not relevant to any of the applicable AR approval criteria. Omission of pages of noise-related evidence does not prejudice Appellant's substantial rights because the right to a full and fair hearing does not extend to the right to raise or rebut irrelevant issues. Similarly, there is no impact to the adequacy of the ARB's findings or evidentiary basis for the approval because the missing pages are not relevant to the approval criteria.

[10] See *Skrepetos v. Jackson County*, 29 Or LUBA 193 (1995).

[11] *Montgomery v. City of Dunes City*, 60 Or LUBA 274 (2010) (no requirement for a traffic study was triggered where applicant cryptically stated in a letter that they would provide a traffic study); *Cape v. City of Beaverton*, 41 Or LUBA 515 (2002) (no basis for reversal where petitioner identified no legal requirement for any of the notice they alleged was lacking).

Second, the inadvertently omitted pages are included in the record that is publicly available. The City Council hearing is de novo,[12] so the public can respond to the pages and the City Council can consider all evidence when making the final decision on the AR. Because the pages are in the record and Appellant is aware of them and can respond before the City Council, their omission at the ARB hearing stage does not prejudice Appellant.

iv. Any Delay in Releasing Public Records is Irrelevant.

Appellant alleges that the City erred through "[u]nnecessary delays in releasing Public Records." If this is a public records disclosure dispute, such a dispute is outside of the scope of a land use appeal and is therefore not a grounds for denial of AR. Further, as explained elsewhere, Appellant has not alleged, and cannot demonstrate, that his substantial rights to a full and fair hearing have been prejudiced.

B. Noise Issues

The Appeal alleges violations of the Noise Ordinance and Manufacturing Park zoning. As a legal and evidentiary matter, there is no basis to deny AR approval of the Project based upon noise.

Noise and compliance with the Noise Ordinance and Manufacturing Park zone are not relevant to the AR approval criteria, so allegations about existing noise or potential future noise impacts are not bases for denying the AR.[13] If the City were to deny the AR based on the noise performance standards (rather than the criteria in TDC Chapter 73A through 73G), that the decision would be reversible error pursuant to ORS 197.835(10)(a)(A).[14]

As detailed below,

- The Architectural Review process considers only the Project, not the existing facility, and is not the appropriate forum for adjudicating noise concerns.
- Compliance with noise performance standards is a matter for Code Enforcement, once a use is operational.
- While not relevant to the approval criteria, the evidence supports the conclusion that Lam's existing facility does not violate the City's Noise Ordinance, and modeling predicts that the Project will also be compliant with the Noise Ordinance.

[12] See TDC 32.310(4)(a) ("All appeals are 'de novo' meaning new evidence and argument may be submitted at the appeal hearing.").
[13] ORS 195.835(8) (land use decision shall be reversed "if the decision is not in compliance with applicable provisions of the comprehensive plan or land use regulations").
[14] ORS 197.835(10)(a)(A) provides: "[t]he board shall reverse or remand a decision… if the decision is not in compliance with applicable provisions of the comprehensive plan or land use regulations." See *Oster v. City of Silverton*, 79 Or LUBA 447 (2019), citing ORS 197.835(10)(a)(A) (reversing a City land use decision based on project's failure to achieve LOS D standard from the City's TSP, where the approval criteria did not specifically and expressly incorporate the TSP).

- The Condition of Approval A25 ensures that the Project complies with noise standards and is legally supportable.

i. Allegations of the Existing Facility's Violation of the Noise Ordinance are Irrelevant.

Appellant's allegations about noise from the existing facility are not a basis for denying AR for the Project. The existing facility is not within the scope of the AR application under review; only the proposed Project is evaluated through Architectural Review.

The exclusive forum for addressing whether the existing facility is in violation of the Noise Ordinance is the enforcement procedures in TMC 7-1. Code Enforcement is reviewing the noise complaints and is the sole City body responsible for determining whether a violation exists.

Although not relevant to the AR, to provide a balanced analysis of the allegations related to noise, the Applicant provided expert testimony that analyzed noise from the existing facility. As detailed in Section B(v), the record of this approval does not establish that the existing facility violates the Noise Ordinance.

ii. The Noise Ordinance is Not Applicable as Approval Criteria and Noise Impacts are Not Relevant to AR.

The AR process considers a *proposed* development (not existing uses). Architectural Review is governed by TDC 33.020. The AR approval criteria are listed in TDC 33.020(5), and require the Project to "comply with the applicable standards and objectives in TDC 73A through 73G." Those criteria do **not** contain noise standards. Those criteria do **not** incorporate by reference the Tualatin Municipal Code, or the Noise Ordinance. Quite simply, noise impacts and the Noise Ordinance are irrelevant to Architectural Review of the Project.

iii. Condition of Approval A25 Appropriately Requires the Project to Comply with the Performance Standards in the Noise Ordinance Once the Project is Operational.

The City is authorized to impose conditions of approval that implement the Tualatin *Development* Code, per TDC 33.020(6)(a)(iii). The Tualatin Noise Ordinance, however, resides in the Tualatin *Municipal* Code, not the Tualatin *Development* Code, and thus falls outside the scope of allowable AR conditions.

TDC Chapter 63 (Industrial Uses and Utilities and Manufacturing Zones – Environmental Regulations) is a requirement of the Tualatin Development Code, so TDC 33.020(6)(a)(iii) authorizes conditions of approval that require compliance with TDC Chapter 63. Accordingly, condition of approval A25 appropriately requires the proposed development to comply with TDC Chapter 63.

The noise performance standard in TDC Chapter 63 is TDC 63.051, which provides, "all uses and development must comply with the Oregon State Department of Environmental Quality standards relating to noise and the City of Tualatin noise ordinance in TMC 6-14."

The purpose statement in TDC 63.010 is not an approval criterion, but provides context for interpreting TDC Chapter 63, and explains, "…It is intended that the following standards provide statutory authority for the **enforcement** of regulations relating to noise…" Emphasis added. This means that the standards in TDC Chapter 63 are performance standards that are applied once a use is operational. It is not a development standard, such as setback or height regulations. Rather, as explained during the ARB hearing, the obligation to comply with the noise standards in Chapter 63, which incorporate the Noise Ordinance, is an obligation that is wholly independent and separate from the AR review process.[15]

Accordingly, Lam's operations at the Project must comply with the Noise Ordinance, and if there are concerns about compliance, the exclusive forum for addressing a violation is the enforcement procedures in TMC 7-1. TDC 63, Condition of Approval A25 and the Noise Ordinance do not require findings that an existing use or proposed use comply with TDC 63 or the Noise Ordinance.

iv. The Manufacturing Park Zoning Purpose Statement is Not an Approval Criterion.

Appellant alleges "violations of Manufacturing Park Zoning" as grounds for this Appeal. Some public comments submitted in advance of the ARB hearing alleged that the purpose statement of the Manufacturing Park zone imposes an additional subjective standard, and that uses "must not cause objectionable noise…emanating from the property." TDC 62.100. Generally worded purposes statements are not mandatory approval criteria, absent explicit wording to the contrary.[16] The aspirational purpose statement in TDC 62.100 is not included in the AR approval criteria, so the irrelevant purpose statement does not impose a noise standard on the Project and cannot be a basis for denying the AR.

v. In the Alternative, the Record Does Not Establish That the Existing Facility or the Proposed Project Violate the Noise Ordinance.

While the AR criteria do not require findings that a Project will comply with TDC Chapter 63 or the Noise Ordinance, because of community interest in noise, the Applicant voluntarily provided evidence and analysis of both the existing facility's current compliance and proposed Project's projected compliance with the Noise Ordinance. Because compliance with the Noise Ordinance is not required as part of AR, we encourage the City to adopt the following findings as reasons in the alternative for rejecting the issues raised in the Appeal.

[15] ARB Hearing, September 10, 2025, available at https://www.youtube.com/watch?v=yTjPbF0YePw
[16] See *Mariposa Townhouses v. City of Medford*, 68 Or LUBA 479 (2013).

In the Alternative, the Existing Facility Does Not Violate the Noise Ordinance

To reiterate, the City's enforcement process is the exclusive forum for evaluating whether the existing facility complies with the Noise Ordinance. However, to respond to community concern and evidence offered that alleged a Noise Ordinance violation, the Applicant provided expert analysis of the existing facility's compliance with the Noise Ordinance.

An expert report from Colin Gordon Associates ("CGA") shows that the existing facility operations do not exceed the City Noise Ordinance limit of 50 dBA from 10 PM to 7 AM.[17] The CGA report is authored by an engineer that specializes in noise measurements for high-technology facilities, HVAC noise analysis, and environmental noise modeling. Furthermore, CGA also analyzed the acoustic survey submitted by Appellant (the "A Acoustics Survey") and concluded that its methodology is deficient.[18] While the A Acoustics Survey reported a measurement of 52 dBA after 10 PM at a home near Lam's campus, CGA identified the following deficiencies in the methodology, which render this measurement an unreliable indicator of ambient noise near the campus:

- The survey does not specify the noise metric used (e.g., L50, L10, L1, Leq), which is essential for interpreting compliance with applicable standards.
- There is no documentation of the measurement duration, location, or integration time.
- The survey lacks frequency analysis and fails to isolate noise sources attributable to Lam Research.
- The measured level of 52 dBA is presented without sufficient context to determine its source or relevance to regulatory thresholds.

Therefore, the A Acoustics Survey does not establish a violation of the City's Noise Ordinance with respect to the existing facility. The Appellant offered as evidence a simulation of the noise frequency that he alleges is emitted from the existing facility. Frequency is not a component of the Noise Ordinance. Without a clear and reliable attribution of the measured decibel sound to Lam Research operations, the alleged violation is unsubstantiated, and a reasonable person could not conclude that a violation exists.

The methodological deficiencies in the A Acoustics Survey are relative to not only the probative value of the expert evidence, but also to the credibility and persuasiveness of the expert offering the testimony. When experts offer opinions that differ, a significant factor in determining the credibility of the evidence is the credentials of the individual offering testimony.[19] CGA has

[17] Staff Report AR24-0002, Exhibit L, pp. 7-8.
[18] Staff Report AR24-0002, Exhibit F: Supplemental Public Comments, pp. 7-15.
[19] *Department of Land Conservation and Development v. Curry County,* LUBA No. 96-073, 31 Or LUBA 503, 505–506 (1996) (when résumé of soil scientist did not establish his credentials to determine forest productivity and the only scientific data in the record was results of soil tests, soil scientist's conclusions with respect to forest productivity were not substantial evidence).

expertise in noise from high technology facilities, like Lam, and provided a detailed explanation of their methodology.

In the Alternative, the Project Is Not Expected to Violate the Noise Ordinance

As previously explained, the Project must comply with the performance standards of the Noise Ordinance once the Project's uses are operational. While the AR approval criteria do not consider noise issues, in response to community feedback the Applicant voluntarily provided modeling of the Project's expected noise impacts.

A preliminary noise model by CGA shows that the new development associated with the Project will not create noise in violation of the City of Tualatin's Noise Ordinance.[20] This preliminary noise model evaluates noise impact from major exterior noise sources associated with the Project's new facilities and shows predicated overall noise levels associate with the existing facility in addition to new proposed facilities associated with Project buildout. This noise modeling was conducted per ISO 9613-2, the industry standard for calculating noise propagation from industrial sources such as these, using layout and information provided by the design team detailing the Project's proposed new major exterior mechanical equipment.

This preliminary noise model by CGA shows that noise levels due to the new sources are predicted to be well below 50 dBA at all points along the north property line.[21] The preliminary noise model also shows that cumulatively, existing and future noise sources will remain consistent with the noise contours allowed by the Noise Ordinance. Although this is not a factor to be considered in the land use approval before the City Council, the preliminary noise model by CGA shows that the Project will not generate noise in violation of the City's Noise Ordinance.

C. Traffic Issues

Appellant provides the following grounds for the Appeal, as related to traffic issues: (1) the "[e]xpanded North 108th Entrance does not meet New Driveway Approach Criteria; (2) the Project's Traffic Study did not consider additional employee work shifts; and (3) the claims that traffic is beyond the scope of the AR are incorrect." As detailed below, these are not a legal basis to deny the AR because they are not relevant to the criteria for approval of the AR and because the record does not support these statements.

i. Relevance of Traffic to Architectural Review.

TDC 33.020(5)(c) requires that the approval criteria for AR are limited to TDC 73A to 73G. None of those criteria require the evaluation of traffic impacts. Instead, TDC Chapters 74 and 75

[20] Lam TUX Expansion Environmental Noise Model, Colin Gordon Associates, September 10, 2025, available at http://www.tualatinroad.org/files/LAM2025091002.pdf

[21] The Noise Ordinance require that noise impacts be measured at the property line, and the north property line is closest to the residential area north of Lam's campus.

evaluate public improvements and access management, which is where traffic impacts are relevant. Although transportation issues are not directly applicable, as explained in Section B(iii), TDC 33.020(6)(a)(iii) authorizes the City to impose conditions of approval that implement the Tualatin Development Code, including TDC Chapters 74 and 75. Accordingly, the Applicant has thoroughly addressed TDC 74 and 75. However, the Appellant has not demonstrated that, from a legal interpretation or evidentiary perspective, TDC Chapters 74 or 75 can be a basis for denying the AR.

ii. Existing SW 108th Avenue Entrance.

Members of the community have expressed concern about the existing traffic on SW Tualatin Road. Lam responded to these concerns by eliminating a proposed new employee access onto SW Tualatin Road. As revised and approved by the ARB, the Project relies exclusively on *existing* driveways for employee traffic. Traffic modeling indicates that the Project will add very few new employee vehicle trips on SW Tualatin Road during peak hours. The TIA and City Engineer concluded that SW Tualatin Road remains adequate to support the Project.[22] Additionally, once the Tualatin-Sherwood Road construction is completed and traffic that is currently diverted onto Tualatin Road returns to its normal patterns, the traffic volumes on SW Tualatin Road are expected to be "lower than experienced today, even with the addition to the project."[23]

Once Lam eliminated the originally proposed new employee access onto SW Tualatin Road, some members of the public pivoted their opposition to the existing northernmost entrance at SW 108th Avenue. Some community members appear to advocate closing the existing driveway, despite data about the de minimis additional volume during peak period and continued functionality of SW Tualatin Road.

Members of the public submitted copies of a form letter to the ARB stating that the Project's existing northernmost entrance at 108th Avenue is inconsistent with three of the new driveway approach criteria at TDC 75.020.5. The ARB did not apply these criteria to the existing driveway on SW 108th Avenue.

[22] See Staff Report AR24-0002, August 5, 2025 email from Tualatin City Engineer, Mike McCarthy that states: "The existing utilities and transportation system are adequate, or can be made adequate through conditions, to support the proposed Lam development."

[23] As detailed in Mackenzie's August 19, 2025 "Lam TUX, TIA Supplemental Letter," Staff Report AR24-0002, Exhibit A4, based upon measurements of Tualatin Road volumes, it appears that as high as 100-200 additional trips in one direction during the peak hour may be attributed to the ongoing SW Tualatin-Sherwood Road construction. While the exact number is difficult to determine, the traffic engineer concluded that when the SW Tualatin-Sherwood Road construction is complete, "some drivers are anticipated to shift back to using Tualatin-Sherwood instead of Tualatin Road, resulting in volumes lower than experienced today, even with the addition to the project."

No Explanation of Why the Existing SW 108th Avenue Driveway is Subject to New Driveway Approach Standards

The Appellant has not explained why he believes that the new driveway approach standards should be applied, other than offering that the northernmost SW 108th Avenue driveway is currently gated. At the hearing, the Applicant explained that the gate is locked in the evening for security reasons, but that the gate is open during business hours.

The Appellant has not provided a legal or evidentiary basis for why a new driveway approach permit is needed for the existing northernmost SW 108th Avenue access.

In the Alternative, the Existing 108th Avenue Entrance Meets the New Driveway Approach Criteria

Assuming, without conceding, that the criteria apply, the existing northern SW 108th Avenue driveway complies with the new driveway approach criteria. While not required, we encourage the City Council to adopt in the alternative the following findings that the existing northernmost entrance on 108th Avenue complies with the three driveway approach criteria raised by commenters:

> *Criterion (g): The proposed driveway approach does not result in significant adverse impacts to the vicinity;*

Applying this criterion first requires the City Council to interpret the terms "significant," "adverse impacts," and the "vicinity." We encourage the City to interpret "adverse impacts" to mean impacts that, even with mitigation measures, a proposal does not meet the City's standards for access management, safety, capacity and queuing, and the adverse impacts are "significant' if they greatly exceed the standards. We encourage the City to interpret the "vicinity" to include the City intersections studied by the TIA study intersections, which here are all City intersections within a ¼ mile of the Project site.

The only conclusion supported by the evidence is that the northernmost driveway on SW 108th Street will not result in significant adverse impacts to the vicinity.

The existing driveway meets all of the City's standards for access management in Chapter 75. Per TDC 75.120, driveways on minor collectors must be spaced at a minimum of 100' and driveways must provide a minimum distance of 40' between on-site driveways per TDC 75.040(10)—the three existing driveways on 108th Avenue are spaced at 100'. Driveways must be located at least 150' from the intersection of Collector or Arterial streets, as measured from the stop bar, per TDC 75.040(11)(a)—the driveway is located approximately 300' south of Tualatin Road.

The Traffic Study shows that, at Project buildout, only 6% of campus trips will use this existing driveway, but that the Project impact on Tualatin Road is less than 10% of site trips. With these volumes of traffic and the required mitigation measures, the vicinity intersections meet safety, capacity and queuing standards.

> *Criterion (h): The proposed driveway approach minimizes impact to the functionality of adjacent streets and intersections; and*

The metrics of the functionality of streets and intersections are the City's standards for access management, safety, capacity and queuing. The Traffic Study shows that the existing driveway meets all of those standards, as conditioned. Accordingly, with the conditions, there is no impact to functionality that needs to be minimized. Further, the existing driveway is one of six driveways available to Lam employees. Trips from the campus will be distributed among multiple driveways, which minimizes the impacts of each driveway on the functionality of adjacent streets and intersections.

> *Criterion (i): The proposed driveway approach balances the adverse impacts to residentially zoned property and the functionality of adjacent streets*.

The residentially zoned property and the adjacent streets subject to this criterion are the residential area and streets within the "vicinity" of the site, which here, is ¼ mile from the Project. The TIA demonstrates that there is no adverse impact from the Project in the vicinity, including the residentially zoned property and functionality of adjacent streets. Furthermore, there are no adverse impacts to the surrounding residential uses because all standards from the Tualatin Development Code are met, and average of 24 new peak hour trips added to SW Tualatin Road is a de minimis amount of traffic on a Major Collector roadway.

iii. The Traffic Study is Not Required to Consider Additional Employee Shifts and Meets the Requirements of TDC 74.440.

Appellant contends that the Traffic Study fails to consider additional employee work shifts. Appellant's argument is undeveloped, and it is unclear if Appellant is arguing that shifts should be required to minimize traffic impacts, or that additional shifts could be added, which would increase traffic impacts. Regardless, neither argument constitutes a valid basis for denial of Architectural Review, as the record demonstrates that the Traffic Study adequately considered the increased employee numbers anticipated from full Project buildout. Accordingly, the Traffic Study satisfies the requirements set forth in TDC 74.440.

Appellant's argument appears to either request mitigation (e.g., requiring shift work) or to challenge the scope of the Traffic Study (e.g., different assumptions about shifts should have been included). Neither is a basis for denying the AR. The Traffic Study concluded, and the City Engineer agreed, that as conditioned, SW Tualatin Road meets all standards. Meaning, there is no grounds for requiring mitigation such as relying upon shifts to spread the Project's

traffic to non-peak hours. If the argument is that additional shifts could be added in a manner that impact peak hour traffic, that is speculation that is not supported by the record and is unreasonable. As detailed below, Lam currently has only a small percentage of staff working outside the typical day 8-5 shift schedule. It would be a significant change in operation to add shifts or more employees to night shifts. Also, if it made sense to have a second shift, then the new office and lab buildings include in the Project would not be needed – the added 600 employees could simply use existing buildings with additional shifts.

The Traffic Study complies with accepted practices and does not include speculative and unsupported assumptions. The Traffic Study's modeling is based upon current patterns and practices. The Traffic Study explains that the AM peak hour is 8 AM to 9 AM, and the PM peak hour is 4:45 to 5:45 PM. The Traffic Study scoping memo includes a discussion of trip generation, and details shift work, explaining that the day shift for office and lab employees is generally 8-5, which overlaps with the AM and PM peak periods. Manufacturing staff work 12-hour shifts "with changes outside the peak hours (7-7 shift schedule)."[24] The Project includes an office building, laboratory building and utility building. Accordingly, the TIA assumes that the new office and lab employees will generally commute during the AM and PM peak periods similar to current employees.

TDC 74.440(1) gives the City Manager discretion to require a Traffic Study as part of the development approval process. As relevant to this Appeal, TDC 74.440 requires that the Traffic Study include the information listed in TDC 74.440(3), including proposed trip generation and distribution for the proposed development. The Traffic Study relied on the following analysis to meet this requirement[25]:

- The Traffic Study contemplates that the Project could add up to 600 employees to the campus.
- The Traffic Study estimates these additional employees will work similar shift schedules as current employees and will generate an additional 244 AM peak hour, 233 PM peak hour, and 2036 daily trips, based on the "Research and Development Center" (LUC 760) trip rate from the Institute of Transportation Engineers' (ITE) Trip Generation Manual.
- The added trip distribution for each surrounding road resulting from the 600 employees was based on (1) the timing of current employee shifts; (2) the zip codes of current employees; and (3) the fact that "most new employees will be assigned to Building H," the parking for which is accommodated at the existing southeast and new northeast parking lots.
- While the Project at buildout will be associated with additional trips, testimony has focused on the impacts to Tualatin Road. The traffic study shows that, during peaks hours, the Project will result in and average of 25 additional trips on Tualatin Road west of SW 108th Avenue, which is a 2% increase in trips during peak hours.

[24] Staff Report AR24-0002, Exhibit A4, June 5, 2025 Updated Transportation Impact Analysis Scoping.
[25] Staff Report AR24-0002, Exhibit A4: Transportation Impact Analysis and Memorandum, p. 12 ("Trip Distribution and Assignment").

The Project's Traffic Study was subject to review by the City Engineer, third party peer review by DKS associates, and subject to review by ODOT and Washington County traffic engineers. Reviewing experts provided some questions about details of the Study, which were addressed, with no further questions. The agencies agree with the scope and conclusions of the Traffic Study. Therefore, the Traffic Study adequately analyzed the proposed trip generation and distribution for the proposed development, pursuant to the requirements in TDC 74.440.

IV. Conclusion

The Applicant respectfully requests that the City Council deny this Appeal and affirm the ARB's approval of AR24-0002. Appellant has not demonstrated a reversible procedural error, nor has Appellant has not demonstrated noncompliance with applicable law, inadequate findings or lack of substantial evidence.

Very truly yours,

Dana L. Krawczuk

MACKENZIE.



LAM TUX TRANSPORTATION IMPACT ANALYSIS

To
City of Tualatin

For
Lam Research

Dated
July 8, 2024
(Revised October 10, 2024)
(Revised July 21, 2025)

Project Number
2250180.00

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RiverEast Center | 1515 SE Water Avenue, Suite 100, Portland, OR 97214
PO Box 14310, Portland, OR 97293 | T 503.224.9560 | www.mackenzie.inc

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I. EXECUTIVE SUMMARY

1. Three new buildings are proposed on both the east side and at the southwest corner of the Lam campus in Tualatin, Oregon.
2. TUX project includes a four-story office building with an area of up to 120,000 square feet (SF) at the southeast corner of the campus and a two-story utility building with approximately 29,000 SF and a laboratory building with approximately 85,000 SF at the southwest corner of the campus.
3. At full occupancy, the proposed campus expansion is estimated to generate an additional 244 AM peak hour, 233 PM peak hour, and 2036 daily trips.
4. A safety review, capacity analysis, and queuing analysis was conducted for all City intersections within a 1/4-mile of the project site, all ODOT facilities anticipated to be impacted by 50 or more peak hour trips, and intersections of concern as noted by ODOT or the City.
5. No study area intersections were found to have a crash rate higher than 1.0 for the five-year crash data from 2019 through 2023, nor were significant patterns found that could be addressed by improvements to the intersections.
6. All public street intersections but one are projected to meet City of Tualatin and ODOT mobility standards with the proposed TUX project. The intersection of SW Hazelbrook Road/OR 99W experiences long delays in the PM peak hour for vehicles turning right onto OR 99W.
7. Queuing for all study area intersections is currently estimated to be accommodated by existing storage areas except for intersections along OR 99W.
8. Based on a review of safety, capacity, and queuing, the following mitigation measures are recommended:
    A. Coordinate left turn movements from OR 99W to SW Tualatin Road at the intersections with SW 124th Avenue. This will minimize the queue lengths and delays for southbound left turns on SW 124th Avenue and avoid potential spill back to OR 99W.
    B. Trim vegetation at the site access locations as needed to provide the recommended intersection sight distances.

II. INTRODUCTION

This Transportation Impact Analysis (TIA) has been prepared in support of an Architectural Review for the proposed laboratory/research and development building, office building, and utility building at the Lam Research campus in Tualatin, Oregon. Figure 1 in Appendix A presents a vicinity map indicating the project location.

Project Description

The TUX project includes the addition of three buildings. Building H is a four-story office building with an area of up to 120,000 square feet (SF), Building U is a two-story utility building with approximately 29,000 SF, and Building X is a laboratory building with approximately 85,000 SF. The total area of the TUX projects adds up to approximately 234,000 SF with an estimated net gain of 600 employees to the campus when the new buildings are at full occupancy.

The new office will be located on the east side of campus replacing the existing parking between Building G and Building B. The new lab and utility buildings will be located at the southwest corner of the site, replacing the existing surface parking. The existing access to SW Leveton Drive will remain and an additional driveway adjacent to the access road and loading dock at building C will serve as truck access for deliveries to the existing and proposed buildings.

The parking areas along the north side of the campus will be expanded and additional parking will be added to the adjacent west property to offset the loss of the southwest lot and to accommodate additional need with the TUX project. The permanent access to the expanded employee parking lots is proposed at the existing West Access from SW Leveton Drive and the North Access from SW 108th Avenue. North Access has previously been used for access to Lam's existing utility yard north of Building B and has served low volumes of employee trips. With this proposal, the driveway will be convenient for employees in the north lots, but no connection is planned to the parking lot constructed with Building G.

Scope of Analysis

This TIA has been prepared in accordance with the City of Tualatin Traffic Study Requirements (updated March 16, 2022), Tualatin Development Code (TDC) Section 74.440, and the Oregon Department of Transportation's (ODOT) Analysis Procedures Manual (APM) Version 2. This study includes a summary of existing traffic conditions, crash review, proposed trip generation, and an analysis of intersection operations, sight distance, queuing, and signal and turn-lane warrants.

Appendix B includes the scoping documents including a TIA scoping letter dated June 25,2025, and email requests from City of Tualatin and ODOT staff.

Study Area

The City's Traffic Study Requirements document requires all intersections along the frontage of the site and any intersection where the site is anticipated to generate more than 500 daily or 60 peak hour trips be included as part of the study area. Washington County requires analysis for all intersections where project trips will exceed 10% of the existing average daily traffic (ADT). No Washington County intersections were found to meet this threshold. In general, ODOT intersections impacted with 50 or more site peak hour trips or with specific concerns were included in the study area.

These public intersections are included in the study area:

- SW Leveton Drive/SW 118th Avenue
- SW Leveton Drive/SW 108th Avenue
- SW Tualatin Road/SW Teton Avenue
- SW Tualatin Road/SW 108th Avenue
- SW Tualatin Road/SW 112th Avenue
- SW Tualatin Road/SW 115th Avenue
- SW 124th Avenue/SW Leveton Road
- SW 124th Avenue/SW Tualatin Road
- SW 124th Avenue/OR 99W
- SW Herman Road/SW 108th Avenue
- SW Hazelbrook Road/SW 115th Avenue
- SW Hazelbrook Road/OR 99W
- SW Herman Road/SW Teton Avenue
- OR 99W/SW Fischer Road
- OR 99W/SW Durham Road

The following site driveways will also be studied (includes those opposite public streets listed above):

- SW Leveton Drive/West Access
- SW Leveton Drive/New Access (trucks only)
- SW Leveton Drive/Center Access
- SW Leveton Drive/East Access
- SW 108th Avenue/North Access
- SW 108th Avenue/Center Access (approved with Building G)
- SW 108th Avenue/South Access (approved with Building G)
- SW Tualatin Road/SW 115th Avenue

All study area intersections are located within City of Tualatin jurisdiction or are along OR 99W, an ODOT facility.

Analysis Scenarios

This TIA addresses AM and PM peak hour conditions for the following scenarios:

- 2025 Seasonally Adjusted Existing Volumes
- 2027 2030 Pre-Development without the TUX project
- 2030 Post-Development with the TUX project

III. EXISTING CONDITIONS

The existing conditions analysis is based on a current year 2025 inventory of transportation facilities and traffic data.

Site Conditions

The project site is in Tualatin, Oregon, within the Portland metropolitan area. The site is approximately 75.95 acres and consists of tax lot 100 of Washington County tax map 2S1 22BA, lot 100 of map 2S1 22AB, and lots 500 and 800 of map 2S1 22AA. The site is part of the City's Manufacturing Park (MP) Planning District. The Novellus Industrial Master Plan (IMP) was approved in 2001 as a four-phase development consisting of 1,440,000 SF. The proposed site plan for the TUX project is presented in Figure 2 in Appendix A.

Vehicular Transportation Facilities

Figure 3 in Appendix A presents existing lane configurations and traffic control devices for all study area intersections. Table 1 below summarizes roadway characteristics within the study area.

TABLE 1 – ROADWAY CHARACTERISTICS

Roadway	Functional Classification	Posted Speed	Travel Lanes	Bike Lanes	On-Street Parking	Sidewalks
OR 99W (Pacific Highway W)	Major Arterial/ (Urban Principal Arterial)	45/55 mph	4	Yes	None	Intermittent
SW 124th Avenue	Major Arterial	45 mph	4/5	Yes	None	Yes
SW Tualatin Road	Major Collector	35 mph	3	Yes	None	Yes
SW Leveton Drive	Minor Arterial	35 mph	2	Yes	None	Yes
SW 108th Avenue	Minor Collector (north of SW Leveton Drive)	35 mph	2	Yes	None	Yes
SW Herman Road	Minor Arterial	35 mph	2	Yes	None	North Side
SW Teton Avenue	Minor Arterial	35 mph	2	Yes	None	Yes
SW 115th Avenue	Minor Collector	35 mph	2	Yes	None	Yes
SW Hazelbrook Road	Minor Collector	35 mph	2	No	None	South Side

Pedestrian and Bicycle Facilities

The study area has nearly complete bicycle and pedestrian networks. Clearly marked bike lanes are provided on all study area roadways. Curb-tight sidewalks are provided on SW 108th Avenue and SW Tualatin Road, as well as some segments of the north side of SW Herman Road. Separated sidewalks are provided on all other study roadways and segments.

Transit Facilities

The study area is served by TriMet Bus Lines 94 and 97 with stops on OR 99W (Pacific Highway W) and SW Tualatin Road. The Tualatin Shuttle Blue Line has two stops on SW Leveton Drive just south of the site and a stop on SW Tualatin Road east of SW Teton Avenue. Transit maps and bus schedules are provided in Appendix C for reference.

Existing Traffic Counts

Traffic counts were conducted at the intersections listed above on Tuesday, May 13, 2025, for standard peak periods of 7:00-9:00 AM and 4:00-6:00 PM. An extended PM time period from 3:00-6:00 PM was counted at five intersections where the nearby Hazelbrook Middle School might cause an earlier peak.

Per ODOT standards, system peak hours from 7:30 AM to 8:30 AM and 4:30 PM to 5:30 PM are proposed for the OR 99W intersections in the AM and PM. The observed site peaks from 8:00 AM to 9:00 AM and 4:45 PM to 5:45 PM are proposed as a system peak for all site driveways. The remaining intersections will be analyzed at individual intersection peaks. The site volumes are 449 (391 enter/58 exit) in the AM and 430 (67 enter/363 exit) in the PM, which is approximately 7% higher than 2024 counts, mostly due to construction activity for Building G with 85 contractors.

A summary of all intersection turning movement counts collected in 2025 is presented in Figure 4 in Appendix A.

Tualatin-Sherwood Road Construction

Traffic volumes on Tualatin Road have increased since 2024, which may be in part to construction activity on SW Tualatin-Sherwood Road and the small increase in site trips. No adjustments are proposed for this analysis.

Seasonal Adjustment

OR 99W is a state facility which requires a seasonal adjustment as specified in ODOT's Analysis Procedures Manual (APM). There is no seasonal adjustment data available for this location as there is no nearby Automatic Traffic Recorder (ATR). Therefore, a seasonal adjustment of 1.03 derived from data presented in ODOT's 2023 Seasonal Trend Table for the "Commuter" trend was applied to 2025 existing through volumes on OR 99W. The 2025 seasonally adjusted traffic volumes are presented in Figure 5 in Appendix A. The seasonal adjustment calculation is provided in Appendix E for reference.

Crash Analysis

Historical crash data reported for the study area intersections were evaluated to identify patterns that might indicate a safety concern. Crash data for the most recent available 5-year period of 2019 through 2023 were obtained from ODOT's online crash data system and used to review crash patterns and estimate intersection crash rates.

Intersection Crash Rates

Intersection crash rates were calculated as a measure of the number of crashes occurring per one million entering vehicles (MEV) per year. The intersection crash rate is calculated by dividing the average number

of crashes per year by the MEV per year. An average daily traffic (ADT) volume was estimated by dividing the PM peak hour volume at each intersection by a peak-to-daily factor, or k-factor, of 0.09 obtained from ODOT's 2023 traffic flow data on OR 99W just west of SW 124th Avenue.

A crash rate of 1.0 crashes per MEV is typically used as a threshold above which additional traffic safety analysis is warranted. In addition, per Chapter 4 of the ODOT APM, any intersection that exceeds the 90th percentile values provided in Exhibit 4-1 of the APM should be flagged for further analysis. The ODOT 90th percentile crash rates have been provided for each intersection type in Table 2.

ODOT's Safety Priority Index System (SPIS) is a method developed to identify highway segments or locations with crash frequency, rates or severity that are in the highest 10 percent of locations statewide. We found that none of the study area intersections appear on either the ODOT or Washington County SPIS lists.

All intersections have crash rates below 1.0/MEV and below the ODOT 90th percentile crash rate threshold for intersection type. No further analysis is recommended.

The crash evaluation is summarized in Table 2. The raw crash data are provided in Appendix F.

TABLE 2 – INTERSECTION CRASH RATES

Intersection (Traffic Control Type)	Year					Total Crashes	ADT	Crash Rate (Crashes/ MEV)	ODOT 90th Percentile Crash Rate
	2019	2020	2021	2022	2023				
OR 99W/ SW 124th Avenue (3SG)	4	1	4	3	1	13	44,800	0.13	0.509
SW Tualatin Road/ SW 124th Avenue (3SG)	3	1	4	5	3	16	24,889	0.29	0.509
SW Tualatin Road/ SW 115th Avenue (3ST)	0	0	0	0	1	1	14,844	0.03	0.293
SW Tualatin Road/ SW 112th Avenue (3ST)	0	0	0	0	0	0	14,456	0.00	0.293
SW Tualatin Road/ SW 108th Avenue (3ST)	0	1	1	1	2	5	14,744	0.15	0.293
SW Leveton Drive/ SW 124th Avenue (4SG)	4	1	0	1	2	8	15,533	0.24	0.860
SW Leveton Drive/ SW 118th Avenue (3ST)	0	0	0	0	0	0	4,533	0.00	0.293
SW Leveton Drive/ Center Site Access (3ST)	0	0	0	2	0	2	3,233	0.28	0.293
SW Leveton Drive/ SW 108th Avenue (3ST)	0	0	0	0	1	1	4,000	0.11	0.293

TABLE 2 – INTERSECTION CRASH RATES									
Intersection (Traffic Control Type)	Year					Total Crashes	ADT	Crash Rate (Crashes/ MEV)	ODOT 90th Percentile Crash Rate
	2019	2020	2021	2022	2023				
SW Herman Road/ SW 108th Avenue (3SG)	0	1	0	0	0	1	11,967	0.04	0.509
SW Tualatin Road/ SW Teton Avenue (3ST)	2	0	0	0	1	3	15,011	0.09	0.293
SW Hazelbrook Road/ SW 115th Avenue (3ST)	0	0	0	0	0	0	4,267	0.00	0.293
SW Hazelbrook Road/ OR 99W (3ST)	1	1	0	2	0	4	38,067	0.05	0.293
SW Herman Road/ SW Teton Avenue (4SG)	2	0	2	1	1	6	15,478	0.18	0.860
OR 99W/ SW Fischer Road (3SG)	6	2	3	5	7	23	43,211	0.24	0.509
OR 99W/ SW Durham Road (4SG)	4	4	6	4	15	33	46,044	0.33	0.860

3SG: Three-legged signalized intersection
3ST: Three-legged stop-controlled intersection
4SG: Four-legged signalized intersection

Crash Data Summary

All study area intersections had crash rates below the ODOT 90th percentile crash rates, and no fatal crashes have occurred at the study area intersections within the five-year study period. Collisions that involve pedestrians and bicyclists, as well as any consistent crash patterns, are detailed below.

OR 99W/SW 124th Avenue

At the intersection of OR 99W and SW 124th Avenue, 13 crashes were reported. Eight of these were rear-end crashes, the most common crash type. These are largely due to inattention, and none resulted in serious injury (Injury Type A or B) being reported.

SW Tualatin Road/SW 124th Avenue

One crash involving a pedestrian occurred at the intersection of SW Tualatin Road and SW 124th Avenue in 2019, resulting in a possible injury (Injury C).

There were 16 crashes reported at the intersection. Of these, 13 were turning movement crashes mostly caused by a failure to yield right-of-way. All left turn movements already have protected turning phases.

SW Leveton Drive/SW 124th Avenue

There were eight crashes reported at the intersection of SW Leveton Drive and SW 124th Avenue. Of these, five were turning movement crashes, mostly in the southbound and westbound directions. The remainder of the crashes were rear-ends or "non-collisions."

SW Leveton Drive/Center Site Access

One crash involving a bicyclist occurred at the center Lam site access on SW Leveton Drive in 2022, resulting in a suspected serious injury (Injury A) to the cyclist. The crash was caused by a failure to yield. One other crash was reported at the driveway: a turning movement crash which did not result in an injury (PDO only).

OR 99W/SW Fischer Road

There were 23 crashes reported at the intersection of OR 99W and SW Fischer Road. Nine of these were turning movement crashes, and ten of them were rear-ends. The remaining collisions include two fixed-object collisions and two crashes involving pedestrians at the crosswalk, resulting in a possible and suspected minor injury (Injury C and B), caused by a failure to yield and/or disregard for the traffic control.

OR 99W/SW Durham Road

There were two crashes involving pedestrians at the crosswalk at the intersection of OR 99W and SW Durham Road in 2020 and 2023, both resulting in a suspected minor injury (Injury B) and both caused by a driver's failure to yield. There was one crash involving a bicycle in 2023, caused by driver inattention and resulting in a suspected minor injury (Injury B).

There were 33 crashes reported at the intersection. Of these, 17 were rear-ends and most of the remainder were either sideswipe or turning movement crashes.

IV. PRE-DEVELOPMENT CONDITIONS

The pre-development conditions reflect build-out year conditions without the proposed development. This scenario includes existing year 2025 traffic volumes, a seasonal adjustment to traffic on OR 99W, a background growth to 2030, and in-process trips from nearby approved developments. The pre-development traffic without project trips will indicate if traffic issues are present before the addition of the proposed development.

Planned Transportation Improvements

The City of Tualatin Capital Improvement Plan 2025-2029 (CIP) was reviewed for any planned transportation improvements in the area that may affect capacity. SW Herman Road will be improved from SW Cipole Road to SW 124th Avenue; however, none of these improvements will affect any of the study area intersections.

SW Tualatin-Sherwood Road is currently under construction for a widening project, and appears to have resulted in an increase in volumes on Tualatin Road. For purposes of this analysis, we have not adjusted the volumes due to uncertainty in the amount of the increase attributable to the construction project. For this reason, actual intersection operation is expected to be better than presented in this report.

The City of Tualatin Transportation System Plan (TSP) has planned for a future traffic signal at the intersection of SW Tualatin Road with SW 115th Avenue, but no funding or schedule has been determined.

To our knowledge, no mitigations or improvements have been required for development of the other in-process projects at any study area intersections included in this analysis.

Background Traffic Growth

Background traffic growth was applied to adjusted year 2025 traffic volumes to forecast future traffic demand. A linear 1% annual growth rate over three years was applied to year 2025 traffic volumes to estimate 2030 background traffic volumes. This growth adjustment was based on ODOT traffic volume projections for OR 99W just south of SW 124th Avenue between years 2019 and 2040. Background growth was applied to all movements at all intersections, except driveways. Figure 6 in Attachment A presents the background growth from 2024 to 2030 for the AM and PM peak hours.

In-Process Traffic

In-process traffic volumes account for developments that have been approved or that are under construction at the time of a traffic study. These traffic volumes account for traffic that will be added to the external roadway network before buildout of the proposed development. Traffic volumes for the following developments were included as in-process:

- Lam Building G
- 124th Business Park
- KAI USA Warehouse Expansion
- Fujimi Expansion

Figure 7 in Attachment A presents the total trip assignment for the 124th Business Park, KAI USA Warehouse Expansion, and Fujimi Expansion.

The Lam Building G project was approved with two new driveways on SW 108th Avenue and a change in use of the existing East Access on SW Leveton Drive to be exclusive for trucks. Figure 8 in Attachment A presents the Lam Building G trip assignment as approved for that project. These Lam Building G trips have been decreased by 34 trips in the AM and 32 trips in the PM to account for current Building G construction traffic showing up in the counts. This is based on the trip rate for 85 Research and Development employees. Detailed copies of the respective project trip assignment sheets are included in Appendix G.

Pre-Development Traffic

The 2030 pre-development analysis scenario is a combination of existing year 2025 traffic volumes, a seasonal adjustment factor on OR 99W, background growth of 1% over five years, and in-process trips from nearby approved developments. Figure 9 in Attachment A presents the 2030 pre-development traffic volumes during the AM and PM peak hours.

V. SITE DEVELOPMENT

The trip-making characteristics of the proposed development are described below.

Trip Generation

Trip generation estimates for the full occupancy of approximately 600 employees were prepared utilizing rates for a Research and Development Center from the Institute of Transportation Engineers' (ITE) Trip Generation Manual, 11th Edition. This land use was found to best match the existing campus trip generation based on employees. Trip generation estimates for the planned expansion are presented in Table 3.

TABLE 3 – PROPOSED TRIP GENERATION

ITE Land Use	Employees	AM Peak Hour			PM Peak Hour			Daily
		In	Out	Total	In	Out	Total	
Research and Development Center (LUC 860)	360	124	22	146	17	123	140	1222

As shown in Table 3, the planned campus expansion is estimated to generate an additional 244 AM peak hour, 233 PM peak hour, and 2036 daily trips with both phases of development.

Transportation Demand Management

According to Lam Research, there are currently no Transportation Demand Management (TDM) programs on site. Carpool and bicycle parking are provided per requirements. No other TDM programs are proposed with this project.

Leveton Access Reroutes

Construction of the TUX project will result in changes to existing campus traffic patterns. The location of Building H will displace approximately 82 parking spaces, which are conveniently accessed from the Center Leveton Access and a new truck only access between the existing Center and West Leveton Accesses will shift truck traffic away from the West Leveton Access.

The displaced parking spaces represent approximately 6% of campus trips during the peak hours, so we have shifted these trips away from the Center Leveton Access and relocated them to the recently contstructed accesses on SW 108th Avenue.

All peak hour existing truck trips at the West Access on SW Leveton Drive have been routed to the new access between the West Access and the Center Access.

Figure 10 in Attachment A presents both reroutes of existing volumes.

Trip Distribution and Assignment

Site trip distribution has been modified slightly from the original master plan based on employee zip code information provided by Lam, as well as counts conducted in May 2025 at the active site driveways on SW Leveton Drive and SW 108th Avenue and the surrounding intersections. Employee zip code information provides more granular and accurate trip distribution assumptions than modeling or other methods. The following general percentages apply to both the AM and PM Peak hours.

- 24.5% to/from the north on Highway 99W
- 26.5% to/from the south on Highway 99W
- 13.5% to/from the east on SW Tualatin Road and SW Herman Road
  - 8.5% on SW Tualatin Road and 5% on SW Herman Road in the AM peak hour
  - 4% on SW Tualatin Road and 9.5% on SW Herman Road in the PM peak hour
- 4.5% to/from the south on SW 118th Avenue
- 10% to/from the south on SW 124th Avenue
- 21% to/from the south on SW Teton Avenue

New trips generated by the project are expected to follow a similar distribution on the roadway network, but the driveways being used will differ from existing campus traffic. Because most new employees will be assigned to Building H, available parking in its proximity will attract the employees. The expanded southeast campus lot with Building G is expected to accommodate up to 30% of the building H demand. Remaining parking demand will be primarily located to new and expanded lots at the north end of the campus. The detailed site trip distribution is based on the following assumptions:

- 30% of new site trips are expected to utilize the West Leveton Access, 20% at the Center Leveton Access, 30% split evenly between the Center and South 108th Accesses, and the remaining 20% at the North 108th Access.
- 10% of new site trips will use SW Tualatin Road to access the North 108th Access.
  - Half of these trips, or 5% total, are expected to use SW 115th Avenue and SW Hazelbrook Road to access Highway 99W when exiting the site.

At ODOT's request, trip distribution estimates were carried out to the Nyberg and Boones Ferry interchanges with Interstate 5 in order to address the anticipated number of vehicles that would be added at these locations.

Figure 11 in Attachment A presents the overall trip distribution at the study area intersections and routes to Interstate 5. Figure 12 in Attachment A presents the trip assignment for TUX project trips.

Post-Development Traffic

Post-Development traffic volumes are the sum of the pre-development traffic volumes, project-related reroutes, and project trips. Figure 13 presents the 2030 post-development traffic volumes for the AM and PM peak hours.

VI. SITE ACCESS AND CIRCULATION

The on-site evaluation of traffic access and circulation and a review of sight distance at the proposed site driveways are presented below.

Site Access

To accommodate added TUX employee traffic to the new parking lots at the north side of the site, existing North Access on SW 108th Avenue is proposed to be opened for Lam employee access. A new access is proposed on SW Leveton Drive between the existing West and Center Accesses for trucks only.

Access Standards

The TDC includes several sections related to access standards. Chapter 75 of the TDC presents access standards relative to driveway widths and spacing on the site. Per Table 75-1 of the TDC, minimum driveway approach width for industrial driveways is 36' and the maximum is 40' for driveways providing access for over 250 parking spaces. The existing driveways for the site meet these standards. The proposed New Access on SW Leveton Drive will meet these standards at a proposed width of 36'.

Per TDC 75.120, driveways on Minor Collectors must be spaced at a minimum of 100'. Driveways must be located at least 150' from the intersection of Collector or Arterial streets, as measured from the stop bar, per TDC 75.040(11)(a). Additionally, driveways must provide a minimum distance of 40' between on-site driveways per TDC 75.040(10). Table 4 below presents a summary of required and proposed access spacing.

TABLE 4 – ACCESS SPACING SUMMARY

Access	Roadway	Functional Classification	Spacing Standard (feet)	Access Spacing Measured Edge-to-Edge (feet)	
				To South/East	To North/West
North Access	SW 108th Avenue	Minor Collector	100' from nearest driveway	100'	100'
New Access	SW Leveton Drive	Minor Arterial	150' from intersection with Arterial or Collector	>600'	>600'

On-Site Circulation

The parking areas along the north side of the campus will be expanded and additional parking will be added to the adjacent west property to offset the loss of the southwest lot and to accommodate additional need with the TUX project. The permanent access to the expanded employee parking lots is proposed at the existing West Access from SW Leveton Drive and the North Access from SW 108th Avenue. North Access has previously been used for access to Lam's existing utility yard north of Building B and has served low volumes of employee trips. With this proposal, the driveway will be convenient for employees in the north lots, but no connection is planned to the parking lot constructed with Building G.

The new driveway to SW Leveton Drive is intended to serve trucks to and from the existing and new buildings.

The existing JAE access to Tualatin Road will remain available for JAE vehicles only per agreement with JAE. Because these vehicles will be traveling through the project site instead of a dedicated driveway, a gate will be used to limit access to JAE. No Lam vehicles will be allowed access through the gate. Only emergency access is allowed for Lam

Sight Distance Evaluation

Intersection sight distance was evaluated for the proposed site driveway locations. The American Association of State Highway and Transportation Officials' (AASHTO) A Policy on Geometric Design of Highways and Streets, 7th Edition provides recommendations for intersection sight distance (ISD) based on roadway design speed. At minimum, stopping sight distance (SSD), also based on roadway design speed, must be provided.

One existing access north of the two recently constructed accesses on SW 108th Avenue will be opened and used by employees. One new access is proposed on SW Leveton Drive between the existing West and Center Accesses, intended for trucks only.

The posted speed on SW Leveton Drive is 35 mph, for a design speed of 40 mph. There is no posted speed on SW 108th Avenue north of SW Herman Road. Therefore, the design speed on SW 108th Avenue is assumed to be 5 mph over the posted speed of 35 mph for other Minor Collectors in the area, or 40 mph. A time gap of 7.5 seconds and 11.5 seconds were assumed for passenger vehicles and combination trucks completing a left turn from stop, respectively. The recommendations for ISD have been noted for left turns from stop on a stop-controlled minor approach (driveway). The sight distance evaluation for the proposed site driveways is presented in Table 5.

TABLE 5 – SIGHT DISTANCE EVALUATION

Access/ Intersection	Design Speed (mph)	Design Vehicle	Recommended Intersection Sight Distance (feet)	Required Stopping Sight Distance (feet)	Available Sight Distance (feet)	
					To North/West	To South/East
North Access SW 108th Avenue	40	Passenger Car	445'	305'	305'	500'
New Access SW Leveton Drive	40	Combination Truck	680'	305'	680'	680'

As presented in Table 5, sight distances for the North Access on SW 108th Avenue were reviewed and found to be met to the south. To the north, the access is spaced about 305' from the intersection with SW Tualatin Road, meeting required SSD and meaning that approaching vehicles are unlikely to be travelling at full speed as they make the turn from SW Tualatin Road. At the proposed New Access on SW Leveton Drive, sight distance can be made available up to 680', meeting the standards for intersection sight distance, though some landscaping and street trees may need to be trimmed.

VII. OPERATIONAL ANALYSIS

Two aspects of operational analysis were evaluated for the study area intersections: 1) intersection operations analysis, which evaluates how well an intersection processes traffic demand; and 2) queuing analysis, which compares intersection queues with available storage for different travel lanes.

Intersection Operation Analysis

Intersection operations are generally measured by three mobility standards: volume-to-capacity (v/c) ratio, level-of-service (LOS), and delay (measured in seconds). Signalized and all-way, stop-controlled (AWSC) intersections are measured by one overall v/c ratio, LOS, and delay. Two-way, stop-controlled (TWSC) intersections are typically measured by a single v/c ratio, LOS, and delay representative of the worst stopped movement.

Performance Measures

Most study area intersections are located within the City of Tualatin jurisdiction with the exception of the intersections on OR 99W which are under ODOT jurisdiction.

City of Tualatin

The TDC Section 74.440(3)(e) requires the following mobility standards for intersections within City jurisdiction:

- LOS D or better for signalized intersections
- LOS E or better for unsignalized intersections

ODOT

The *Oregon Highway Plan* (OHP) designates OR 99W as a Principal Arterial Route. Table 7 of the OHP establishes a v/c target of 0.99 for the OR 99W intersections with SW 124th Avenue, SW Fischer Road, and SW Durham Road.

Methodology

Intersection operations were analyzed with the use of Synchro 12 software, which utilizes the Transportation Research Board's *Highway Capacity Manual* (HCM) 2000, HCM 2010, and HCM 7 methodologies. Signalized study area intersections were reported using the v/c calculator tool from ODOT when possible and HCM 2000 reports when not for overall v/c ratio and HCM 7 reports for delay and LOS. Two-way, stop-controlled (TWSC) and AWSC intersections were reported using HCM 7 reports. Signal timing plans were obtained from the Washington County traffic plans database, as well as from ODOT staff, and are provided in Appendix H for reference.

Calibration

For 2024 Existing conditions at several intersections, Synchro and SimTraffic delay and queue results were not consistent with field observations. The City's Traffic Study Requirements document states that the existing conditions calculations shall be calibrated to reflect observed site conditions through delay studies and other observations, so queue and delay studies were conducted in order to determine the methodology and any calibration needed to best match observed conditions in the field.

In order to calibrate the model for consistency with existing conditions, the critical gap setting was adjusted from 7 seconds to 6 seconds for right turns onto OR 99W from SW Hazelbrook Road. HCM 2000 results are reported for this intersection to show the impact of this calibration.

In some cases, alternate results were reported in all scenarios as they proved to be more consistent with existing conditions: SimTraffic delay are reported for the intersection of SW 115th Avenue/SW Tualatin Road, and HCM 2000 results are reported for SW Tualatin Road/SW Teton Avenue.

Findings

Table 6 below summarizes the AM and PM peak hour capacity results. For signalized intersections, the overall intersection performance (v/c ratio, LOS, delay) is reported. For unsignalized intersections, the intersection movement with the maximum v/c ratio and delay is reported. The Synchro output reports and summary tables of all lane groups are provided in Appendix I.

TABLE 6 – PEAK HOUR INTERSECTION OPERATIONS

Intersection (Control)	Peak Hour	Analysis Results (v/c-LOS-Delay in seconds)		
		2025 Existing	2030 Pre-Development	2030 Post-Development
OR 99W/ SW 124th (Signalized)	AM	0.85-C-32.9	0.91-D-43.8	0.94-D-49.8
	PM	0.75-C-28.6	0.80-C-30.4	0.82-C-31.3
SW Tualatin/ SW 124th (Signalized)	AM	0.69-B-12.8	0.72-B-14.8	0.77-B-14.9
	PM	0.70-B-19.9	0.77-C-21.8	0.81-C-23.1
SW Tualatin/ SW 115th/ JAE Access (TWSC)	AM	0.44 (SB) C-19.1 (SB)	0.51 (EBL) C-18.8 (SB)	0.53 (SB) C-19.9 (NBL)
	PM	0.20 (SB) C-19.6 (SBL)	0.23 (SB) D-22.2 (NB)	0.24 (SB) D-29.1 (NB)
SW Tualatin/ SW 112th (TWSC)	AM	0.09-C-17.0 (SB)	0.10-C-17.9 (SB)	0.10-C-18.2 (SB)
	PM	0.05-C-17.9 (SB)	0.05-C-18.8 (SB)	0.05-C-19.2 (SB)
SW Tualatin/ SW 108th (TWSC)	AM	0.07-C-18.9 (NB)	0.10-C-20.3 (NB)	0.13-C-21.4 (NB)
	PM	0.16-C-16.1 (NB)	0.22-C-17.5 (NB)	0.31-C-19.7 (NB)
SW 108th/ North Access (TWSC)	AM	0.01-A-9.6 (EB)	0.01-A-9.8 (EB)	0.02 (NBL) B-10.2 (EB)
	PM	0.01-A-8.69 (EB)	0.01-A-9.0 (EB)	0.05-A-9.0 (EB)
SW 108th/ Center Access (TWSC)	AM	0.02 (NBL) A-9.1 (EB)	0.11 (NBL) A-9.4 (EB)	0.13 (NBL) B-10.0 (EB)
	PM	0.04-A-8.7 (EB)	0.13-A-9.1 (EB)	0.17-A-9.4 (EB)
SW 108th/ South Access (TWSC)	AM	0.05 (NBL) A-8.8 (EB)	0.08 (NBL) A-9.3 (EB)	0.11 (NBL) A-9.6 (EB)
	PM	0.06-A-8.7 (EB)	0.11-A-9.6 (EB)	0.19-B-10.5 (EB)

TABLE 6 – PEAK HOUR INTERSECTION OPERATIONS				
Intersection (Control)	Peak Hour	Analysis Results (v/c-LOS-Delay in seconds)		
		2025 Existing	2030 Pre-Development	2030 Post-Development
SW 124th/ SW Leveton (Signalized)	AM	0.37-B-13.2	0.46-B-14.3	0.53-B-15.4
	PM	0.43-B-16.8	0.51-B-19.7	0.59-C-23.0
SW Leveton/ SW 118th (AWSC)	AM	0.43-A-10.0 (EB)	0.58-B-12.4 (EB)	0.72-C-17.6 (EB)
	PM	0.44-B-10.7 (WB)	0.61-B-14.3 (WB)	0.79-C-22.3 (WB)
SW Leveton/ West Access (TWSC)	AM	0.12 (EBL) B-14.4 (SBL)	0.13 (EBL) C-16.9 (SBL)	0.17 (EBL) C-22.7 (SBL)
	PM	0.11-B-10.8 (SBL)	0.26 (SBR) B-12.3 (SBL)	0.38 (SBR) B-14.4 (SBL)
SW Leveton/ New Access (TWSC)	AM	N/A	N/A	0.03 (EBL) B-10.6 (SB)
	PM	N/A	N/A	0.01-B-12.1 (SB)
SW Leveton/ Center Access (TWSC)	AM	0.02-B-10.9 (SBL)	0.03-B-12.6 (SBL)	0.04-B-14.6 (SBL)
	PM	0.06-B-10.5 (SBL)	0.08-B-11.8 (SBL)	0.10 (SBR) B-13.0 (SBL)
SW Leveton/ East Access (TWSC)	AM	No minor road volume	0.04-B-12.2 (NB)	0.04-B-13.3 (NB)
	PM	0.01-B-11.4 (NB)	0.09-B-12.3 (NB)	0.10-B-13.4 (NB)
SW Leveton/ SW 108th (TWSC)	AM	0.22-B-11.7 (EB)	0.46-C-17.3 (EB)	0.69-D-28.9 (EB)
	PM	0.16-A-9.7 (EB)	0.24-B-11.3 (EB)	0.32-B-12.9 (EB)
SW Herman/ SW 108th (Signalized)	AM	0.39-A-5.9	0.47-A-6.5	0.53-A-7.0
	PM	0.51-A-9.6	0.59-B-12.0	0.64-B-14.3
SW Tualatin/ SW Teton (TWSC)	AM	0.51 (EB) C-17.3 (NBL)	0.53 (EB) C-18.4 (NBL)	0.53 (EB) C-18.6 (NBL)
	PM	0.46 (WBT) C-20.7 (NBL)	0.49 (WBT) C-22.8 (NBL)	0.49 (WBT) C-22.9 (NBL)
SW Hazelbrook/ SW 115th (TWSC)	AM	0.44-B-14.2 (NB)	0.47-B-14.6 (NB)	0.47-C-15.0 (NB)
	PM	0.35-B-11.6 (NB)	0.37-B-11.9 (NB)	0.39-B-12.0 (NB)

TABLE 6 – PEAK HOUR INTERSECTION OPERATIONS				
Intersection (Control)	Peak Hour	Analysis Results (v/c-LOS-Delay in seconds)		
		2025 Existing	2030 Pre-Development	2030 Post-Development
SW Hazelbrook/ OR 99W (TWSC)	AM	0.47-C-20.3 (WBR)	0.52-C-22.7 (WBR)	0.53-C-23.1 (WBR)
	PM	0.80-E-39.1 (WBR)	**0.86-F-50.4 (WBR)**	**0.91-F-59.5 (WBR)**
SW Herman/ SW Teton (Signalized)	AM	0.64-C-20.9	0.70-C-23.6	0.74-C-26.3
	PM	0.73-C-24.3	0.82-C-31.3	0.88-D-37.8
OR 99W/ SW Fischer (Signalized)	AM	0.67-C-27.2	0.72-C-30.1	0.73-C-30.4
	PM	0.77-D-41.7	0.80-D-45.4	0.80-D-45.0
OR 99W/ SW Durham (Signalized)	AM	0.70-C-33.8	0.74-D-35.0	0.74-D-35.4
	PM	0.88-E-55.8	0.93-E-64.4	0.95-E-67.9

*Capacity results which exceed the City or ODOT performance thresholds are **bolded**.

As shown in Table 6, all but one of the study area intersections will meet operational standards with the addition of site trips:

- SW Hazelbrook Road/OR 99W – long delays are expected on the stop-controlled approach to OR 99W during the PM peak hour. Mitigation is not recommended because it would encourage vehicles to travel this route from SW Tualatin Road instead of using SW 124th Avenue to access OR 99W northbound.

Intersection Queuing Analysis

An intersection queuing analysis was conducted for the study area intersections for both the AM and PM peak hours to evaluate any potential queue spillbacks.

Methodology

The 95th percentile queues during the AM and PM peak hours were estimated using Synchro and SimTraffic software. The 95th percentile queue is not indicative of a typical queue experienced by drivers and is instead a reasonable worst-case queue possible and is measured by a calculation of 1.65 standard deviations of the average queue and is sometimes longer than the maximum queue observed in traffic modelling. Queue demand results were rounded to the nearest 25' to represent average vehicle lengths. Because queues are based on an average of five traffic simulations using random arrivals, some fluctuation in results can be anticipated, particularly for movements that are near or over-capacity.

For intersections on OR 99W, SimTraffic modelling results were reviewed against traffic count video and found to be inconsistent with existing conditions. Synchro HCM 2000 queuing results were found to match observed queuing for the 2025 Existing scenario and are reported instead for all scenarios. Synchro HCM

2000 results were also used for the SW 115th Avenue/SW Hazelbrook Road intersection, as inaccurate SimTraffic queues were shown backing up to this intersection and creating unreliable results.

Available queue lengths were estimated using Google Earth Pro software and rounded to the nearest 5'. For turn lanes, two available storage values are stated: the first represents the striped storage and the second is the effective storage, or the length physically available regardless of striping, such as a center turn lane upstream of a striped left-turn lane at an intersection. Although travel lanes have no storage defined by striping at signalized locations, we note the distance to an upstream public street intersection.

Findings

The 95th percentile queues obtained from SimTraffic or Synchro as described above for the AM and PM peak hours are presented in Table 7. The detailed SimTraffic reports are provided in Appendix J for reference. Queue lengths in **bold** type show movements which exceed the effective storage length.

TABLE 7 – 95TH PERCENTILE QUEUING ANALYSIS

Intersection (Control)	Approach/ Movement	Striped/ Effective Storage (feet)	AM/PM Peak Hour Queue (feet)		
			2025 Existing	2030 Pre-Development	2030 Post-Development
OR 99W/ SW 124th (Signalized)	EBT1	>1,000	700/400	750/425	750/425
	EBT2	>1,000	700/400	750/425	750/425
	EBR	225/305	300/50	400/50	500/50
	WBL1	550/770	575/300	675/325	725/325
	WBL2	550/690	575/300	675/325	725/325
	WBT1	>1,000	200/325	225/325	225/325
	WBT2	>1,000	200/325	225/325	225/325
	NBL1	315/475	75/300	75/350	75/375
	NBL2	315/475	75/300	75/350	75/375
	NBR1	295/330	125/300	125/350	125/350
	NBR2	295/315	125/300	125/350	125/350
SW 124th/ SW Tualatin (Signalized)	WBL	310/350	75/100	100/100	100/100
	WBR	300/>1,000	125/400	125/500	125/500
	NBT1	995	100/275	150/425	125/600
	NBT2	995	200/375	275/600	225/825
	NBR	145/250	50/100	100/**275**	75/**325**
	SBL	200/300	**425/425**	**400/425**	**375/425**
	SBT1	450	325/150	325/200	275/225
	SBT2	450	125/125	125/175	125/150

TABLE 7 – 95TH PERCENTILE QUEUING ANALYSIS					
Intersection (Control)	Approach/ Movement	Striped/ Effective Storage (feet)	AM/PM Peak Hour Queue (feet)		
			2025 Existing	2030 Pre-Development	2030 Post-Development
SW Tualatin/ SW 115th/ JAE Access (TWSC)	EBL	60	50/50	50/50	50/50
	WBL	60	25/25	25/350	25/25
	NBL	100	25/25	25/25	25/25
	NB	100	25/50	25/25	25/50
	SB	630	100/75	75/75	75/75
SW Tualatin/ SW 112th (TWSC)	EBL	750	25/25	25/25	25/25
	SBL+R	95	50/50	50/50	50/50
SW Tualatin/ SW 108th (TWSC)	WBL	140	50/25	50/25	50/25
	NB	330	50/75	50/125	75/125
SW 108th/ North Access (TWSC)	EB L+R	TBD	25/25	25/25	50/75
SW 108th/ Center Access (TWSC)	EB L+R	60	25/50	50/75	50/75
SW 108th/ South Access (TWSC)	EB L+R	60	25/50	50/75	50/75
SW 124th/ SW Leveton (Signalized)	EBL	100/130	50/50	50/50	50/75
	EBT+R	580	150/75	175/100	200/125
	WBL	145/185	50/75	75/75	75/125
	WBT+R	>1,000	50/100	75/125	100/175
	NBL	155/230	25/25	25/25	50/25
	NBT	>1,000	100/150	100/150	100/175
	NBT+R	>1,000	175/175	175/225	200/250
	SBL	165/245	125/50	125/75	150/75
	SBT	>1,000	100/125	100/125	125/150
	SBT+R	995	125/150	150/150	125/175
SW Leveton/ SW 118th (AWSC)	EB	>1,000	100/50	125/50	150/75
	WB	>1,000	75/75	50/100	75/225
	NB	>1,000	50/50	50/50	50/50

TABLE 7 – 95TH PERCENTILE QUEUING ANALYSIS					
Intersection (Control)	Approach/ Movement	Striped/ Effective Storage (feet)	AM/PM Peak Hour Queue (feet)		
			2025 Existing	2030 Pre-Development	2030 Post-Development
	SB	650	25/50	25/50	25/25
SW Leveton/ West Access (TWSC)	EBL	>1,000	50/25	50/25	75/25
	SBL	135	25/50	25/75	25/75
	SBR	135	50/75	50/75	50/100
SW Leveton/ New Access (TWSC)	EBL	400	N/A	N/A	50/25
	SBL	TBD	N/A	N/A	50/25
SW Leveton/ Center Access (TWSC)	EBL	450	25/25	25/25	50/25
	SBL	125	25/50	25/50	50/50
	SBR	125	25/50	25/50	50/75
SW Leveton/ East Access (TWSC)	EBL	425	25/25	25/25	25/25
	SB	105	25/25	25/25	50/25
SW Leveton/ SW 108th (TWSC)	EB	270	75/25	100/75	125/75
	NB	175	25/25	50/50	50/50
SW Herman/ SW 108th (Signalized)	EBL	100/390	25/25	50/25	50/25
	EB	>1,000	125/125	125/150	150/150
	WB	435	175/200	200/225	225/325
	SBL	135/200	50/100	50/125	75/175
	SBR	115/790	25/25	25/25	25/75
SW Tualatin/ SW Teton (TWSC)	WBL	260	75/50	75/50	75/50
	NBL	95/175	100/150	125/200	125/175
	NBR	30/>1,000	75/100	75/250	100/200
SW 115th/SW Hazelbrook (TWSC)	NB	215	50/50	50/50	75/50
OR 99W/ SW Hazelbrook	WBR	325	50/175	75/200	75/250
SW Teton/	EBL	>1,000	50/25	25/25	50/25
	EB T+R	>1,000	300/400	325/600	400/775

TABLE 7 – 95TH PERCENTILE QUEUING ANALYSIS					
Intersection (Control)	Approach/ Movement	Striped/ Effective Storage (feet)	AM/PM Peak Hour Queue (feet)		
			2025 Existing	2030 Pre-Development	2030 Post-Development
SW Herman (Signalized)	WBL	100/150	75/100	50/100	75/100
	WB T+R	500	200/225	225/275	225/275
	NBL	>1,000	150/150	175/175	175/175
	NB T+R	800	175/225	275/325	300/425
	SBL	50/100	50/25	50/50	50/50
	SB T+R	>1,000	175/150	175/175	175/200
OR 99W/ SW Fischer (Signalized)	EBL	290/400	300/250	325/300	325/275
	EBR	300/>1,000	275/125	350/175	350/175
	NBL	270/475	225/450	225/450	225/475
	NBT1	80/>1,000	525/450	575/525	600/575
	NBT2	80/>1,000	525/450	575/525	600/575
	SBU	300/425	25/25	25/25	25/25
	SBT1	330/>1,000	700/800	775/850	825/850
	SBT2	330/>1,000	700/800	775/850	825/850
	SBR	200/725	25/75	25/75	25/75
OR 99W/ SW Durham (Signalized)	EB LT	275	50/100	50/100	50/100
	EB TR	175/440	50/100	50/100	50/100
	WBL	310/440	225/**475**	250/**500**	275/**500**
	WB LT	440	225/**475**	250/**500**	250/**500**
	WBR	310/440	75/100	75/125	75/125
	NBL	550/600	100/250	100/250	100/250
	NBT1	350/>1,000	600/800	650/900	650/950
	NBT2	350/>1,000	600/800	650/900	650/950
	NBR	230/260	25/75	25/75	25/75
	SBL1	240/300	225/300	250/**325**	250/**325**
	SBL2	240/300	225/300	250/**325**	250/**325**
	SBT1	890/1,300	450/500	500/550	525/550
	SBT2	890/1,300	450/500	500/550	525/550
	SBR	400/425	25/25	25/25	25/25

TABLE 7 – 95TH PERCENTILE QUEUING ANALYSIS					
Intersection (Control)	Approach/ Movement	Striped/ Effective Storage (feet)	AM/PM Peak Hour Queue (feet)		
			2025 Existing	2030 Pre-Development	2030 Post-Development

*Queues exceeding effective storage lengths are **bolded**.

Recommendations

As shown in Table 7, queues at some intersections along OR 99W appear to be longer than available storage lengths. These intersections are built out to their full capacity, and little can be done to mitigate these queues. At the intersections of OR 99W and SW Tualatin Road with SW 124th Avenue, we are recommending coordination of the left turn movement from OR 99W with the left turn movement to SW Tualatin Road in order to minimize queuing and delays in the short segment between the two intersections, especially during the AM commute times.

Pedestrian and Bicycle Facilities

Pedestrian and bicycle facilities are currently provided in the study area and along the frontages of the campus. With development of the TUX project, these facilities will remain and will be enhanced as appropriate with any required frontage or intersection improvements, especially where curb ramps are replaced. There are no gaps in the bicycle or pedestrian facilities that need to be addressed along the site frontage or nearby roadways.

Existing bicycle volumes along SW Tualatin Road are less than 10 per hour.

Pedestrian volumes on the SW Tualatin Road frontage are currently low with a maximum of 10 per hour. SW Leveton Avenue has higher pedestrian volumes including less than 15 pedestrians crossing at the Center and West Accesses during peak hours.

Transit Facilities

No changes are proposed to existing transit facilities or locations of stops.

VIII. RECOMMENDATIONS

The following recommendations for mitigation are made to address impacts of the project on the transportation system:

1. Coordinate left turn movements from OR 99W to SW Tualatin Road at the intersections with SW 124th Avenue. This will minimize the queue lengths and delays for southbound left turns on SW 124th Avenue and avoid potential spill back to OR 99W.
2. Trim vegetation at the site access locations as needed to provide the recommended intersection sight distances.

IX. APPENDIX

Appendix A. Figures

Appendix B. Scoping Material

Appendix C. Transit Information

Appendix D. Traffic Count Summaries

Appendix E. Seasonal Adjustment Data

Appendix F. Crash Data

Appendix G. In-Process Data

Appendix H. Signal Information

Appendix I. Operations Calculations

Appendix J. Queuing Analysis

APPENDIX A.

FIGURES



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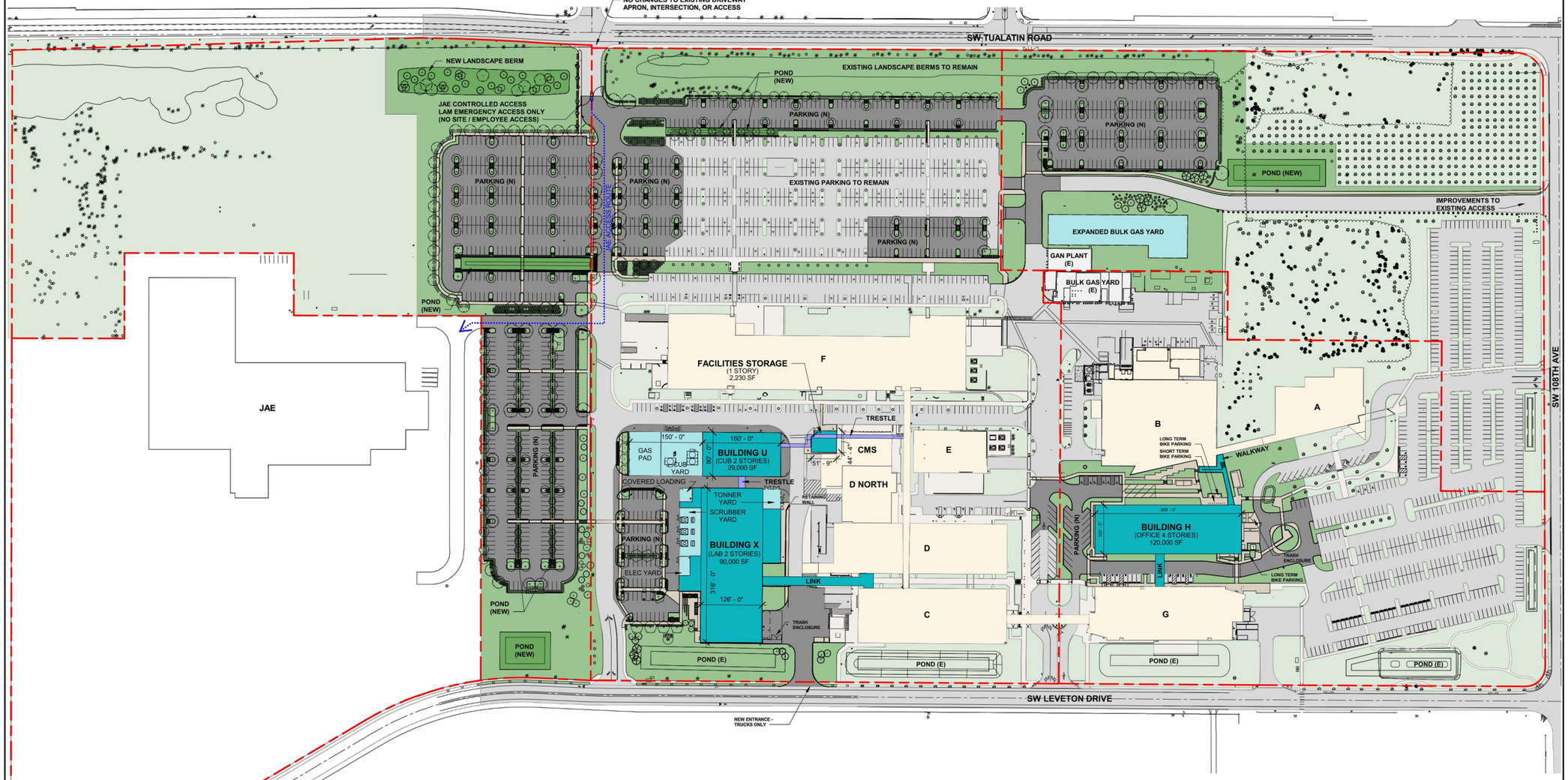
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VICINITY MAP

LAM TUX
TUALATIN, OR

FIGURE
1



1 A0.01 ARCHITECTURAL SITE PLAN
1" = 100'-0"

LEGEND

- EXISTING BUILDINGS
- NEW BUILDINGS (TOTAL: 241,230 SQ FT)
- NEW YARDS
- NEW TRESTLE
- NEW PEDESTRIAN
- NEW PARKING AND DRIVE AISLES
- NEW DETENTION POND
- RETAINING WALL
- PROPERTY LINE

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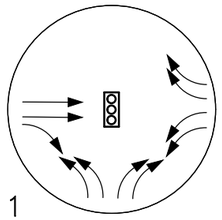
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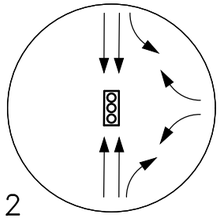
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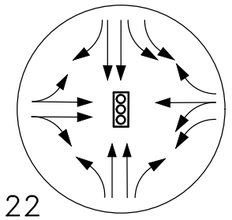
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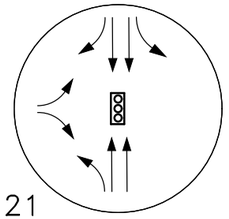
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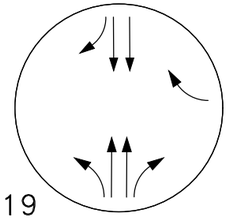
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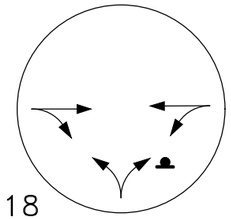


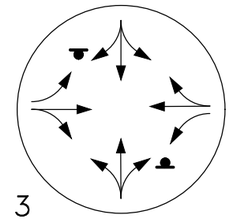


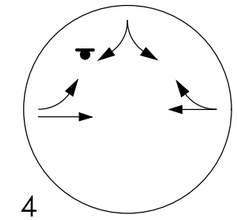


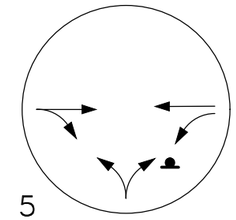


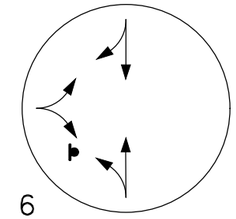


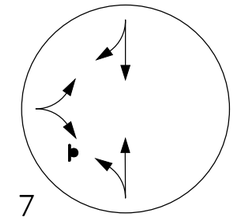


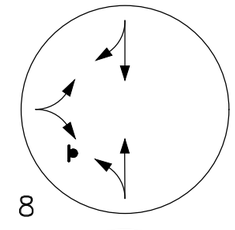


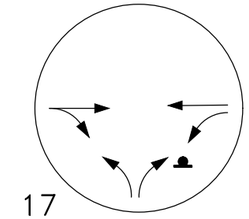


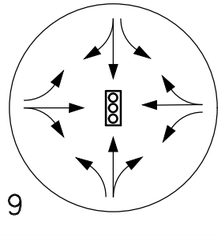


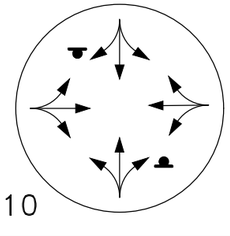


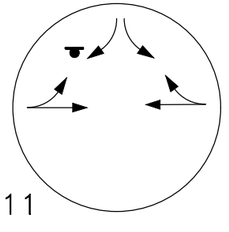


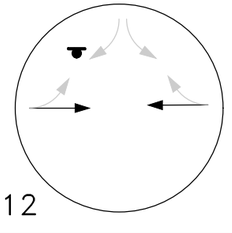


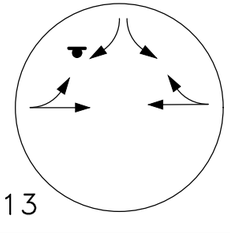


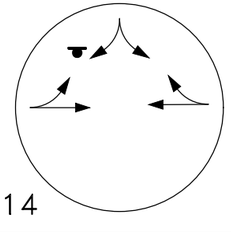


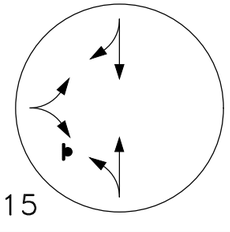


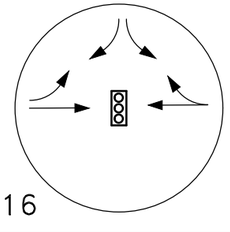


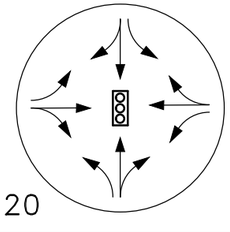


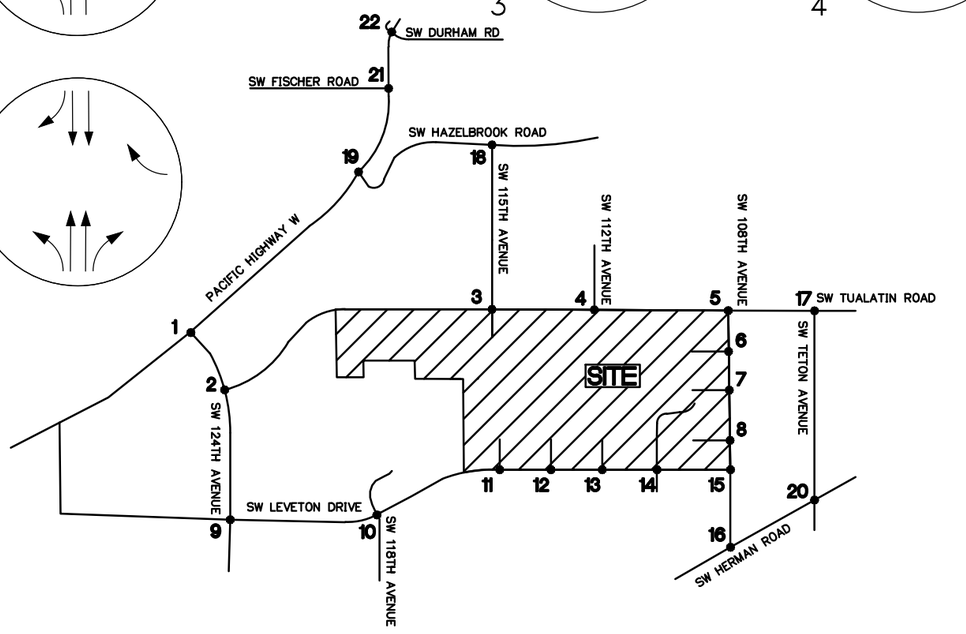


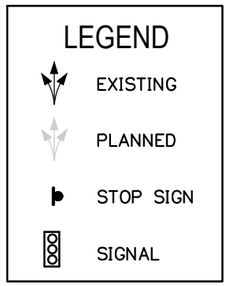












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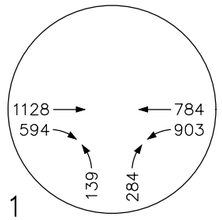
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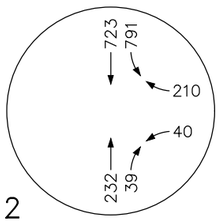
EXISTING + PLANNED TRAFFIC CONTROL DEVICES + LANE CONFIGURATIONS

LAM TUX
TUALATIN, OR

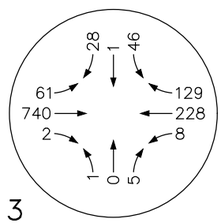
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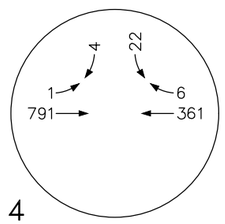
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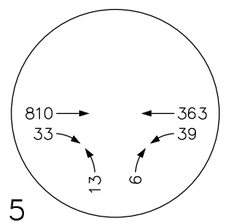
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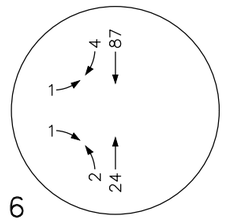
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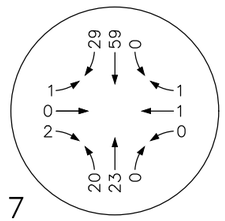
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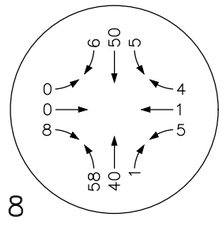
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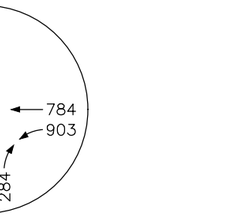
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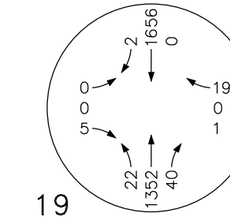
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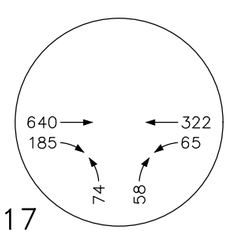
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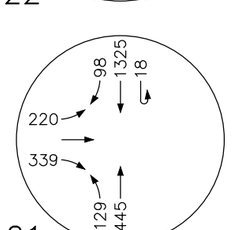
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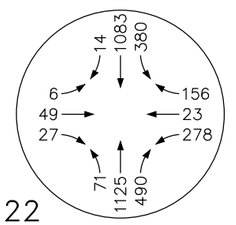


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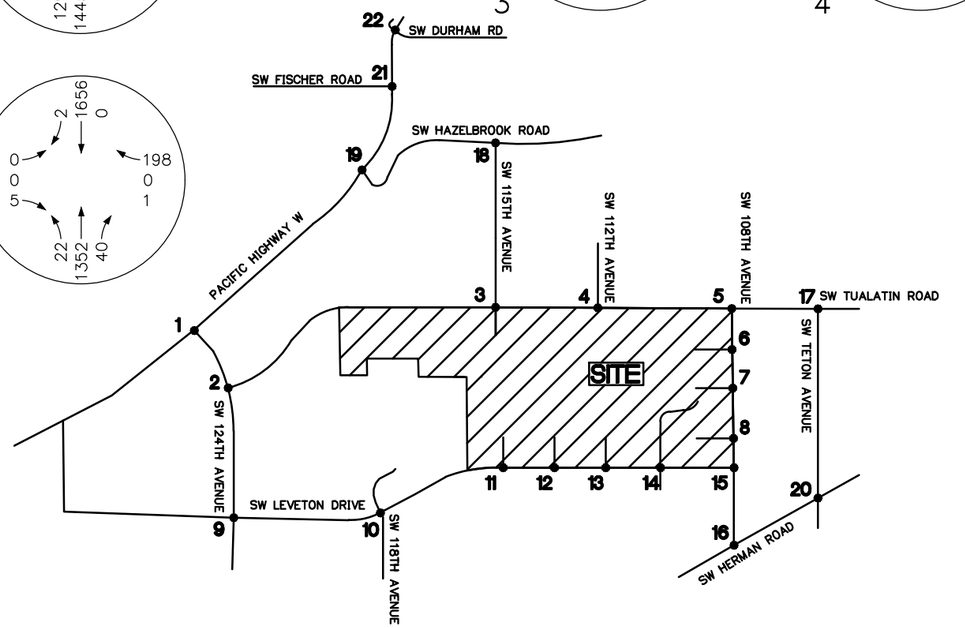


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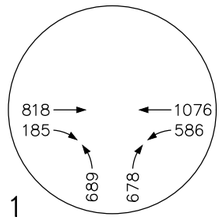
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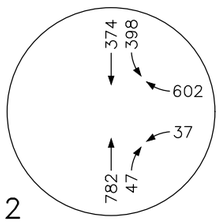
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TUALATIN, OR

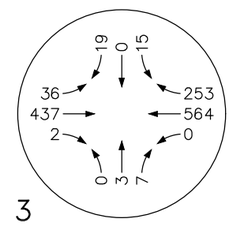
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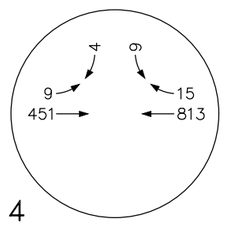
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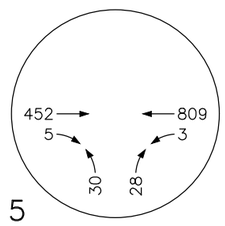
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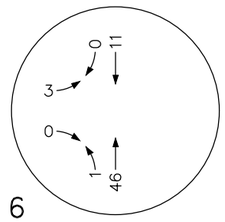
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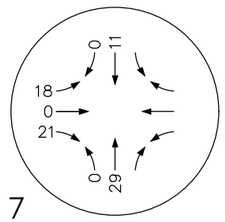
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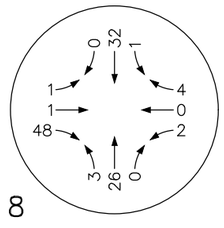
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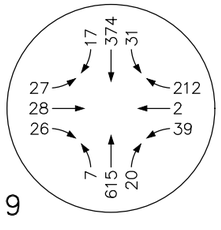
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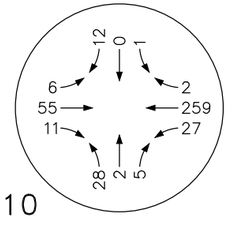
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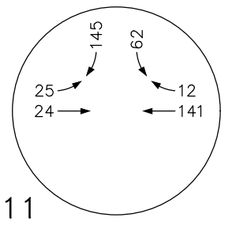
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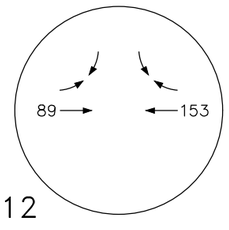
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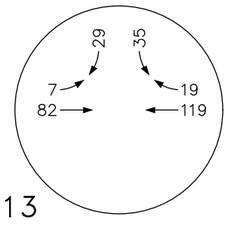
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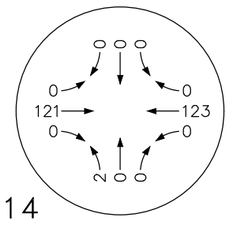
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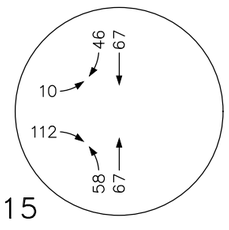
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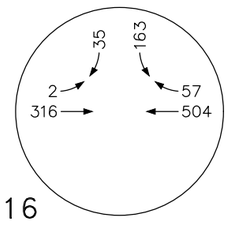
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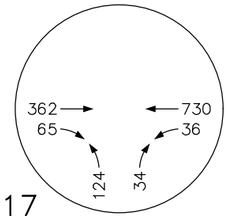
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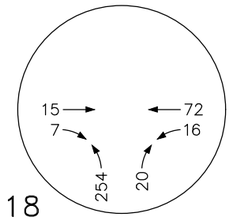
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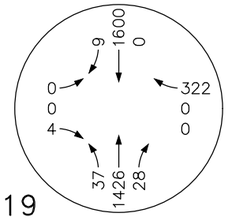
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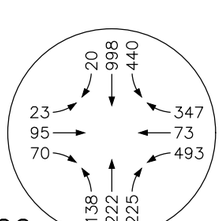
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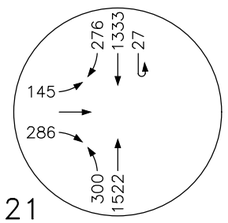
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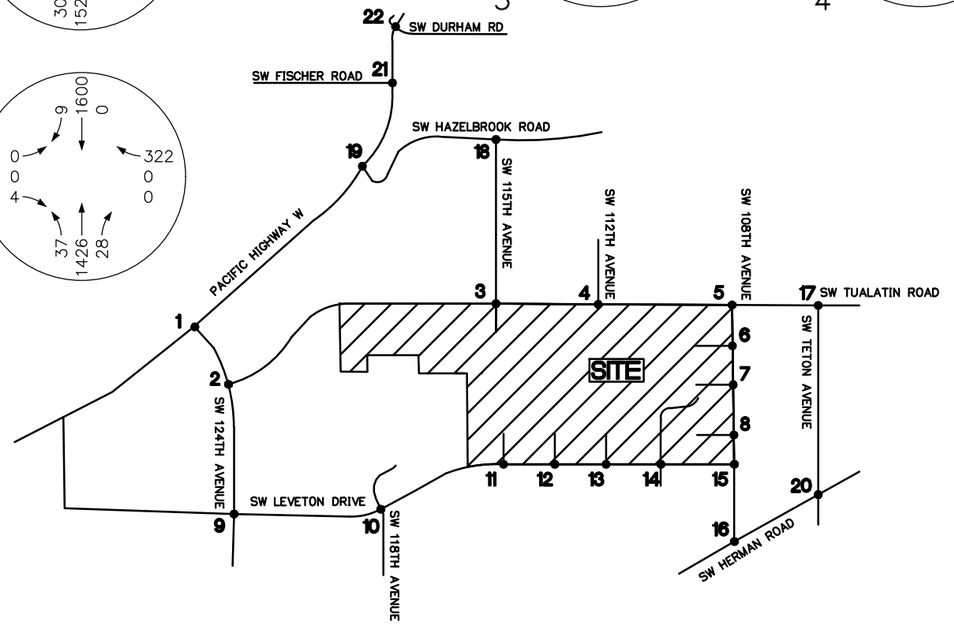
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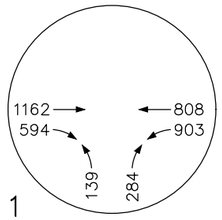
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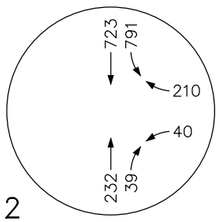
2025 EXISTING TRAFFIC VOLUMES - PM PEAK HOUR

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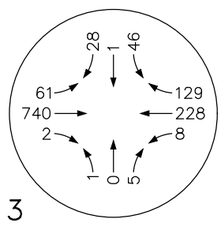
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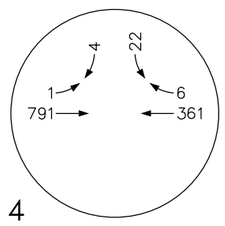
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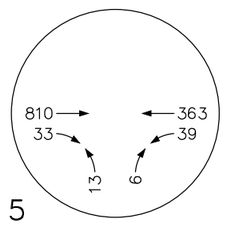
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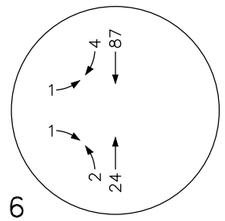
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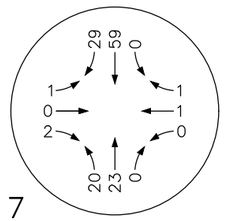
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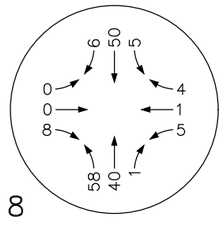
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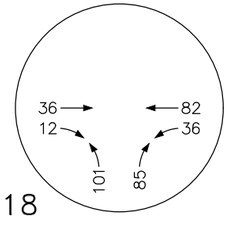
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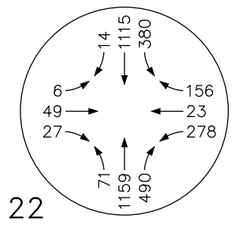
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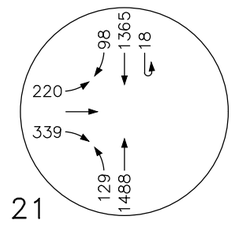
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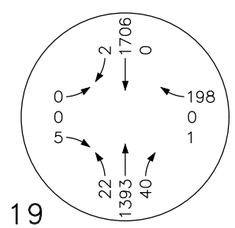
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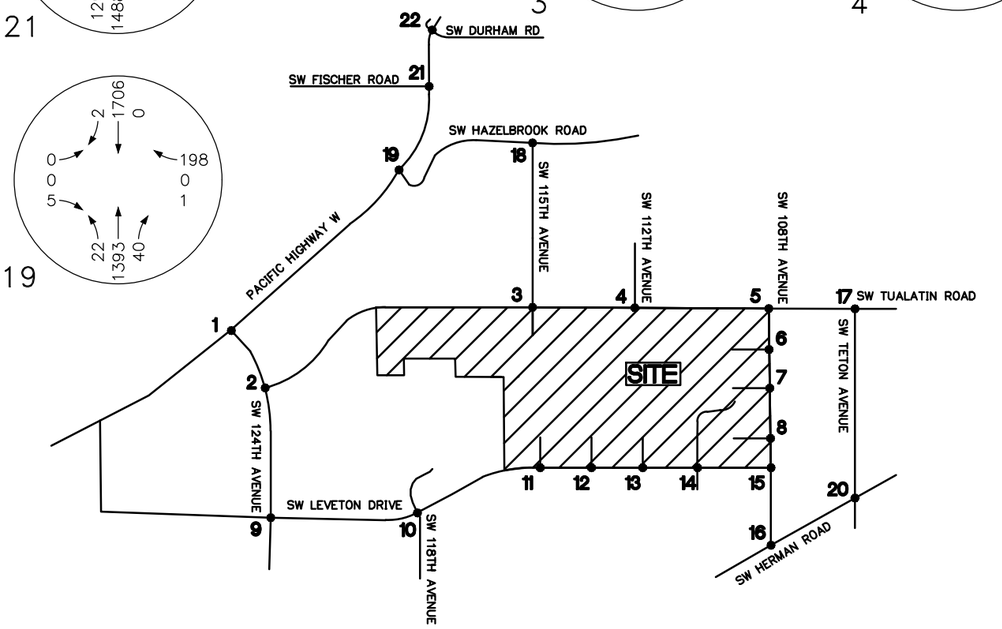
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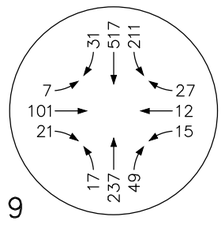


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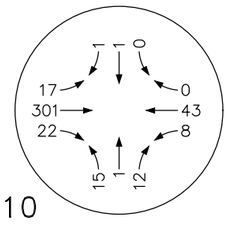


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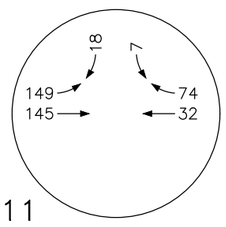




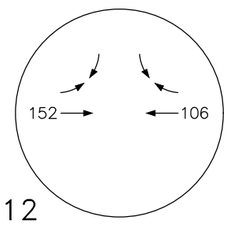
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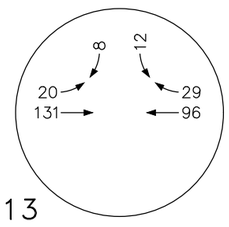
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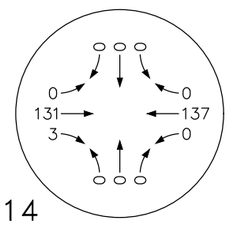
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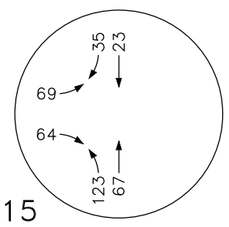
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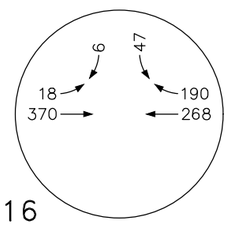
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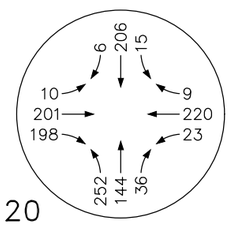
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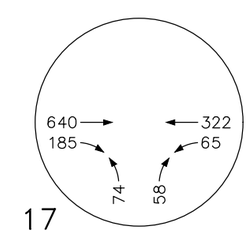
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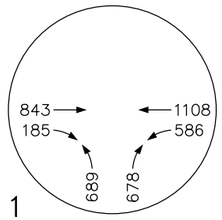
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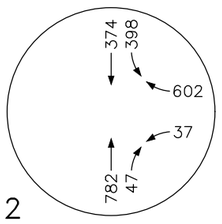
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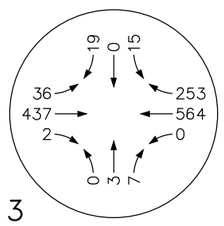
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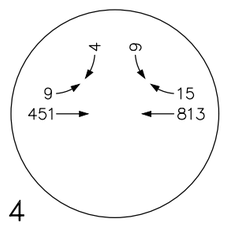
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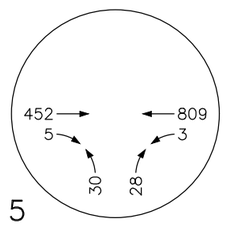
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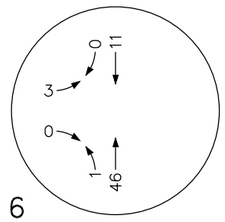
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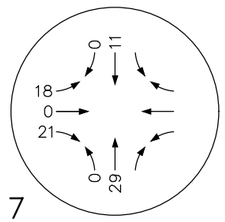
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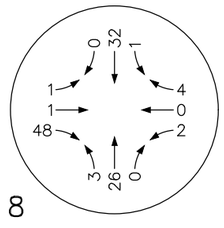
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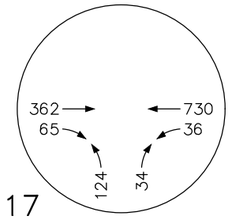
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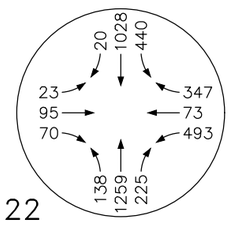
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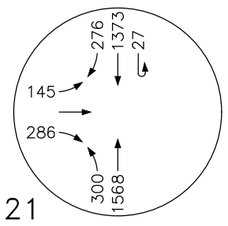
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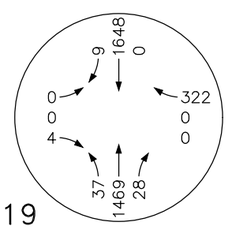
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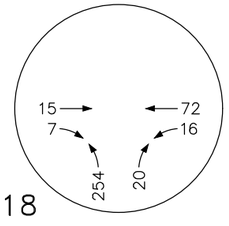
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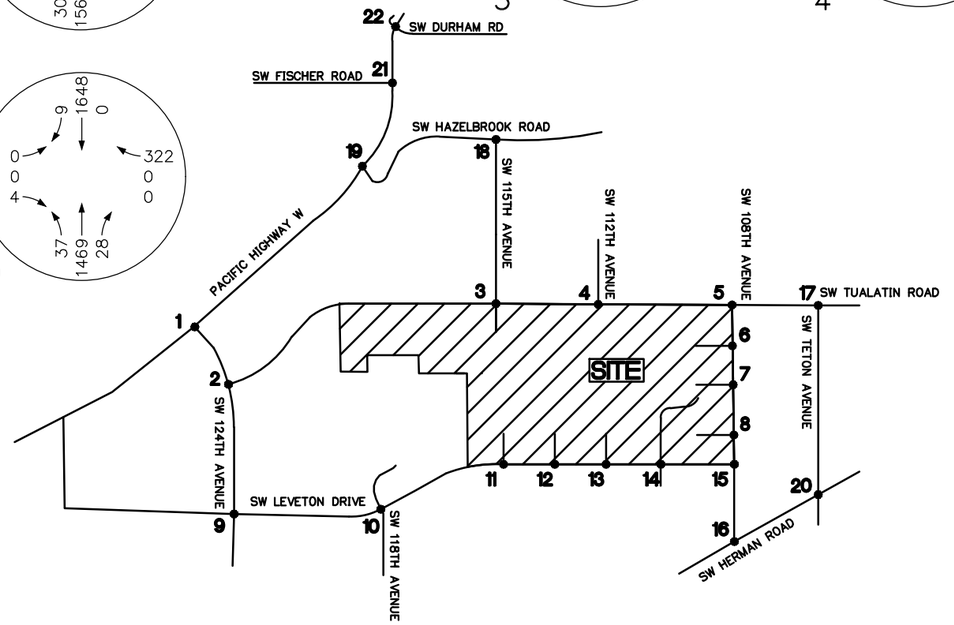


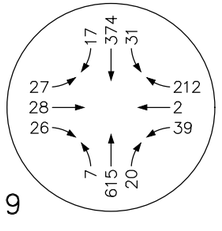
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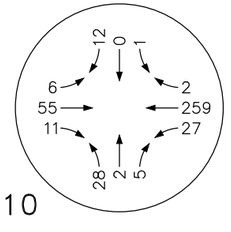
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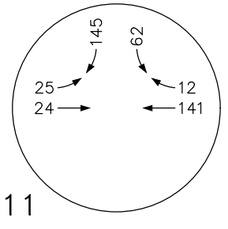




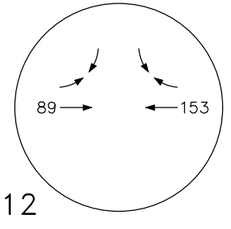
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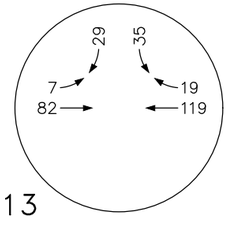
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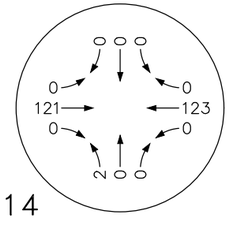
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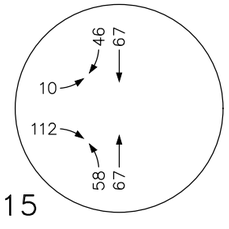
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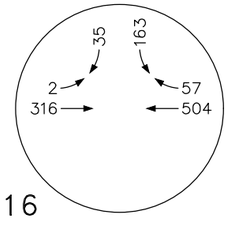
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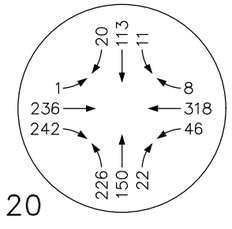
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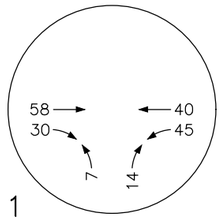
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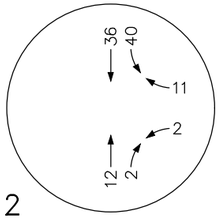
2025 SEASONALLY ADJUSTED TRAFFIC VOLUMES - PM PEAK HOUR

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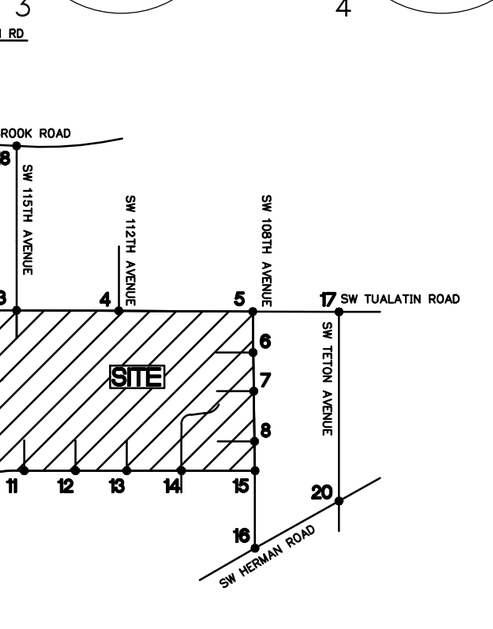
FIGURE
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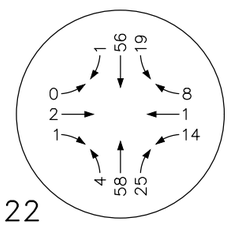


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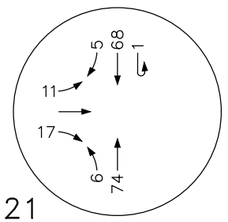


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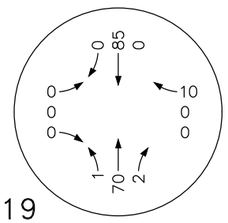




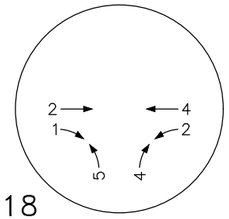
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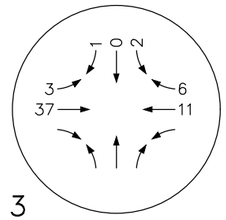
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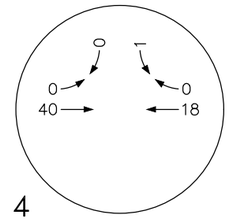
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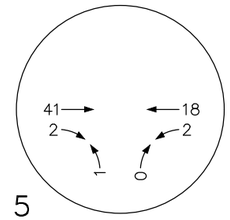
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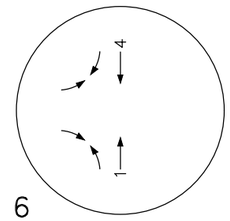
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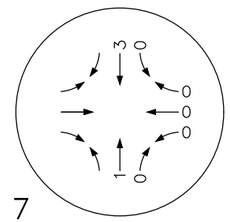
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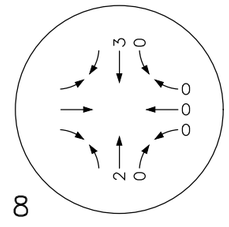
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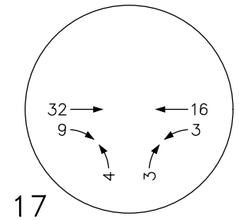
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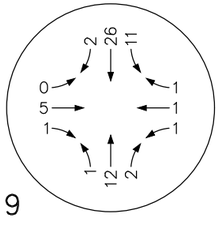
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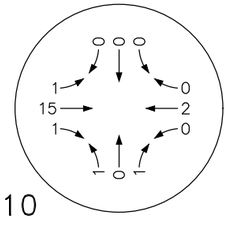
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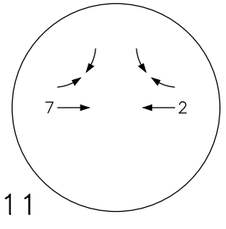
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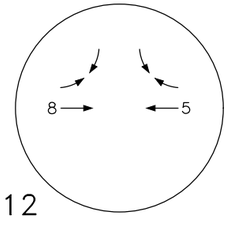
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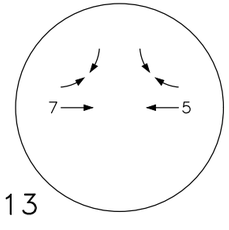
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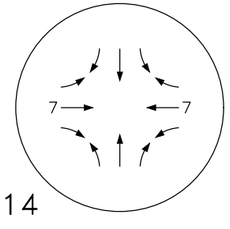
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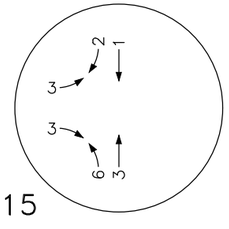
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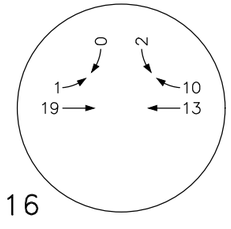
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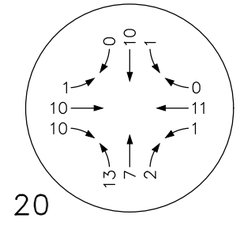
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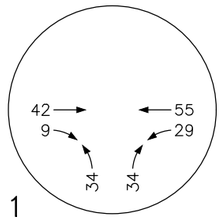
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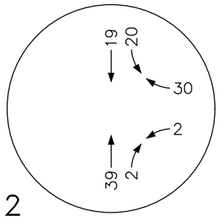
BACKGROUND GROWTH TO 2030, 5 YEARS AT 1% PER YEAR – AM PEAK HOUR

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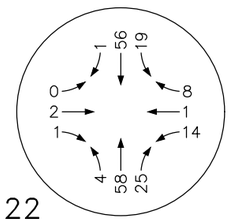
FIGURE 6A



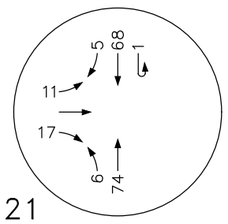
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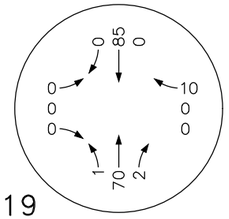
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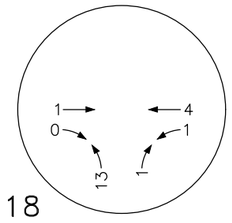
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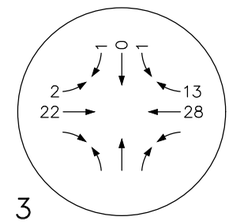
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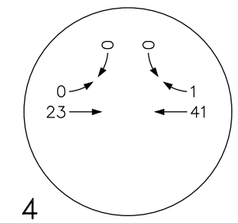
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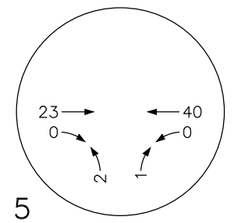
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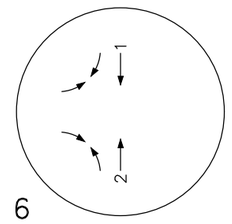
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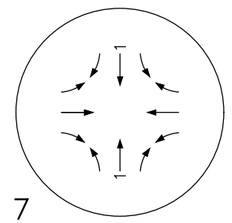
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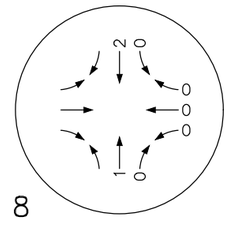
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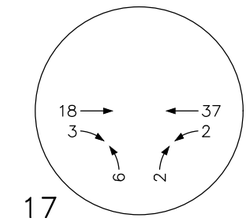
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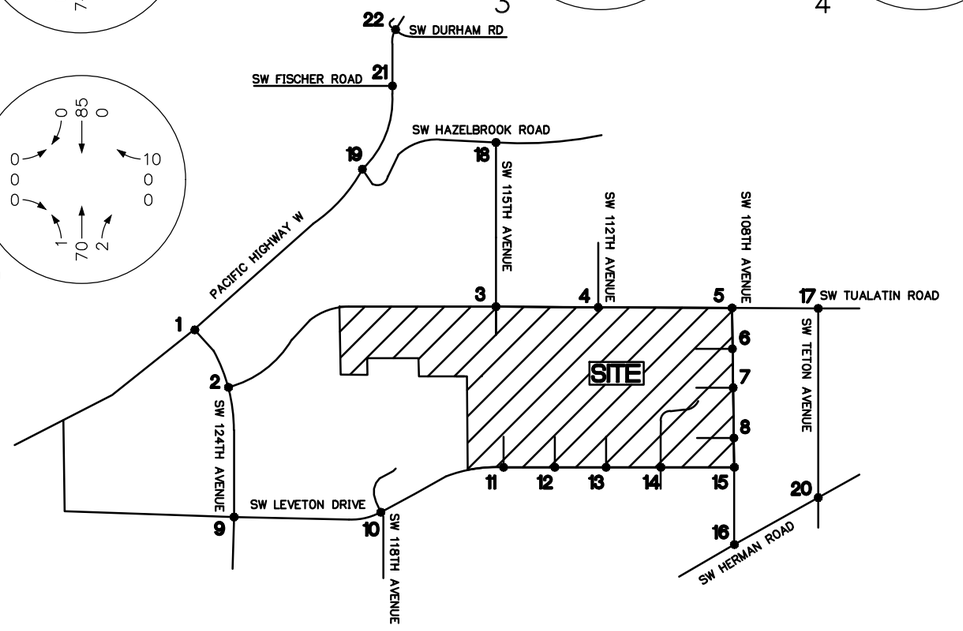
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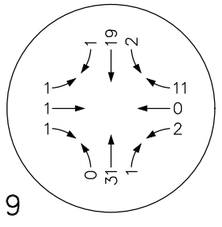


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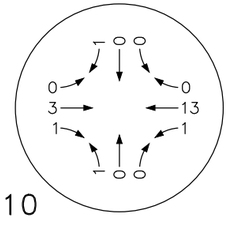


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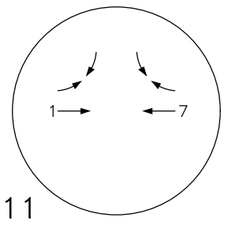




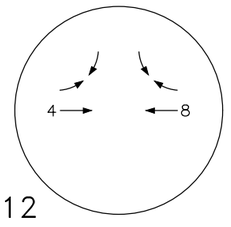
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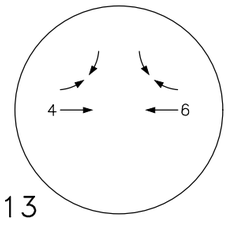
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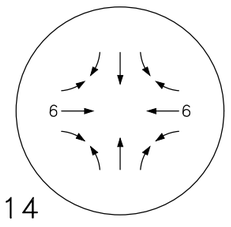
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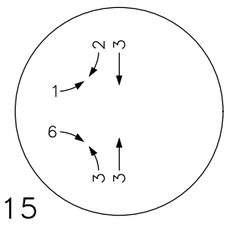
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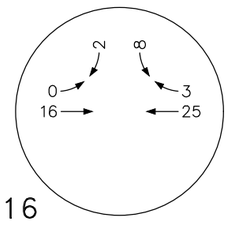
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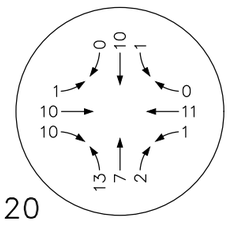
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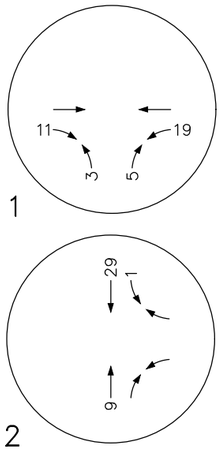
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CHECKED BY: BTA
JOB NO: 225018000

BACKGROUND GROWTH TO 2030, 5 YEARS AT 1% PER YEAR - PM PEAK HOUR

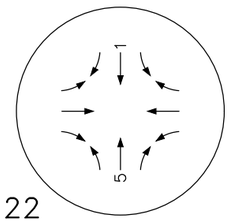
LAM TUX
TUALATIN, OR

FIGURE 6B

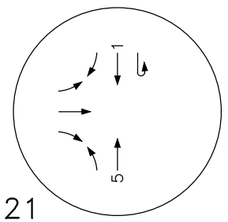


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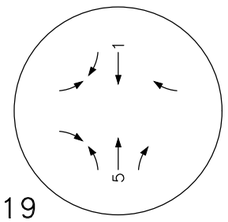
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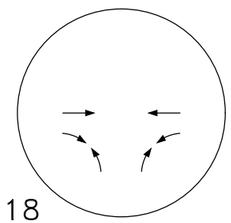
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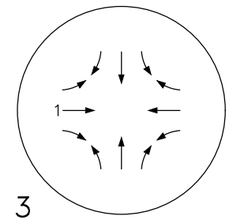
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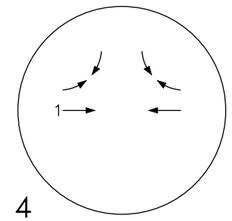
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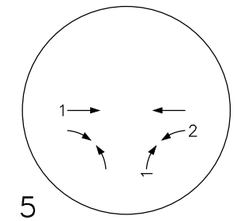
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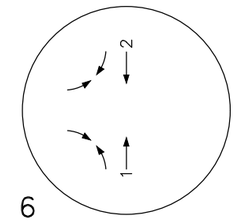
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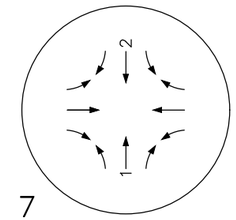
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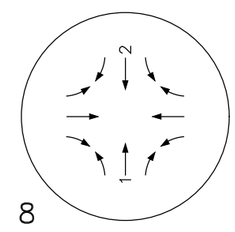
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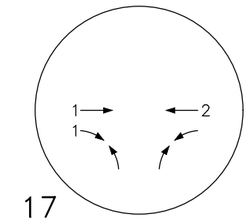
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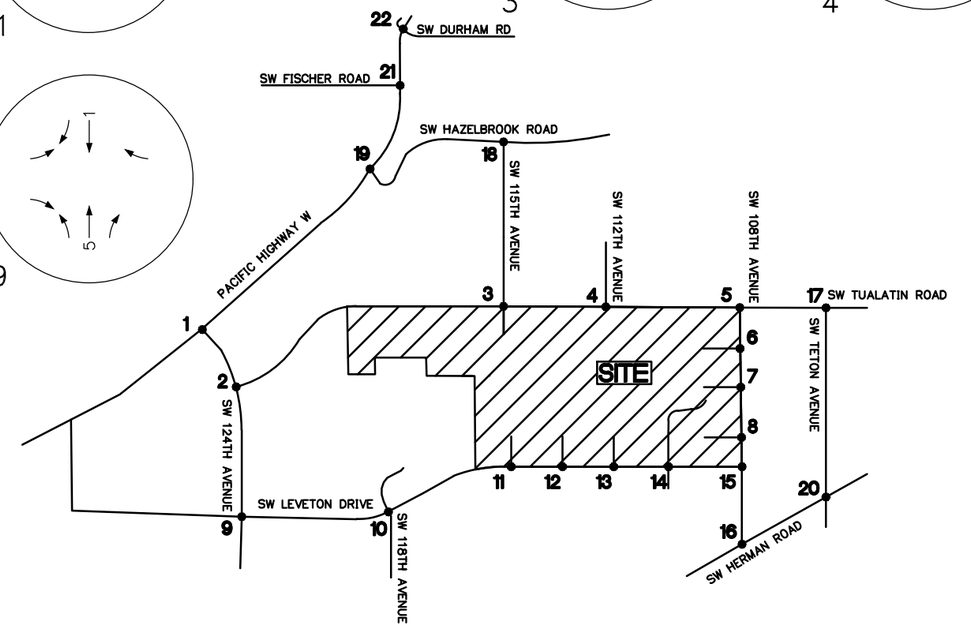
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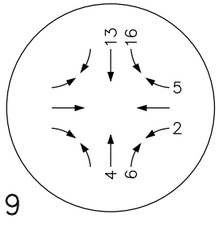


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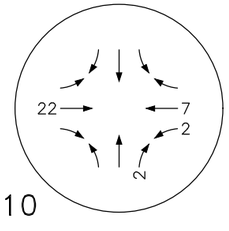


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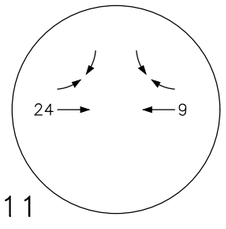




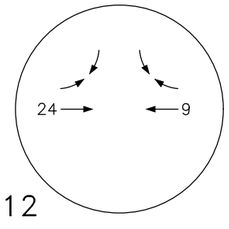
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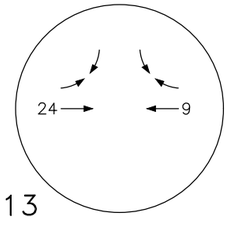
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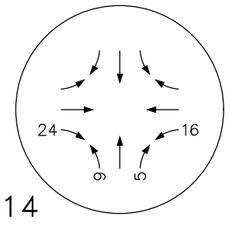
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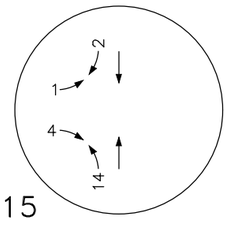
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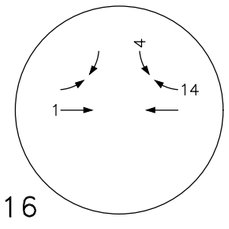
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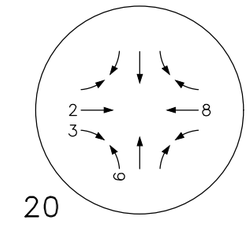
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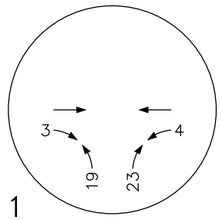
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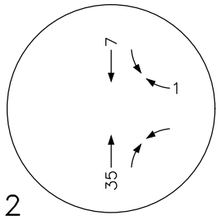
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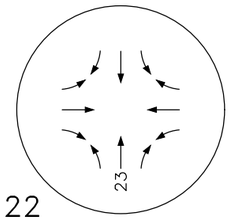
FIGURE
7A



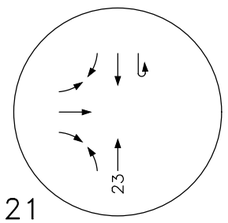
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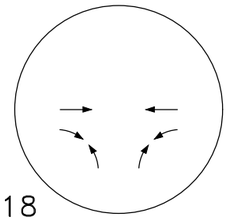


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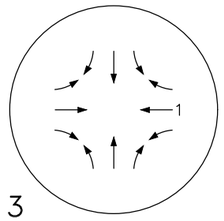


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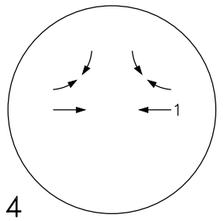
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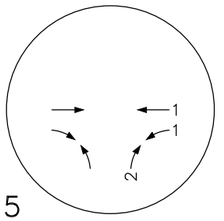
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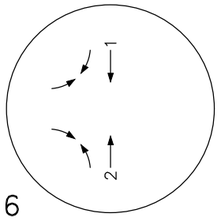
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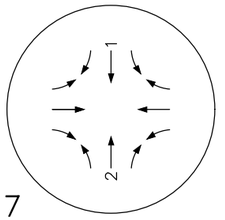
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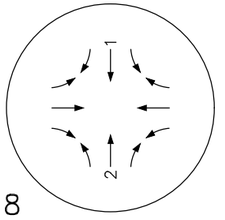
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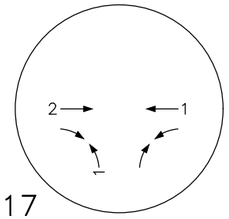
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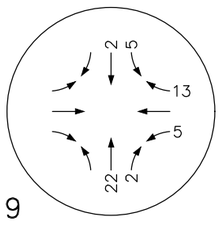
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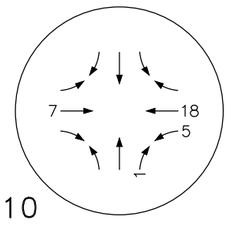
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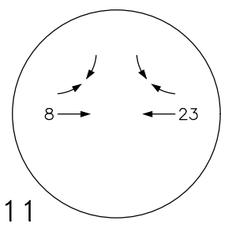
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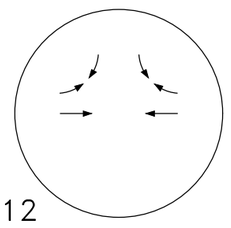
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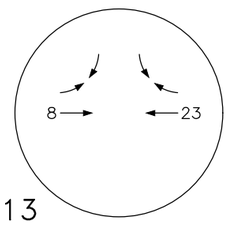
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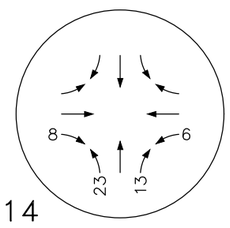
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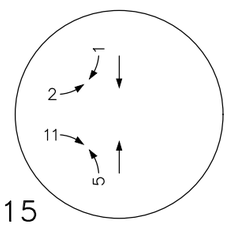
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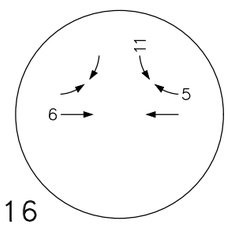
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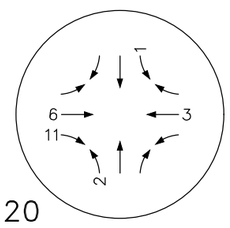
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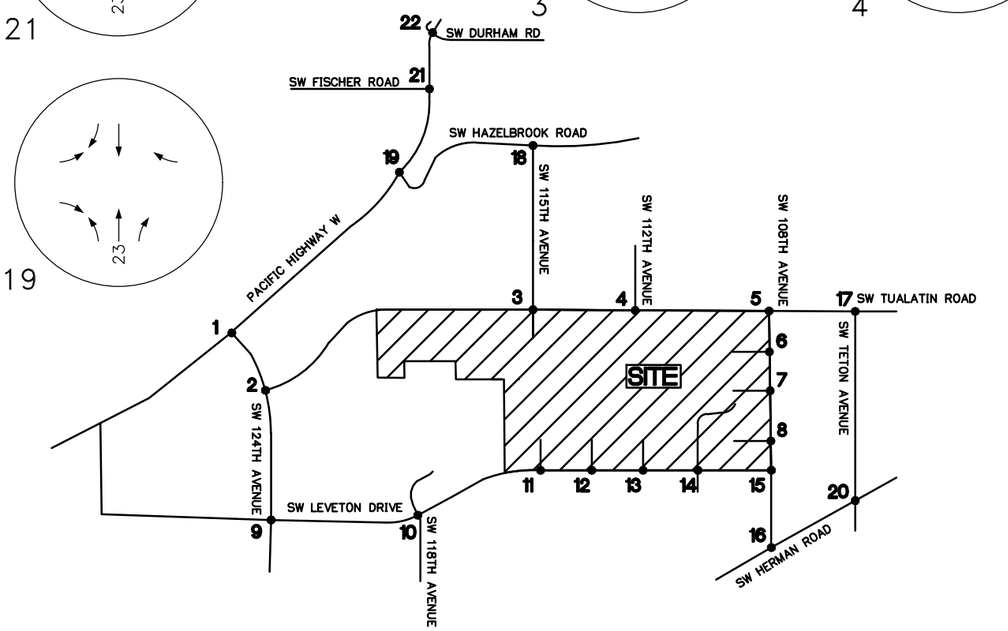
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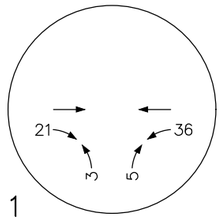
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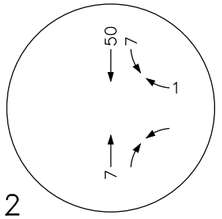
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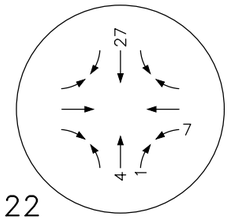
FIGURE
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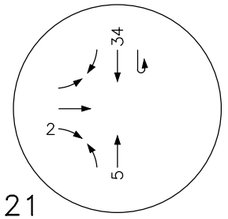
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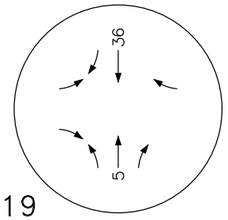
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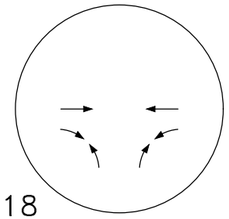
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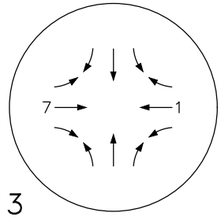
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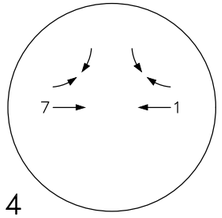
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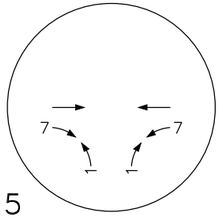
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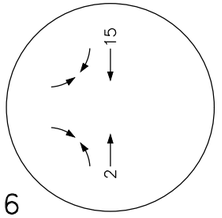
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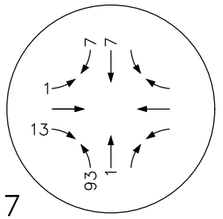
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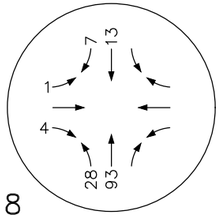
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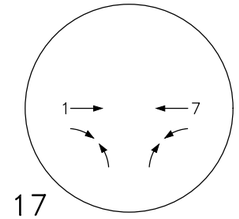
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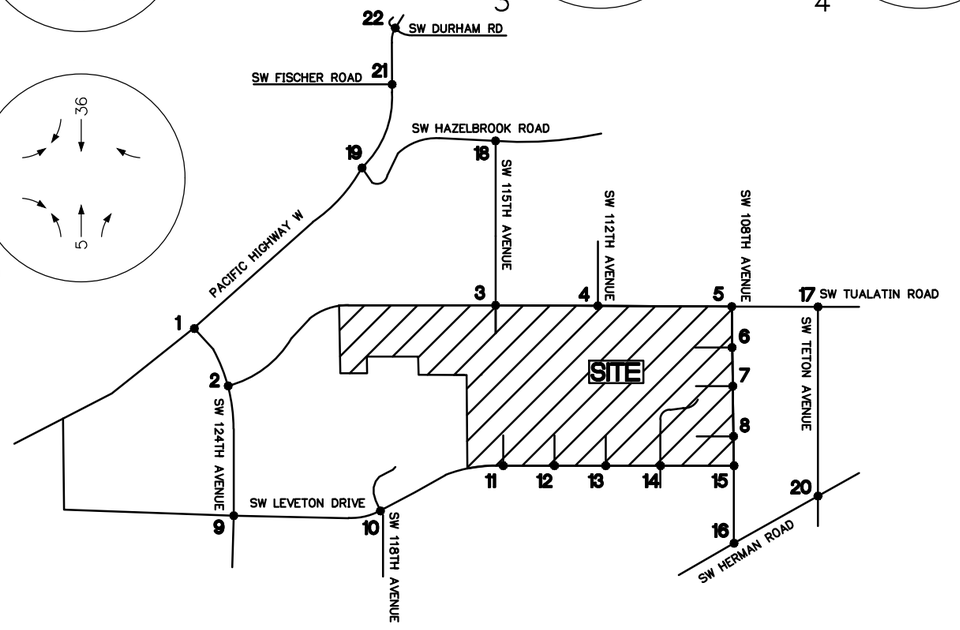
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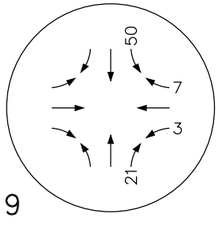


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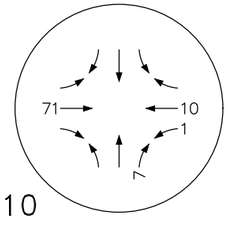


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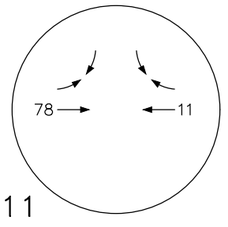




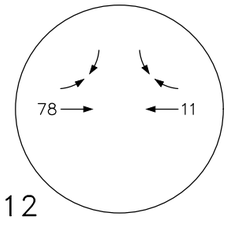
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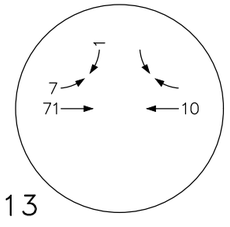
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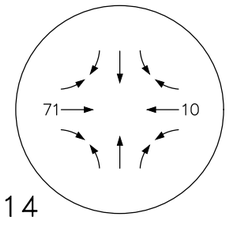
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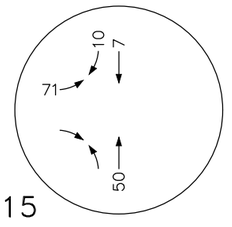
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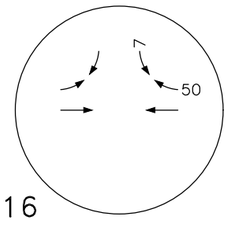
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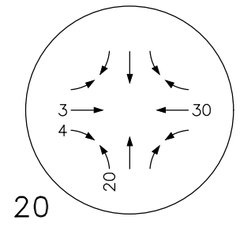
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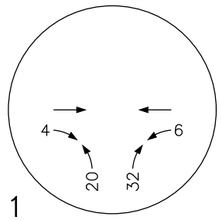
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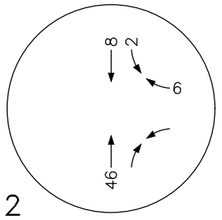
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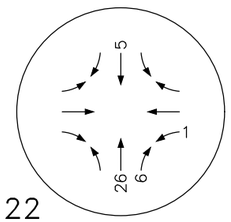
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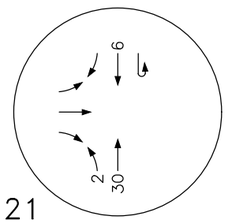
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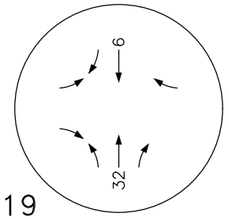
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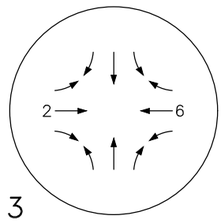


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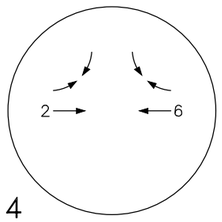


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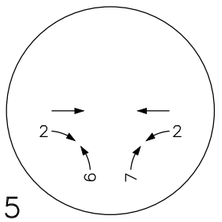
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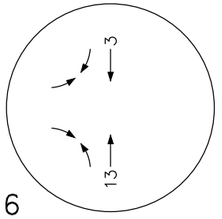
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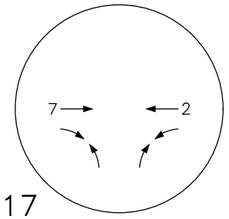
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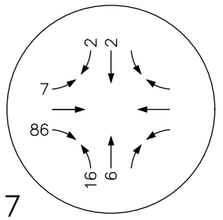
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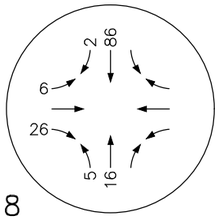
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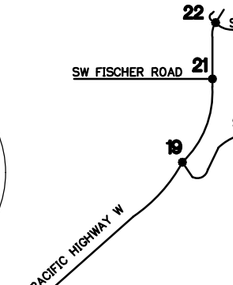
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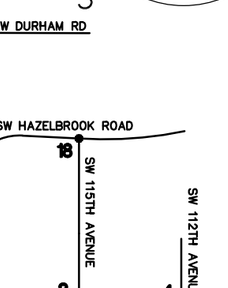
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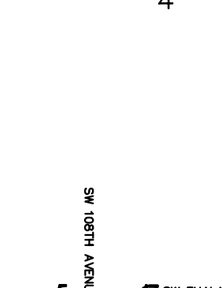
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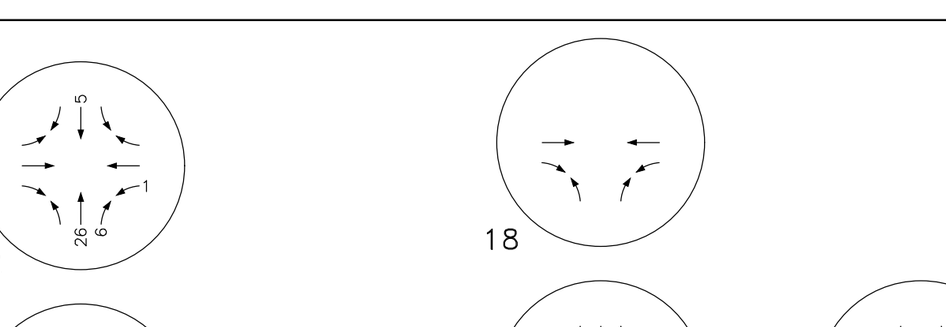
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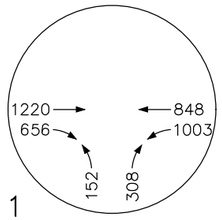
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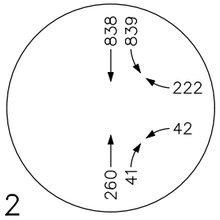
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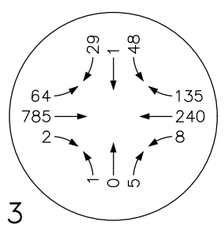
FIGURE
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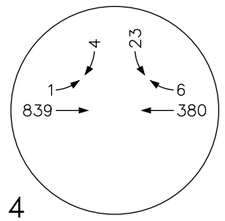
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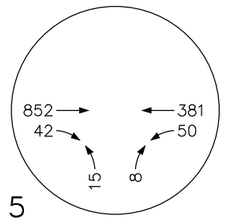
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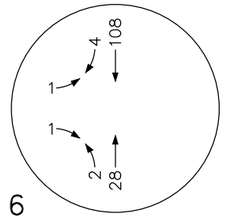
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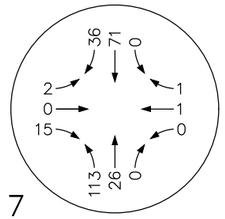
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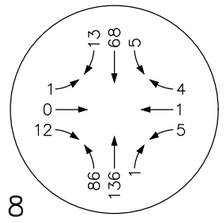
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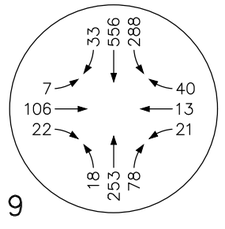
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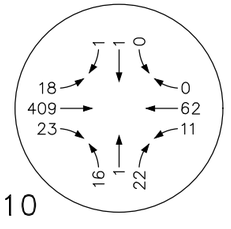
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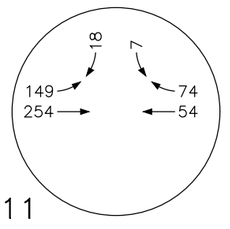
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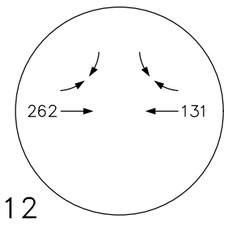
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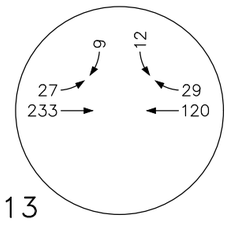
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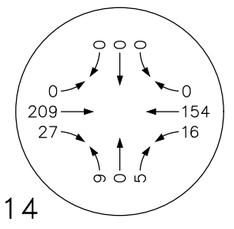
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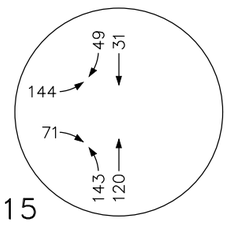
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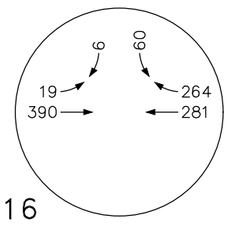
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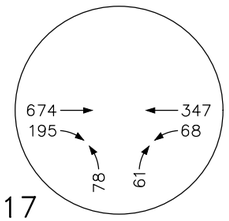
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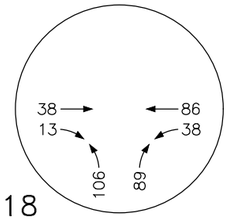
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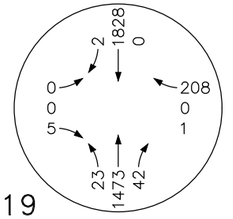
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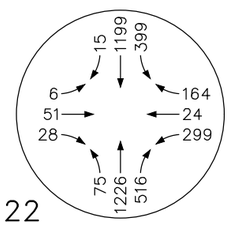
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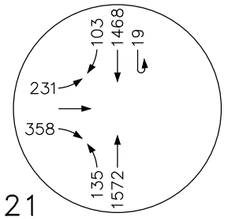
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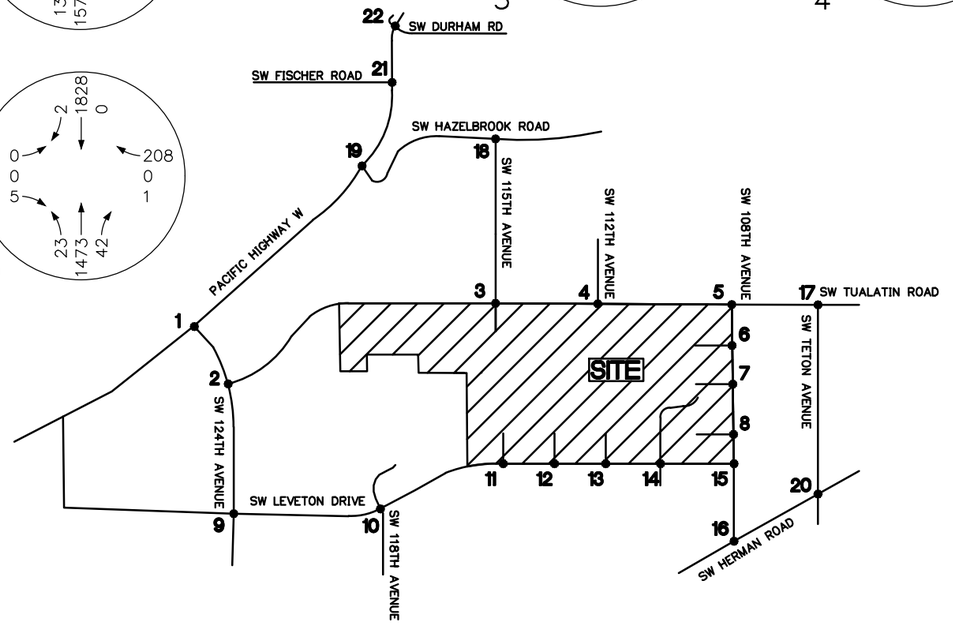
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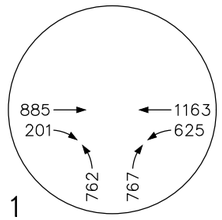
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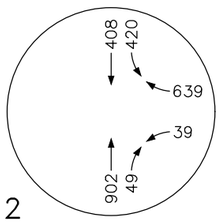
2030 PRE-DEVELOPMENT TRAFFIC VOLUMES - AM PEAK HOUR

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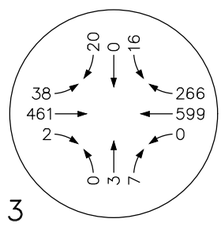
FIGURE
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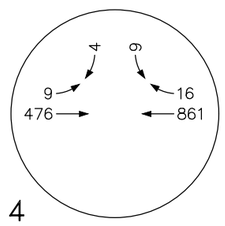
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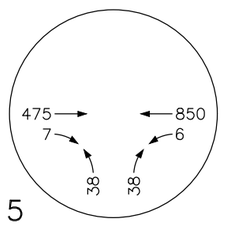
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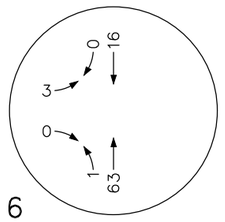
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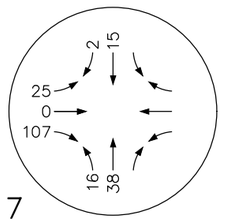
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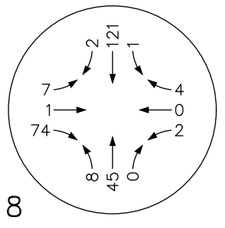
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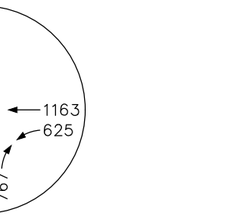
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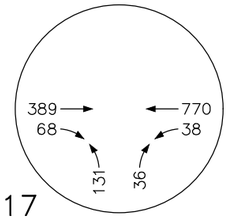
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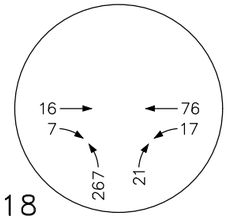
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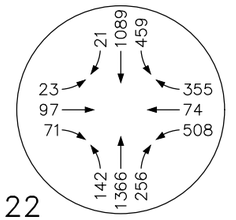
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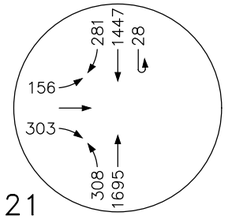
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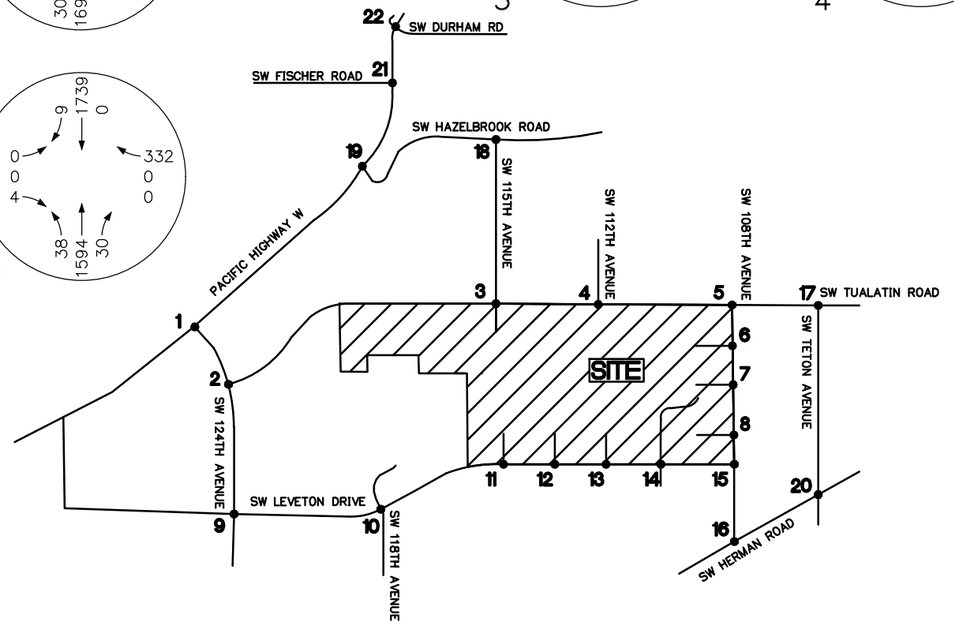
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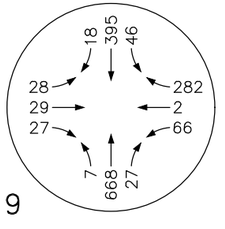


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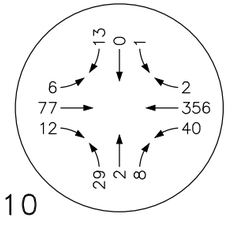


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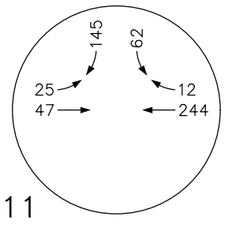




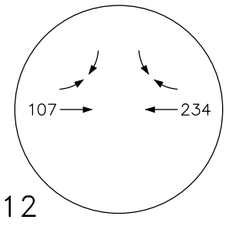
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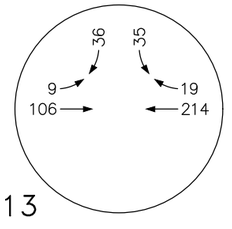
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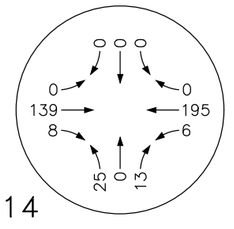
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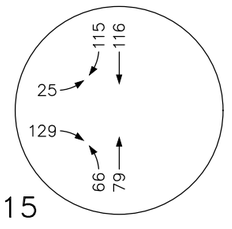
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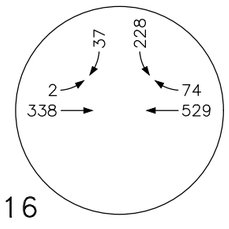
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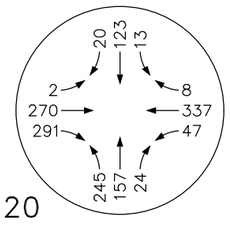
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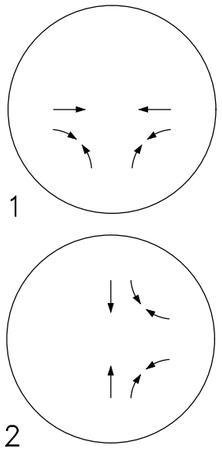
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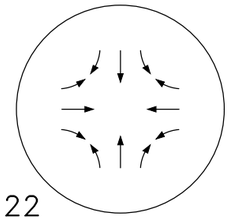
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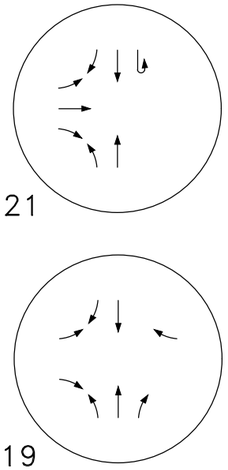
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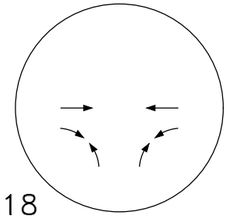
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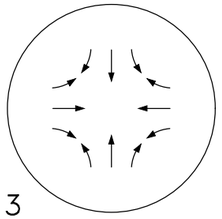
FIGURE
9B

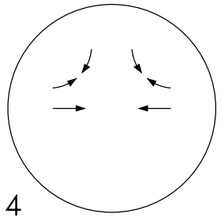


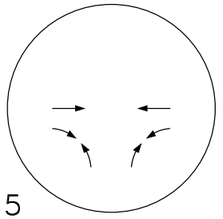


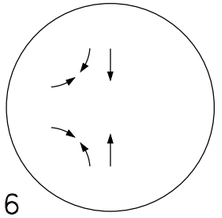


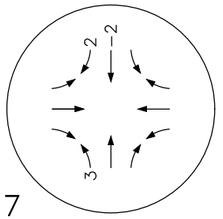


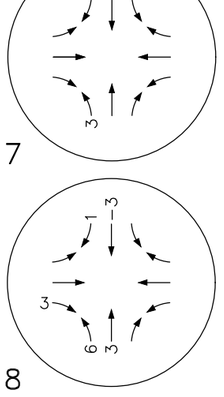


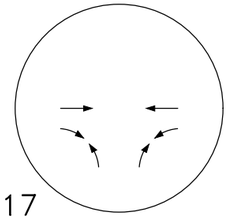


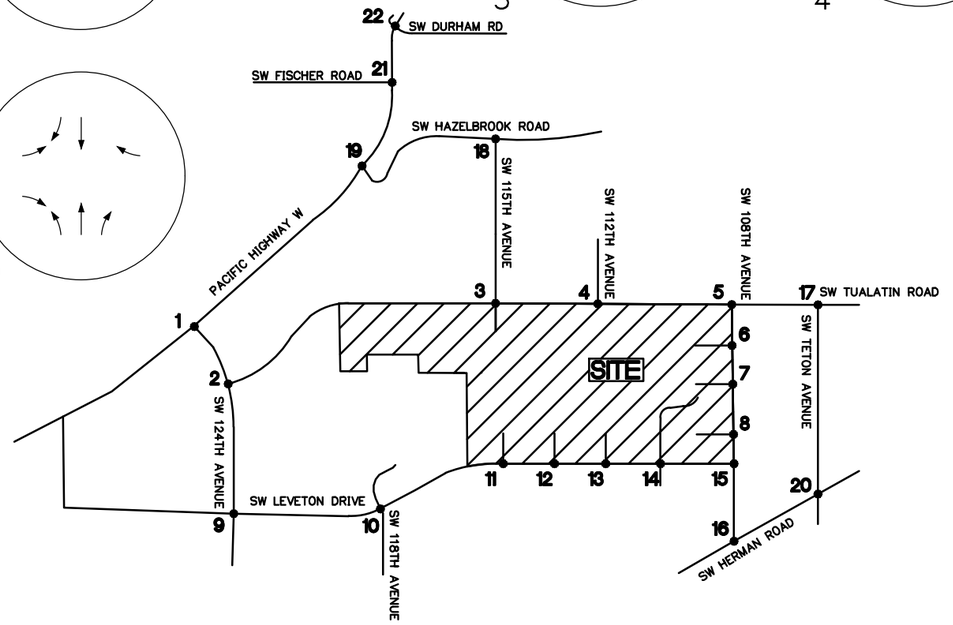


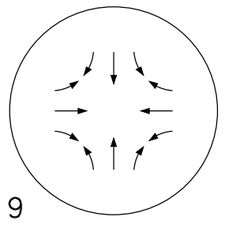


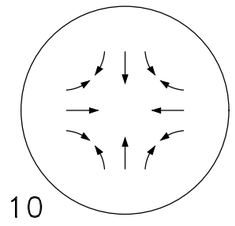


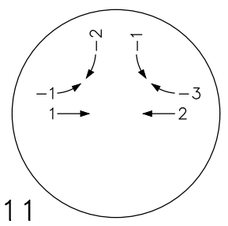


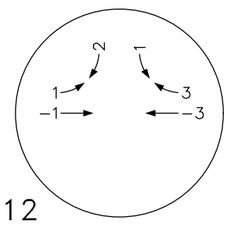


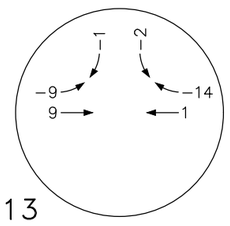


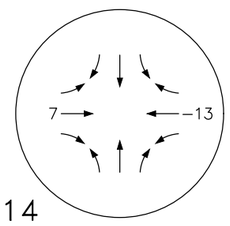


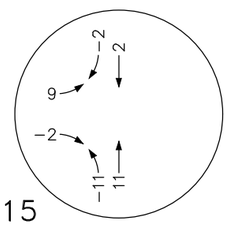


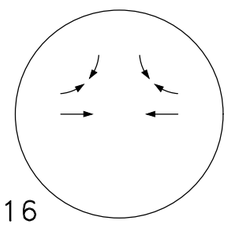


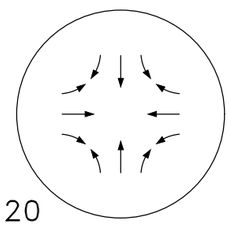












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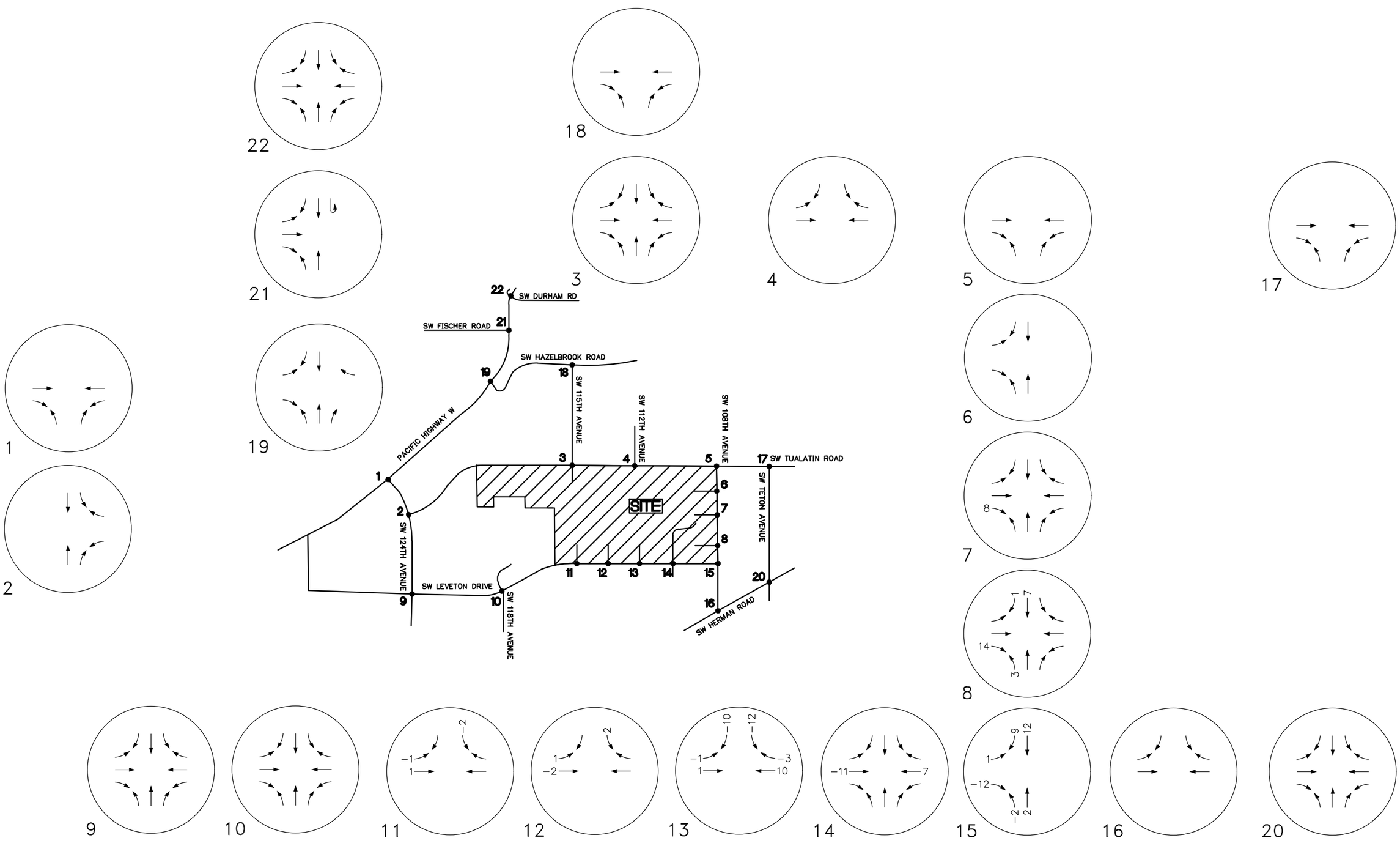
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LEVETON ACCESS REROUTED VOLUMES - AM PEAK HOUR

LAM TUX
TUALATIN, OR

FIGURE
10A



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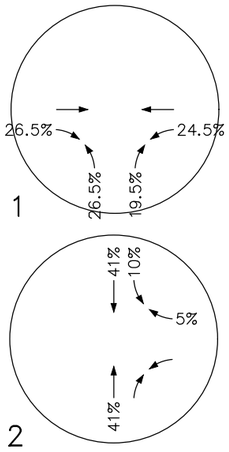
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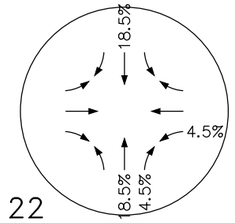
LAM TUX
TUALATIN, OR

FIGURE
10B

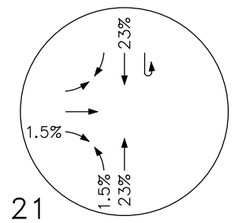


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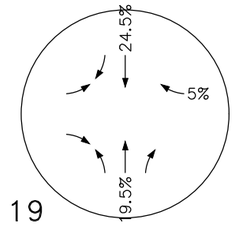
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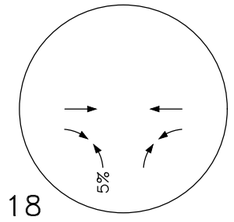
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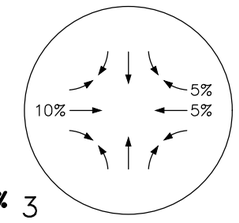
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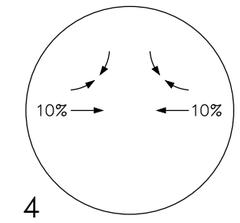
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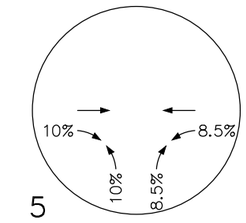
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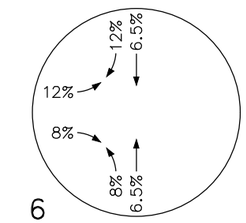
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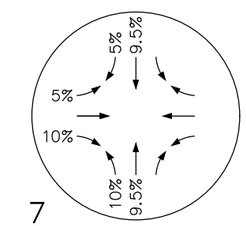
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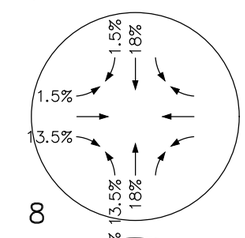
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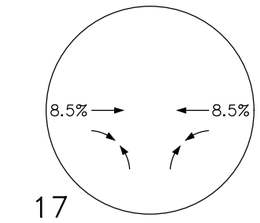
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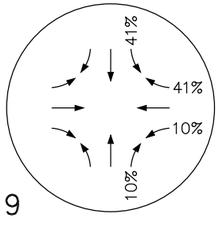
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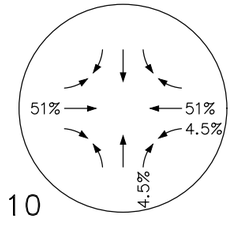
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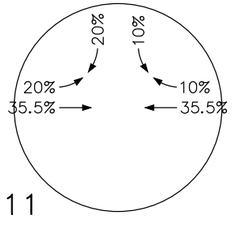
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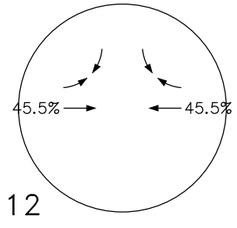
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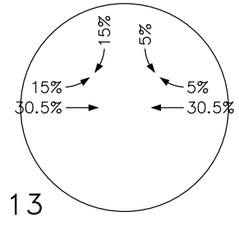
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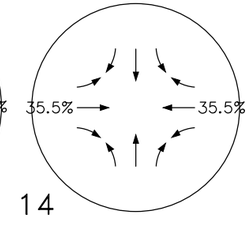
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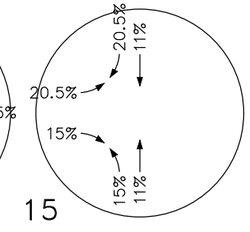
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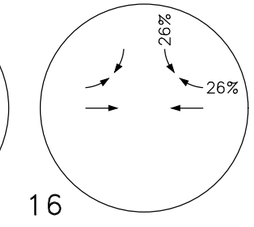
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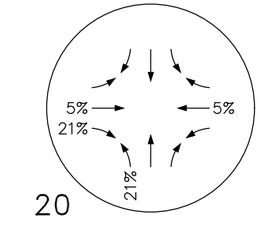
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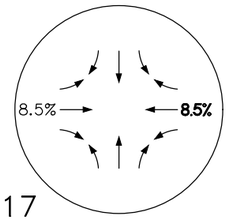
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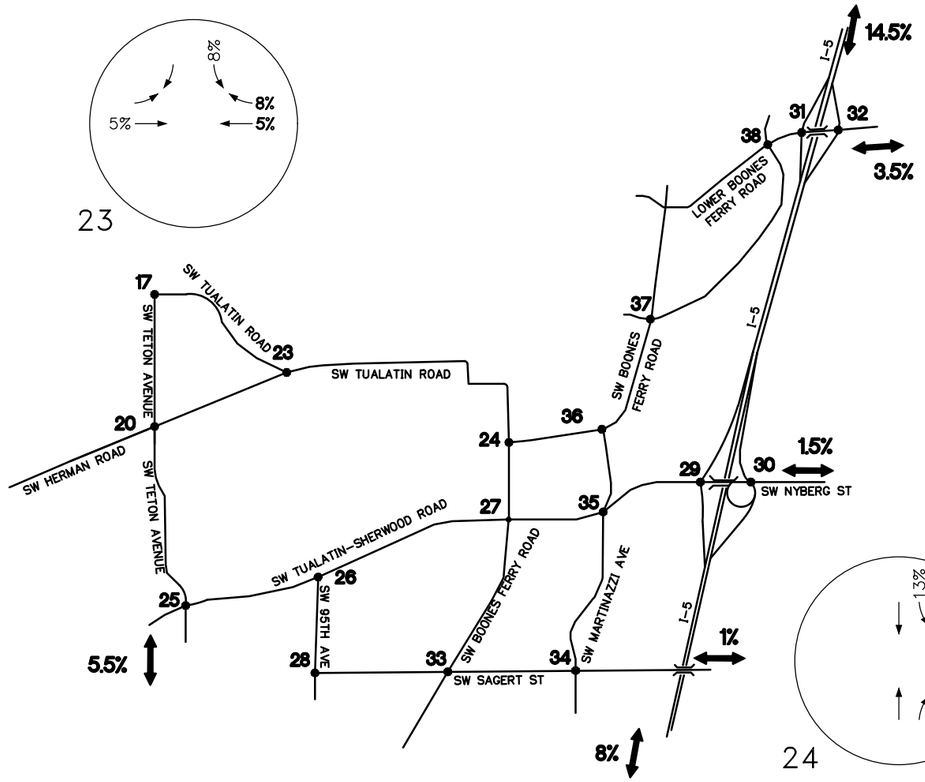
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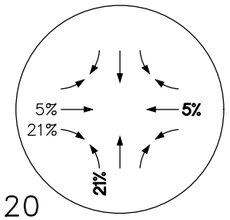
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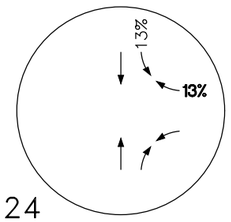
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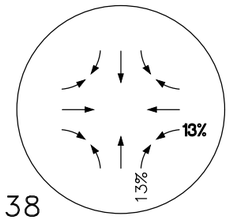




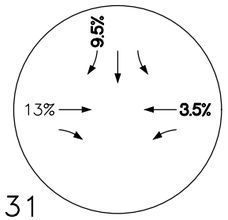
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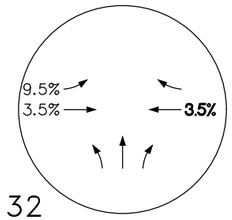
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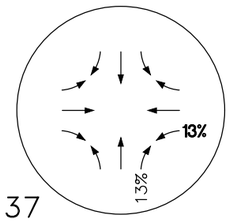
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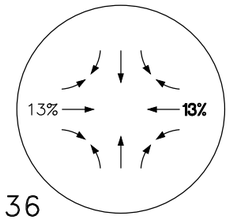
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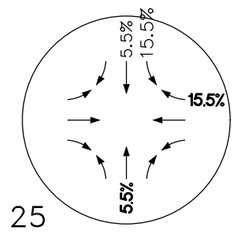
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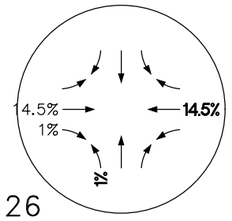
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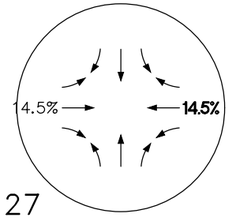
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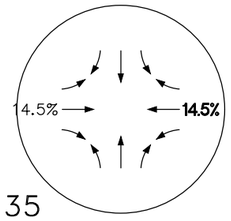
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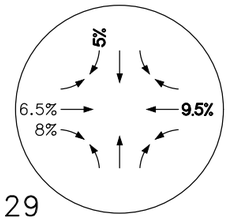
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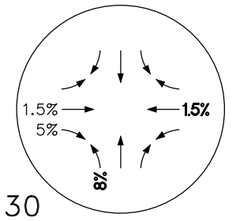
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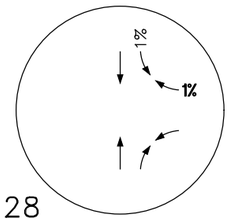
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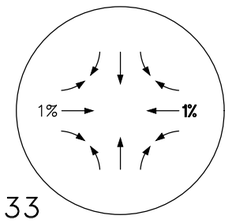
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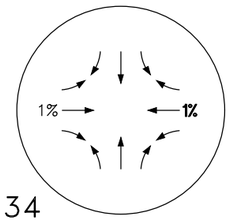
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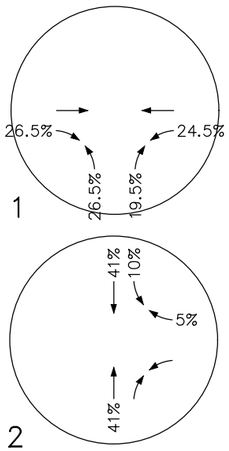
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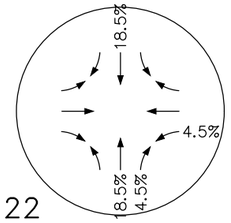
LAM TUX
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FIGURE
11B

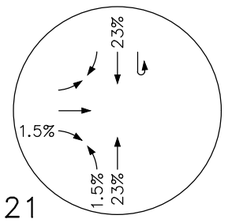


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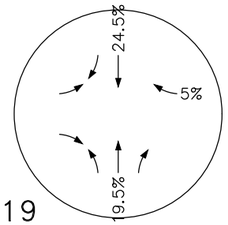
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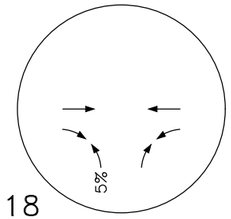
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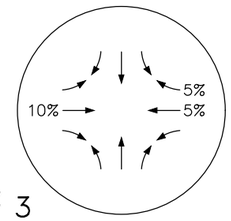
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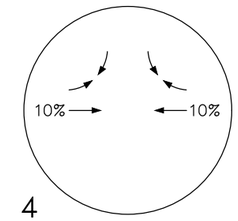
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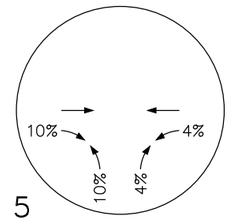
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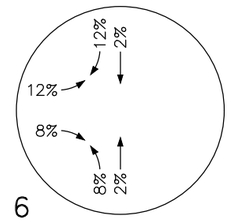
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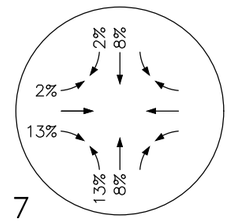
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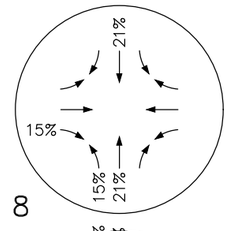
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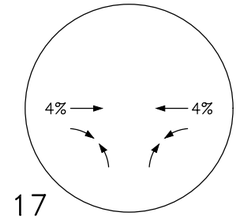
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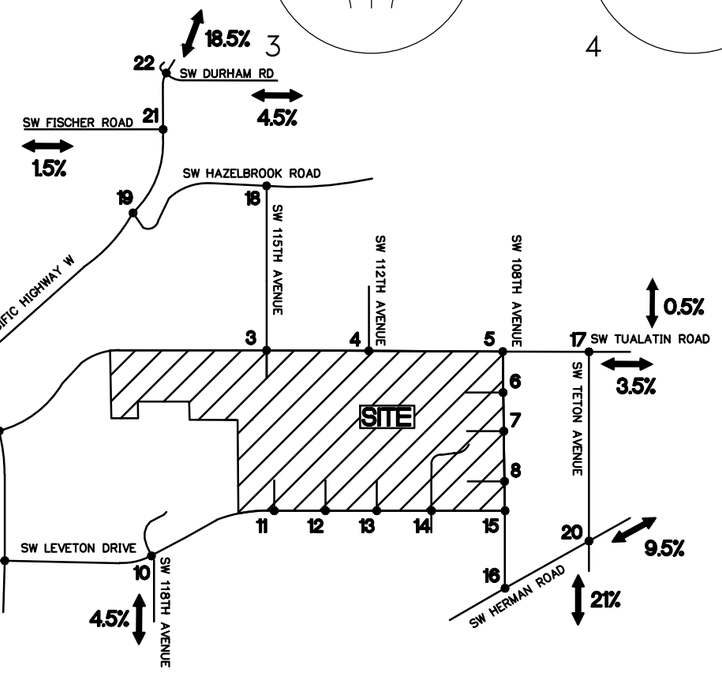
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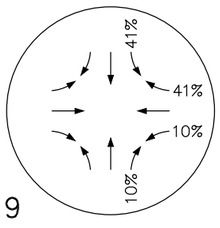


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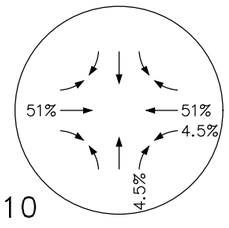


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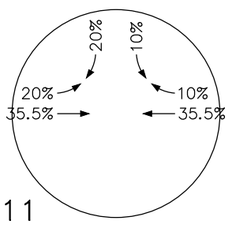




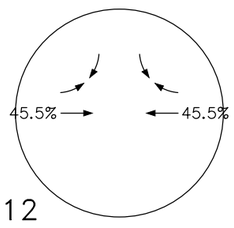
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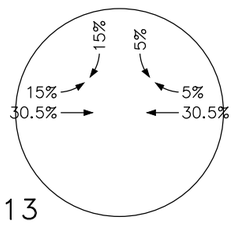
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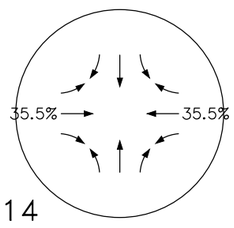
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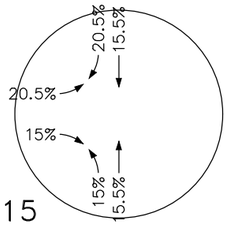
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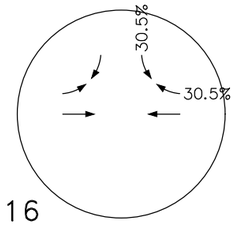
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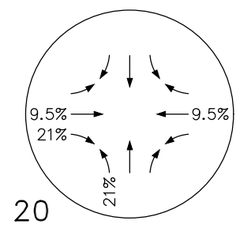
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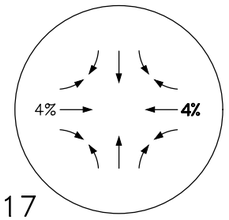
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DRAWN BY: CNL
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JOB NO: 225018000

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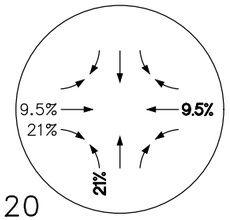
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FIGURE
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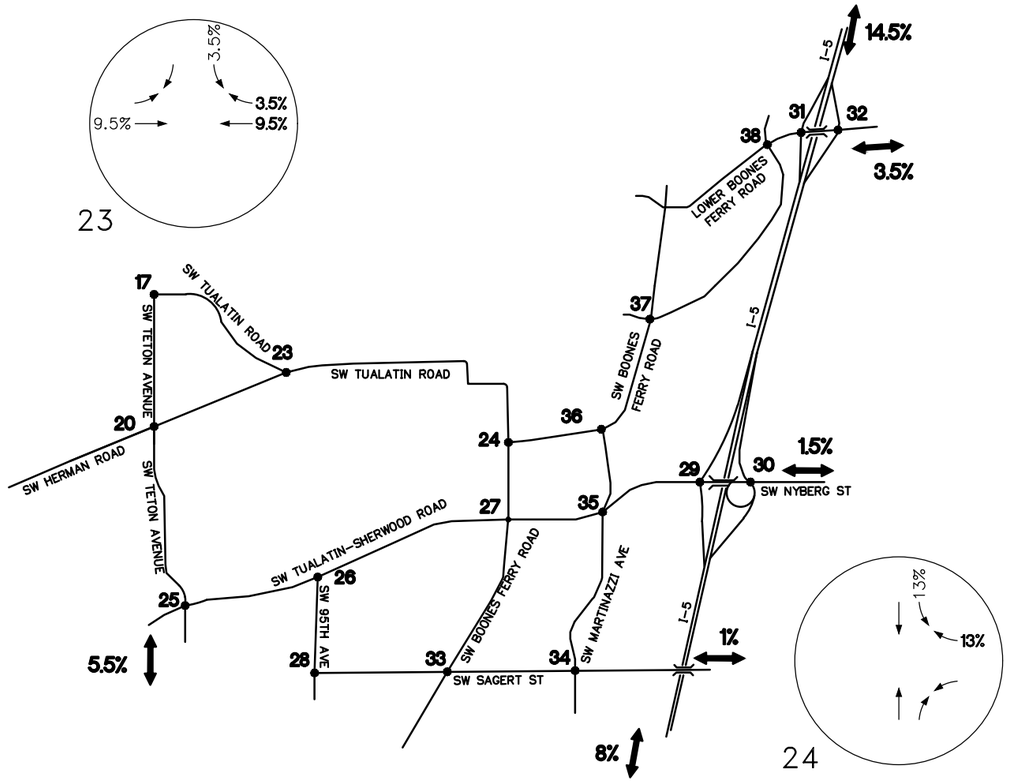


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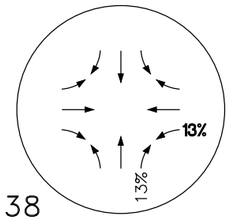
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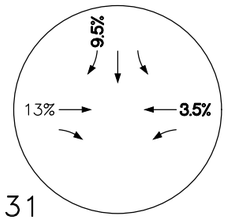
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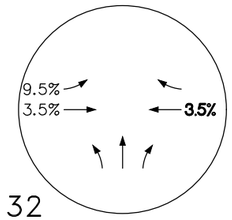
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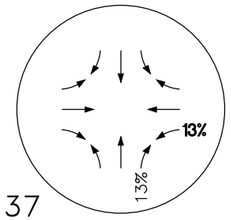
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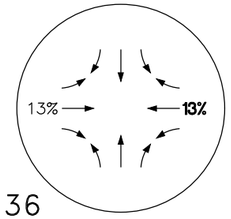
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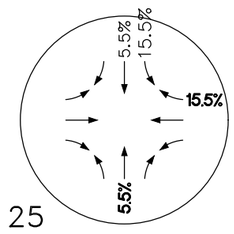
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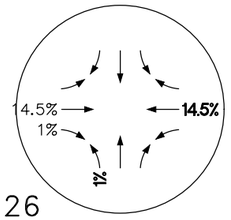
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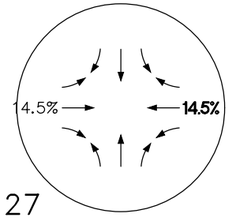
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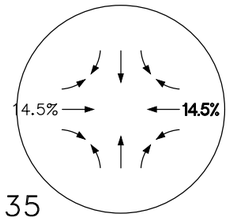
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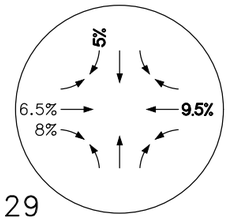
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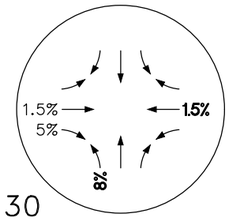
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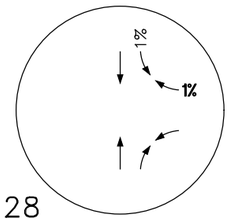
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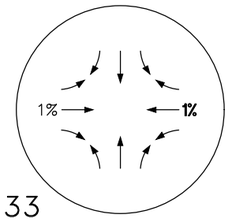
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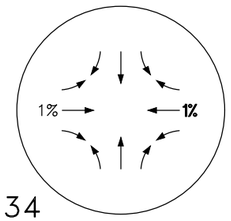
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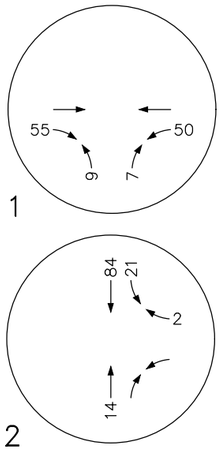
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NEW TUX
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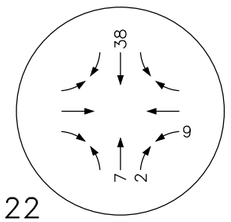
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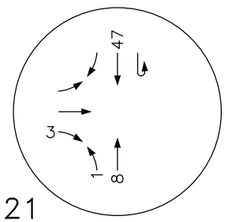


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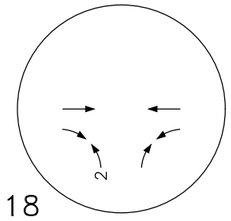


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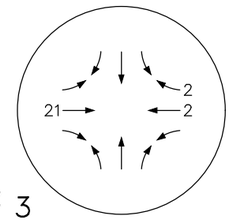


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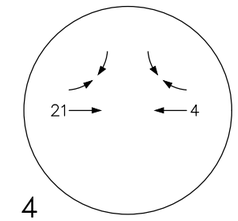
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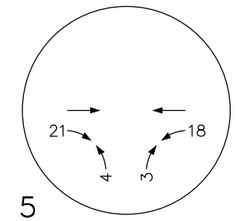
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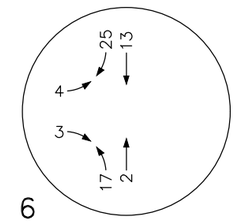
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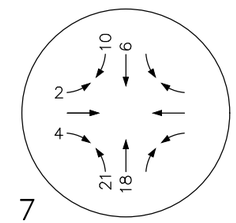
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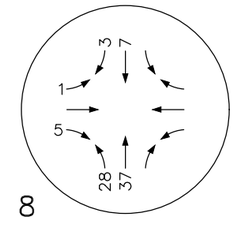
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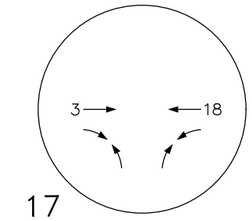
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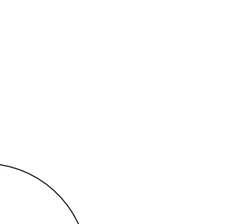
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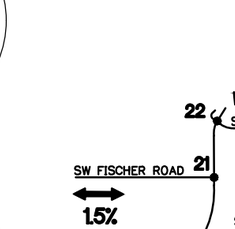


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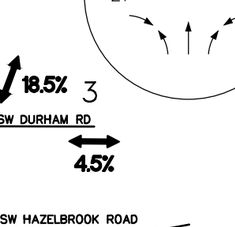


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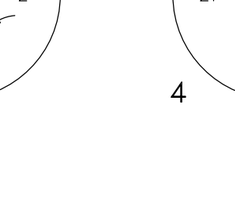
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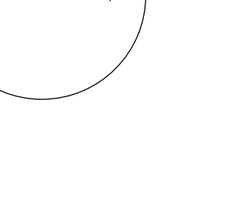
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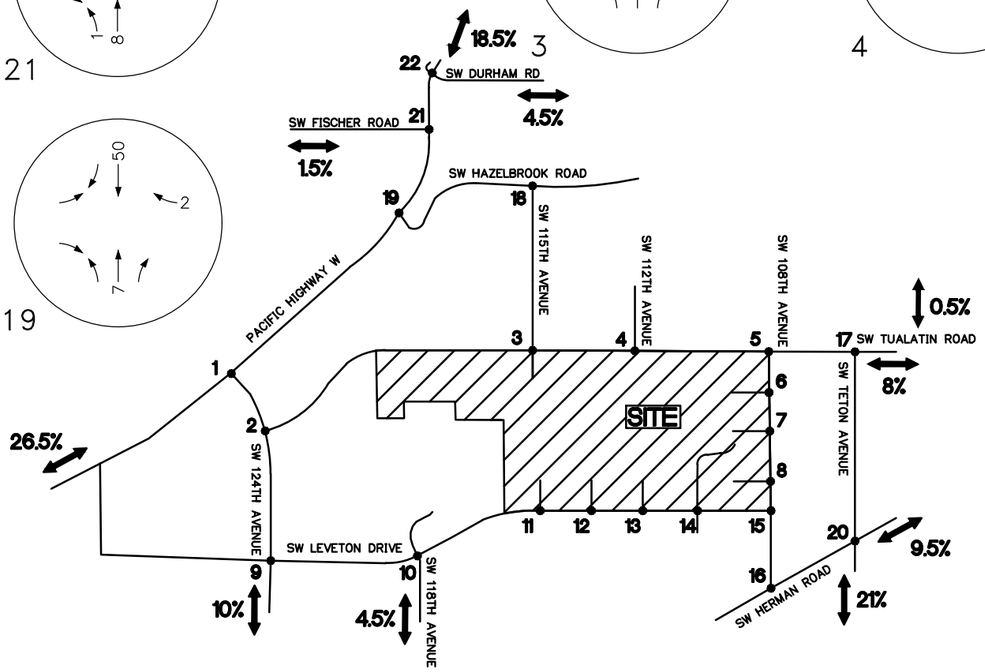


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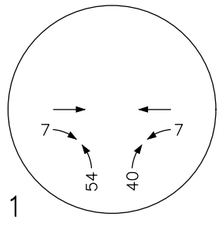
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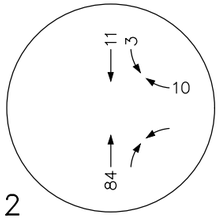
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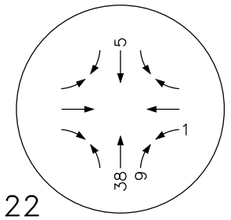
FIGURE
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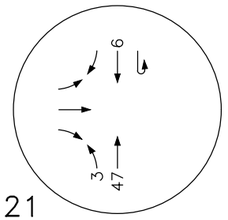
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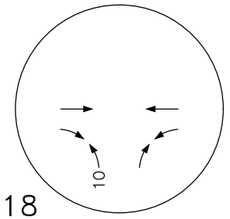


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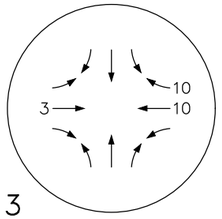


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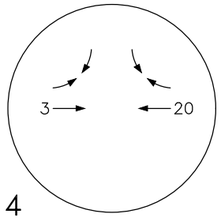
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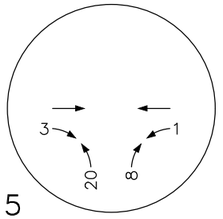
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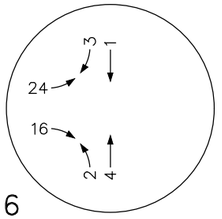
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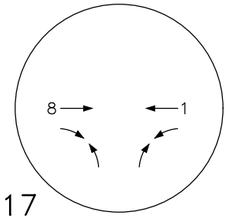
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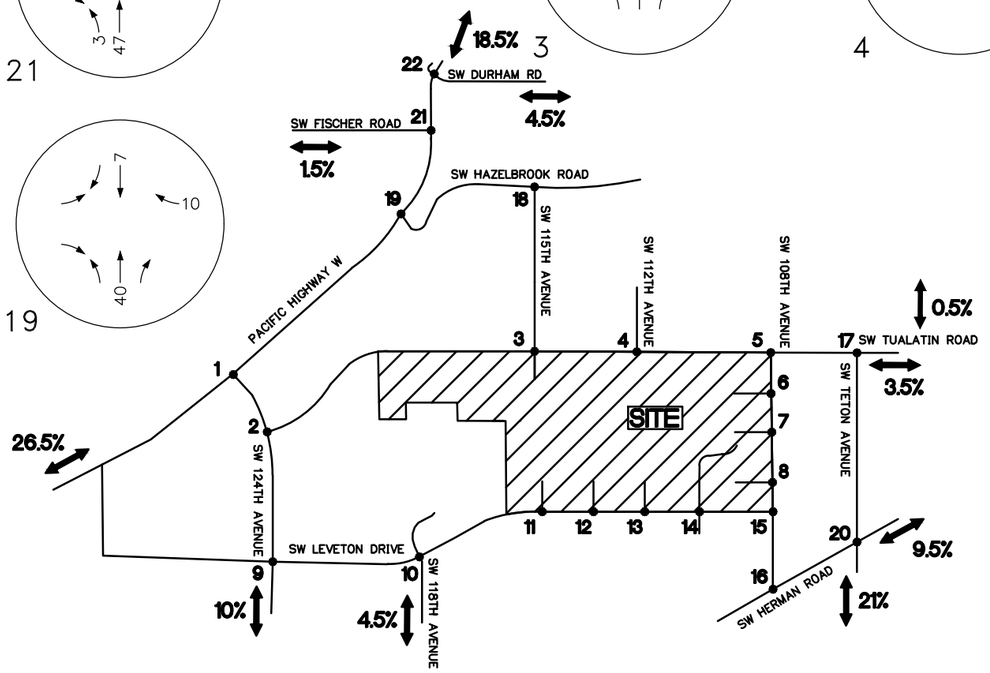
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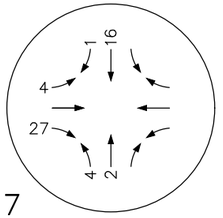
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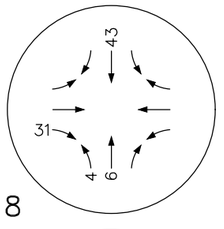
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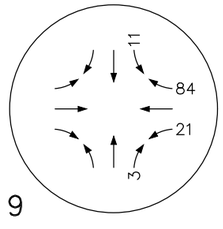
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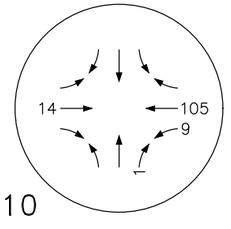
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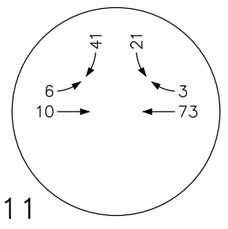
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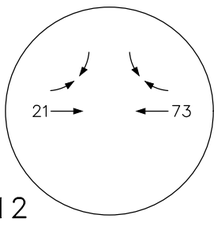
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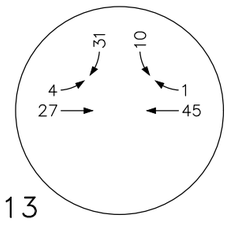
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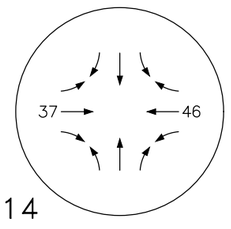
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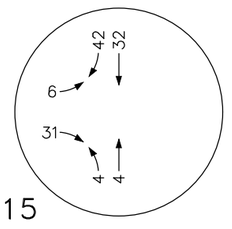
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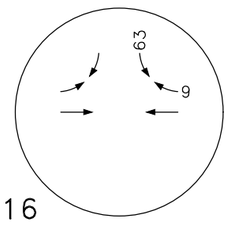
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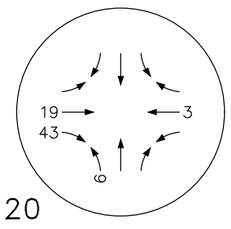
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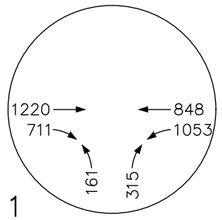
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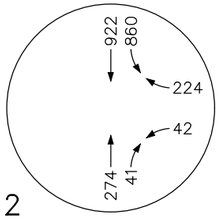
NEW TUX
TRIP ASSIGNMENT - PM PEAK HOUR

LAM TUX
TUALATIN, OR

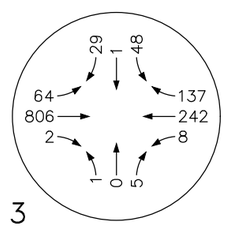
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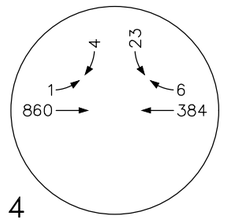
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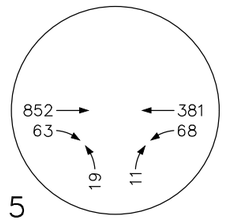
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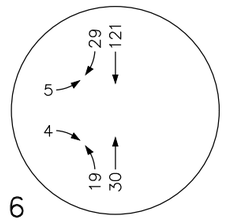
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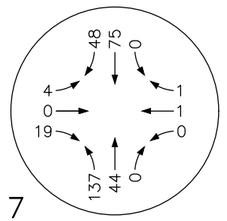
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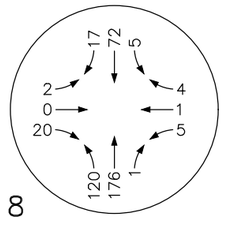
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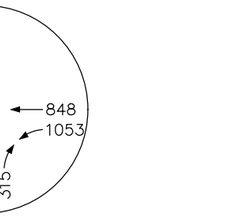
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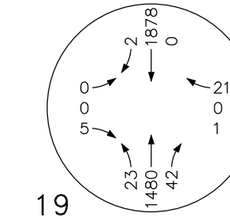
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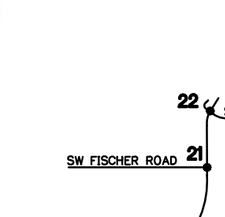
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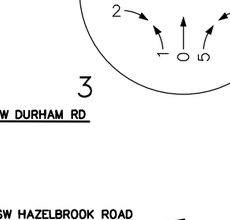
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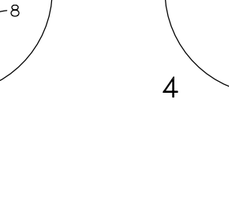
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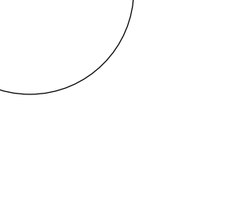
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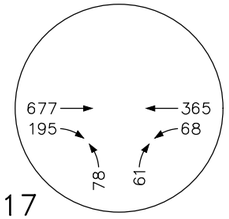
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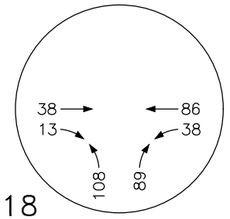
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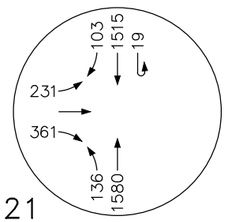
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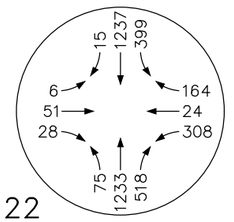
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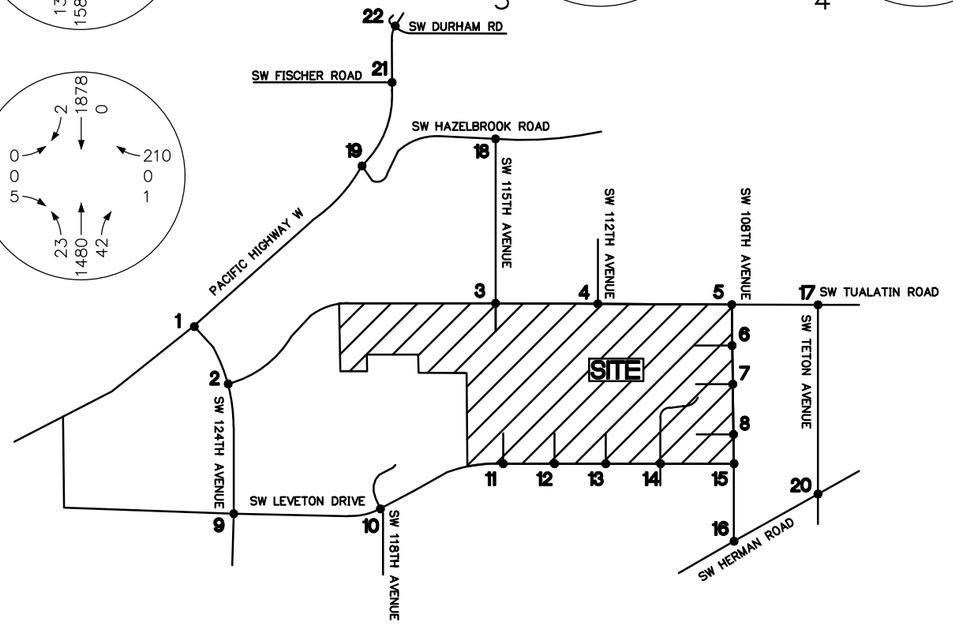
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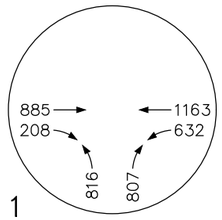
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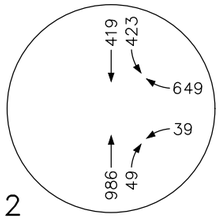
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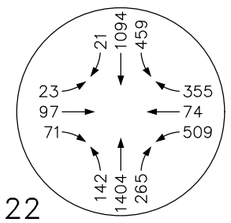
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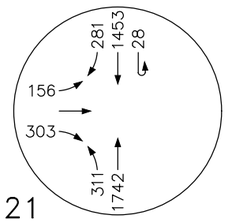
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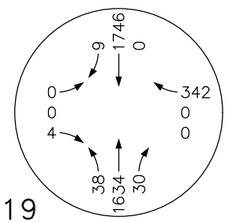
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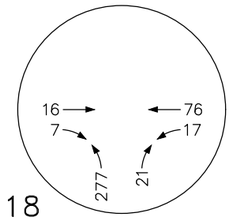
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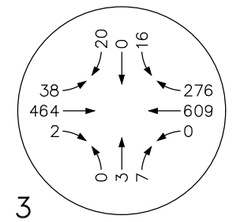
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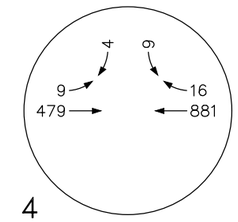
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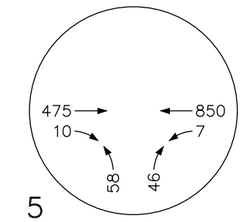
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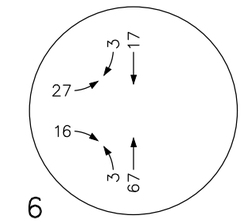
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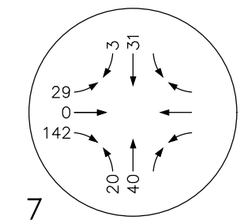
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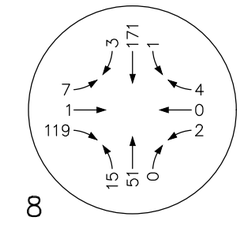
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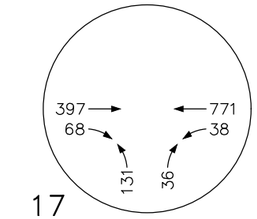
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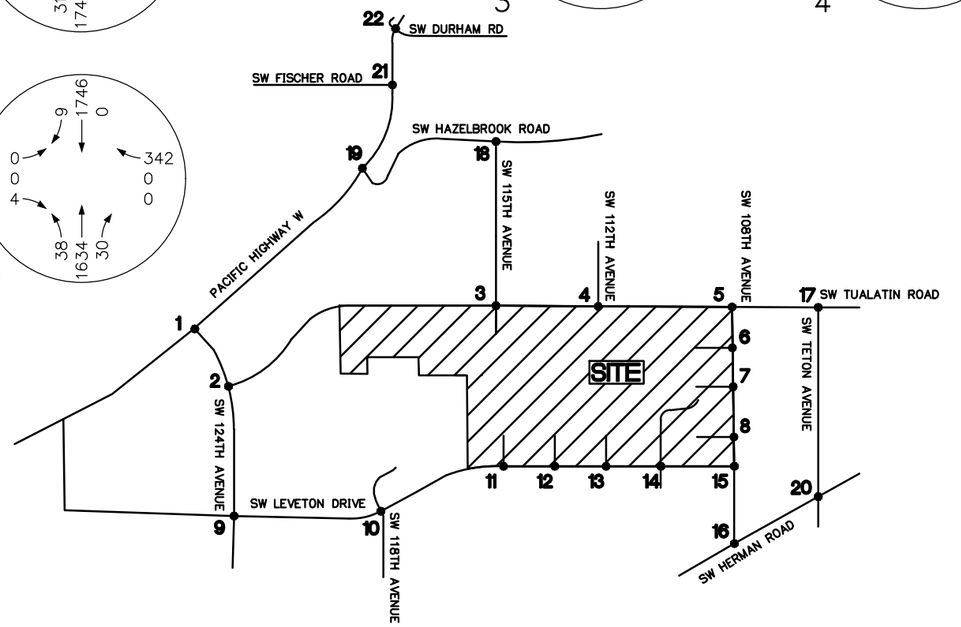
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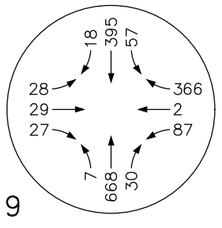


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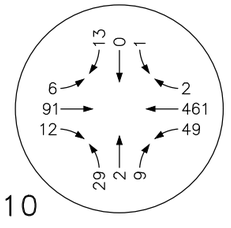


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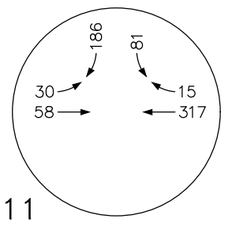




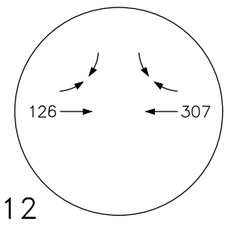
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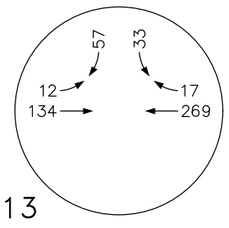
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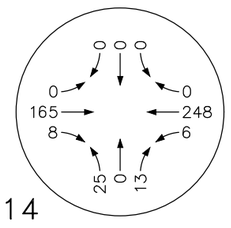
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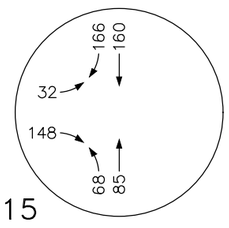
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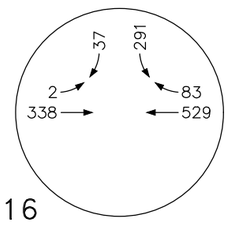
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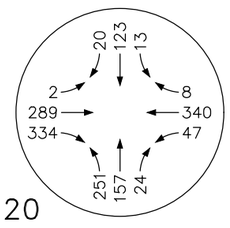
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2030 POST-DEVELOPMENT TRAFFIC VOLUMES - PM PEAK HOUR

LAM TUX
TUALATIN, OR

FIGURE
13B

APPENDIX B.

SCOPING MATERIAL

June 25, 2025

City of Tualatin
Attention: Mike McCarthy
18880 SW Martinazzi Avenue
Tualatin, OR 97062

Re: **Lam TUX**
Updated Transportation Impact Analysis Scoping
Project Number 2250180.00

Dear Mike:

Mackenzie has prepared this updated scoping letter reflecting the updated site plan described below and planned changes to the required Transportation Impact Analysis (TIA) for the proposed laboratory/research and development building, office building, and utility building at the Lam Research campus in Tualatin, Oregon.

TUX Proposal

The TUX project includes the addition of three buildings. Building H is a four-story office building with an area of up to 120,000 square feet (SF), Building U is a two-story utility building with approximately 29,000 SF, and Building X is a laboratory building with approximately 85,000 SF. The total area of the TUX projects adds up to approximately 234,000 SF with an estimated net gain of 600 employees to the campus when the new buildings are at full occupancy.

The new office will be located on the east side of campus replacing the existing parking between Building G and Building B. The new lab and utility buildings will be located at the southwest corner of the site, replacing the existing surface parking. The existing access to SW Leveton Drive will remain and an additional driveway adjacent to the access road and loading dock at building C will serve as truck access for deliveries to the existing and proposed buildings.

The parking areas along the north side of the campus will be expanded and additional parking will be added to the adjacent west property to offset the loss of the southwest lot and to accommodate additional need with the TUX project. The permanent access to the expanded employee parking lots is proposed at the existing West Access from SW Leveton Drive and the North Access from SW 108th Avenue. North Access has previously been used for access to Lam's existing utility yard north of Building B and has served low volumes of employee trips. With this proposal, the driveway will be convenient for employees in the north lots, but no connection is planned to the parking lot constructed with Building G.

Two phases of development are proposed, with all buildings in Phase 1. Phase 2 will add infrastructure such as additional parking and utilities. For this reason, we propose to analyze both phases in a single buildout year.

PARKING AND ACCESS

The project will increase the available parking spaces from 1,728 to approximately 2,384. This includes a net loss of 82 parking spaces in the center of the campus with Building H (105 removed and 23 added back) and 286 spaces in the southwest lot for the lab and CUB buildings (347 removed and 61 added back).

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The impact of these parking changes is that approximately 6% of vehicles at the site that currently park in the central area would instead use the parking lot constructed with Building G, shifting trips from the Center Access on SW Leveton Drive to the two accesses on SW 108th Avenue.

The additional parking added with the project will primarily be served by opening the North Access on SW 108th Avenue and the existing West Access on SW Leveton Drive. A smaller number of vehicles may access the new parking areas from the Center Access on SW Leveton Drive.

The attached site plan presents the proposed site plan with new parking areas identified (Attachment A).

TRIP GENERATION

The three buildings operate in conjunction with each other and best match the description of a "Research and Development Center" (LUC 760) from the Institute of Transportation Engineers' (ITE) Trip Generation Manual, 11th Edition.

The appropriateness of this land use was confirmed by comparing campus conditions in 2024. Due to current construction on site, we are presenting a comparison to observed employment and trips in 2024. In 2024, the campus had approximately 1,160 office and lab employees assigned and working a day shift (generally 8-5) plus 400 manufacturing staff who worked 12-hour shifts with changes outside the peak hours (7-7 shift schedule). The 2024 campus driveway counts during the peak hours of the site (8-9 AM, 4:45-5:45 PM) were 371 and 378, respectively. Applying the R&D trip rate to the 1,160 employees working a typical day shift results in an estimate of 418 AM, 402 PM and 3,609 daily trips, indicating actual trip generation was about 10% lower than predicted using this approach.

The proposed trip generation for the TUX project is presented in Table 1 below. We utilized the trip generation equations for each time period based on the full occupancy of 600 net new employees.

TABLE 1 – PROPOSED TRIP GENERATION

ITE LUC	ITE Land Use	Employees	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
860	Research and Development Center	600	207	37	244	28	205	233	2,036

As shown in Table 1, the planned campus expansion is estimated to generate an additional 244 AM peak hour, 233 PM peak hour, and 2,036 daily trips with both phases of development.

TRIP DISTRIBUTION

Site trip distribution has been modified slightly from the original master plan based on counts conducted in May 2025 at the active site driveways on SW Leveton Drive. With access now provided on SW 108th Avenue, there has been a small increase in trips on SW Tualatin Road. The overall distribution onto the greater roadway network remains consistent with employee zip code data provided by Lam. Unless otherwise noted, the following percentages apply to both the AM and PM peak hours.

- 24.5% to/from the north on Highway 99W.
- 26.5% to/from the south on Highway 99W.
- 13.5% to/from the east on SW Tualatin Road and SW Herman Road.
  - 8.5% on SW Tualatin Road and 5% on SW Herman Road in the AM peak hour.
  - 4% on SW Tualatin Road and 9.5% on SW Herman Road in the PM peak hour.
- 4.5% to/from the south on SW 118th Avenue.
- 10% to/from the south on SW 124th Avenue.
- 21% to/from the south on SW Teton Avenue.

The attached trip distribution figure (Attachment B) presents the percentage of trips at each study area intersection based on the locations of proposed parking and access points. Trip distribution near the site will reflect the following assumptions:

- 30% of new site trips are expected to utilize the West Leveton Access, 20% at the Center Leveton Access, 30% split evenly between the Center and South 108th Accesses, and the remaining 20% at the North 108th Access.
- 10% of new site trips will use SW Tualatin Road to access the North 108th Access.
  - Half of these trips, or 5% total, are expected to use SW 115th Avenue and SW Hazelbrook Road to access Highway 99W when exiting the site.

STUDY AREA

Based on previous studies, as well as the City's *Traffic Study Requirements* document requiring that all intersections within a 1/4-mile radius of the project site be included as part of the study area and City and neighborhood concerns, the following public intersections are included in the study area:

- SW Leveton Drive/SW 118th Avenue.
- SW Leveton Drive/SW 108th Avenue.
- SW Tualatin Road/SW Teton Road.
- SW Tualatin Road/SW 108th Avenue.
- SW Tualatin Road/SW 112th Avenue.
- SW Tualatin Road/SW 115th Avenue.
- SW 124th Avenue/SW Leveton Road.
- SW 124th Avenue/SW Tualatin Road.
- SW 124th Avenue/OR 99W.
- SW Herman Road/SW 108th Avenue.
- SW Hazelbrook Road/SW 115th Avenue.
- SW Hazelbrook Road/OR 99W.

The following site driveways will also be studied (includes those opposite public streets listed above):

- SW Leveton Drive/West Access.
- SW Leveton Drive/Proposed New Access (between existing West and Center Accesses).
- SW Leveton Drive/Center Access.
- SW Leveton Drive/East Access.
- SW 108th Avenue/North Access.

- SW 108th Avenue/Center Access (constructed with Building G).
- SW 108th Avenue/South Access (constructed with Building G).

No additional Washington County intersections are proposed because projected trips are not expected to meet the threshold of 10% impact of the roadway's average daily traffic (ADT).

TRAFFIC COUNTS

Traffic counts were conducted at the intersections listed above for standard peak periods of 7:00-9:00 AM and 4:00-6:00 PM. An extended PM time period from 3:00-6:00 PM was counted at five intersections where the nearby Hazelbrook Middle School might cause an earlier peak. Intersections were counted on Tuesday, May 13, 2025. Raw traffic counts as well as 2025 existing traffic figures are enclosed with this letter (Attachments C and D).

Per ODOT standards, system peak hours from 7:30 AM to 8:30 AM and 4:30 PM to 5:30 PM are proposed for the OR 99W intersections in the AM and PM.

The observed site peaks from 8:00 AM to 9:00 AM and 4:45 PM to 5:45 PM are proposed as a system peak for all site driveways. The remaining intersections will be analyzed at individual intersection peaks. The site volumes are 449 (391 enter/58 exit) in the AM and 430 (67 enter/363 exit) in the PM, which is approximately 7% higher than 2024 counts, mostly due to construction activity for Building G with 85 contractors.

Traffic volumes on Tualatin Road have increased since 2024, which may be in part to construction activity on SW Tualatin-Sherwood Road and the small increase in site trips. No adjustments are proposed for this analysis.

TRANSPORTATION IMPACT ANALYSIS

Based on the City's traffic study requirements, as well as the required scope for the new Lam Research office building, the TIA will review AM and PM peak hour conditions at the study area intersections for the following scenarios:

- 2025 Existing.
- 2030 Pre-Development without project.
- 2030 Post-Development with project.

The TIA will also include the following analysis components:

- 1% annual background growth per ODOT's 2040 Future Volumes table for OR 99W south of 124th Avenue.
- Seasonal adjustment factor of 1.03 applied to through volumes on OR 99W per ODOT's Seasonal Trend Table for count date of May 13, 2025.
- 6% of existing site trips rerouted from the Center Leveton Access to the South and Center 108th Accesses due to proposed changes to parking as noted above.
- Intersection capacity analyses will be conducted at the study area intersections using Synchro 12 software which implements the methodologies of the *Highway Capacity Manual* (HCM) 7th Edition, with v/c calculated using ODOT methodology in the APM for ODOT intersections and HCM 2000 for all other intersections.
- Trips from the approved Lam Building G project will be included as in-process volumes.

- We reviewed the prior and any new in-process project trips to include. We propose to add the KAI USA Warehouse Expansion on SW Herman Road. The land use approval has expired for Tualatin Logistics Park so it will not be included. The proposed in-process projects include the following:
  - Lam Building G.
  - Fujimi Expansion.
  - 124th Business Park.
  - KAI USA Warehouse Expansion.
  - An adjustment of site trips will be made for the existing contractors on site and is estimated to be 34 AM and 32 PM trips. Because these contractors are parking in the lot for Building G, we propose reducing the in-process trips for Building G by these amounts.
- Crash data for the most recent five years will be compiled and evaluated for safety concerns.
- Intersection sight distance evaluations will be based on AASHTO methodology for the proposed site access points.
- Intersection queuing, turn-lane warrants, and signal warrants will also be evaluated where appropriate. Queueing will be estimated using SimTraffic, with adjustments as needed to calibrate to observed conditions and/or Synchro output. Signal warrants will follow MUTCD standards and TTI for turn lane warrants.

Please confirm the proposed trip generation, trip distribution, study area, TIA analysis components, and in-process project list are acceptable for the required TIA.

Please contact me at bahrend@mcknze.com or 971-346-3781 if you have any questions or comments regarding the information presented in this scoping letter.

Sincerely,

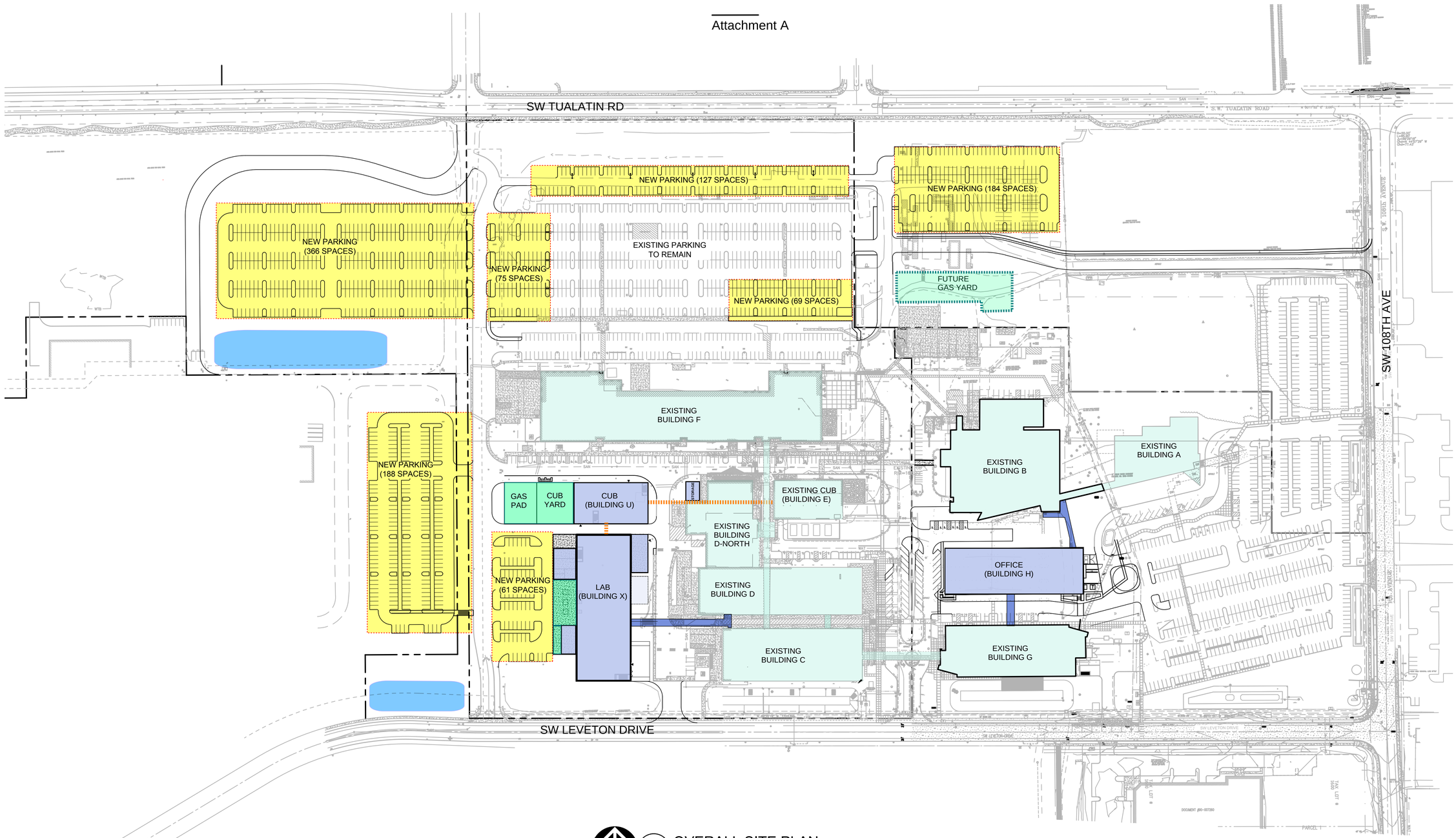


Brent Ahrend, PE
Associate Principal | Traffic Engineer

Enclosure(s): Attachment A – Site Plan
Attachment B – Existing Parking Rerouted Volumes
Attachment C – New TUX Trip Distribution
Attachment D – 2025 Existing Traffic Volumes
Attachment E – 2025 Turning Movement Counts

c: Steve Koper, Kim McMillan, Mike McCarthy, Abby McFetridge, Tony Doran, Hayden Ausland – City of Tualatin
Jinde Zhu – Washington County
John Russell – ODOT
Jennifer Otterness Majid, Mike Halvorson, Stefanie McEvers, Danielle Nonamaker, Paul Roessler, Todd Fosler – Lam Research
Joel Rabinovitz, Garth Appanaitis – DKS Associates
Suzannah Stanley, Bill Bezio, Megan Diaz, Mike Rueter, Clara Layton, Nicole Burrell – Mackenzie

Attachment A



1 / EX 2 OVERALL SITE PLAN

1" = 100'-0"

100 0 50 100 200 400 1:1

(IN FEET)

1 inch = **100** ft.

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Client

Lam RESEARCH

Project

LAM RESEARCH TUALATIN

TUX

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SHEET TITLE:

OVERALL SITE PLAN

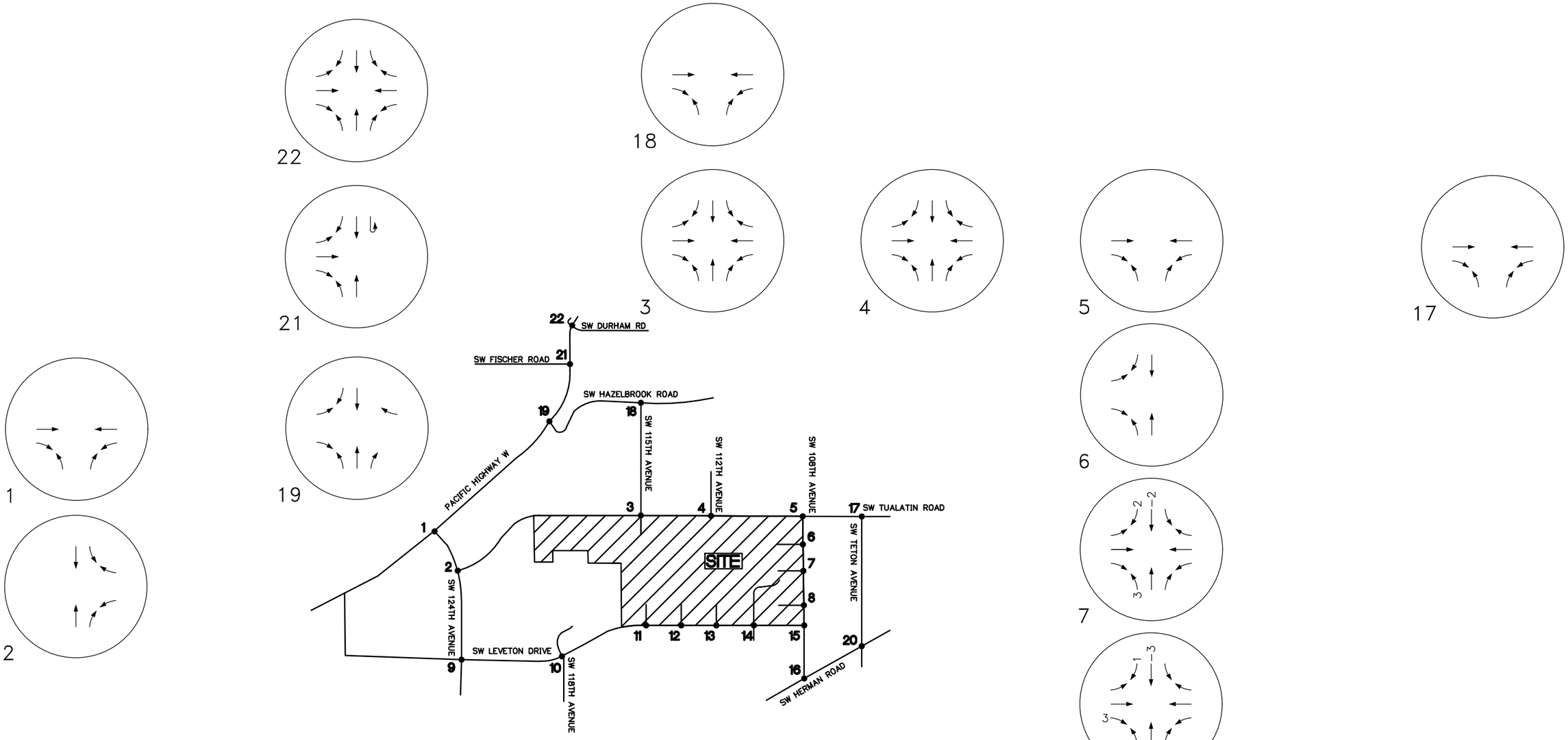
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EX 2

JOB NO. **2250180.00**

PRELIMINARY ONLY

225018000\DRAWINGS\BASES\180-PSITE.DWG:Whole Campus SJS 06/13/25 14:14 1:5



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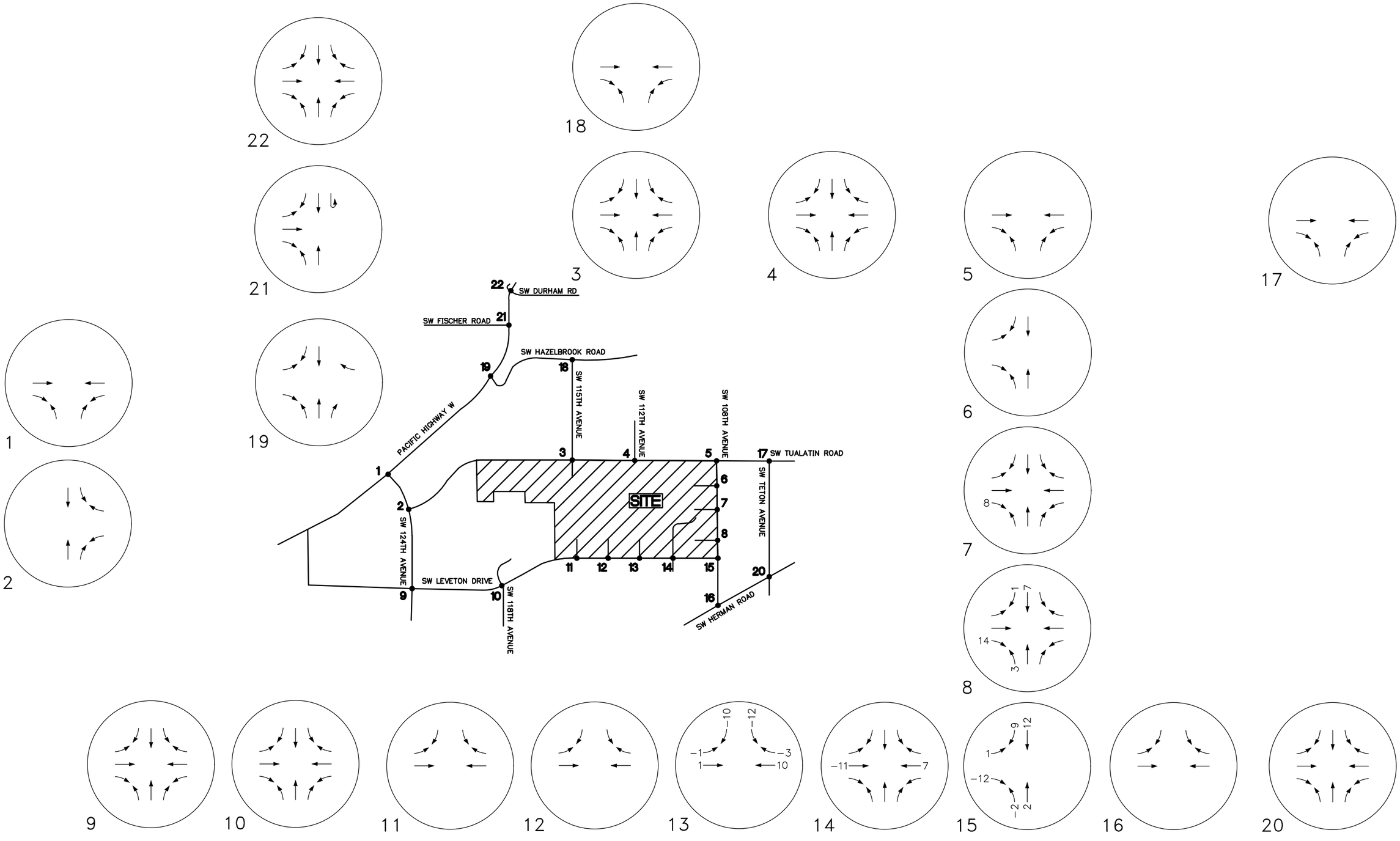
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EXISTING PARKING REROUTED VOLUMES - AM PEAK HOUR

LAM TUX
TUALATIN, OR

FIGURE
1A



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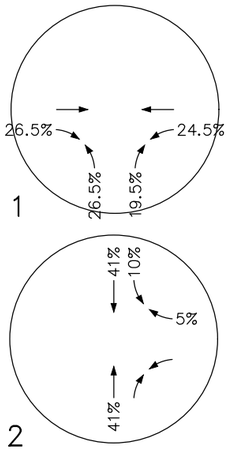
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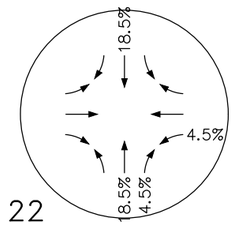
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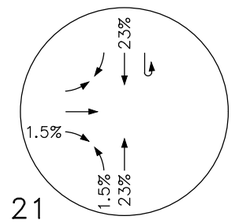
EXISTING PARKING REROUTED VOLUMES - PM PEAK HOUR

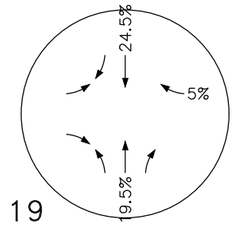
LAM TUX
TUALATIN, OR

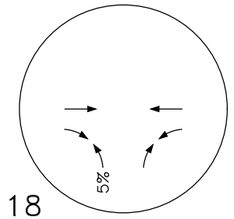
FIGURE
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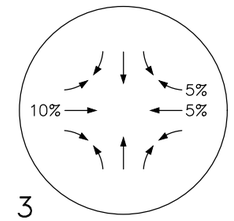


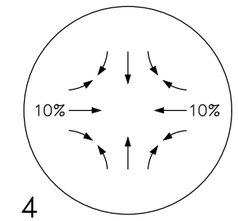


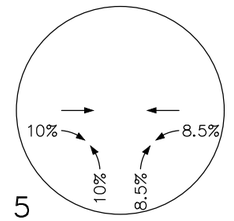


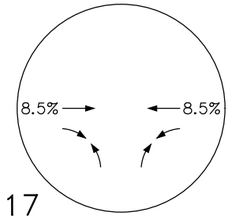


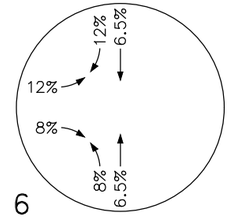


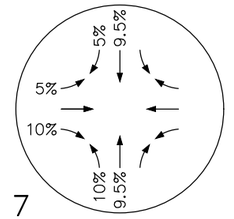


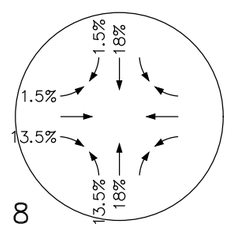


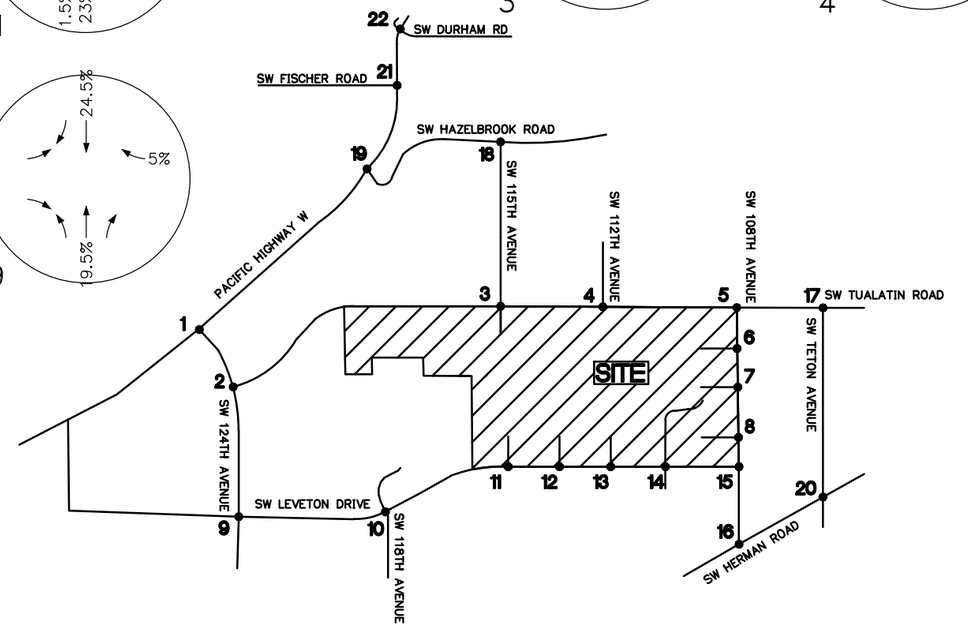


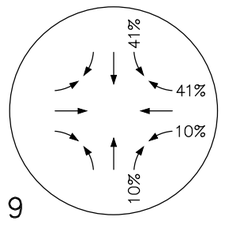


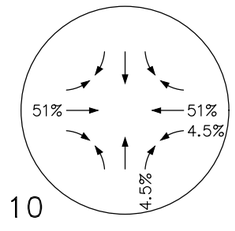


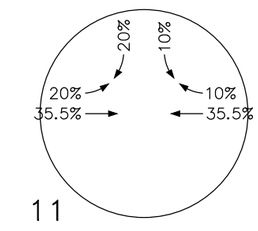


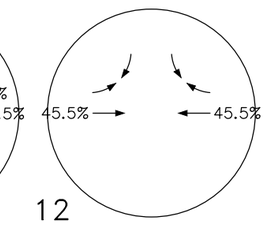


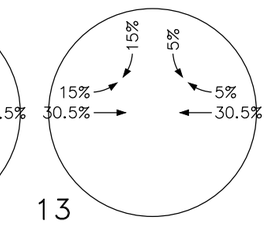


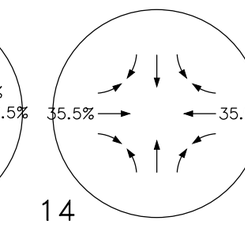


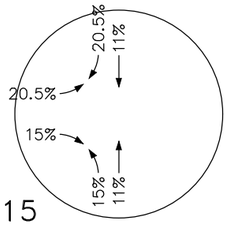


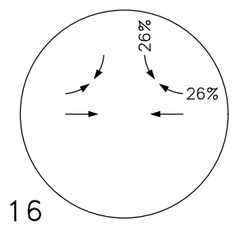


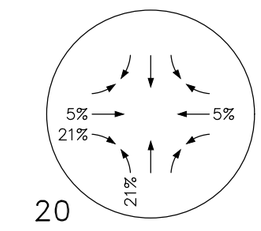












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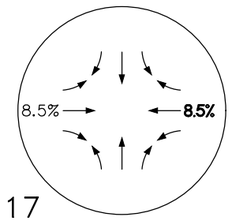
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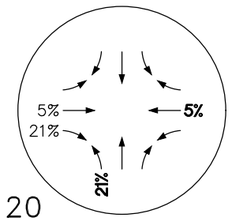
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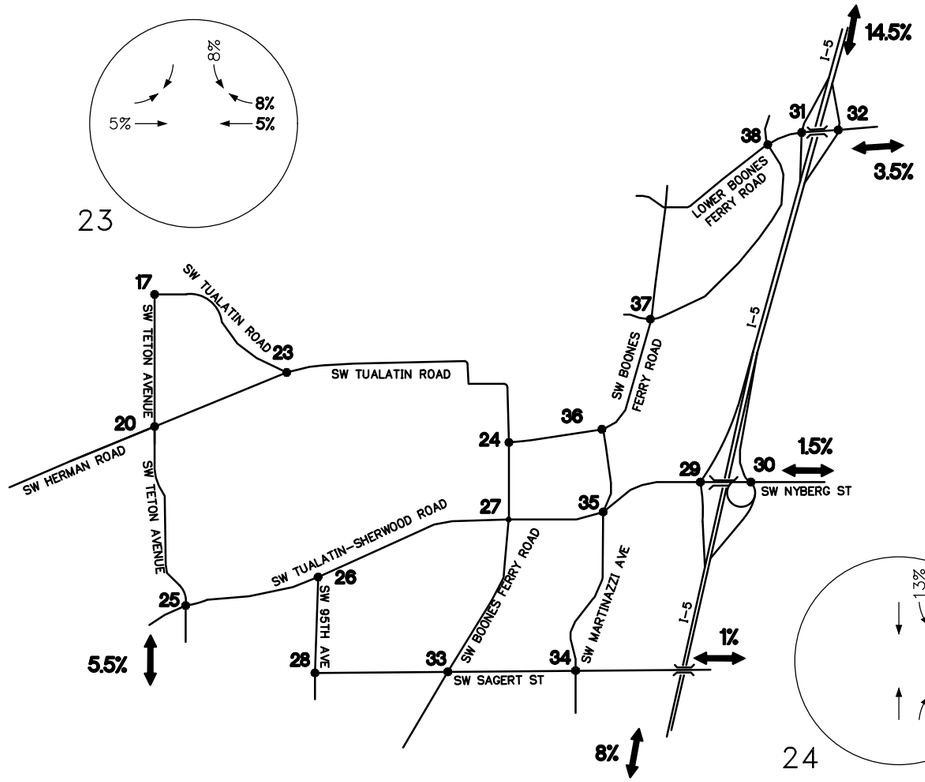
NEW TUX
TRIP DISTRIBUTION -
AM PEAK HOUR

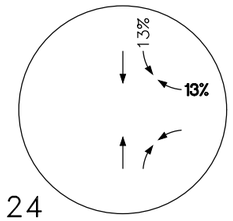
LAM TUX
TUALATIN, OR

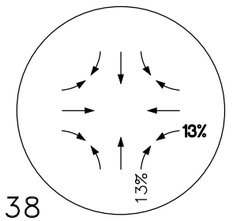
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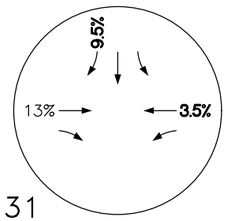


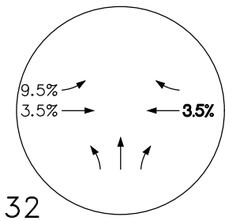


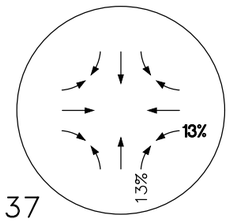


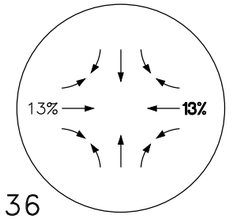


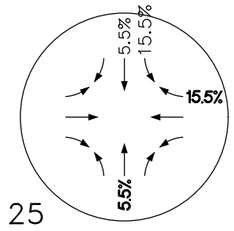


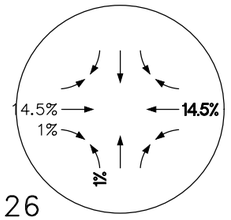


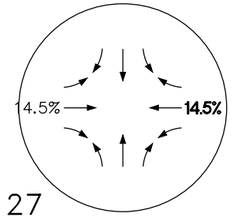


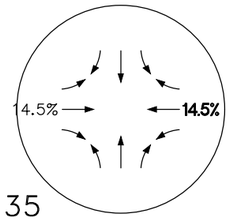


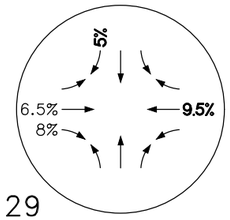


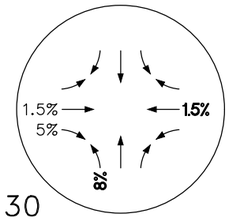


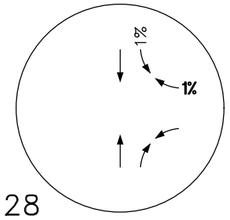


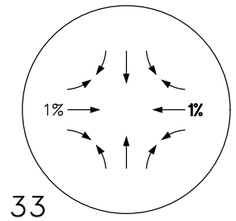


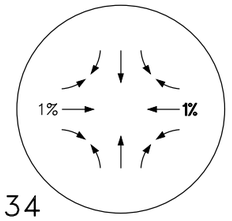












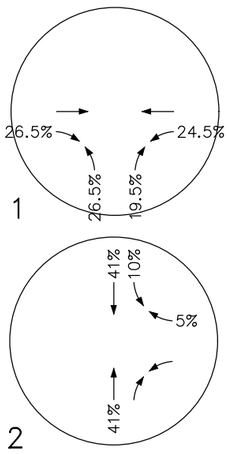
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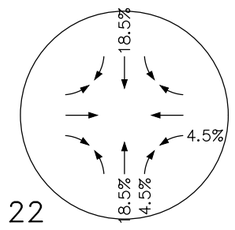
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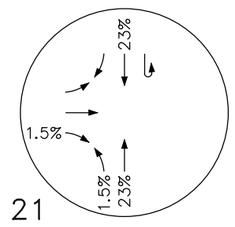
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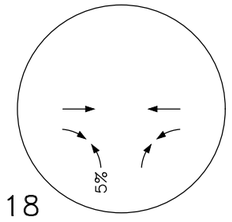
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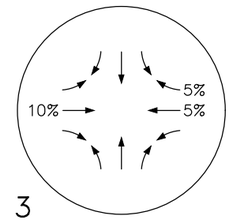
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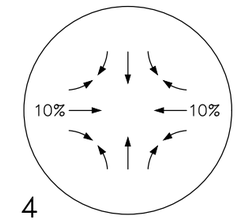


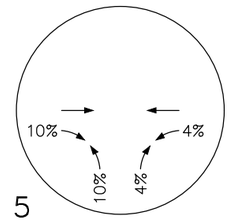


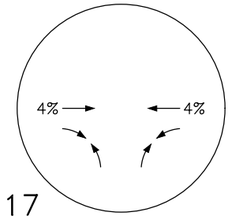


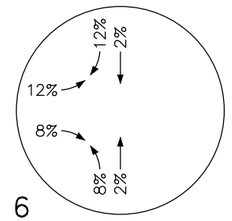


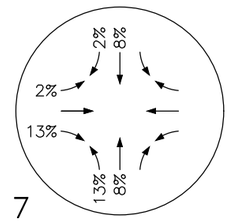


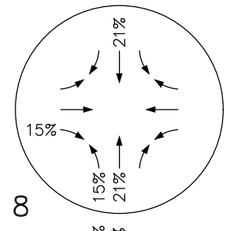


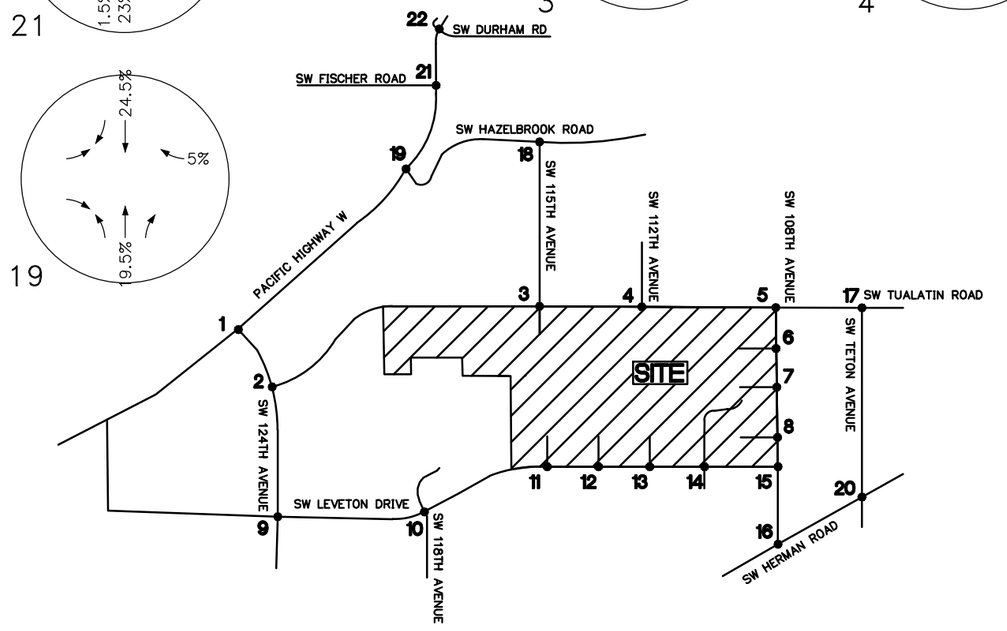


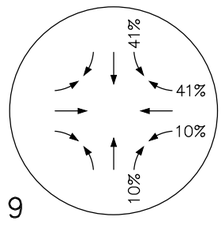


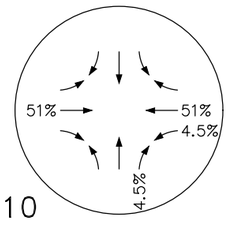


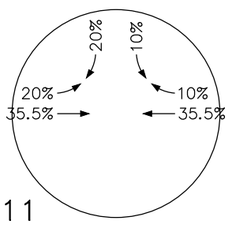


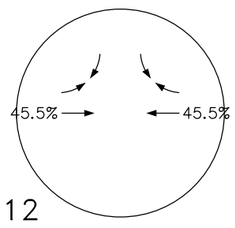


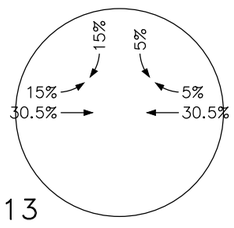


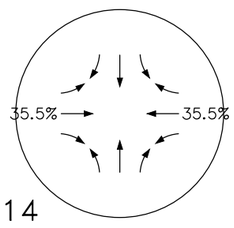


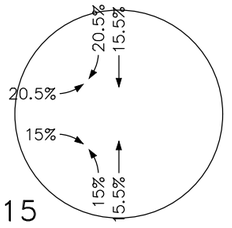


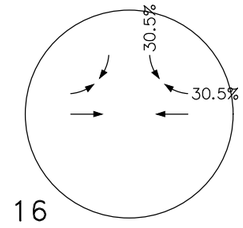


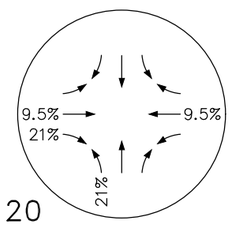












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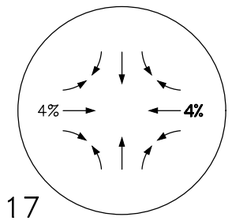
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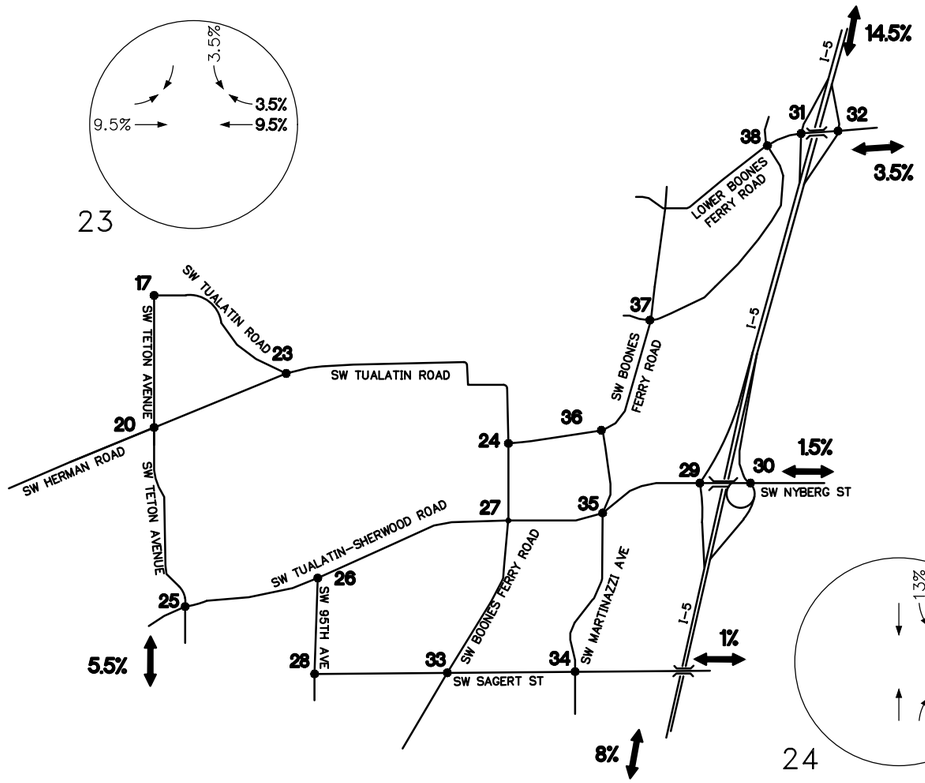
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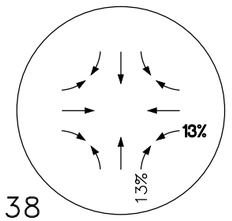
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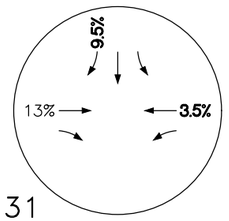
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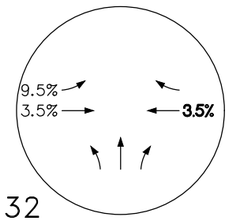
FIGURE
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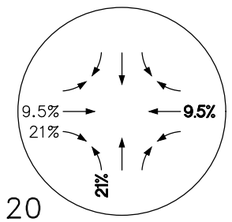


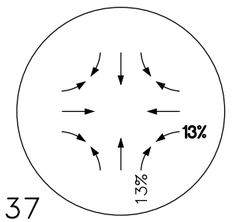


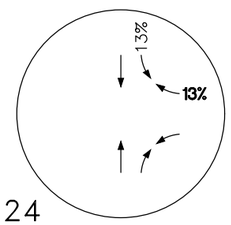


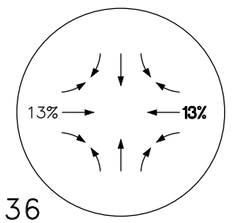


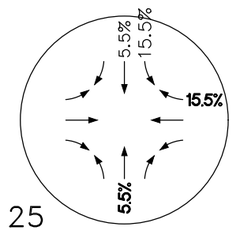


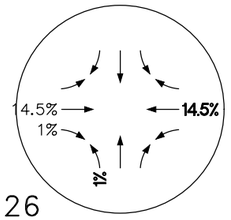


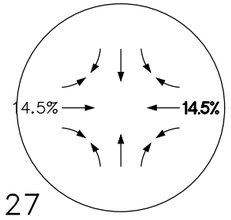


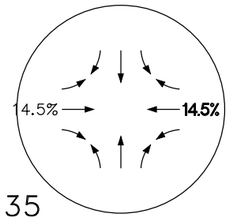


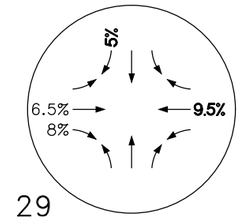


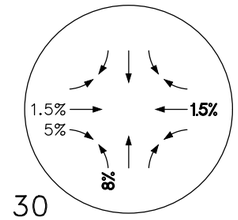


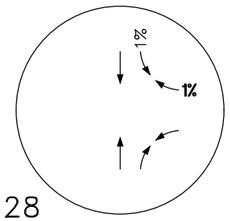


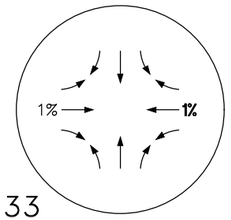


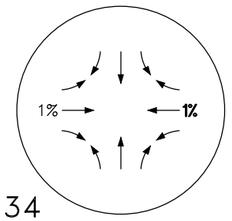












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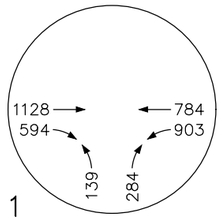
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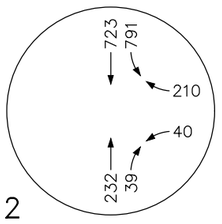
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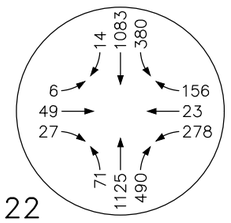
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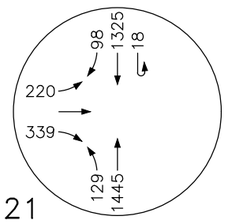
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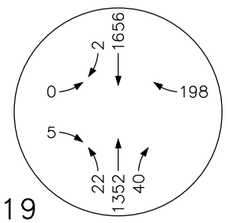
FIGURE
2D

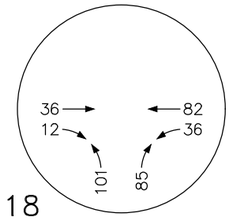


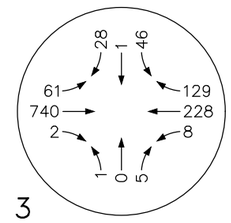


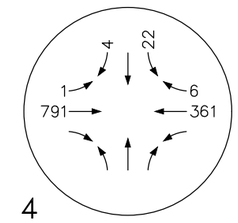


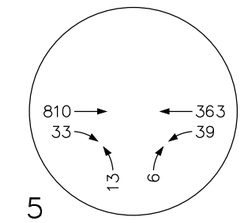


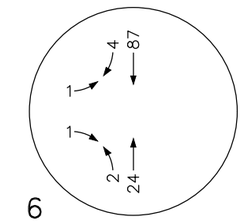


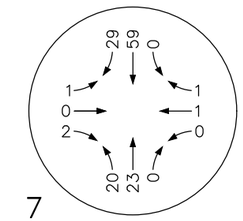


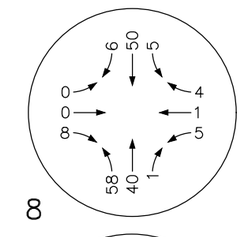


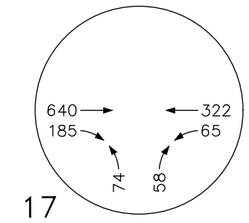


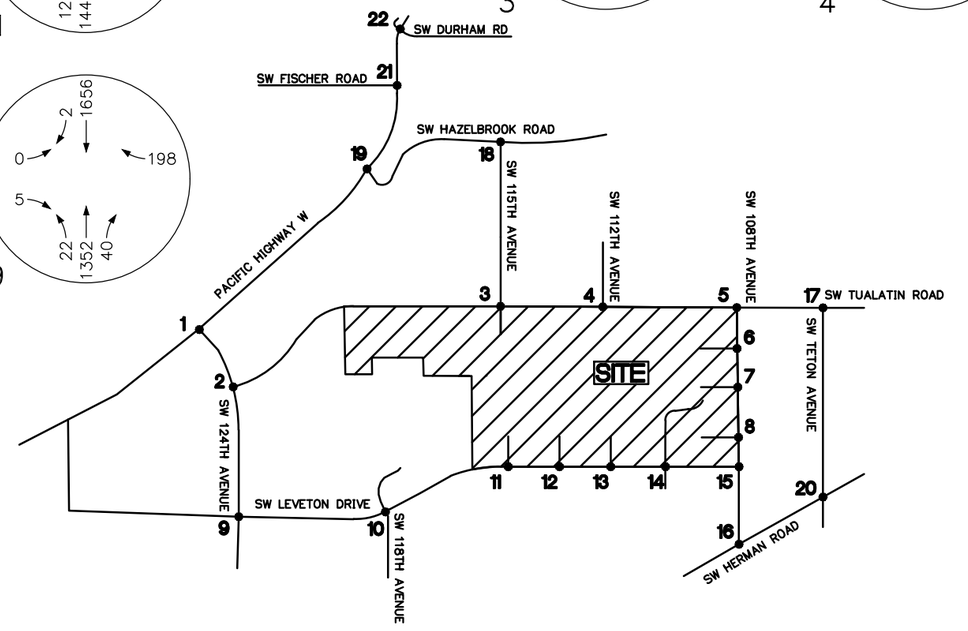


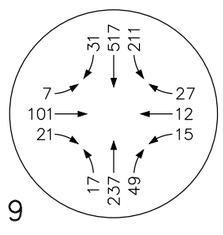


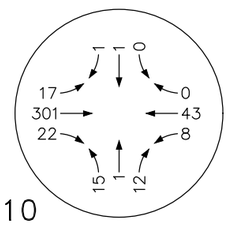


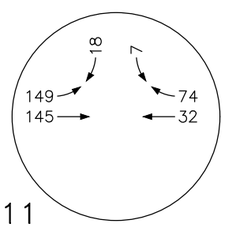


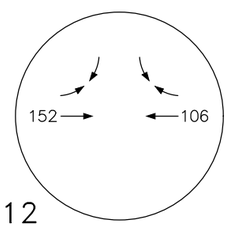


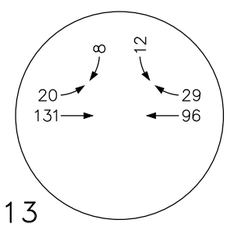


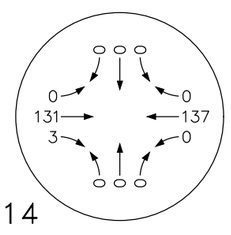


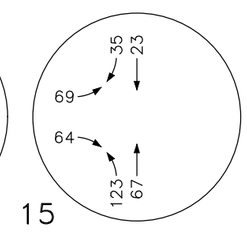


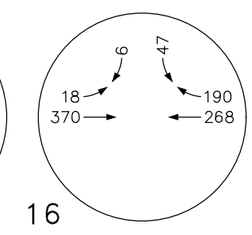


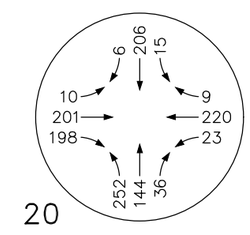












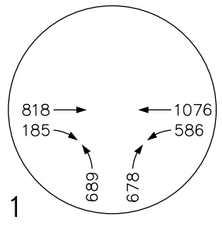
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DATE: 6.24.2025
DRAWN BY: CNL
CHECKED BY: BTA
JOB NO: 225018000

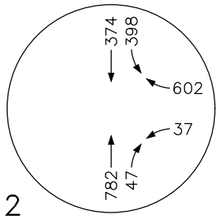
2025 EXISTING TRAFFIC VOLUMES - AM PEAK HOUR

LAM TUX
TUALATIN, OR

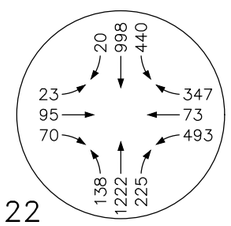
FIGURE
3A



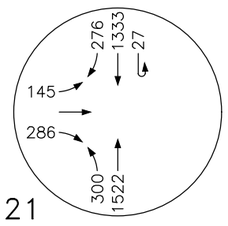
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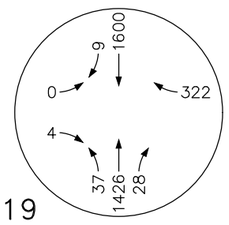
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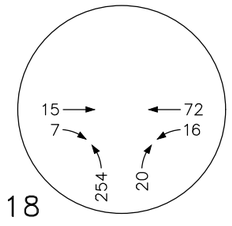
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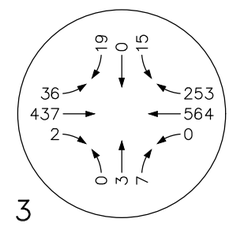
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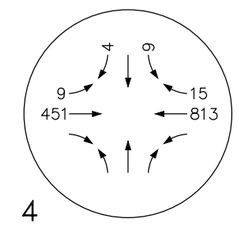
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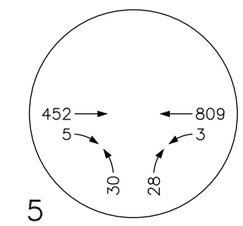
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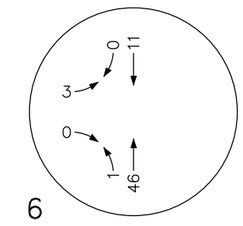
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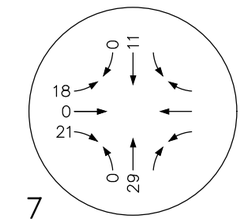
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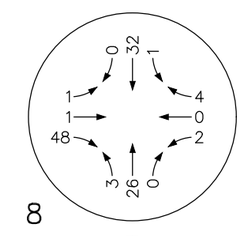
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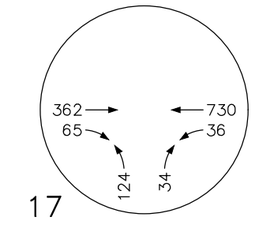
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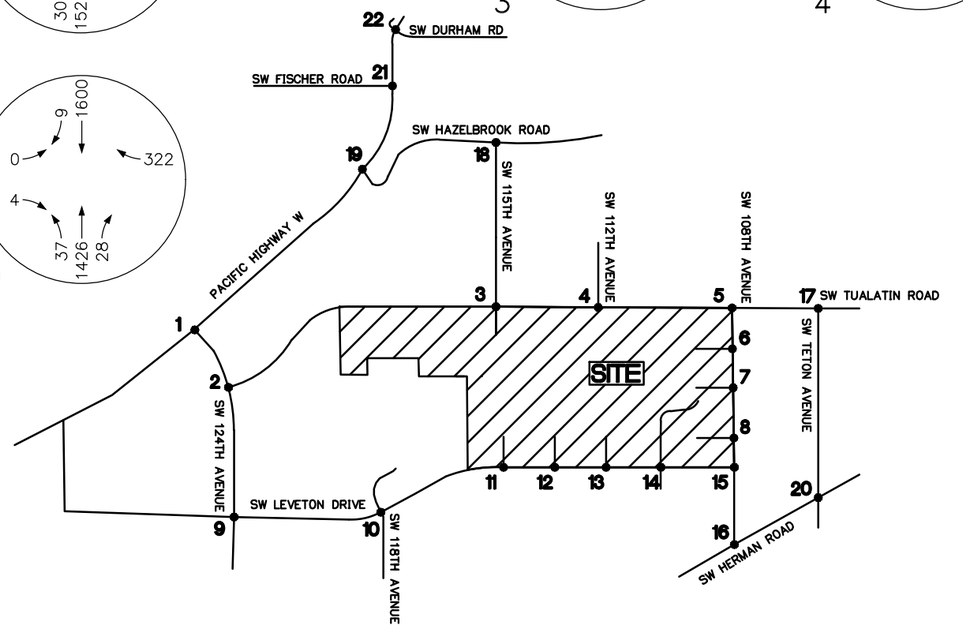
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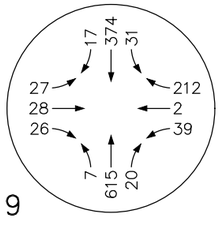


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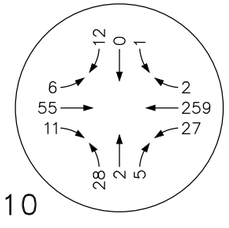


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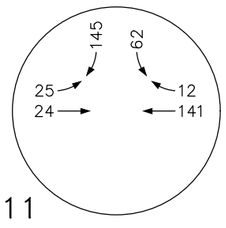




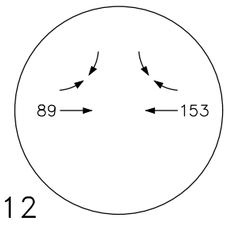
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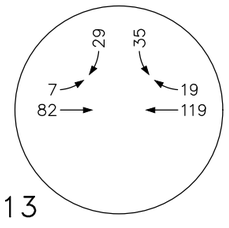
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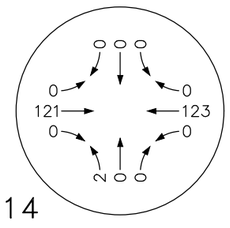
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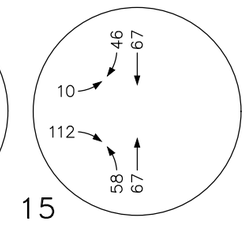
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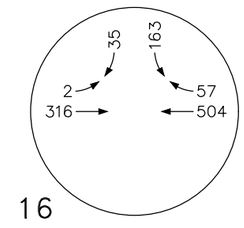
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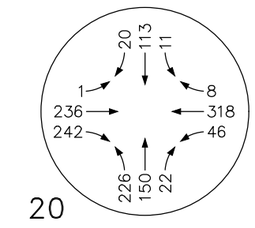
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DATE: 6.24.2025
DRAWN BY: CNL
CHECKED BY: BTA
JOB NO: 225018000

2025 EXISTING TRAFFIC VOLUMES - PM PEAK HOUR

LAM TUX
TUALATIN, OR

FIGURE
3B

Clara Layton

From: Mike McCarthy <mmccarthy@tualatin.gov>
Sent: Thursday, July 3, 2025 10:06 AM
To: Brent Ahrend; Clara Layton
Cc: Bill Bezio; Mike Rueter; Nicole Burrell; Suzannah Stanley; Megan Diaz; Hayden Ausland; Majid, Jen Otterness; Michael.Halvorson@lamresearch.com; McEvers, Stefanie; Nonamaker, Danielle; Roessler, Paul; Fosler, Todd; Joel Rabinovitz; Garth Appanaitis; Tony Doran; Abby McFetridge; Steve Koper; Aquilla Hurd-Ravich
Subject: RE: Tualatin Exp Lab/CUB/Bldg H
Attachments: 00LTR-City of Tualatin-LAM SMP Update TIA Scoping-250625.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Brent and Clara,

Thank you for submitting this draft scoping letter. We would not object to proceeding as planned with the following notes, modifications, and questions:

As we discussed at our meeting, please include the intersections of Hwy 99W with Fisher Rd and Durham Rd, which were included in the previous study area.

If Phase 1 is the buildings and Phase 2 is the parking and utilities, please describe where people will park for Phase 1 before Phase 2 is constructed, and show how this will be adequate parking for the demand without affecting traffic on public streets.

Table 1 ITE code lists 860 and should be corrected to 760 as reflected in the text. This does not change any assumptions/analysis

Trip Distribution/Routing - The overall distribution assumptions seem reasonable as based on zip code data. However for localized routing, it seems like more traffic leaving the site and heading north on Highway 99W might do so via Hazelbrook, especially with the internal drive aisle connecting to 115th. For traffic leaving the site and heading north on Highway 99W, the current assumption shows out of direction travel to 124th Avenue. Clarification on the traffic routing between these options should be provided.

Analysis Period - The narrative notes that the periods of 7:30 to 8:30 AM and 4:30 to 5:30 PM are proposed for the ODOT intersections based on "ODOT standards". It appears that this is just based on the system (and individual) intersection peaks for these locations, but can you include which ODOT document and standard you are referring to?

Intersection crash data - Should be analyzed generally following APM procedures including comparison to critical crash rates

Intersection queuing analysis - The narrative notes that it will be provided using a combination of SimTraffic and Synchro. SimTraffic outputs should be used unless there is a limitation that impacts the results, in which case other methods can be used as appropriate.

Analysis should use procedures from the current version of the Highway Capacity Manual (HCM 7 with ODOT-approved methodology) unless a good reason is documented for using different procedures.

Please include explanations of any Transportation Demand Management / Employee Commute Options programs that Lam uses or plans to use to help employees find options such as carpooling, transit, walking, or cycling in order to commute to work by means other than driving themselves.

Please include complete explanations for all assumptions made – such as the direction of trips, and estimates about which driveways they would use.

Our correspondence with ODOT and Washington County have not indicated a need for any further adjustments to this scope.

While we have attempted to find all the items that would need adjusting, it is possible that additional adjustments may need to be made to the final study as we see the results and/or as additional issues/questions come to light.

Thanks,

Mike McCarthy
Tualatin City Engineer
Phone: 503.691.3674
Cell: 971.666.0000

From: Brent Ahrend <BAhrend@mcknze.com>
Sent: Wednesday, June 25, 2025 1:24 PM
To: Mike McCarthy <mmccarthy@tualatin.gov>; Steve Koper <skoper@tualatin.gov>; Kim McMillan <kmcmillan@tualatin.gov>; Abby McFetridge <Amcfetridge@tualatin.gov>; Tony Doran <TDORAN@tualatin.gov>; Hayden Ausland <hausland@tualatin.gov>
Cc: Bill Bezio <WBezio@mcknze.com>; Mike Rueter <MRueter@mcknze.com>; Nicole Burrell <NBurrell@mcknze.com>; Suzannah Stanley <SStanley@mcknze.com>; Megan Diaz <MDiaz@mcknze.com>; Clara Layton <CLayton@mcknze.com>; Majid, Jen Otterness <jennifer.otterness@lamresearch.com>; Michael.Halvorson@lamresearch.com; McEvers, Stefanie <stefanie.mcevers@lamresearch.com>; Nonamaker, Danielle <danielle.nonamaker@lamresearch.com>; Roessler, Paul <paul.roessler@lamresearch.com>; Fosler, Todd <todd.fosler@lamresearch.com>; Joel Rabinovitz <joel.rabinovitz@dksassociates.com>; Garth Appanaitis <gaa@dksassociates.com>
Subject: Tualatin Exp Lab/CUB/Bldg H

Mike,

Please see the attached scoping letter for the updated Lam TUX site plan. Our traffic analysis will be based on this updated scoping.

We understand you will forward this to Washington County and ODOT staff for their review and input.

Let us know if you have any questions.

Thanks,

Brent Ahrend PE
D 971-346-3781 **C** 503-705-7554

Transportation Planning
Associate Principal
Professional Licenses & Certifications

Clara Layton

From: Abby McFetridge <Amcfetridge@tualatin.gov>
Sent: Tuesday, July 15, 2025 4:02 PM
To: Clara Layton; Brent Ahrend
Cc: Mike McCarthy; Rabinovitz, Joel
Subject: FW: Tualatin Exp Lab/CUB/Bldg H

Follow Up Flag: Follow up
Flag Status: Flagged

Abby McFetridge, EI
Engineering Associate
Phone: 503.691.3020

From: RUSSELL John <John.RUSSELL@odot.oregon.gov>
Sent: Monday, June 30, 2025 12:29 PM
To: Mike McCarthy <mmccarthy@tualatin.gov>; Jinde Zhu <jinde_zhu@washingtoncountyor.gov>; ODOT_R1_DevRev <ODOT_R1_DevRev@odot.oregon.gov>
Cc: Abby McFetridge <Amcfetridge@tualatin.gov>; Samuel Banceu <sbanceu@tualatin.gov>; Joel Rabinovitz <joel.rabinovitz@dksassociates.com>; Garth Appanaitis <gaa@dksassociates.com>
Subject: RE: Tualatin Exp Lab/CUB/Bldg H

Mike,

I've reviewed the scoping memo and **ODOT does not have any concerns with the proposed scope**. The only significant changes related to ODOT facilities are covered with the analysis of OR 99W at both SW 124th Ave and SW Hazelbrook Rd.

Thank you for taking the time to keep ODOT involved with this process.

John Russell, PE [he/him]
Traffic Analysis Engineer
Oregon Dept of Transportation
John.Russell@odot.oregon.gov
503.731.8282

From: Mike McCarthy <mmccarthy@tualatin.gov>
Sent: Friday, June 27, 2025 5:24 PM
To: RUSSELL John <John.RUSSELL@odot.oregon.gov>; Jinde Zhu <jinde_zhu@washingtoncountyor.gov>; ODOT_R1_DevRev <ODOT_R1_DevRev@odot.oregon.gov>
Cc: Abby McFetridge <Amcfetridge@tualatin.gov>; Samuel Banceu <sbanceu@tualatin.gov>; Joel Rabinovitz <joel.rabinovitz@dksassociates.com>; Garth Appanaitis <gaa@dksassociates.com>
Subject: FW: Tualatin Exp Lab/CUB/Bldg H

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Hello,

Attached is a scoping letter from Mackenzie for the updated traffic study for their revised layout. Please get us any comments you have next week.

Thanks,

Mike McCarthy
Tualatin City Engineer
Phone: 503.691.3674
Cell: 971.666.0000

From: Mike McCarthy
Sent: Wednesday, June 25, 2025 2:27 PM
To: Brent Ahrend <BAhrend@mcknze.com>; Steve Koper <skoper@tualatin.gov>; Aquilla Hurd-Ravich <ahurd-ravich@tualatin.gov>; Abby McFetridge <Amcfetridge@tualatin.gov>; Tony Doran <TDORAN@tualatin.gov>; Hayden Ausland <hausland@tualatin.gov>
Cc: Bill Bezio <WBezio@mcknze.com>; Mike Rueter <MRueter@mcknze.com>; Nicole Burrell <NBurrell@mcknze.com>; Suzannah Stanley <SStanley@mcknze.com>; Megan Diaz <MDiaz@mcknze.com>; Clara Layton <CLayton@mcknze.com>; Majid, Jen Otterness <jennifer.otterness@lamresearch.com>; Michael.Halvorson@lamresearch.com; McEvers, Stefanie <stefanie.mcevers@lamresearch.com>; Nonamaker, Danielle <danielle.nonamaker@lamresearch.com>; Roessler, Paul <paul.roessler@lamresearch.com>; Fosler, Todd <todd.fosler@lamresearch.com>; Joel Rabinovitz <joel.rabinovitz@dksassociates.com>; Garth Appanaitis <gaa@dksassociates.com>
Subject: RE: Tualatin Exp Lab/CUB/Bldg H

Thanks Brent – We've received this and will be reviewing it.

Mike McCarthy
Tualatin City Engineer
Phone: 503.691.3674
Cell: 971.666.0000

From: Brent Ahrend <BAhrend@mcknze.com>
Sent: Wednesday, June 25, 2025 1:24 PM
To: Mike McCarthy <mmccarthy@tualatin.gov>; Steve Koper <skoper@tualatin.gov>; Kim McMillan <kmcmillan@tualatin.gov>; Abby McFetridge <Amcfetridge@tualatin.gov>; Tony Doran <TDORAN@tualatin.gov>; Hayden Ausland <hausland@tualatin.gov>
Cc: Bill Bezio <WBezio@mcknze.com>; Mike Rueter <MRueter@mcknze.com>; Nicole Burrell <NBurrell@mcknze.com>; Suzannah Stanley <SStanley@mcknze.com>; Megan Diaz <MDiaz@mcknze.com>; Clara Layton <CLayton@mcknze.com>; Majid, Jen Otterness <jennifer.otterness@lamresearch.com>; Michael.Halvorson@lamresearch.com; McEvers, Stefanie <stefanie.mcevers@lamresearch.com>; Nonamaker, Danielle <danielle.nonamaker@lamresearch.com>; Roessler, Paul <paul.roessler@lamresearch.com>; Fosler, Todd <todd.fosler@lamresearch.com>; Joel Rabinovitz <joel.rabinovitz@dksassociates.com>; Garth Appanaitis <gaa@dksassociates.com>
Subject: Tualatin Exp Lab/CUB/Bldg H

Mike,

Please see the attached scoping letter for the updated Lam TUX site plan. Our traffic analysis will be based on this updated scoping.

We understand you will forward this to Washington County and ODOT staff for their review and input.

Let us know if you have any questions.

Thanks,

Brent Ahrend PE
D 971-346-3781 **C** 503-705-7554

Transportation Planning
Associate Principal
Professional Licenses & Certifications

Mackenzie.
ARCHITECTURE ▪ INTERIORS ▪ STRUCTURAL ENGINEERING
CIVIL ENGINEERING ▪ LAND USE PLANNING ▪ LANDSCAPE ARCHITECTURE
PORTLAND, OR | VANCOUVER, WA | SEATTLE, WA | SACRAMENTO, CA www.MACKENZIE.inc

Disclaimer

APPENDIX C.

TRANSIT INFORMATION

97-Tualatin-Sherwood Rd

NORTH

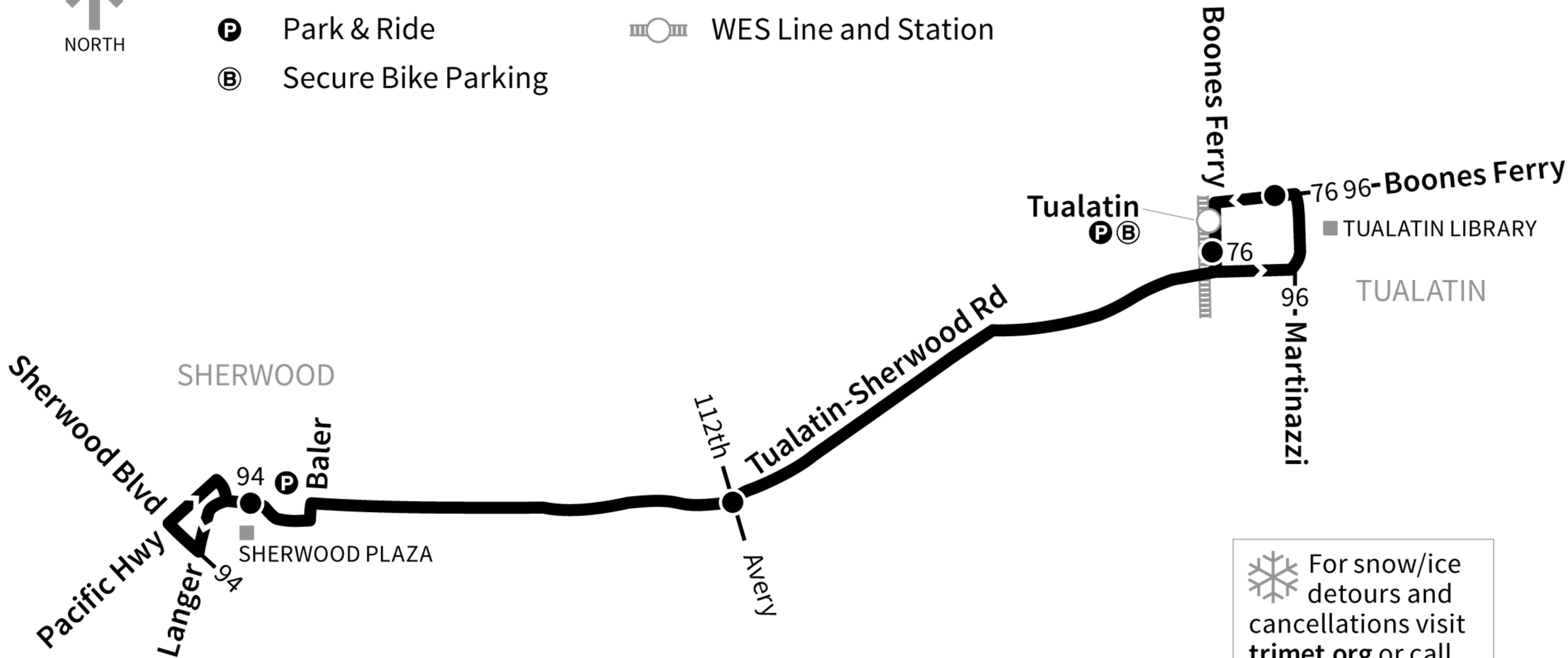
Route/Schedule Stop

Park & Ride

Secure Bike Parking

–35– Transfer Nearby

WES Line and Station



For snow/ice detours and cancellations visit **trimet.org** or call **503-238-7433** (RIDE).

TRIMET

97-Tualatin-Sherwood Rd

Weekday **To SW Langer Dr/Sherwood Plaza**

SW Boones Ferry Rd & Nyberg Stop ID 13079	SW Tualatin-Sherwood Rd & 112th Stop ID 13830	SW Langer & Sherwood Plaza Stop ID 9188
6:18	6:23	6:32
7:18	7:23	7:32
8:18	8:23	8:32
9:18	9:23	9:32
3:33	**3:39**	**3:50**
4:43	**4:49**	**5:00**
5:53	**5:59**	**6:10**

Times in darker print are p.m.

Please note: Schedules may change without notice by up to three minutes to relieve overcrowding or adjust to traffic conditions. Service can also be affected by construction, accidents and weather conditions. You can check for any current detours or service disruptions at *trimet.org/alerts* or call 503-238-RIDE (7433) for real-time arrival information from TransitTracker™. All buses, MAX trains and streetcars are accessible to people with disabilities.

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97-Tualatin-Sherwood Rd

Weekday **To Tualatin WES Station**

16100 Block SW Langer Stop ID 9190	SW Tualatin-Sherwood Rd & Avery Stop ID 13843	SW Boones Ferry Rd & Martinazzi Stop ID 13078	SW Boones Ferry Rd & Nyberg Stop ID 13079
6:58	7:06	7:16	7:18
8:00	8:08	8:16	8:18
9:00	9:08	9:16	9:18
3:12	**3:20**	**3:31**	**3:33**
4:21	**4:29**	**4:41**	**4:43**
5:30	**5:38**	**5:51**	**5:53**
6:42	**6:50**	**7:01**	**7:03**

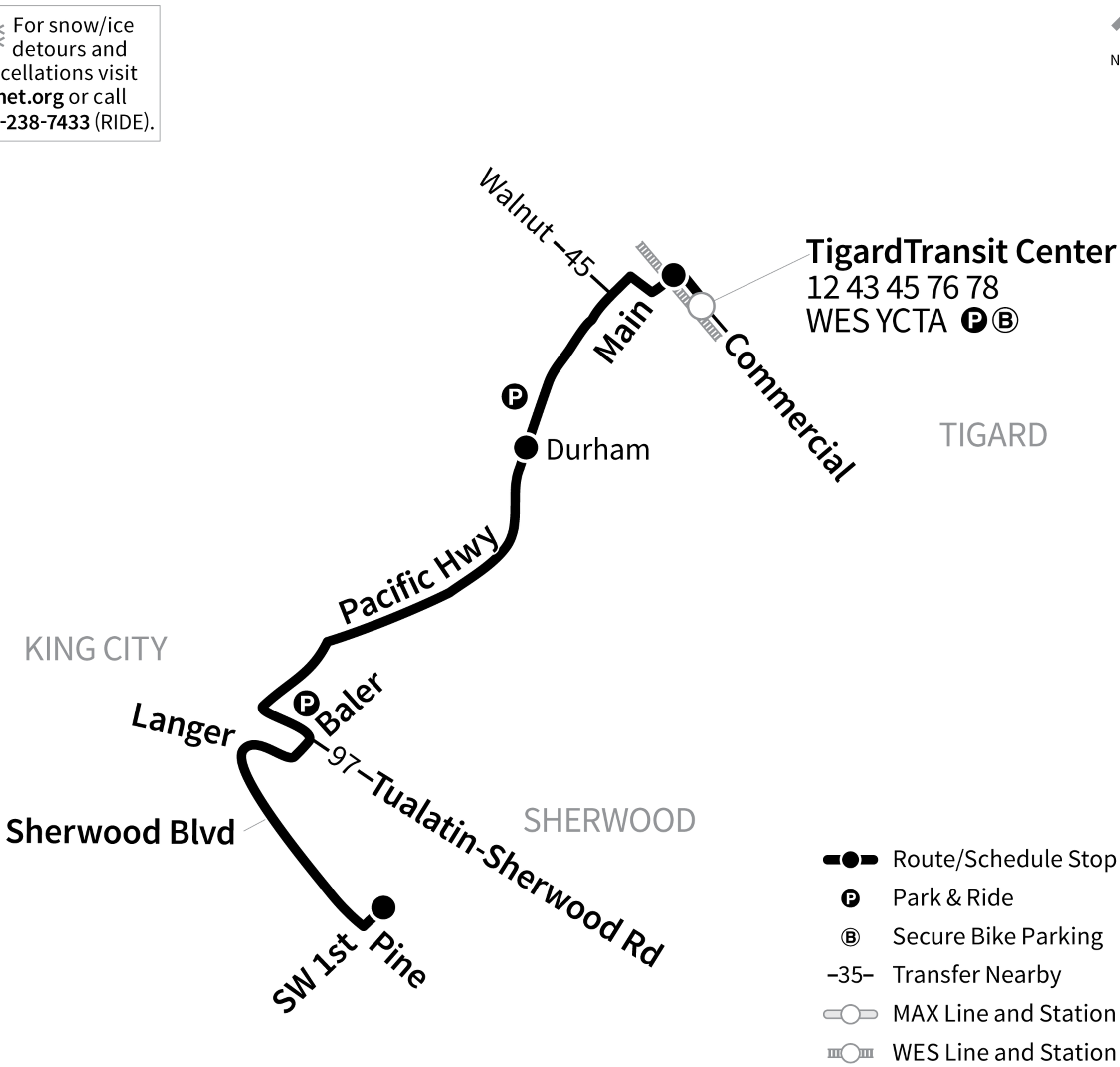
Times in darker print are p.m.

Please note: Schedules may change without notice by up to three minutes to relieve overcrowding or adjust to traffic conditions. Service can also be affected by construction, accidents and weather conditions. You can check for any current detours or service disruptions at *trimet.org/alerts* or call 503-238-RIDE (7433) for real-time arrival information from TransitTracker™. All buses, MAX trains and streetcars are accessible to people with disabilities.

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94-Tigard/Sherwood

For snow/ice detours and cancellations visit **trimet.org** or call **503-238-7433** (RIDE).



TRIMET

94-Tigard/Sherwood

Weekday — **To Tigard Transit Center**

SW 1st & Pine Stop ID 14108	SW Pacific Hwy & Durham Stop ID 8792	Tigard Transit Center
4:32	4:46	4:53
5:12	5:26	5:33
5:47	6:01	—
6:08	6:23	—
6:27	6:43	—
6:47	7:03	—
7:07	7:23	—
7:27	7:43	—
7:47	8:03	—
8:07	8:23	—
8:27	8:43	—
8:47	9:03	—
9:07	9:23	—
9:27	9:43	—
9:47	10:03	—
10:07	10:23	—
10:27	10:43	—
10:47	11:03	—
11:07	11:23	—
11:27	11:44	—
11:47	**12:04**	—
12:07	**12:24**	—
12:27	**12:44**	—
12:47	**1:04**	—
1:07	**1:24**	—
1:27	**1:44**	—
1:47	**2:04**	—
2:07	**2:24**	—
2:27	**2:44**	—
2:47	**3:05**	—
3:07	**3:25**	—
3:27	**3:45**	—
3:47	**4:05**	—
4:07	**4:25**	—
4:27	**4:45**	—
4:47	**5:05**	—
5:07	**5:25**	—
5:27	**5:45**	—
5:47	**6:05**	—
6:07	**6:25**	—
6:27	**6:44**	—
6:47	**7:03**	—
7:07	**7:23**	—
7:37	**7:53**	—
8:07	**8:23**	—
8:36	**8:51**	—
9:07	**9:22**	—
9:37	**9:52**	**10:00**
10:09	**10:22**	—
11:22	**11:35**	—

Times in darker print are p.m.

Please note: Schedules may change without notice by up to three minutes to relieve overcrowding or adjust to traffic conditions. Service can also be affected by construction, accidents and weather conditions. You can check for any current detours or service disruptions at *trimet.org/alerts* or call 503-238-RIDE (7433) for real-time arrival information from TransitTracker™. All buses, MAX trains and streetcars are accessible to people with disabilities.

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TRIMET

94-Tigard/Sherwood

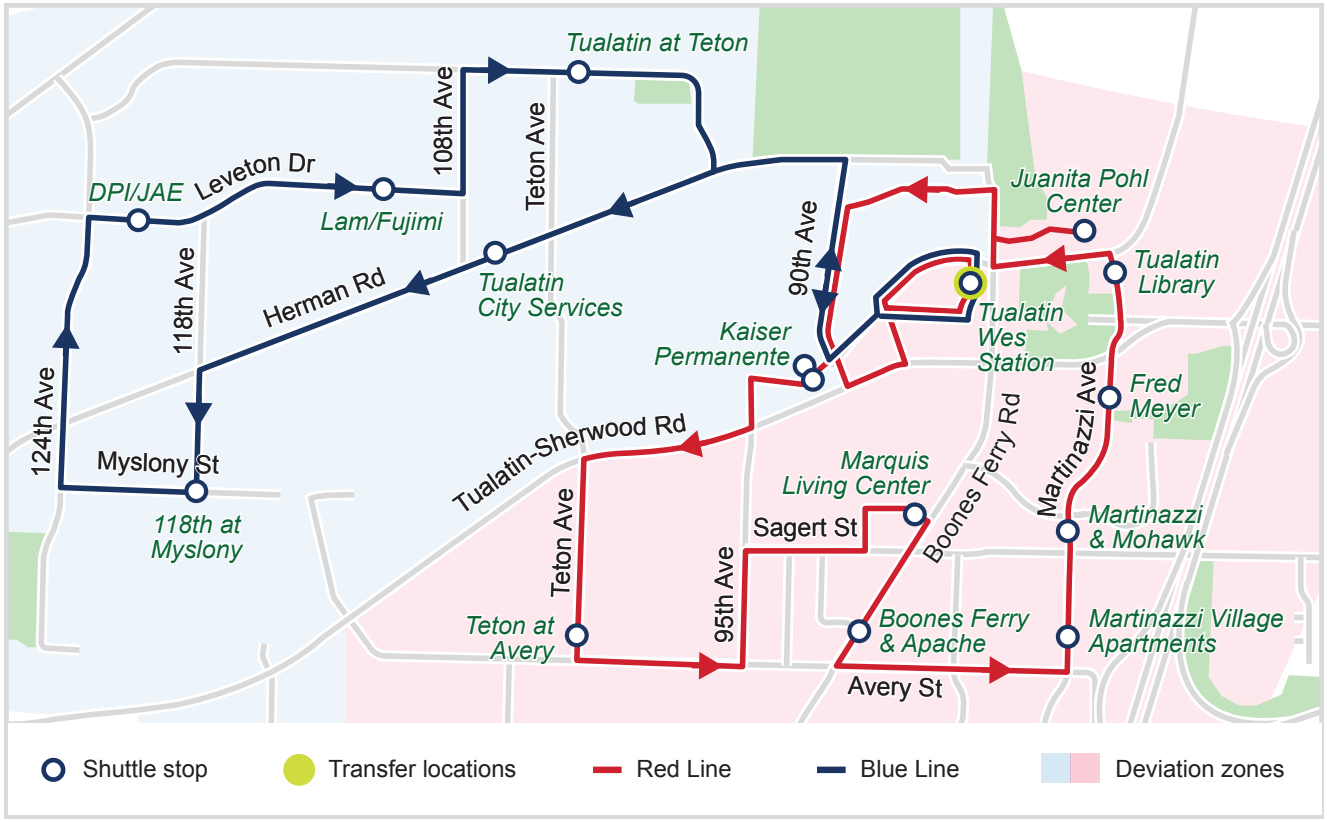
Weekday **To Sherwood**

Tigard Transit Center Stop ID 10180	SW Pacific Hwy & Durham Stop ID 8644	SW 1st & Pine Stop ID 14108
6:04	6:12	6:27
6:23	6:31	6:47
6:43	6:51	7:07
7:02	7:10	7:27
7:21	7:29	7:47
7:40	7:49	8:07
8:00	8:09	8:27
8:20	8:29	8:47
8:40	8:49	9:07
8:59	9:09	9:27
9:19	9:29	9:47
9:39	9:49	10:07
9:59	10:09	10:27
10:18	10:29	10:47
10:38	10:49	11:07
10:58	11:09	11:27
11:18	11:29	11:47
11:38	11:49	**12:07**
11:58	**12:09**	**12:27**
12:18	**12:29**	**12:47**
12:38	**12:49**	**1:07**
12:58	**1:09**	**1:27**
1:18	**1:29**	**1:47**
1:38	**1:49**	**2:07**
1:58	**2:09**	**2:27**
2:18	**2:29**	**2:47**
2:38	**2:49**	**3:07**
2:58	**3:09**	**3:27**
3:18	**3:29**	**3:47**
3:38	**3:49**	**4:07**
3:58	**4:09**	**4:27**
4:18	**4:29**	**4:47**
4:38	**4:49**	**5:07**
4:57	**5:08**	**5:27**
5:17	**5:28**	**5:47**
5:38	**5:49**	**6:07**
5:59	**6:10**	**6:27**
6:19	**6:30**	**6:47**
6:39	**6:50**	**7:07**
7:09	**7:20**	**7:37**
7:40	**7:51**	**8:07**
8:11	**8:21**	**8:36**
8:42	**8:52**	**9:07**
9:14	**9:23**	**9:37**
9:47	**9:56**	**10:09**
10:19	**10:27**	**10:40**
11:01	**11:09**	**11:22**
11:47	**11:54**	12:07
12:18	12:25	—
1:04	1:11	—

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CAR SEAT REQUIREMENT

Child passengers must be restrained in child safety seats until they weigh forty pounds or reach the upper weight limit for the car seat in use. Infants must ride rear-facing until they reach two years of age. Ride Connection does not provide/ install child safety seats.

HOLIDAY CLOSURES

Service will not be available on: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas Day. Limited service on Christmas and New Year's Eve. If a holiday falls on Saturday, there is no service on Friday; if a holiday falls on Sunday, there is no service on Monday. Information about closures available at **rideconnection.org**

SEVERE WEATHER

Information about closures available at **rideconnection.org**

COVID-19 SAFETY

All our vehicles and drivers follow CDC protocols for COVID safe practices.

CONTACT US

503-226-0700 | TTY: 711
info@rideconnection.org

Tualatin Shuttle is operated by: Ride Connection

To link accessible, responsive transportation alternatives with community and individual needs.

We respect civil rights. For a copy of our policy or to request a brochure in an alternate format call the number above.

Updated December 2022



We'll get you there.

Connect with

Tualatin Shuttle Blue & Red Line

Free weekday service open to the public

Ride CONNECTION

Tualatin Shuttle

PM times in bold
Transfers TM TriMet

Blue Line Schedule

Southbound WES Arrival Time TM	Tualatin WES Station TM	Tualatin City Services	118th at Myslony	DPI/JAE	SW Leveton (Fujimi & LAM Research)	SW Tualatin Rd & SW Teton Ave	Tualatin WES Station TM	Northbound WES Depart Time TM
	5:41	5:46	5:51	5:54	5:55	5:57	6:17	6:11
6:25	6:26	6:31	6:36	6:39	6:40	6:42	7:02	6:56
7:10	7:11	7:16	7:21	7:24	7:25	7:27	7:47	
7:55	7:56	8:01	8:06	8:09	8:10	8:12	8:32	
8:40	8:41	8:46	8:51	8:54	8:55	8:57	9:17	
9:25	9:26	9:31	9:36	9:39	9:40	9:42	10:02	
	3:03	**3:08**	**3:13**	**3:16**	**3:17**	**3:19**	**3:24**	**3:38**
	3:33	**3:38**	**3:43**	**3:46**	**3:47**	**3:49**	**4:09**	**4:23**
	4:18	**4:23**	**4:28**	**4:31**	**4:32**	**4:34**	**4:54**	**5:08**
	5:03	**5:08**	**5:13**	**5:16**	**5:17**	**5:19**	**5:39**	**5:53**
	5:48	**5:53**	**5:58**	**6:01**	**6:02**	**6:04**	**6:24**	**6:38**
6:07	**6:33**	**6:38**	**6:43**	**6:46**	**6:47**	**6:49**	**7:09**	

Red Line Schedule

Southbound WES Arrival Time TM	Tualatin WES Station TM	Kaiser Permanente	SW Teton Ave & SW Avery St	Marquis Living Center	Fred Meyer	Tualatin Library	Juanita Pohl Center	Tualatin WES Station TM	Northbound WES Depart Time TM
	5:02	5:06	5:10	5:18	5:24	5:25	5:30	5:38	
	5:47	5:51	5:55	6:03	6:09	6:10	6:15	6:23	
6:25	6:32	6:36	6:40	6:48	6:54	6:55	7:00	7:08	
7:10	7:17	7:21	7:25	7:33	7:39	7:40	7:45	7:53	
7:55	8:02	8:06	8:10	8:18	8:24	8:25	8:30	8:38	
	8:53	8:57	9:01	9:09	9:15	9:16	9:21	9:29	
	12:15	**12:19**	**12:23**	**12:31**	**12:37**	**12:38**	**12:43**	**12:51**	
	1:00	**1:04**	**1:08**	**1:16**	**1:22**	**1:23**	**1:28**	**1:36**	
	1:50	**1:54**	**1:58**	**2:06**	**2:12**	**2:13**	**2:18**	**2:26**	
	3:00	**3:04**	**3:08**	**3:16**	**3:22**	**3:23**	**3:28**	**3:36**	**3:38**
	3:42	**3:46**	**3:50**	**3:58**	**4:04**	**4:05**	**4:10**	**4:18**	**4:23**
	4:24	**4:28**	**4:32**	**4:40**	**4:46**	**4:47**	**4:52**	**5:00**	**5:08**
	5:14	**5:18**	**5:22**	**5:30**	**5:36**	**5:37**	**5:42**	**5:50**	**5:53**
	5:56	**6:00**	**6:04**	**6:12**	**6:18**	**6:19**	**6:24**	**6:32**	**6:38**
	6:38	**6:42**	**6:46**	**6:54**	**7:00**	**7:01**	**7:06**	**7:14**	

FLAG TUALATIN SHUTTLE DOWN

If you are on a residential street along the route, and not near a designated stop, you can “flag” or simply wave using your full arm to signal the Tualatin Shuttle bus driver to stop. Be sure to stand on the same side of the road as the bus’ direction of travel. Please identify a safe location, where the bus can stop without creating a hazard, and where the driver can see you in plenty of time to stop.

DEVIATIONS

We will deviate off the route to pick you up or drop you off for one leg of your trip. Deviation requests must be called in one day in advance. To call in for a deviation, please call 503-226-0700 between 7:30am and 5pm Monday-Friday. TTY: 711.

Deviations are not reservations. If the shuttle reaches capacity, we will make every effort to accomodate you.

The service operates **Monday through Friday** and it´s **free**.

Ride CONNECTION

APPENDIX D.

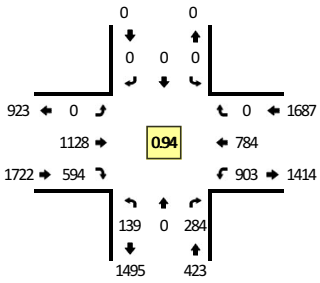
TRAFFIC COUNT SUMMARIES

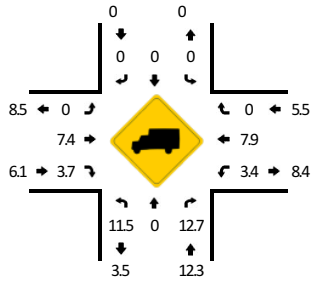
Type of peak hour being reported: System-wide Peak | Method for determining peak hour: Total Entering Volume

LOCATION: SW 124th Ave -- SW Pacific Hwy
CITY/STATE: Tualatin, OR

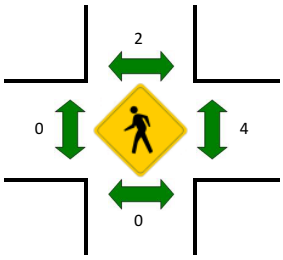
QC JOB #: 17042801
DATE: Tue, May 13 2025

Peak-Hour: 7:30 AM -- 8:30 AM
Peak 15-Min: 7:45 AM -- 8:00 AM

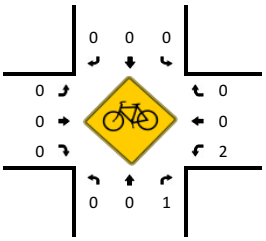


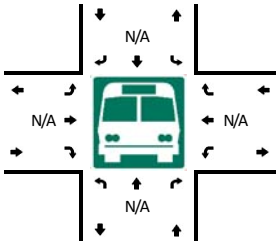


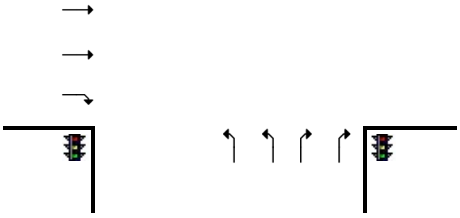
TRUE DATA TO IMPROVE MOBILITY

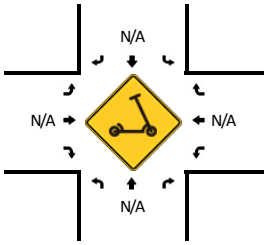












15-Min Count Period Beginning At	SW 124th Ave (Northbound)				SW 124th Ave (Southbound)				SW Pacific Hwy (Eastbound)				SW Pacific Hwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	29	0	50	0	0	0	0	0	0	307	76	0	145	196	0	0	803	
7:15 AM	33	0	68	0	0	0	0	0	0	339	121	0	198	199	0	0	958	
7:30 AM	34	0	76	0	0	0	0	0	0	282	146	0	164	214	0	0	916	
7:45 AM	41	0	65	0	0	0	0	0	0	252	178	0	286	193	0	0	1015	3692
8:00 AM	27	0	67	0	0	0	0	0	0	312	148	0	228	171	0	2	955	3844
8:15 AM	37	0	76	0	0	0	0	0	0	282	122	0	223	206	0	0	946	3832
8:30 AM	41	0	79	1	0	0	0	0	0	268	136	0	185	176	0	0	886	3802
8:45 AM	49	0	81	0	0	0	0	0	0	235	98	0	177	176	0	0	816	3603

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	164	0	260	0	0	0	0	0	0	1008	712	0	1144	772	0	0	4060
Heavy Trucks	24	0	20		0	0	0		0	88	32		24	44	0		232
Buses																	
Pedestrians		0				8				0				8			16
Bicycles	0	0	0		0	0	0		0	0	0		4	0	0		4
Scooters																	

Comments:

Report generated on 6/2/2025 1:03 PM

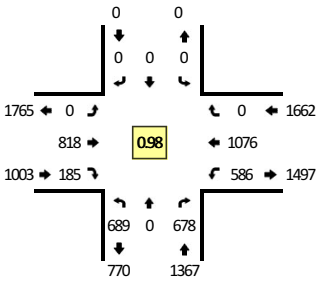
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

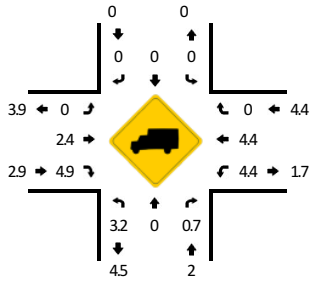
Type of peak hour being reported: System-wide Peak | Method for determining peak hour: Total Entering Volume

LOCATION: SW 124th Ave -- SW Pacific Hwy
CITY/STATE: Tualatin, OR

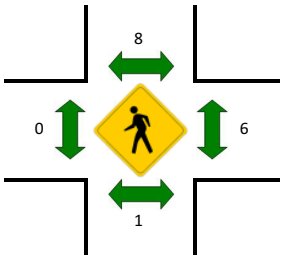
QC JOB #: 17042802
DATE: Tue, May 13 2025

Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 4:30 PM -- 4:45 PM

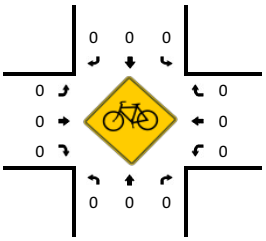


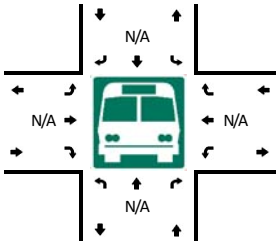


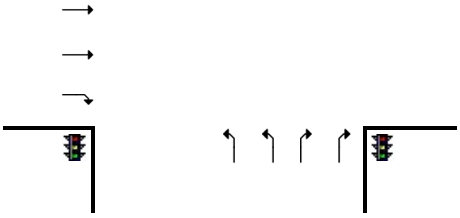


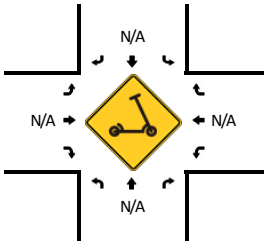












15-Min Count Period Beginning At	SW 124th Ave (Northbound)				SW 124th Ave (Southbound)				SW Pacific Hwy (Eastbound)				SW Pacific Hwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	156	0	207	0	0	0	0	0	0	223	73	0	119	259	0	1	1038	
4:15 PM	159	0	158	0	0	0	0	0	0	185	55	0	143	240	0	0	940	
4:30 PM	180	0	169	0	0	0	0	0	0	202	40	0	166	271	0	0	1028	
4:45 PM	155	0	152	0	0	0	0	0	0	203	48	0	143	264	0	0	965	3971
5:00 PM	188	0	190	0	0	0	0	0	0	213	44	0	139	250	0	1	1025	3958
5:15 PM	166	0	167	0	0	0	0	0	0	200	53	0	137	291	0	0	1014	4032
5:30 PM	125	0	158	0	0	0	0	0	0	197	38	0	105	237	0	0	860	3864
5:45 PM	83	0	118	0	0	0	0	0	0	214	35	0	91	231	0	2	774	3673

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	720	0	676	0	0	0	0	0	0	808	160	0	664	1084	0	0	4112
Heavy Trucks	4	0	4		0	0	0		0	16	12		36	72	0		144
Buses																	
Pedestrians		0				16				0				12			28
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 6/2/2025 1:04 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

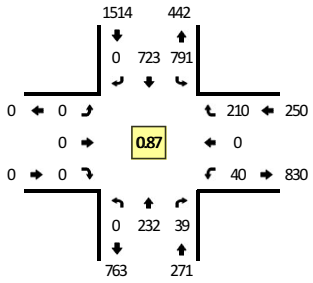
Method for determining peak hour: Total Entering Volume

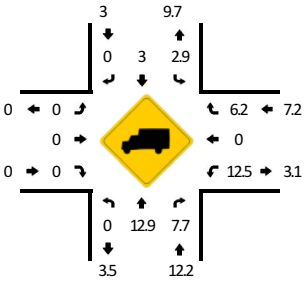
LOCATION: SW 124th Ave -- SW Tualatin Rd
CITY/STATE: Tualatin, OR

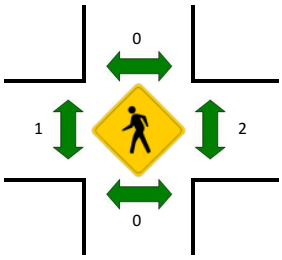
QC JOB #: 17042803
DATE: Tue, May 13 2025

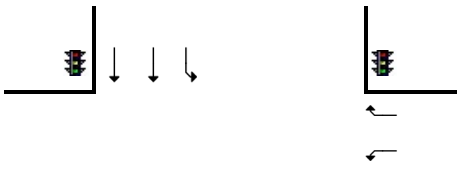
Peak-Hour: 7:45 AM -- 8:45 AM
Peak 15-Min: 7:45 AM -- 8:00 AM

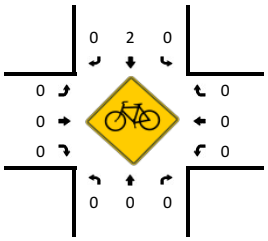
TRUE DATA TO IMPROVE MOBILITY

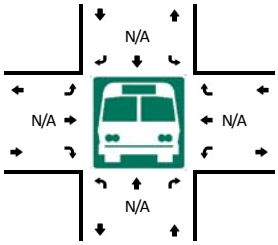


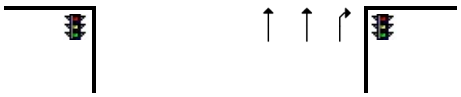


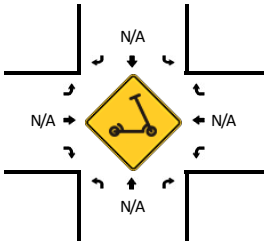












15-Min Count Period Beginning At	SW 124th Ave (Northbound)				SW 124th Ave (Southbound)				SW Tualatin Rd (Eastbound)				SW Tualatin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	58	3	0	106	114	0	0	0	0	0	0	3	0	31	0	315	
7:15 AM	0	57	6	0	158	160	0	0	0	0	0	0	7	0	40	0	428	
7:30 AM	0	54	8	0	187	127	0	0	0	0	0	0	9	0	47	0	432	
7:45 AM	0	50	8	0	241	219	0	0	0	0	0	0	13	0	57	0	588	1763
8:00 AM	0	52	16	0	215	173	0	0	0	0	0	0	6	0	48	0	510	1958
8:15 AM	0	68	9	0	165	174	0	0	0	0	0	0	10	0	49	0	475	2005
8:30 AM	0	62	6	0	170	157	0	0	0	0	0	0	11	0	56	0	462	2035
8:45 AM	0	70	14	0	132	143	0	0	0	0	0	0	3	0	54	0	416	1863

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	200	32	0	964	876	0	0	0	0	0	0	52	0	228	0	2352
Heavy Trucks	0	16	8		36	16	0		0	0	0		0	0	20		96
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	4	0		0	0	0		0	0	0		4
Scooters																	

Comments:

Report generated on 6/2/2025 1:12 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

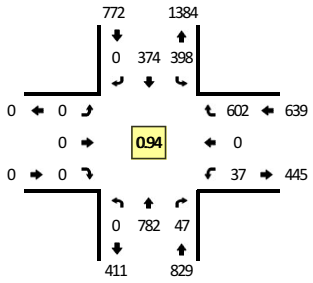
Type of peak hour being reported: Intersection Peak

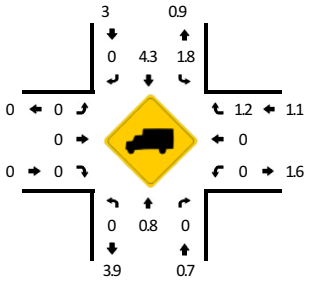
Method for determining peak hour: Total Entering Volume

LOCATION: SW 124th Ave -- SW Tualatin Rd
CITY/STATE: Tualatin, OR

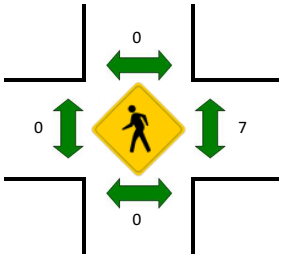
QC JOB #: 17042804
DATE: Tue, May 13 2025

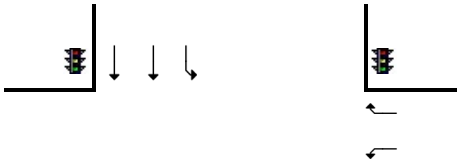
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 4:30 PM -- 4:45 PM

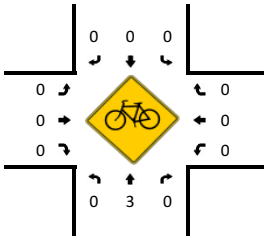


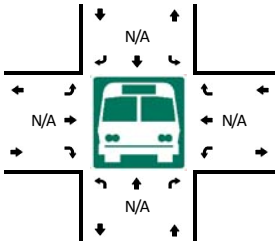


TRUE DATA TO IMPROVE MOBILITY

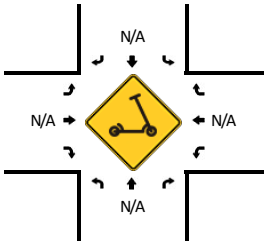












15-Min Count Period Beginning At	SW 124th Ave (Northbound)				SW 124th Ave (Southbound)				SW Tualatin Rd (Eastbound)				SW Tualatin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	228	14	0	105	89	0	0	0	0	0	0	13	0	141	0	590	
4:15 PM	0	177	4	0	102	96	0	0	0	0	0	0	9	0	133	0	521	
4:30 PM	0	214	13	0	102	108	0	0	0	0	0	0	6	0	155	0	598	
4:45 PM	0	177	9	0	91	94	0	0	0	0	0	0	6	0	142	0	519	2228
5:00 PM	0	202	12	0	89	86	0	0	0	0	0	0	16	0	162	0	567	2205
5:15 PM	0	189	13	0	116	86	0	0	0	0	0	0	9	0	143	0	556	2240
5:30 PM	0	161	4	0	80	62	0	0	0	0	0	0	4	0	116	0	427	2069
5:45 PM	0	110	9	0	79	48	0	0	0	0	0	0	3	0	80	0	329	1879

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	856	52	0	408	432	0	0	0	0	0	0	24	0	620	0	2392
Heavy Trucks	0	4	0		8	32	0		0	0	0		0	0	0		44
Buses																	
Pedestrians		0				0				0				12			12
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

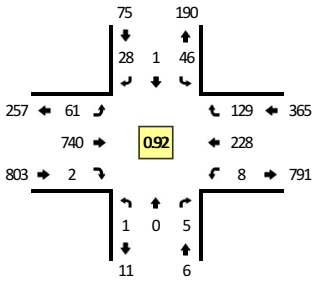
Report generated on 6/2/2025 1:12 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

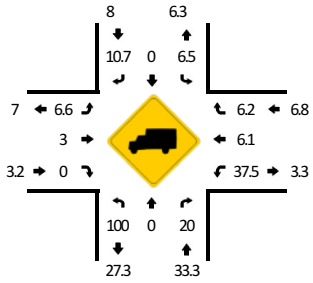
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

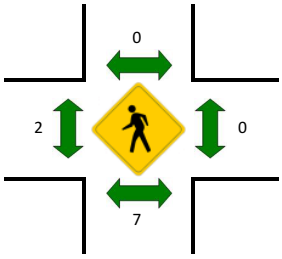
LOCATION: SW 115th Ave -- SW Tualatin Rd | **QC JOB #:** 17042831
CITY/STATE: Tualatin, OR | **DATE:** Tue, May 13 2025

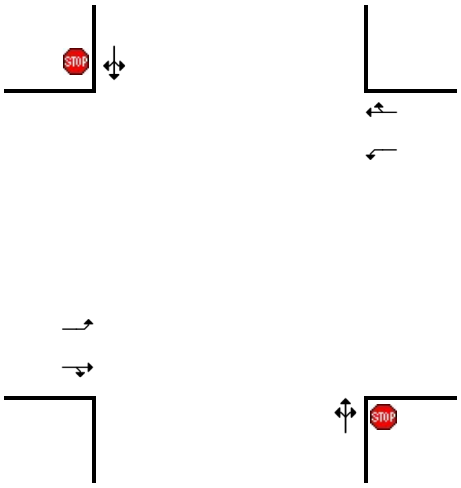
Peak-Hour: 7:30 AM -- 8:30 AM
Peak 15-Min: 7:45 AM -- 8:00 AM

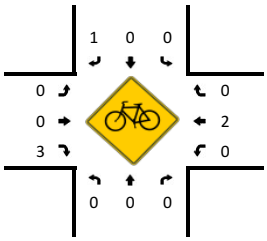


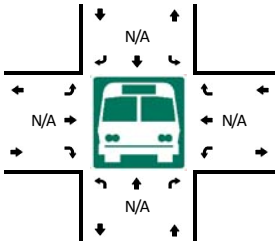


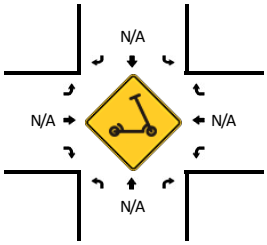












15-Min Count Period Beginning At	SW 115th Ave (Northbound)				SW 115th Ave (Southbound)				SW Tualatin Rd (Eastbound)				SW Tualatin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	3	0	3	0	6	90	0	0	2	24	7	0	135	
7:15 AM	0	0	0	0	11	0	7	0	10	138	1	0	1	27	14	0	209	
7:30 AM	0	0	1	0	11	0	6	0	8	179	1	0	3	50	24	0	283	
7:45 AM	0	0	0	0	13	1	2	0	10	225	0	0	1	70	19	0	341	968
8:00 AM	0	0	1	0	8	0	6	0	19	190	0	0	3	54	45	0	326	1159
8:15 AM	1	0	3	0	14	0	14	0	24	146	1	0	1	54	41	0	299	1249
8:30 AM	0	1	1	0	10	0	9	0	13	145	0	0	2	64	24	0	269	1235
8:45 AM	0	1	0	0	6	0	1	0	3	138	0	0	0	59	31	0	239	1133

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	52	4	8	0	40	900	0	0	4	280	76	0	1364
Heavy Trucks	0	0	0		0	0	0		8	36	0		0	24	0		68
Buses																	
Pedestrians		12				0				8				0			20
Bicycles	0	0	0		0	0	4		0	0	8		0	4	0		16
Scooters																	

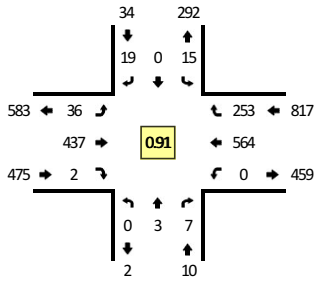
Comments:

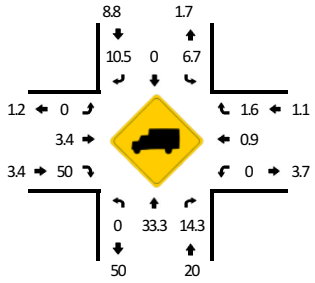
Report generated on 6/2/2025 1:12 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

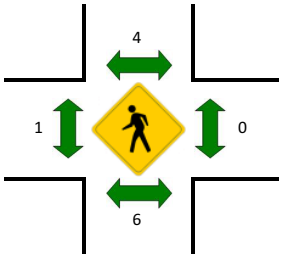
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

LOCATION: SW 115th Ave -- SW Tualatin Rd | **QC JOB #:** 17042832
CITY/STATE: Tualatin, OR | **DATE:** Tue, May 13 2025

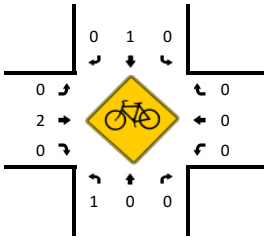
Peak-Hour: 3:45 PM -- 4:45 PM
Peak 15-Min: 4:30 PM -- 4:45 PM

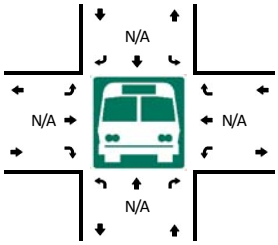




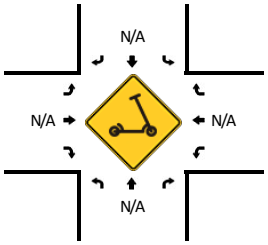












15-Min Count Period Beginning At	SW 115th Ave (Northbound)				SW 115th Ave (Southbound)				SW Tualatin Rd (Eastbound)				SW Tualatin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	2	1	1	0	9	0	5	0	17	93	0	0	0	104	54	0	286	
3:15 PM	0	1	0	0	11	0	18	0	6	85	1	0	0	103	43	0	268	
3:30 PM	1	1	1	0	7	0	8	0	6	89	0	0	0	112	57	0	282	
3:45 PM	0	1	2	0	6	0	6	0	9	124	2	0	0	122	60	0	332	1168
4:00 PM	0	1	4	0	2	0	7	0	6	100	0	0	0	130	76	0	326	1208
4:15 PM	0	1	0	0	3	0	3	0	6	105	0	0	0	135	58	0	311	1251
4:30 PM	0	0	1	0	4	0	3	0	15	108	0	0	0	177	59	0	367	1336
4:45 PM	0	2	1	0	7	0	3	0	14	77	0	0	2	144	48	0	298	1302
5:00 PM	0	1	1	0	8	0	5	0	14	103	0	0	0	125	77	0	334	1310
5:15 PM	0	1	1	0	8	0	6	0	9	94	0	0	1	124	74	0	318	1317
5:30 PM	1	0	3	0	5	0	3	0	9	77	2	0	2	99	53	0	254	1204
5:45 PM	0	0	1	0	1	0	3	0	4	68	1	0	0	75	56	0	209	1115

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	4	0	16	0	12	0	60	432	0	0	0	708	236	0	1468
Heavy Trucks	0	0	0		0	0	0		0	8	0		0	0	0		8
Buses																	
Pedestrians		4				0				0				0			4
Bicycles	0	0	0		0	0	0		0	4	0		0	0	0		4
Scooters																	

Comments:

Report generated on 6/2/2025 1:12 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

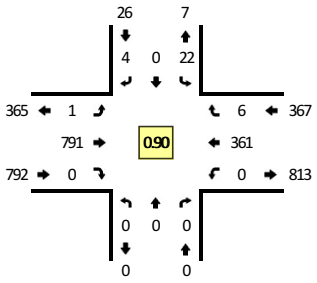
Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

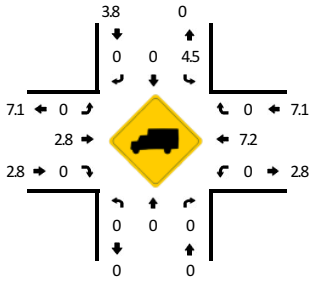
LOCATION: SW 112th Ave -- SW Tualatin Rd
CITY/STATE: Tualatin, OR

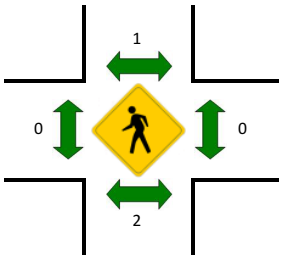
QC JOB #: 17042839
DATE: Tue, May 13 2025

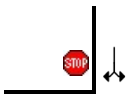
Peak-Hour: 7:30 AM -- 8:30 AM
Peak 15-Min: 7:45 AM -- 8:00 AM

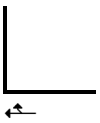


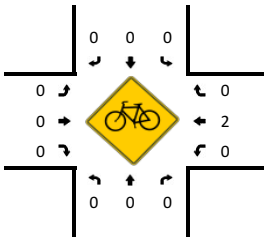


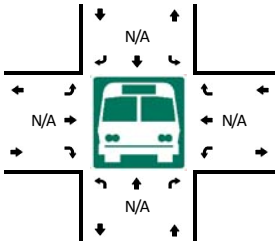


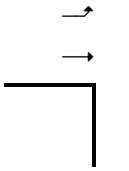




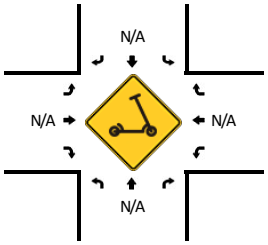












15-Min Count Period Beginning At	SW 112th Ave (Northbound)				SW 112th Ave (Southbound)				SW Tualatin Rd (Eastbound)				SW Tualatin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	1	0	1	0	0	90	0	0	0	31	2	0	125	
7:15 AM	0	0	0	0	11	0	1	0	3	148	0	0	0	41	1	0	205	
7:30 AM	0	0	0	0	12	0	2	0	0	191	0	0	0	75	1	0	281	
7:45 AM	0	0	0	0	2	0	0	0	1	233	0	0	0	90	2	0	328	939
8:00 AM	0	0	0	0	4	0	2	0	0	201	0	0	0	100	0	0	307	1121
8:15 AM	0	0	0	0	4	0	0	0	0	166	0	0	0	96	3	0	269	1185
8:30 AM	0	0	0	0	7	0	2	0	0	156	0	0	0	85	1	0	251	1155
8:45 AM	0	0	0	0	5	0	2	0	1	140	0	0	0	89	2	0	239	1066

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	8	0	0	0	4	932	0	0	0	360	8	0	1312
Heavy Trucks	0	0	0		0	0	0		0	28	0		0	24	0		52
Buses																	
Pedestrians		0				4				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	4	0		4
Scooters																	

Comments:

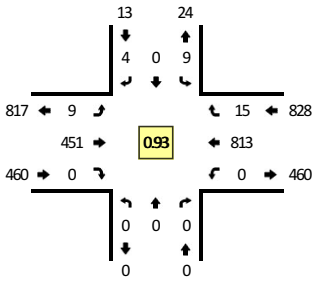
Report generated on 6/2/2025 1:12 PM

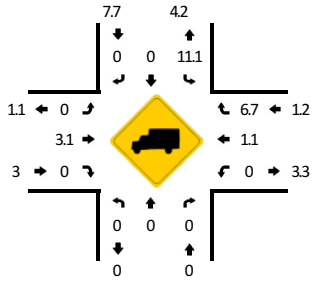
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

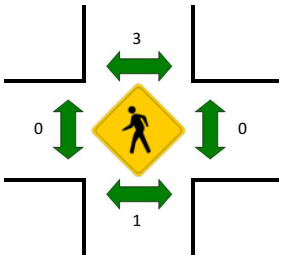
LOCATION: SW 112th Ave -- SW Tualatin Rd | **QC JOB #:** 17042840
CITY/STATE: Tualatin, OR | **DATE:** Tue, May 13 2025

Peak-Hour: 3:45 PM -- 4:45 PM
Peak 15-Min: 4:30 PM -- 4:45 PM

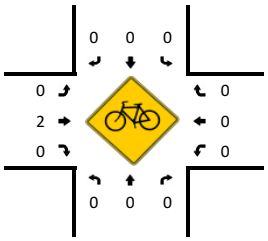


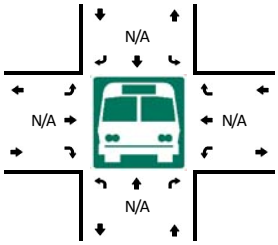


TRUE DATA TO IMPROVE MOBILITY

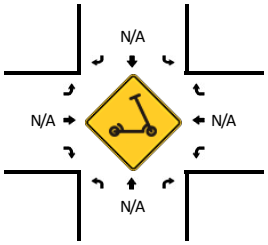












15-Min Count Period Beginning At	SW 112th Ave (Northbound)				SW 112th Ave (Southbound)				SW Tualatin Rd (Eastbound)				SW Tualatin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	0	0	0	0	2	0	1	0	1	100	0	0	0	163	5	0	272	
3:15 PM	0	0	0	0	1	0	0	0	1	97	0	0	0	142	3	0	244	
3:30 PM	0	0	0	0	4	0	1	0	2	95	0	0	0	169	3	0	274	
3:45 PM	0	0	0	0	3	0	0	0	2	132	0	0	0	182	7	0	326	1116
4:00 PM	0	0	0	0	2	0	1	0	3	103	0	0	0	207	1	0	317	1161
4:15 PM	0	0	0	0	3	0	2	0	1	106	0	0	0	190	6	0	308	1225
4:30 PM	0	0	0	0	1	0	1	0	3	110	0	0	0	234	1	0	350	1301
4:45 PM	0	0	0	0	8	0	2	0	3	81	0	0	0	191	9	0	294	1269
5:00 PM	0	0	0	0	2	0	1	0	3	109	0	0	0	200	7	0	322	1274
5:15 PM	0	0	0	0	2	0	0	0	5	97	0	0	0	201	10	0	315	1281
5:30 PM	0	0	0	0	3	0	2	0	3	81	0	0	0	151	9	0	249	1180
5:45 PM	0	0	0	0	0	0	1	0	0	72	0	0	0	127	2	0	202	1088

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	4	0	4	0	12	440	0	0	0	936	4	0	1400
Heavy Trucks	0	0	0		0	0	0		0	8	0		0	0	0		8
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	4	0		0	0	0		4
Scooters																	

Comments:

Report generated on 6/2/2025 1:12 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

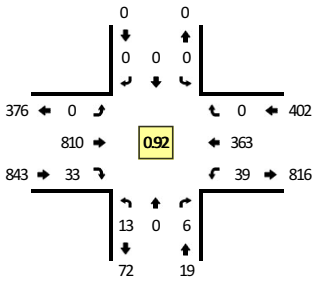
Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

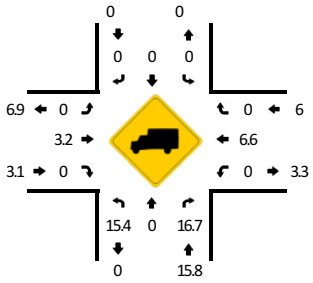
LOCATION: SW 108th Ave -- SW Tualatin Rd
CITY/STATE: Tualatin, OR

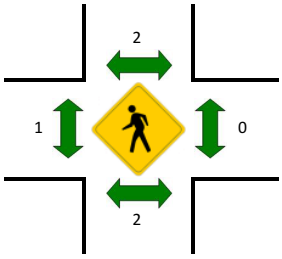
QC JOB #: 17042833
DATE: Tue, May 13 2025

Peak-Hour: 7:30 AM -- 8:30 AM
Peak 15-Min: 7:45 AM -- 8:00 AM

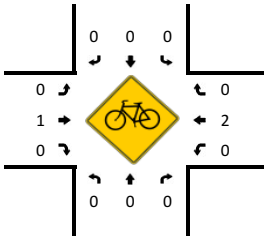


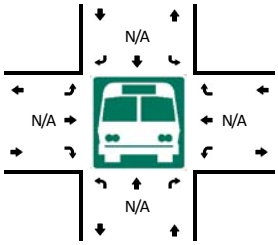




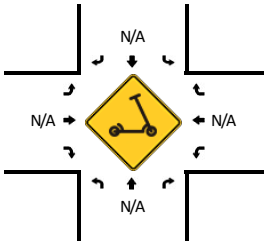












15-Min Count Period Beginning At	SW 108th Ave (Northbound)				SW 108th Ave (Southbound)				SW Tualatin Rd (Eastbound)				SW Tualatin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	1	0	0	0	0	0	0	91	2	0	3	37	0	0	134	
7:15 AM	1	0	2	0	0	0	0	0	0	151	6	0	8	40	0	0	208	
7:30 AM	2	0	0	0	0	0	0	0	0	221	2	0	4	75	0	0	304	
7:45 AM	1	0	1	0	0	0	0	0	0	231	7	0	8	95	0	0	343	989
8:00 AM	1	0	3	0	0	0	0	0	0	194	11	0	15	103	0	0	327	1182
8:15 AM	9	0	2	0	0	0	0	0	0	164	13	0	12	90	0	0	290	1264
8:30 AM	3	0	4	0	0	0	0	0	0	156	8	0	9	83	0	0	263	1223
8:45 AM	2	0	2	0	0	0	0	0	0	135	12	0	10	85	0	0	246	1126

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	0	4	0	0	0	0	0	0	924	28	0	32	380	0	0	1372
Heavy Trucks	0	0	0		0	0	0		0	36	0		0	24	0		60
Buses																	
Pedestrians		0				8				0				0			8
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

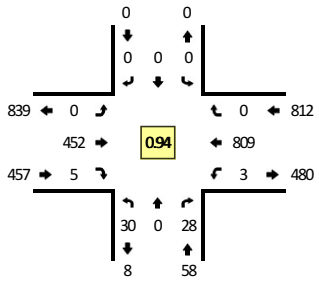
Report generated on 6/2/2025 1:12 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

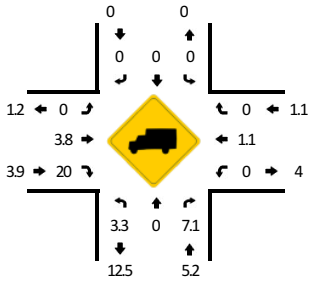
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

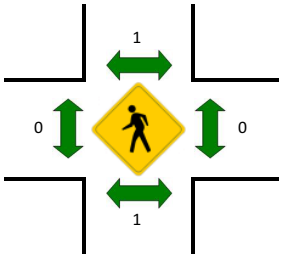
LOCATION: SW 108th Ave -- SW Tualatin Rd | **QC JOB #:** 17042834
CITY/STATE: Tualatin, OR | **DATE:** Tue, May 13 2025

Peak-Hour: 3:45 PM -- 4:45 PM
Peak 15-Min: 4:30 PM -- 4:45 PM

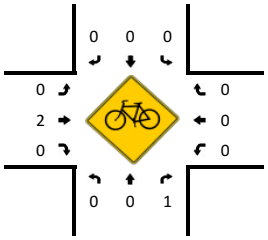


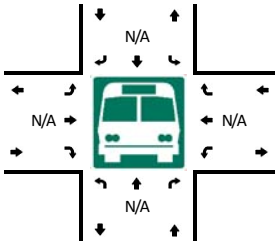




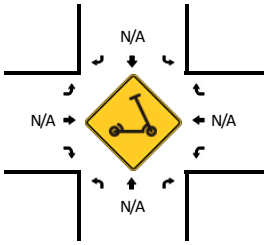












15-Min Count Period Beginning At	SW 108th Ave (Northbound)				SW 108th Ave (Southbound)				SW Tualatin Rd (Eastbound)				SW Tualatin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	9	0	6	0	0	0	0	0	0	100	2	0	1	158	0	0	276	
3:15 PM	2	0	3	0	0	0	0	0	0	100	2	0	2	148	0	0	257	
3:30 PM	7	0	4	0	0	0	0	0	0	99	0	0	0	171	0	0	281	
3:45 PM	5	0	11	0	0	0	0	0	0	129	2	0	0	188	0	0	335	1149
4:00 PM	7	0	6	0	0	0	0	0	0	109	2	0	0	202	0	0	326	1199
4:15 PM	6	0	3	0	0	0	0	0	0	107	1	0	2	194	0	0	313	1255
4:30 PM	12	0	8	0	0	0	0	0	0	107	0	0	1	225	0	0	353	1327
4:45 PM	5	0	4	0	0	0	0	0	0	89	1	0	4	200	0	0	303	1295
5:00 PM	6	0	7	0	0	0	0	0	0	101	3	0	0	209	0	0	326	1295
5:15 PM	5	0	10	0	0	0	0	0	0	100	0	0	1	204	0	0	320	1302
5:30 PM	6	0	6	0	0	0	0	0	0	80	2	0	1	161	0	0	256	1205
5:45 PM	2	0	3	0	0	0	0	0	0	75	0	0	2	132	0	0	214	1116

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	48	0	32	0	0	0	0	0	0	428	0	0	4	900	0	0	1412
Heavy Trucks	0	0	4		0	0	0		0	8	0		0	0	0		12
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	4	0		0	0	0		4
Scooters																	

Comments:

Report generated on 6/2/2025 1:12 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: SW 108th Ave -- North Lam Access

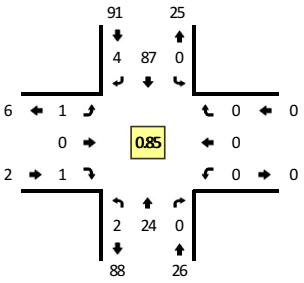
CITY/STATE: Tualatin, OR

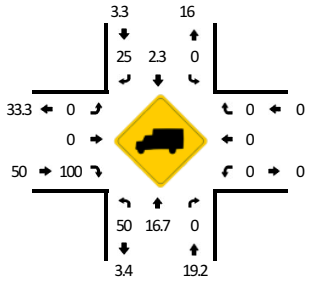
QC JOB #: 17042841

DATE: Tue, May 13 2025

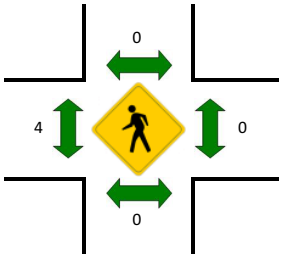
Peak-Hour: 8:00 AM -- 9:00 AM

Peak 15-Min: 8:15 AM -- 8:30 AM

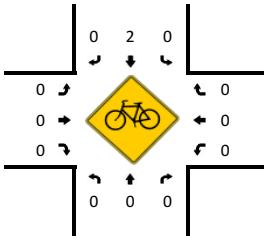


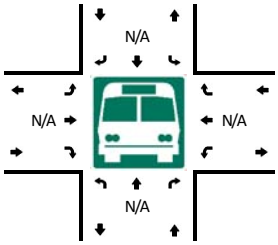


TRUE DATA TO IMPROVE MOBILITY

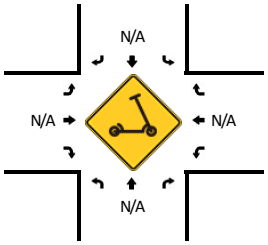












15-Min Count Period Beginning At	SW 108th Ave (Northbound)				SW 108th Ave (Southbound)				North Lam Access (Eastbound)				North Lam Access (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	2	1	0	0	0	5	0	0	0	0	2	1	0	0	0	0	11	
7:15 AM	2	2	0	0	0	13	1	0	1	0	1	0	0	0	0	0	20	
7:30 AM	0	1	0	0	0	6	1	0	1	0	2	0	0	0	0	0	11	
7:45 AM	0	2	0	0	0	12	1	0	0	0	0	0	0	0	0	0	15	57
8:00 AM	1	2	0	0	0	28	0	0	1	0	0	0	0	0	0	0	32	78
8:15 AM	0	11	0	0	0	24	0	0	0	0	0	0	0	0	0	0	35	93
8:30 AM	0	7	0	0	0	17	0	0	0	0	0	0	0	0	0	0	24	106
8:45 AM	1	4	0	0	0	18	4	0	0	0	1	0	0	0	0	0	28	119

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	44	0	0	0	96	0	0	0	0	0	0	0	0	0	0	140
Heavy Trucks	0	4	0		0	0	0		0	0	0		0	0	0		4
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	4	0		0	0	0		0	0	0		4
Scooters																	

Comments:

Report generated on 6/2/2025 1:08 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

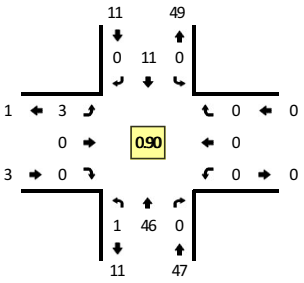
Type of peak hour being reported: User-Defined

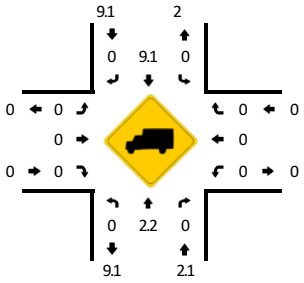
Method for determining peak hour: Total Entering Volume

LOCATION: SW 108th Ave -- North Lam Access
CITY/STATE: Tualatin, OR

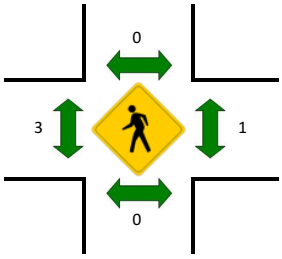
QC JOB #: 17042842
DATE: Tue, May 13 2025

Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:15 PM -- 5:30 PM

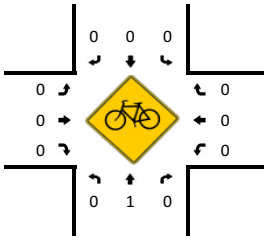


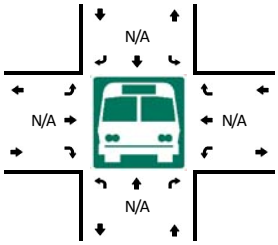


TRUE DATA TO IMPROVE MOBILITY

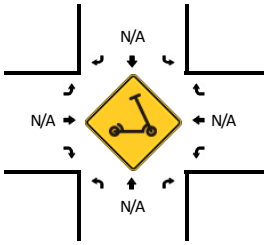












15-Min Count Period Beginning At	SW 108th Ave (Northbound)				SW 108th Ave (Southbound)				North Lam Access (Eastbound)				North Lam Access (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	11	0	0	0	2	0	0	1	0	1	0	0	0	0	0	15	
4:15 PM	0	9	0	0	0	2	1	0	0	0	0	0	0	0	0	0	12	
4:30 PM	0	19	0	0	0	1	0	0	1	0	1	0	0	0	0	0	22	
4:45 PM	0	10	0	0	0	5	0	0	0	0	0	0	0	0	0	0	15	64
5:00 PM	0	10	0	0	0	3	0	0	2	0	0	0	0	0	0	0	15	64
5:15 PM	1	14	0	0	0	1	0	0	1	0	0	0	0	0	0	0	17	69
5:30 PM	0	12	0	0	0	2	0	0	0	0	0	0	0	0	0	0	14	61
5:45 PM	0	6	0	0	0	3	0	0	0	0	0	0	0	0	0	0	9	55

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	56	0	0	0	4	0	0	4	0	0	0	0	0	0	0	68
Heavy Trucks	0	4	0		0	0	0		0	0	0		0	0	0		4
Buses																	
Pedestrians		0				0				4				0			4
Bicycles	0	4	0		0	0	0		0	0	0		0	0	0		4
Scooters																	

Comments:

Report generated on 6/2/2025 1:10 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

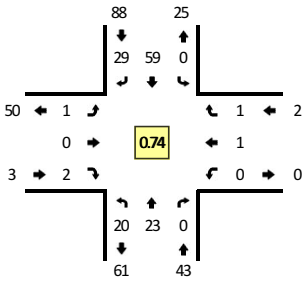
Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

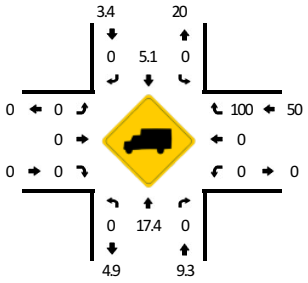
LOCATION: SW 108th Ave -- Central Lam Access/North 18220 Access
CITY/STATE: Tualatin, OR

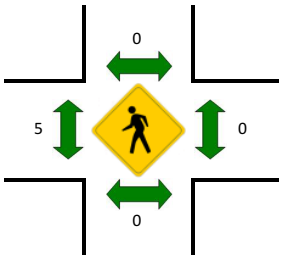
QC JOB #: 17042829
DATE: Tue, May 13 2025

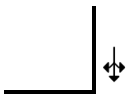
Peak-Hour: 8:00 AM -- 9:00 AM
Peak 15-Min: 8:15 AM -- 8:30 AM

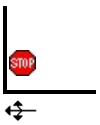


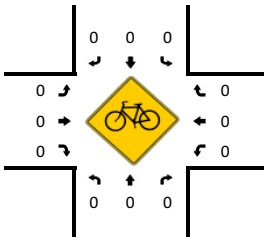
TRUE DATA TO IMPROVE MOBILITY

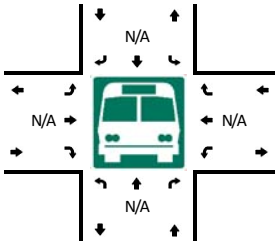


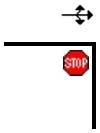


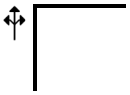


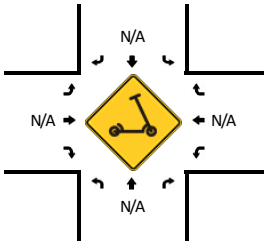












15-Min Count Period Beginning At	SW 108th Ave (Northbound)				SW 108th Ave (Southbound)				Central Lam Access/North 18220 Access (Eastbound)				Central Lam Access/North 18220 Access (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	3	2	0	0	3	4	2	0	0	0	1	0	0	0	1	0	16	
7:15 AM	0	4	0	0	1	10	3	0	0	0	0	0	0	0	0	1	19	
7:30 AM	5	1	0	0	0	6	2	0	0	0	0	0	0	0	0	0	14	
7:45 AM	5	2	0	0	0	6	5	0	0	0	0	0	0	0	0	0	18	67
8:00 AM	4	2	0	0	0	18	10	0	1	0	1	0	0	0	0	0	36	87
8:15 AM	9	11	0	0	0	21	4	0	0	0	0	0	0	1	0	0	46	114
8:30 AM	4	6	0	0	0	6	10	0	0	0	1	0	0	0	0	0	27	127
8:45 AM	3	4	0	0	0	14	5	0	0	0	0	0	0	0	1	0	27	136

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	36	44	0	0	0	84	16	0	0	0	0	0	0	4	0	0	184
Heavy Trucks	0	4	0		0	0	0		0	0	0		0	0	0		4
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 6/2/2025 1:08 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

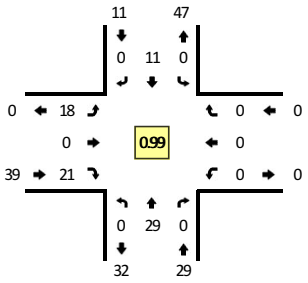
Type of peak hour being reported: User-Defined

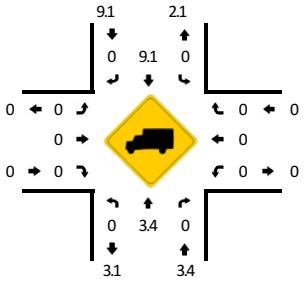
Method for determining peak hour: Total Entering Volume

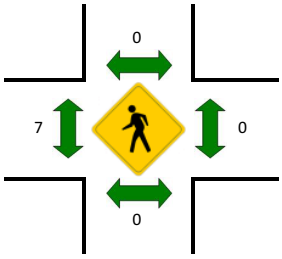
LOCATION: SW 108th Ave -- Central Lam Access/North 18220 Access
CITY/STATE: Tualatin, OR

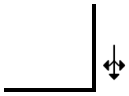
QC JOB #: 17042830
DATE: Tue, May 13 2025

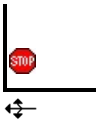
Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 4:45 PM -- 5:00 PM

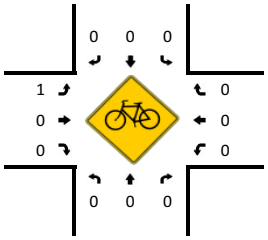


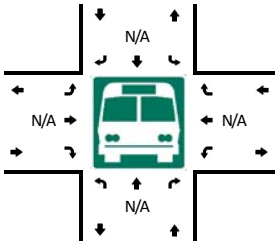


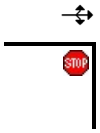


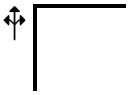


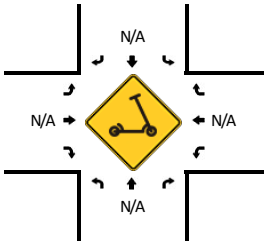












15-Min Count Period Beginning At	SW 108th Ave (Northbound)				SW 108th Ave (Southbound)				Central Lam Access/North 18220 Access (Eastbound)				Central Lam Access/North 18220 Access (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	1	8	0	0	0	1	1	0	2	0	1	0	0	0	0	0	14	
4:15 PM	1	7	0	0	0	1	1	0	2	0	2	0	0	0	0	0	14	
4:30 PM	0	12	0	0	0	2	0	0	7	0	2	0	0	0	0	0	23	
4:45 PM	0	7	0	0	0	5	0	0	3	0	5	0	0	0	0	0	20	71
5:00 PM	0	8	0	0	0	3	0	0	2	0	6	0	0	0	0	0	19	76
5:15 PM	0	8	0	0	0	1	0	0	7	0	4	0	0	0	0	0	20	82
5:30 PM	0	6	0	0	0	2	0	0	6	0	6	0	0	0	0	0	20	79
5:45 PM	0	3	0	0	0	3	0	0	3	0	3	0	0	0	0	0	12	71

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	28	0	0	0	20	0	0	12	0	20	0	0	0	0	0	80
Heavy Trucks	0	0	0		0	4	0		0	0	0		0	0	0		4
Buses																	
Pedestrians		0				0				4				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 6/2/2025 1:10 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: SW 108th Ave -- South Lam Access/Ascentec North Access

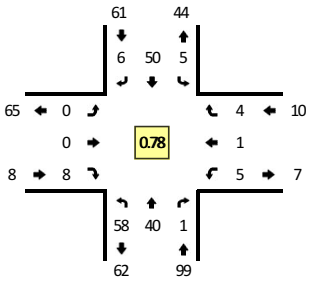
CITY/STATE: Tualatin, OR

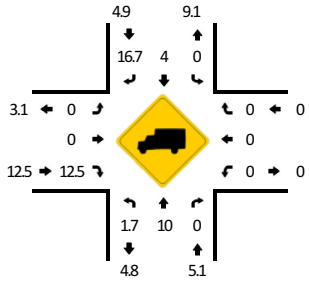
QC JOB #: 17042827

DATE: Tue, May 13 2025

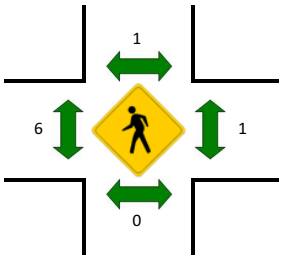
Peak-Hour: 8:00 AM -- 9:00 AM

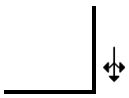
Peak 15-Min: 8:15 AM -- 8:30 AM

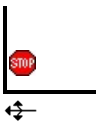


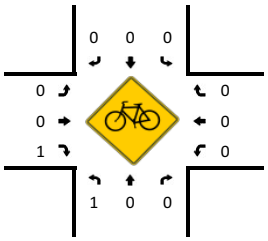


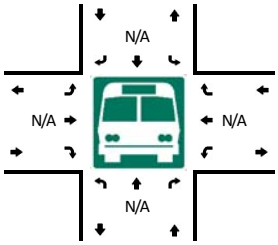
TRUE DATA TO IMPROVE MOBILITY

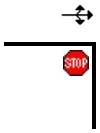


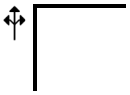


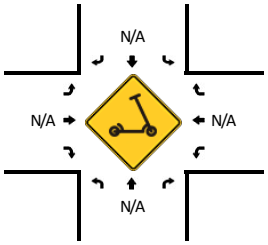












15-Min Count Period Beginning At	SW 108th Ave (Northbound)				SW 108th Ave (Southbound)				South Lam Access/Ascentec North Access (Eastbound)				South Lam Access/Ascentec North Access (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	1	5	2	0	0	7	1	0	1	0	0	0	0	0	0	0	17	
7:15 AM	3	3	0	0	1	7	2	0	1	0	2	0	0	0	0	0	19	
7:30 AM	3	6	0	0	2	5	0	0	0	0	0	0	1	0	0	0	17	
7:45 AM	9	7	0	0	0	7	0	0	0	0	0	0	1	0	0	0	24	77
8:00 AM	12	7	1	0	1	16	2	0	0	0	2	0	1	0	0	0	42	102
8:15 AM	12	18	0	0	2	19	0	0	0	0	3	0	0	0	2	1	57	140
8:30 AM	18	9	0	0	1	5	1	0	0	0	2	0	2	0	2	0	40	163
8:45 AM	16	6	0	0	1	10	3	0	0	0	1	0	1	1	0	0	39	178

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	48	72	0	0	8	76	0	0	0	0	12	0	0	0	8	4	228
Heavy Trucks	0	4	0		0	0	0		0	0	4		0	0	0		8
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 6/2/2025 1:08 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

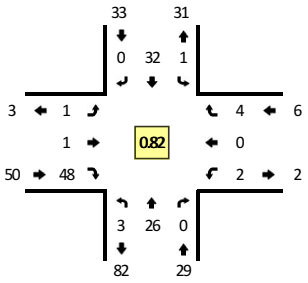
Type of peak hour being reported: User-Defined

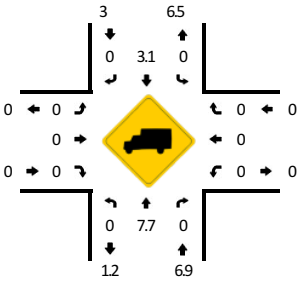
Method for determining peak hour: Total Entering Volume

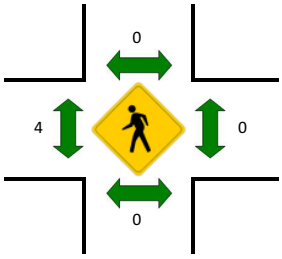
LOCATION: SW 108th Ave -- South Lam Access/Ascentec North Access
CITY/STATE: Tualatin, OR

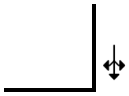
QC JOB #: 17042828
DATE: Tue, May 13 2025

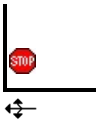
Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

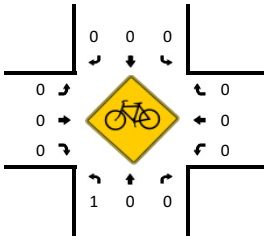


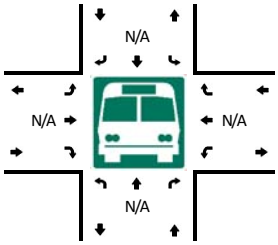


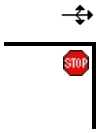


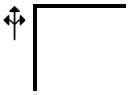


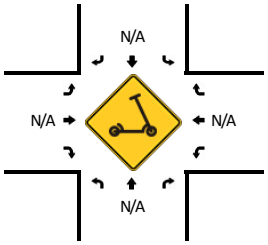












15-Min Count Period Beginning At	SW 108th Ave (Northbound)				SW 108th Ave (Southbound)				South Lam Access/Ascentec North Access (Eastbound)				South Lam Access/Ascentec North Access (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	2	9	0	0	0	2	0	0	0	0	8	0	0	0	0	0	21	
4:15 PM	1	6	1	0	0	3	0	0	0	0	6	0	0	0	2	0	19	
4:30 PM	0	11	1	0	0	4	0	0	0	0	2	0	3	0	1	0	22	
4:45 PM	0	5	0	0	0	10	0	0	0	0	5	0	1	0	2	0	23	85
5:00 PM	1	8	0	0	1	8	0	0	0	1	16	0	1	0	0	0	36	100
5:15 PM	1	6	0	0	0	5	0	0	1	0	11	0	0	0	1	0	25	106
5:30 PM	1	7	0	0	0	9	0	0	0	0	16	0	0	0	1	0	34	118
5:45 PM	1	2	0	0	0	8	0	0	1	0	12	0	0	0	0	0	24	119

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	32	0	0	4	32	0	0	0	4	64	0	4	0	0	0	144
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	0		0
Buses																	
Pedestrians		0				0				8				0			8
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

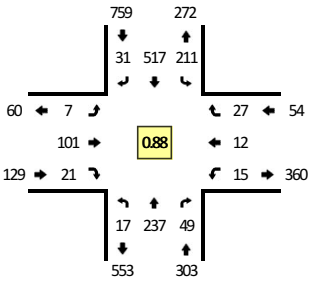
Report generated on 6/2/2025 1:10 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

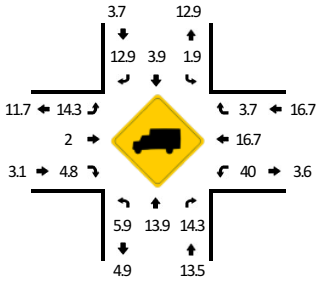
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

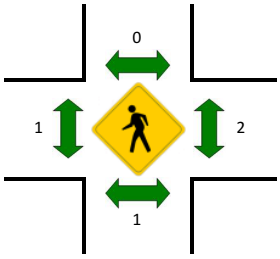
LOCATION: SW 124th Ave -- SW Leveton Dr | **QC JOB #:** 17042805
CITY/STATE: Tualatin, OR | **DATE:** Tue, May 13 2025

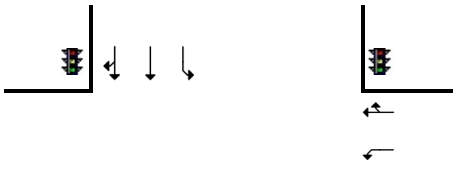
Peak-Hour: 7:45 AM -- 8:45 AM
Peak 15-Min: 7:45 AM -- 8:00 AM

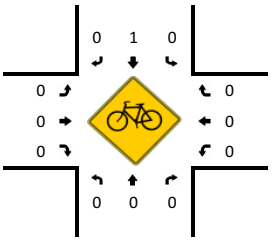


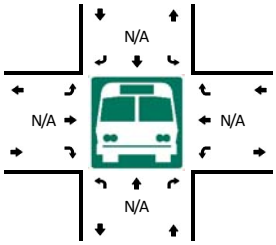
TRUE DATA TO IMPROVE MOBILITY

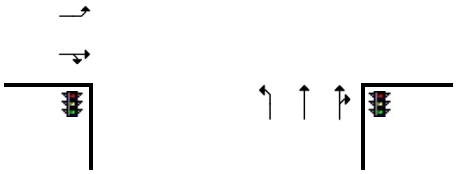


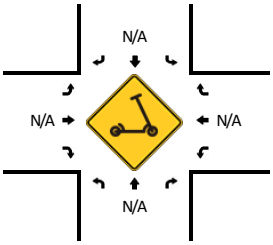












15-Min Count Period Beginning At	SW 124th Ave (Northbound)				SW 124th Ave (Southbound)				SW Leveton Dr (Eastbound)				SW Leveton Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	6	46	7	0	26	89	4	0	7	13	3	0	0	2	10	0	213	
7:15 AM	3	47	5	0	31	126	9	0	5	17	11	0	3	1	9	0	267	
7:30 AM	8	54	14	0	33	98	6	0	2	18	6	0	1	0	7	0	247	
7:45 AM	5	53	13	0	57	158	11	1	0	41	5	0	1	4	5	0	354	1081
8:00 AM	5	59	9	0	52	124	7	0	2	28	9	0	5	2	9	0	311	1179
8:15 AM	3	69	17	0	60	118	4	0	1	16	2	0	5	2	5	0	302	1214
8:30 AM	4	56	10	0	41	117	9	0	4	16	5	0	4	4	8	0	278	1245
8:45 AM	2	83	10	0	44	100	4	0	0	16	9	0	4	2	5	0	279	1170

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	20	212	52	0	228	632	44	4	0	164	20	0	4	16	20	0	1416
Heavy Trucks	0	24	4		4	16	0		0	4	0		4	0	4		60
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	4	0		0	0	0		0	0	0		4
Scooters																	

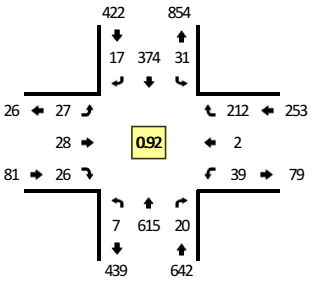
Comments:

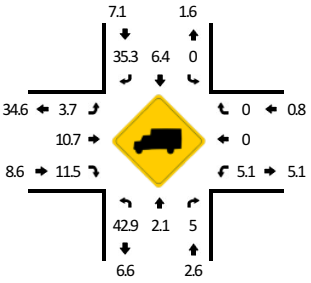
Report generated on 6/2/2025 1:12 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

LOCATION: SW 124th Ave -- SW Leveton Dr | **QC JOB #:** 17042806
CITY/STATE: Tualatin, OR | **DATE:** Tue, May 13 2025

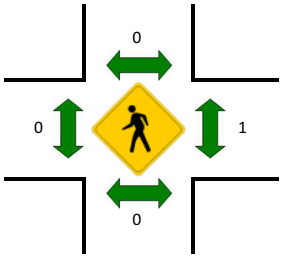
Peak-Hour: 4:00 PM -- 5:00 PM
Peak 15-Min: 4:30 PM -- 4:45 PM

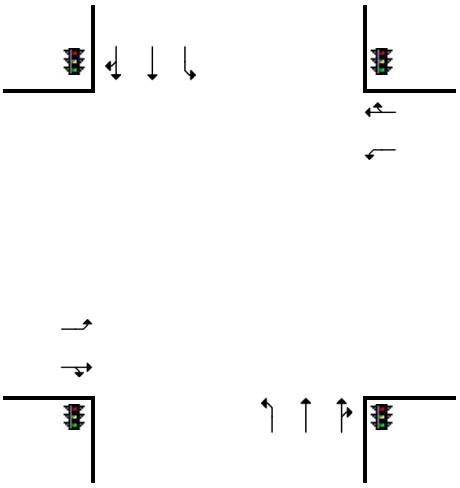


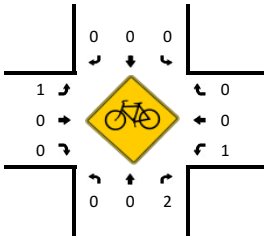


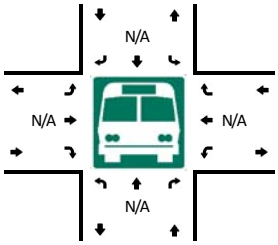


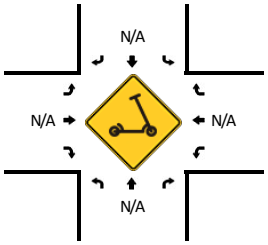
TRUE DATA TO IMPROVE MOBILITY











15-Min Count Period Beginning At	SW 124th Ave (Northbound)				SW 124th Ave (Southbound)				SW Leveton Dr (Eastbound)				SW Leveton Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	1	191	6	0	4	94	3	0	5	7	4	0	5	0	56	0	376	
4:15 PM	3	129	3	0	6	94	7	0	5	8	10	0	12	0	48	0	325	
4:30 PM	1	162	5	0	8	96	5	0	9	8	7	0	12	2	63	0	378	
4:45 PM	2	133	6	0	13	90	2	0	8	5	5	0	10	0	45	0	319	1398
5:00 PM	3	130	2	0	4	90	1	0	3	5	12	0	15	0	88	0	353	1375
5:15 PM	3	115	2	0	12	85	0	0	4	2	2	0	8	0	74	0	307	1357
5:30 PM	0	97	0	0	5	60	1	0	3	2	5	0	6	0	58	0	237	1216
5:45 PM	0	78	2	0	2	47	2	0	2	2	2	0	5	0	35	0	177	1074

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	648	20	0	32	384	20	0	36	32	28	0	48	8	252	0	1512
Heavy Trucks	4	0	4		0	24	4		0	0	0		4	0	0		40
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

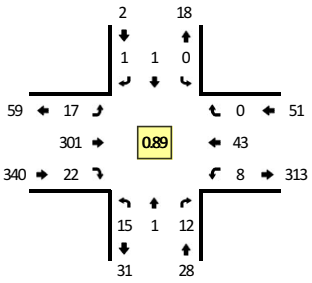
Comments:

Report generated on 6/2/2025 1:12 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

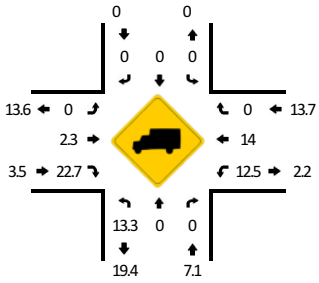
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

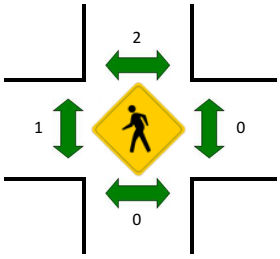
LOCATION: SW 118th Ave -- SW Leveton Dr | **QC JOB #:** 17042807
CITY/STATE: Tualatin, OR | **DATE:** Tue, May 13 2025

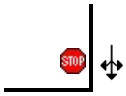
Peak-Hour: 7:45 AM -- 8:45 AM
Peak 15-Min: 7:45 AM -- 8:00 AM

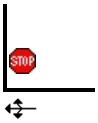


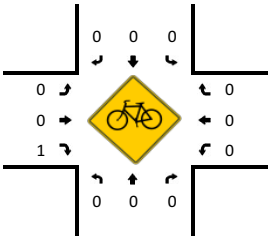


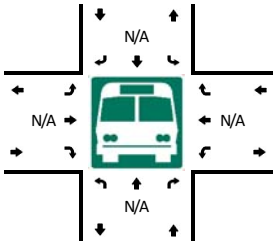


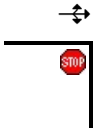


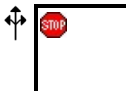


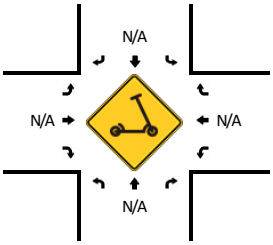












15-Min Count Period Beginning At	SW 118th Ave (Northbound)				SW 118th Ave (Southbound)				SW Leveton Dr (Eastbound)				SW Leveton Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	3	1	1	0	0	0	0	0	5	36	5	0	1	9	0	0	61	
7:15 AM	5	2	1	0	0	0	2	0	7	30	10	0	2	8	0	0	67	
7:30 AM	2	1	5	0	0	1	0	0	2	59	1	0	1	6	0	0	78	
7:45 AM	4	0	5	0	0	0	0	0	6	85	7	0	2	9	0	0	118	324
8:00 AM	4	0	1	0	0	1	1	0	5	77	8	0	1	14	0	0	112	375
8:15 AM	5	1	4	0	0	0	0	0	5	74	4	0	3	8	0	0	104	412
8:30 AM	2	0	2	0	0	0	0	0	1	65	3	0	2	12	0	0	87	421
8:45 AM	3	1	3	0	1	0	0	0	0	68	2	0	2	8	0	0	88	391

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	16	0	20	0	0	0	0	0	24	340	28	0	8	36	0	0	472
Heavy Trucks	4	0	0		0	0	0		0	8	4		4	4	0		24
Buses																	
Pedestrians		0				8				0				0			8
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

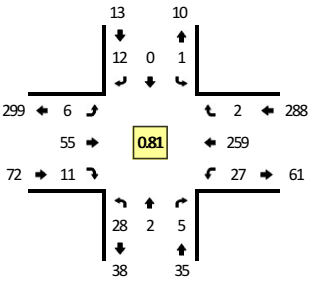
Comments:

Report generated on 6/2/2025 1:12 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

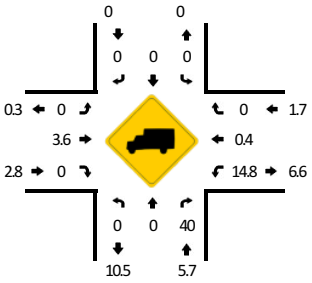
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

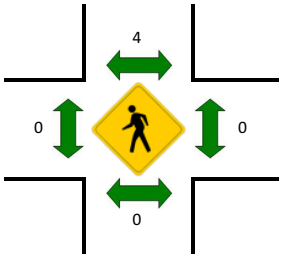
LOCATION: SW 118th Ave -- SW Leveton Dr | **QC JOB #:** 17042808
CITY/STATE: Tualatin, OR | **DATE:** Tue, May 13 2025

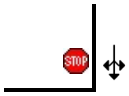
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

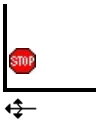


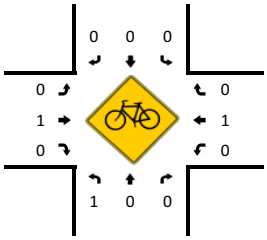


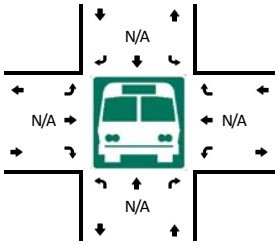


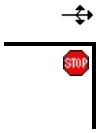


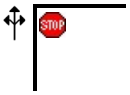


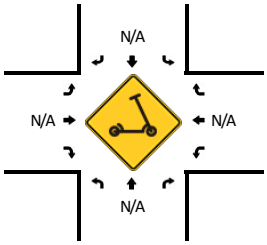












15-Min Count Period Beginning At	SW 118th Ave (Northbound)				SW 118th Ave (Southbound)				SW Leveton Dr (Eastbound)				SW Leveton Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	15	0	2	0	2	1	5	0	0	14	4	0	8	37	0	0	88	
4:15 PM	4	0	2	0	0	1	0	0	0	14	4	0	6	47	0	0	78	
4:30 PM	8	0	1	0	0	0	4	0	1	14	4	0	3	61	1	0	97	
4:45 PM	3	0	1	0	0	0	2	0	0	24	1	0	4	41	1	0	77	340
5:00 PM	6	1	2	0	0	0	5	0	2	10	3	0	9	88	0	0	126	378
5:15 PM	11	1	1	0	1	0	1	0	3	7	3	0	11	69	0	0	108	408
5:30 PM	3	0	0	0	0	0	2	0	2	3	4	0	1	59	0	0	74	385
5:45 PM	2	1	1	0	0	0	1	0	0	5	1	0	1	34	1	0	47	355

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	24	4	8	0	0	0	20	0	8	40	12	0	36	352	0	0	504
Heavy Trucks	0	0	0		0	0	0		0	0	0		4	0	0		4
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	4	0	0		0	0	0		0	0	0		0	0	0		4
Scooters																	

Comments:

Report generated on 6/2/2025 1:12 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

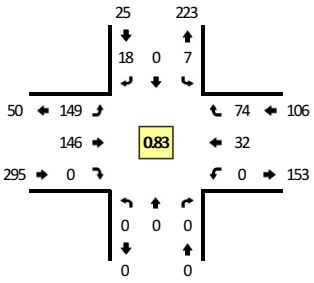
Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

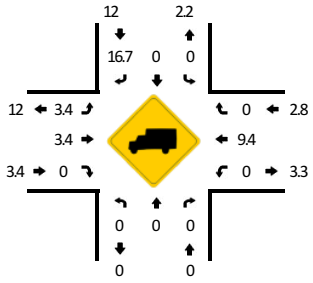
LOCATION: West Lam Access -- SW Leveton Dr
CITY/STATE: Tualatin, OR

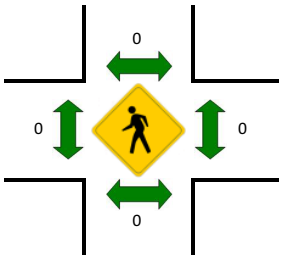
QC JOB #: 17042809
DATE: Tue, May 13 2025

Peak-Hour: 8:00 AM -- 9:00 AM
Peak 15-Min: 8:15 AM -- 8:30 AM

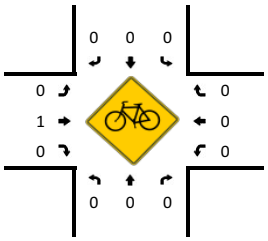


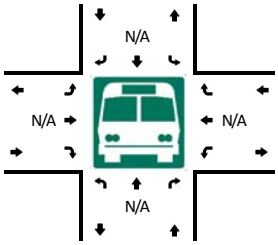




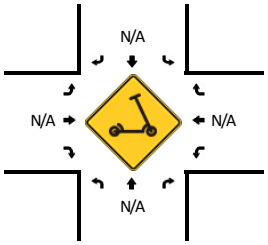












15-Min Count Period Beginning At	West Lam Access (Northbound)				West Lam Access (Southbound)				SW Leveton Dr (Eastbound)				SW Leveton Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	2	0	4	0	14	21	0	0	0	8	9	0	58	
7:15 AM	0	0	0	0	0	0	6	0	15	20	0	0	0	2	9	0	52	
7:30 AM	0	0	0	0	1	0	3	0	33	31	0	0	0	4	8	0	80	
7:45 AM	0	0	0	0	1	0	2	0	34	53	0	0	0	9	22	0	121	311
8:00 AM	0	0	0	0	3	0	4	0	30	45	0	0	0	11	14	0	107	360
8:15 AM	0	0	0	0	2	0	5	0	42	41	0	0	0	7	31	0	128	436
8:30 AM	0	0	0	0	1	0	3	0	39	29	0	0	0	10	18	0	100	456
8:45 AM	0	0	0	0	1	0	6	0	38	31	0	0	0	4	11	0	91	426

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	8	0	20	0	168	164	0	0	0	28	124	0	512
Heavy Trucks	0	0	0		0	0	4		4	4	0		0	4	0		16
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 6/2/2025 1:08 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

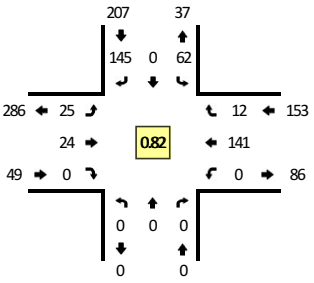
Type of peak hour being reported: User-Defined

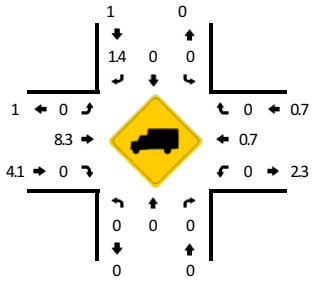
Method for determining peak hour: Total Entering Volume

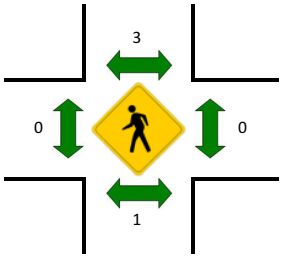
LOCATION: West Lam Access -- SW Leveton Dr
CITY/STATE: Tualatin, OR

QC JOB #: 17042810
DATE: Tue, May 13 2025

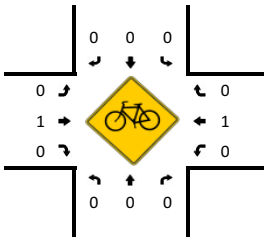
Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

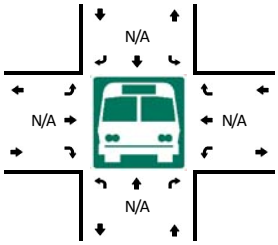




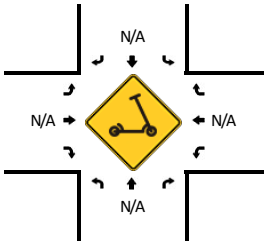












15-Min Count Period Beginning At	West Lam Access (Northbound)				West Lam Access (Southbound)				SW Leveton Dr (Eastbound)				SW Leveton Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	8	0	27	0	4	14	0	0	0	23	6	0	82	
4:15 PM	0	0	0	0	8	0	26	0	5	10	0	0	0	21	4	0	74	
4:30 PM	0	0	0	0	17	0	33	0	10	6	0	0	0	31	8	0	105	
4:45 PM	0	0	0	0	6	0	25	0	18	7	0	0	0	24	8	0	88	349
5:00 PM	0	0	0	0	14	0	45	0	6	6	0	0	0	53	1	0	125	392
5:15 PM	0	0	0	0	27	0	44	0	1	8	0	0	0	36	2	0	118	436
5:30 PM	0	0	0	0	15	0	31	0	0	3	0	0	0	28	1	0	78	409
5:45 PM	0	0	0	0	14	0	23	0	1	5	0	0	0	10	1	0	54	375

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	56	0	180	0	24	24	0	0	0	212	4	0	500
Heavy Trucks	0	0	0		0	0	4		0	0	0		0	0	0		4
Buses																	
Pedestrians		4				0				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 6/2/2025 1:10 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

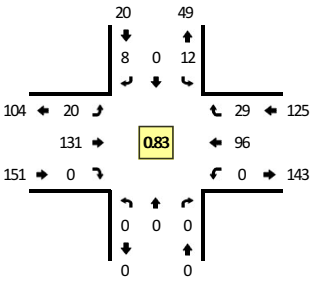
Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

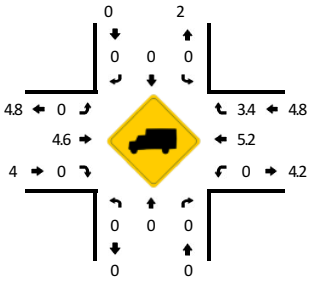
LOCATION: Central Lam Access -- SW Leveton Dr
CITY/STATE: Tualatin, OR

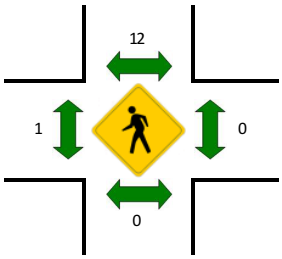
QC JOB #: 17042811
DATE: Tue, May 13 2025

Peak-Hour: 8:00 AM -- 9:00 AM
Peak 15-Min: 8:15 AM -- 8:30 AM

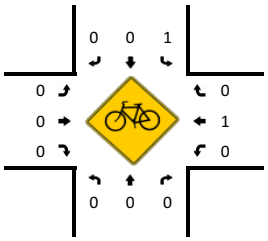


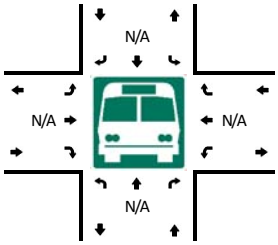




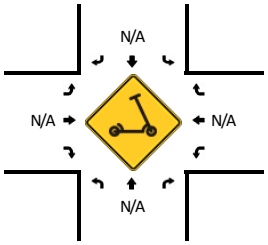












15-Min Count Period Beginning At	Central Lam Access (Northbound)				Central Lam Access (Southbound)				SW Leveton Dr (Eastbound)				SW Leveton Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	3	0	5	0	7	14	0	0	0	13	5	0	47	
7:15 AM	0	0	0	0	2	0	1	0	2	21	0	0	0	13	3	0	42	
7:30 AM	0	0	0	0	1	0	2	0	5	26	0	0	0	10	5	0	49	
7:45 AM	0	0	0	0	3	0	1	0	8	45	0	0	0	32	7	0	96	234
8:00 AM	0	0	0	0	5	0	4	0	10	36	0	0	0	22	8	0	85	272
8:15 AM	0	0	0	0	3	0	1	0	2	43	0	0	0	37	3	0	89	319
8:30 AM	0	0	0	0	1	0	3	0	3	27	0	0	0	24	10	0	68	338
8:45 AM	0	0	0	0	3	0	0	0	5	25	0	0	0	13	8	0	54	296

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	12	0	4	0	8	172	0	0	0	148	12	0	356
Heavy Trucks	0	0	0		0	0	0		0	4	0		0	8	0		12
Buses																	
Pedestrians		0				24				0				0			24
Bicycles	0	0	0		4	0	0		0	0	0		0	0	0		4
Scooters																	

Comments:

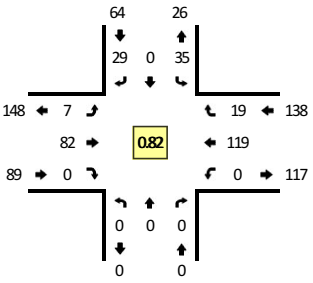
Report generated on 6/2/2025 1:08 PM

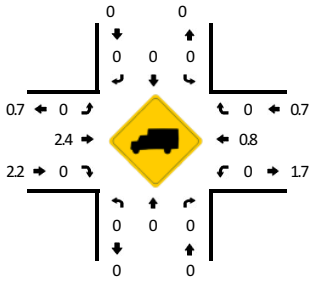
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

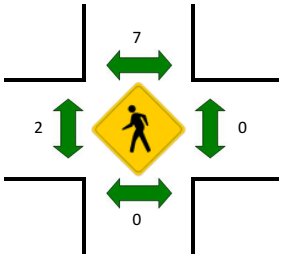
Type of peak hour being reported: User-Defined | Method for determining peak hour: Total Entering Volume

LOCATION: Central Lam Access -- SW Leveton Dr | **QC JOB #:** 17042812
CITY/STATE: Tualatin, OR | **DATE:** Tue, May 13 2025

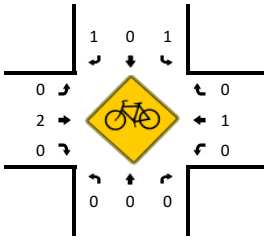
Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:15 PM -- 5:30 PM

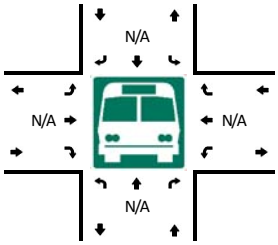




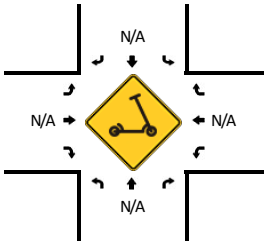












15-Min Count Period Beginning At	Central Lam Access (Northbound)				Central Lam Access (Southbound)				SW Leveton Dr (Eastbound)				SW Leveton Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	5	0	6	0	1	21	0	0	0	22	6	0	61	
4:15 PM	0	0	0	0	4	0	6	0	2	18	0	0	0	19	4	0	53	
4:30 PM	0	0	0	0	1	0	6	0	0	24	0	0	0	28	6	0	65	
4:45 PM	0	0	0	0	7	0	7	0	2	10	0	0	0	25	6	0	57	236
5:00 PM	0	0	0	0	4	0	9	0	1	23	0	0	0	43	4	0	84	259
5:15 PM	0	0	0	0	12	0	8	0	4	30	0	0	0	29	6	0	89	295
5:30 PM	0	0	0	0	12	0	5	0	0	19	0	0	0	22	3	0	61	291
5:45 PM	0	0	0	0	7	0	3	0	3	18	0	0	0	7	1	0	39	273

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	48	0	32	0	16	120	0	0	0	116	24	0	356
Heavy Trucks	0	0	0		0	0	0		0	8	0		0	0	0		8
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		4	0	4		0	4	0		0	0	0		12
Scooters																	

Comments:

Report generated on 6/2/2025 1:10 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

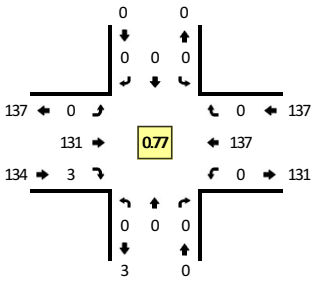
Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

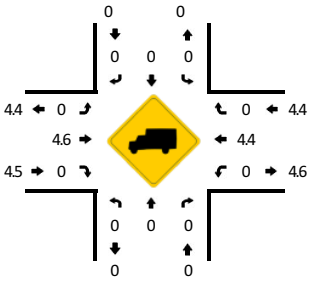
LOCATION: East Lam Access -- SW Leveton Dr
CITY/STATE: Tualatin, OR

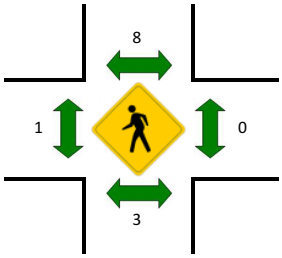
QC JOB #: 17042813
DATE: Tue, May 13 2025

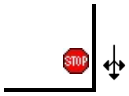
Peak-Hour: 8:00 AM -- 9:00 AM
Peak 15-Min: 8:15 AM -- 8:30 AM

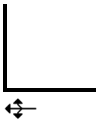


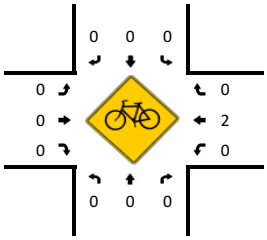


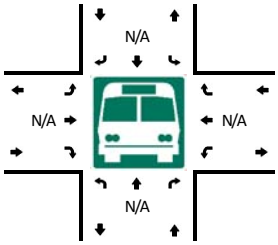


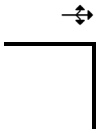


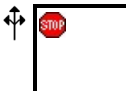


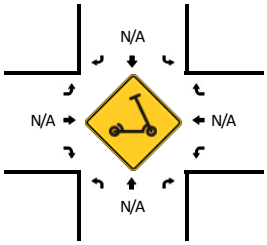












15-Min Count Period Beginning At	East Lam Access (Northbound)				East Lam Access (Southbound)				SW Leveton Dr (Eastbound)				SW Leveton Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	0	0	0	0	13	2	0	0	20	0	0	35	
7:15 AM	0	0	0	0	0	0	0	0	0	15	1	0	0	16	0	0	32	
7:30 AM	0	0	0	0	0	0	0	0	0	21	0	0	0	16	0	0	37	
7:45 AM	0	0	0	0	0	0	0	0	0	43	0	0	1	41	0	0	85	189
8:00 AM	0	0	0	0	0	0	0	0	0	34	1	0	0	36	0	0	71	225
8:15 AM	0	0	0	0	0	0	0	0	0	42	1	0	0	45	0	0	88	281
8:30 AM	0	0	0	0	0	0	0	0	0	26	1	0	0	36	0	0	63	307
8:45 AM	0	0	0	0	0	0	0	0	0	29	0	0	0	20	0	0	49	271

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	0	0	0	0	0	168	4	0	0	180	0	0	352
Heavy Trucks	0	0	0		0	0	0		0	4	0		0	8	0		12
Buses																	
Pedestrians		4				8				4				0			16
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 6/2/2025 1:08 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: East Lam Access -- SW Leveton Dr

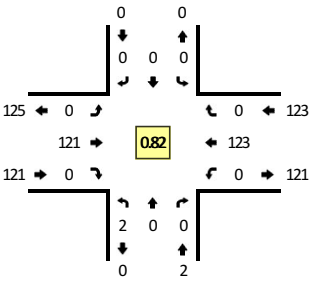
CITY/STATE: Tualatin, OR

QC JOB #: 17042814

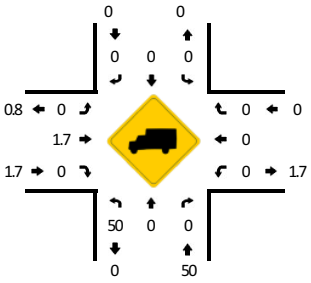
DATE: Tue, May 13 2025

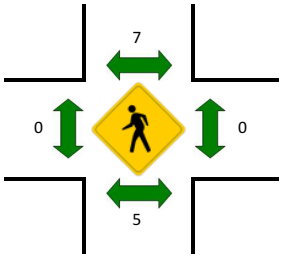
Peak-Hour: 4:45 PM -- 5:45 PM

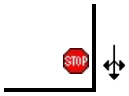
Peak 15-Min: 5:15 PM -- 5:30 PM

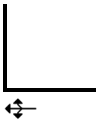


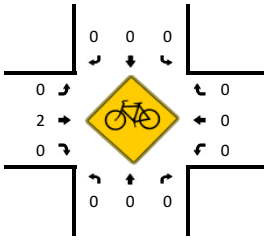


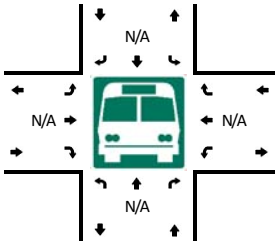


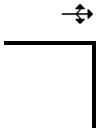


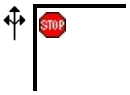


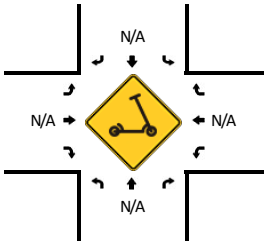












15-Min Count Period Beginning At	East Lam Access (Northbound)				East Lam Access (Southbound)				SW Leveton Dr (Eastbound)				SW Leveton Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	0	0	0	0	0	30	0	0	0	26	0	0	56	
4:15 PM	0	0	0	0	0	0	0	0	0	21	0	0	0	21	0	0	42	
4:30 PM	0	0	1	0	0	0	0	0	0	27	1	0	0	33	0	0	62	
4:45 PM	1	0	0	0	0	0	0	0	0	18	0	0	0	29	0	0	48	208
5:00 PM	1	0	0	0	0	0	0	0	0	27	0	0	0	44	0	0	72	224
5:15 PM	0	0	0	0	0	0	0	0	0	45	0	0	0	30	0	0	75	257
5:30 PM	0	0	0	0	0	0	0	0	0	31	0	0	0	20	0	0	51	246
5:45 PM	0	0	0	0	0	0	0	0	0	26	0	0	0	8	0	0	34	232

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	0	0	0	0	0	180	0	0	0	120	0	0	300
Heavy Trucks	0	0	0		0	0	0		0	8	0		0	0	0		8
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

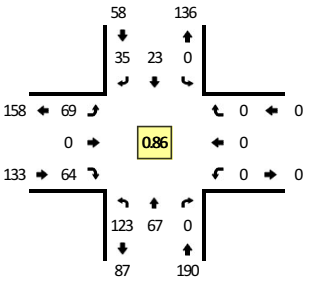
Report generated on 6/2/2025 1:10 PM

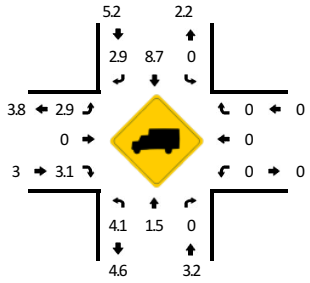
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

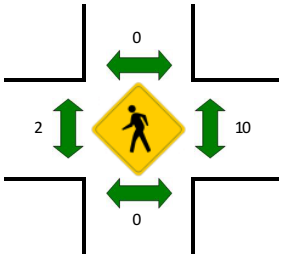
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

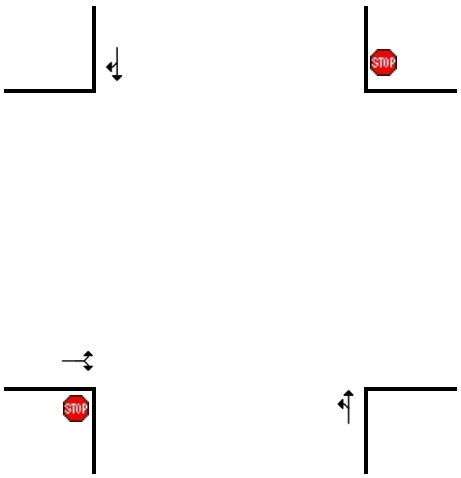
LOCATION: SW 108th Ave -- SW Leveton Dr | **QC JOB #:** 17042815
CITY/STATE: Tualatin, OR | **DATE:** Tue, May 13 2025

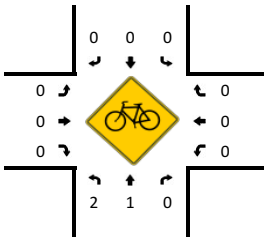
Peak-Hour: 7:45 AM -- 8:45 AM
Peak 15-Min: 8:15 AM -- 8:30 AM

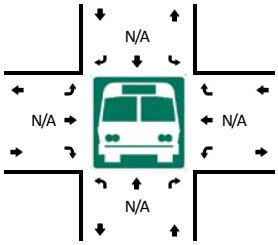


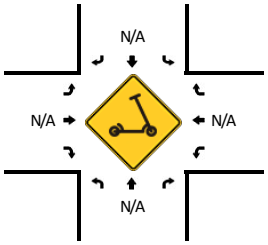












15-Min Count Period Beginning At	SW 108th Ave (Northbound)				SW 108th Ave (Southbound)				SW Leveton Dr (Eastbound)				SW Leveton Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	17	9	0	0	0	2	5	0	2	0	9	0	0	0	0	0	44	
7:15 AM	13	10	0	0	0	6	2	0	3	0	12	0	0	0	0	0	46	
7:30 AM	13	17	0	0	0	5	3	0	5	0	14	0	0	0	0	0	57	
7:45 AM	38	11	0	0	0	3	5	0	20	0	23	0	0	0	0	0	100	247
8:00 AM	22	17	0	0	0	5	12	0	13	0	15	0	0	0	0	0	84	287
8:15 AM	31	22	0	0	0	8	13	0	19	0	18	0	0	0	0	0	111	352
8:30 AM	32	17	0	0	0	7	5	0	17	0	8	0	0	0	0	0	86	381
8:45 AM	14	16	0	0	0	9	6	0	11	0	15	0	0	0	0	0	71	352

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	124	88	0	0	0	32	52	0	76	0	72	0	0	0	0	0	444
Heavy Trucks	4	4	0		0	0	4		0	0	4		0	0	0		16
Buses																	
Pedestrians		0				0				0				24			24
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

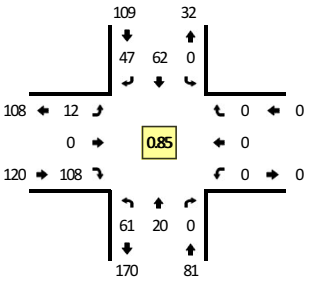
Comments:

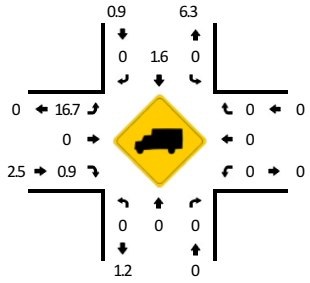
Report generated on 6/2/2025 1:12 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

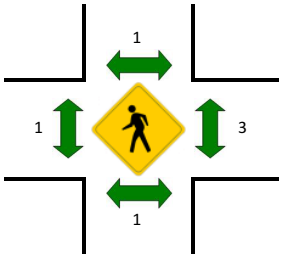
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

LOCATION: SW 108th Ave -- SW Leveton Dr | **QC JOB #:** 17042816
CITY/STATE: Tualatin, OR | **DATE:** Tue, May 13 2025

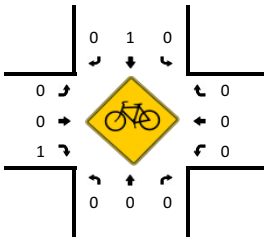
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

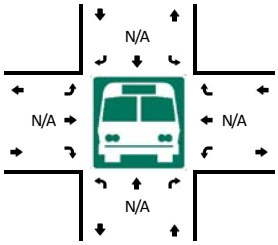




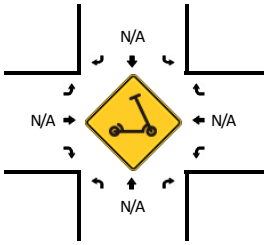












15-Min Count Period Beginning At	SW 108th Ave (Northbound)				SW 108th Ave (Southbound)				SW Leveton Dr (Eastbound)				SW Leveton Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	12	9	0	0	0	20	4	0	8	0	22	0	0	0	0	0	75	
4:15 PM	14	2	0	0	0	10	4	0	3	0	18	0	0	0	0	0	51	
4:30 PM	20	9	0	0	0	16	7	0	5	0	23	0	0	0	0	0	80	
4:45 PM	15	2	0	0	0	13	8	0	2	0	19	0	0	0	0	0	59	265
5:00 PM	15	8	0	0	0	22	19	0	1	0	26	0	0	0	0	0	91	281
5:15 PM	11	1	0	0	0	11	13	0	4	0	40	0	0	0	0	0	80	310
5:30 PM	3	7	0	0	0	20	11	0	1	0	31	0	0	0	0	0	73	303
5:45 PM	2	1	0	0	0	20	6	0	1	0	25	0	0	0	0	0	55	299

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	60	32	0	0	0	88	76	0	4	0	104	0	0	0	0	0	364
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	0		0
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	4		0	0	0		4
Scooters																	

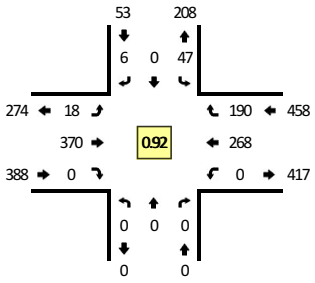
Comments:

Report generated on 6/2/2025 1:12 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

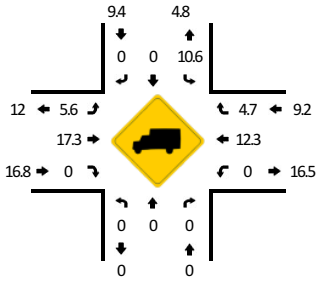
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

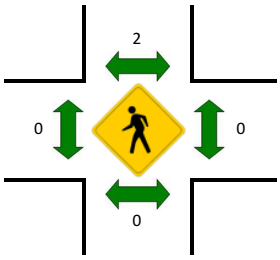
LOCATION: SW 108th Ave -- SW Herman Rd | **QC JOB #:** 17042817
CITY/STATE: Tualatin, OR | **DATE:** Tue, May 13 2025

Peak-Hour: 7:30 AM -- 8:30 AM
Peak 15-Min: 7:45 AM -- 8:00 AM

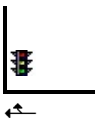


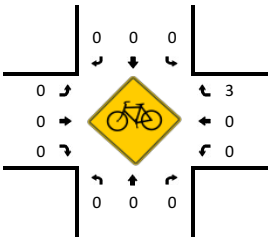


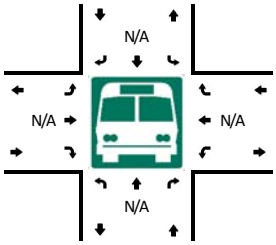


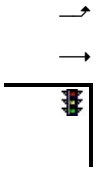




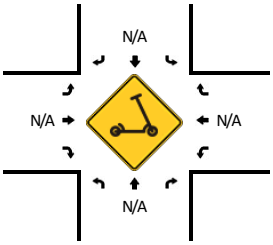












15-Min Count Period Beginning At	SW 108th Ave (Northbound)				SW 108th Ave (Southbound)				SW Herman Rd (Eastbound)				SW Herman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	6	0	1	0	4	69	0	0	0	59	28	0	167	
7:15 AM	0	0	0	0	11	0	1	0	4	78	0	0	0	68	30	0	192	
7:30 AM	0	0	0	0	10	0	1	0	3	101	0	0	0	78	35	0	228	
7:45 AM	0	0	0	0	15	0	1	0	5	95	0	0	0	74	53	0	243	830
8:00 AM	0	0	0	0	13	0	1	0	8	86	0	0	0	63	43	0	214	877
8:15 AM	0	0	0	0	9	0	3	0	2	88	0	0	0	53	59	0	214	899
8:30 AM	0	0	0	0	10	0	2	0	3	68	0	0	0	53	57	0	193	864
8:45 AM	0	0	0	0	13	0	0	0	3	77	0	0	0	55	39	0	187	808

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	60	0	4	0	20	380	0	0	0	296	212	0	972
Heavy Trucks	0	0	0		4	0	0		0	88	0		0	48	4		144
Buses																	
Pedestrians		0				4				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 6/2/2025 1:12 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

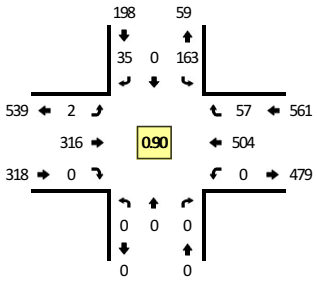
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

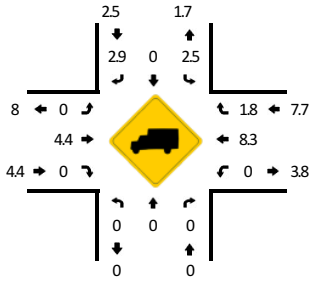
LOCATION: SW 108th Ave -- SW Herman Rd | **QC JOB #:** 17042818

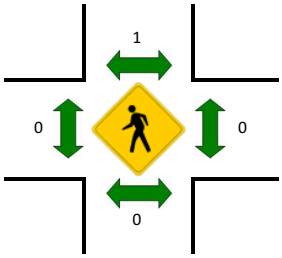
CITY/STATE: Tualatin, OR | **DATE:** Tue, May 13 2025

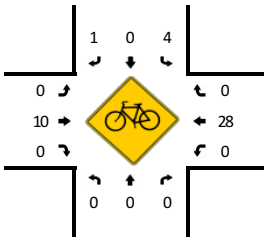
Peak-Hour: 4:00 PM -- 5:00 PM

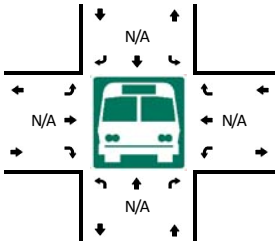
Peak 15-Min: 4:30 PM -- 4:45 PM

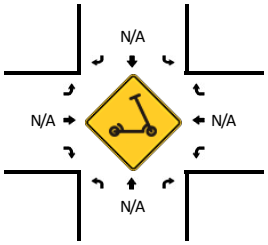












15-Min Count Period Beginning At	SW 108th Ave (Northbound)				SW 108th Ave (Southbound)				SW Herman Rd (Eastbound)				SW Herman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	54	0	7	0	2	94	0	0	0	121	13	0	291	
4:15 PM	0	0	0	0	35	0	6	0	0	79	0	0	0	119	7	0	246	
4:30 PM	0	0	0	0	38	0	9	0	0	75	0	0	0	155	23	0	300	
4:45 PM	0	0	0	0	36	0	13	0	0	68	0	0	0	109	14	0	240	1077
5:00 PM	0	0	0	0	55	0	9	0	2	67	0	0	0	98	11	0	242	1028
5:15 PM	0	0	0	0	63	0	3	0	0	59	0	0	0	102	10	0	237	1019
5:30 PM	0	0	0	0	56	0	7	0	2	48	0	0	0	81	7	0	201	920
5:45 PM	0	0	0	0	46	0	5	0	0	28	0	0	0	51	4	0	134	814

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	152	0	36	0	0	300	0	0	0	620	92	0	1200
Heavy Trucks	0	0	0		0	0	0		0	12	0		0	40	4		56
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		4	0	0		0	0	0		0	108	0		112
Scooters																	

Comments:

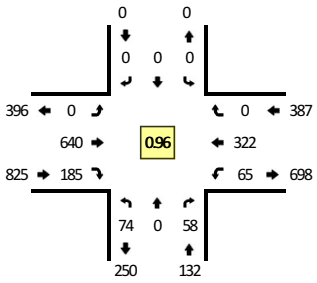
Report generated on 6/2/2025 1:12 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

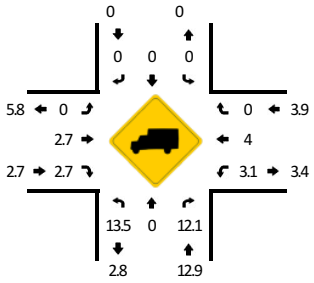
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

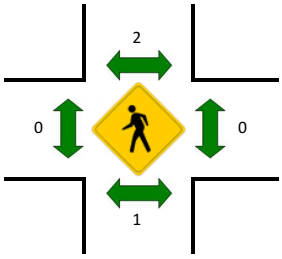
LOCATION: Teton Ave -- SW Tualatin Rd | **QC JOB #:** 17042821
CITY/STATE: Tualatin, OR | **DATE:** Tue, May 13 2025

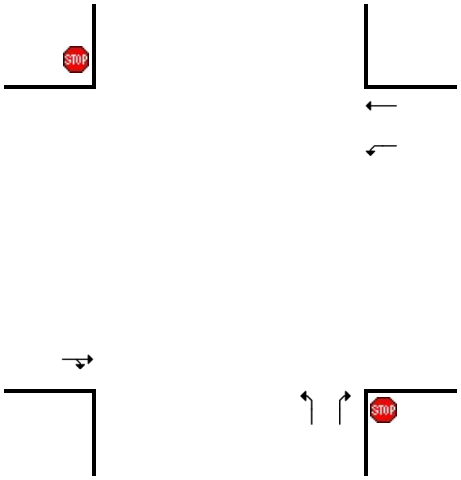
Peak-Hour: 7:30 AM -- 8:30 AM
Peak 15-Min: 8:00 AM -- 8:15 AM

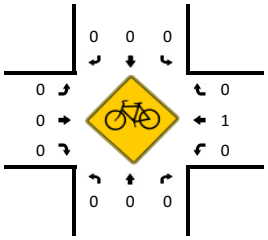


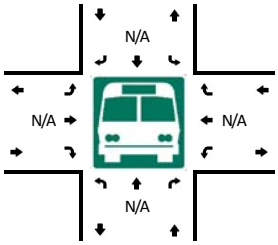
TRUE DATA TO IMPROVE MOBILITY

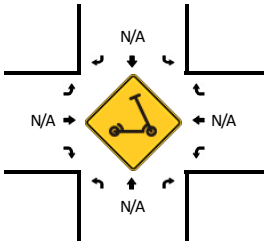












15-Min Count Period Beginning At	Teton Ave (Northbound)				Teton Ave (Southbound)				SW Tualatin Rd (Eastbound)				SW Tualatin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	8	0	3	0	0	0	0	0	0	79	17	0	3	39	0	0	149	
7:15 AM	5	0	7	0	0	0	0	0	0	116	33	0	5	40	0	0	206	
7:30 AM	14	0	3	0	0	0	0	0	0	175	49	0	4	64	0	0	309	
7:45 AM	17	0	7	0	0	0	0	0	0	174	57	0	8	85	0	0	348	1012
8:00 AM	21	0	19	0	0	0	0	0	0	155	44	0	17	94	0	0	350	1213
8:15 AM	22	0	29	0	0	0	0	0	0	136	35	0	36	79	0	0	337	1344
8:30 AM	15	0	5	0	0	0	0	0	0	124	39	0	18	74	0	0	275	1310
8:45 AM	19	0	6	0	0	0	0	0	0	108	31	0	4	76	0	0	244	1206

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	84	0	76	0	0	0	0	0	0	620	176	0	68	376	0	0	1400
Heavy Trucks	0	0	16		0	0	0		0	4	8		4	8	0		40
Buses																	
Pedestrians		4				4				0				0			8
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

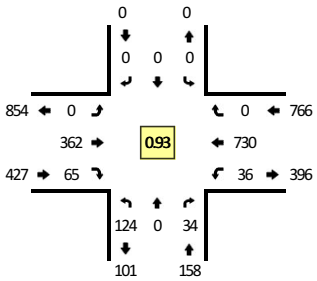
Comments:

Report generated on 6/2/2025 1:12 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

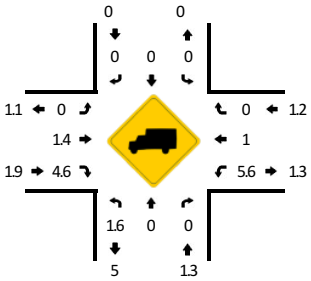
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

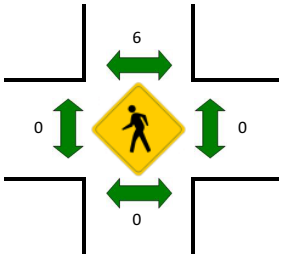
LOCATION: Teton Ave -- SW Tualatin Rd | **QC JOB #:** 17042822
CITY/STATE: Tualatin, OR | **DATE:** Tue, May 13 2025

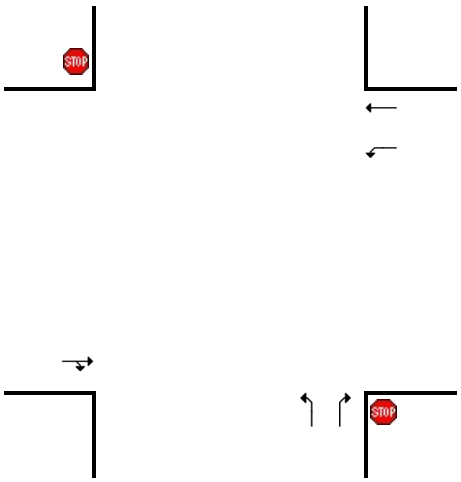
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 4:30 PM -- 4:45 PM

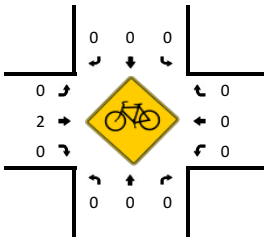


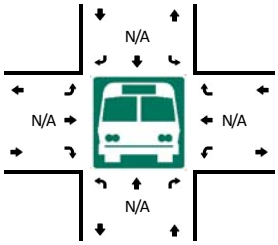
TRUE DATA TO IMPROVE MOBILITY

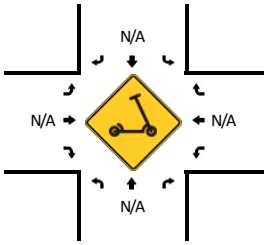












15-Min Count Period Beginning At	Teton Ave (Northbound)				Teton Ave (Southbound)				SW Tualatin Rd (Eastbound)				SW Tualatin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	41	0	12	0	0	0	0	0	0	93	25	0	7	164	0	0	342	
4:15 PM	31	0	14	0	0	0	0	0	0	91	22	0	12	163	0	0	333	
4:30 PM	43	0	12	0	0	0	0	0	0	92	21	0	8	188	0	0	364	
4:45 PM	23	0	5	0	0	0	0	0	0	81	14	0	10	176	0	0	309	1348
5:00 PM	39	0	8	0	0	0	0	0	0	98	12	0	9	173	0	0	339	1345
5:15 PM	19	0	9	0	0	0	0	0	0	91	18	0	9	193	0	0	339	1351
5:30 PM	37	0	7	0	0	0	0	0	0	74	13	0	5	125	0	0	261	1248
5:45 PM	20	0	5	0	0	0	0	0	0	63	11	0	3	112	0	0	214	1153

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	172	0	48	0	0	0	0	0	0	368	84	0	32	752	0	0	1456
Heavy Trucks	0	0	0		0	0	0		0	8	4		0	0	0		12
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 6/2/2025 1:12 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

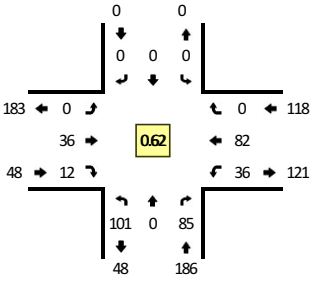
Type of peak hour being reported: Intersection Peak

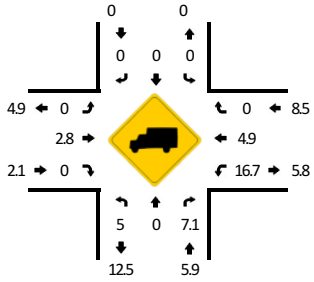
Method for determining peak hour: Total Entering Volume

LOCATION: SW 115th Ave -- SW Hazelbrook Rd
CITY/STATE: Tualatin, OR

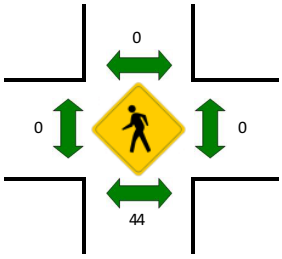
QC JOB #: 17042835
DATE: Tue, May 13 2025

Peak-Hour: 7:45 AM -- 8:45 AM
Peak 15-Min: 8:15 AM -- 8:30 AM

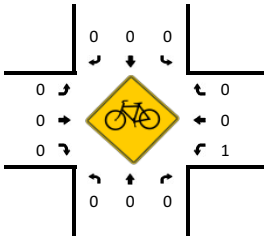


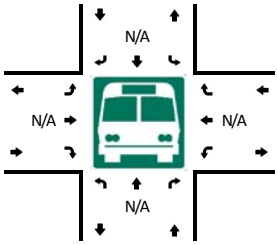


TRUE DATA TO IMPROVE MOBILITY

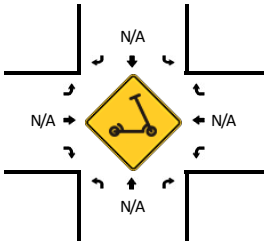












15-Min Count Period Beginning At	SW 115th Ave (Northbound)				SW 115th Ave (Southbound)				SW Hazelbrook Rd (Eastbound)				SW Hazelbrook Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	15	0	3	0	0	0	0	0	0	3	2	0	1	11	0	0	35	
7:15 AM	21	0	7	0	0	0	0	0	0	8	8	0	2	8	0	0	54	
7:30 AM	31	0	6	0	0	0	0	0	0	5	2	0	1	10	0	0	55	
7:45 AM	24	0	3	0	0	0	0	0	0	11	3	0	2	9	0	0	52	196
8:00 AM	27	0	30	0	0	0	0	0	0	10	2	0	11	17	0	0	97	258
8:15 AM	27	0	41	0	0	0	0	0	0	12	3	0	16	43	0	0	142	346
8:30 AM	23	0	11	0	0	0	0	0	0	3	4	0	7	13	0	0	61	352
8:45 AM	33	0	3	0	0	0	0	0	0	0	5	0	2	8	0	0	51	351

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	108	0	164	0	0	0	0	0	0	48	12	0	64	172	0	0	568
Heavy Trucks	12	0	12		0	0	0		0	4	0		12	16	0		56
Buses																	
Pedestrians		92				0				0				0			92
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

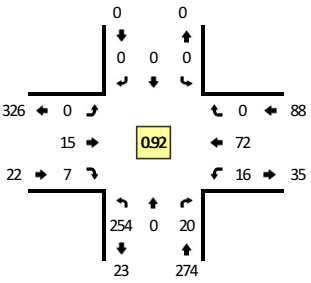
Report generated on 6/2/2025 1:12 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

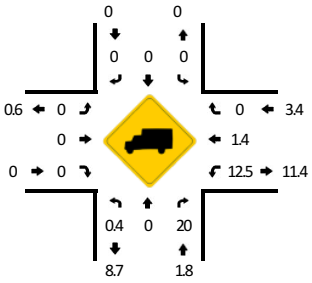
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

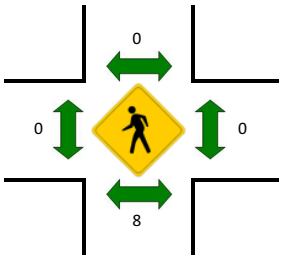
LOCATION: SW 115th Ave -- SW Hazelbrook Rd | **QC JOB #:** 17042836
CITY/STATE: Tualatin, OR | **DATE:** Tue, May 13 2025

Peak-Hour: 3:45 PM -- 4:45 PM
Peak 15-Min: 4:30 PM -- 4:45 PM

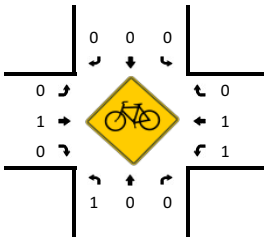


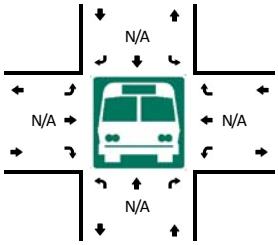




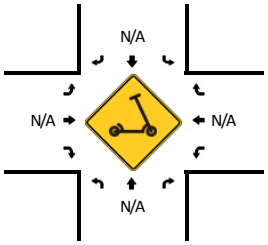












15-Min Count Period Beginning At	SW 115th Ave (Northbound)				SW 115th Ave (Southbound)				SW Hazelbrook Rd (Eastbound)				SW Hazelbrook Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	42	0	17	0	0	0	0	0	0	11	3	0	8	9	0	0	90	
3:15 PM	44	0	3	0	0	0	0	0	0	4	5	0	20	28	0	0	104	
3:30 PM	56	0	3	0	0	0	0	0	0	4	3	0	5	7	0	0	78	
3:45 PM	58	0	5	0	0	0	0	0	0	1	5	0	8	11	0	0	88	360
4:00 PM	71	0	6	0	0	0	0	0	0	6	2	0	4	11	0	0	100	370
4:15 PM	60	0	3	0	0	0	0	0	0	4	0	0	4	21	0	0	92	358
4:30 PM	65	0	6	0	0	0	0	0	0	4	0	0	0	29	0	0	104	384
4:45 PM	52	0	3	0	0	0	0	0	0	4	2	0	2	8	0	0	71	367
5:00 PM	75	0	0	0	0	0	0	0	0	3	3	0	2	9	0	0	92	359
5:15 PM	70	0	3	0	0	0	0	0	0	4	3	0	2	11	0	0	93	360
5:30 PM	61	0	0	0	0	0	0	0	0	1	1	0	1	6	0	0	70	326
5:45 PM	51	0	2	0	0	0	0	0	0	2	3	0	1	4	0	0	63	318

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	260	0	24	0	0	0	0	0	0	16	0	0	0	116	0	0	416
Heavy Trucks	0	0	4		0	0	0		0	0	0		0	4	0		8
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

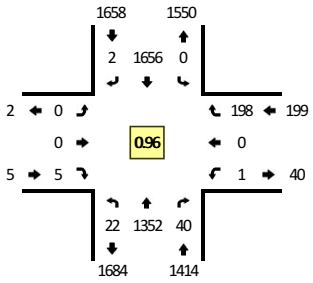
Report generated on 6/2/2025 1:12 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

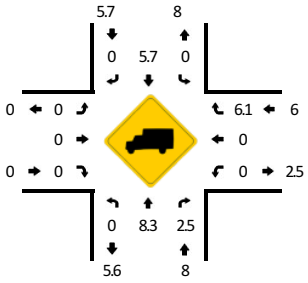
Type of peak hour being reported: System-wide Peak | Method for determining peak hour: Total Entering Volume

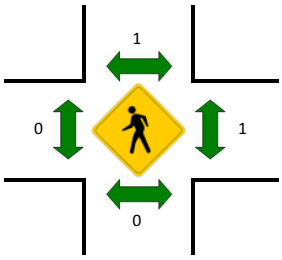
LOCATION: SW Pacific Hwy -- SW Hazelbrook Rd
CITY/STATE: Tualatin, OR

QC JOB #: 17042837
DATE: Tue, May 13 2025

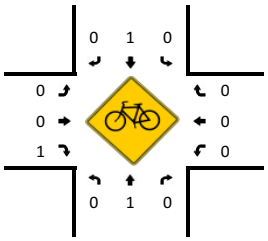
Peak-Hour: 7:30 AM -- 8:30 AM
Peak 15-Min: 8:15 AM -- 8:30 AM

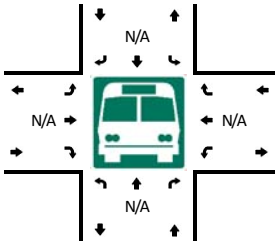




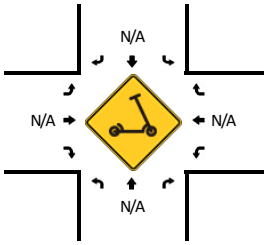












15-Min Count Period Beginning At	SW Pacific Hwy (Northbound)				SW Pacific Hwy (Southbound)				SW Hazelbrook Rd (Eastbound)				SW Hazelbrook Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	336	2	5	0	317	0	0	0	0	3	0	0	0	37	0	700	
7:15 AM	0	401	14	1	0	368	0	0	0	0	0	0	0	0	33	0	817	
7:30 AM	0	355	8	2	0	415	1	0	0	0	1	0	0	0	42	0	824	
7:45 AM	0	308	11	7	0	475	1	0	0	0	1	0	0	0	43	0	846	3187
8:00 AM	0	340	9	8	0	346	0	0	0	0	2	0	1	0	48	0	754	3241
8:15 AM	0	349	12	5	0	420	0	0	0	0	1	0	0	0	65	0	852	3276
8:30 AM	0	341	3	5	0	357	0	0	0	0	3	0	0	0	44	0	753	3205
8:45 AM	0	326	2	8	0	378	2	0	0	0	1	0	0	0	44	0	761	3120

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	1396	48	20	0	1680	0	0	0	0	4	0	0	0	260	0	3408
Heavy Trucks	0	140	4		0	140	0		0	0	0		0	0	32		316
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 6/2/2025 1:03 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

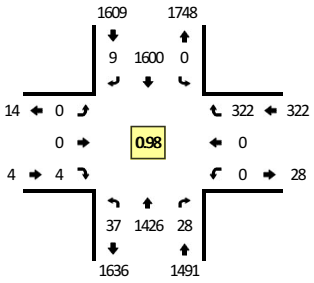
Type of peak hour being reported: User-Defined

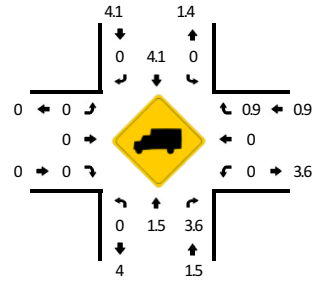
Method for determining peak hour: Total Entering Volume

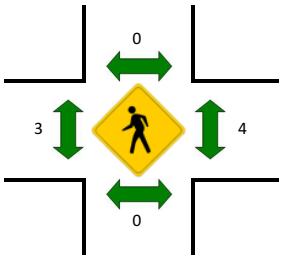
LOCATION: SW Pacific Hwy -- SW Hazelbrook Rd
CITY/STATE: Tualatin, OR

QC JOB #: 17042838
DATE: Tue, May 13 2025

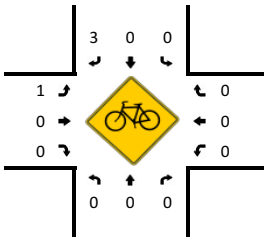
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

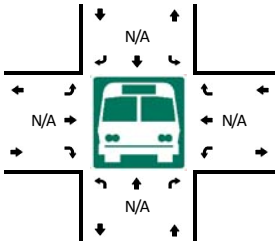




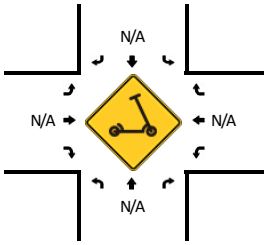












15-Min Count Period Beginning At	SW Pacific Hwy (Northbound)				SW Pacific Hwy (Southbound)				SW Hazelbrook Rd (Eastbound)				SW Hazelbrook Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	1	374	12	5	0	449	2	0	0	0	1	0	0	0	50	0	894	
3:15 PM	1	336	5	8	0	404	1	0	0	0	1	0	0	0	72	0	828	
3:30 PM	3	358	6	5	0	413	2	0	0	0	1	0	0	0	64	0	852	
3:45 PM	5	367	4	2	0	381	1	0	0	0	2	0	0	0	65	0	827	3401
4:00 PM	0	407	6	11	0	375	0	0	0	0	1	0	0	0	73	0	873	3380
4:15 PM	0	333	4	5	0	407	0	0	0	0	1	0	0	0	97	0	847	3399
4:30 PM	1	361	4	7	0	387	2	0	0	0	0	0	0	0	90	0	852	3399
4:45 PM	2	338	13	6	0	395	3	0	0	0	2	0	0	0	67	0	826	3398
5:00 PM	1	380	5	7	0	402	2	0	0	0	2	0	0	0	78	0	877	3402
5:15 PM	1	347	6	12	0	416	2	0	0	0	0	0	0	0	87	0	871	3426
5:30 PM	2	337	1	15	0	351	1	0	0	0	2	0	0	0	73	0	782	3356
5:45 PM	2	311	6	9	0	295	0	0	0	0	5	0	0	0	53	0	681	3211

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	1520	20	28	0	1608	8	0	0	0	8	0	0	0	312	0	3508
Heavy Trucks	0	12	0		0	36	0		0	0	0		0	0	4		52
Buses																	
Pedestrians		0				0				8				0			8
Bicycles	0	0	0		0	0	12		0	0	0		0	0	0		12
Scooters																	

Comments:

Report generated on 6/2/2025 1:07 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

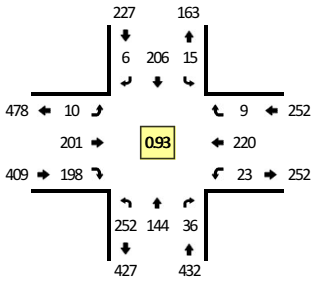
Type of peak hour being reported: Intersection Peak

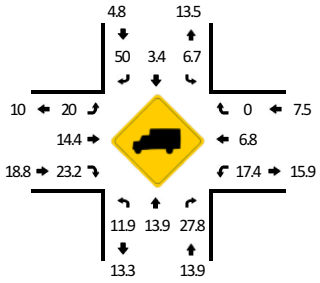
Method for determining peak hour: Total Entering Volume

LOCATION: Teton Ave -- SW Herman Rd
CITY/STATE: Tualatin, OR

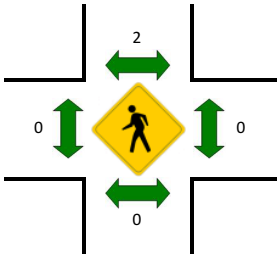
QC JOB #: 17042819
DATE: Tue, May 13 2025

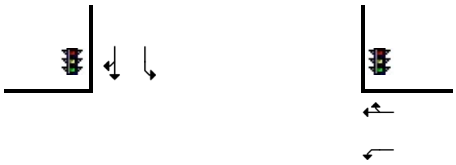
Peak-Hour: 7:30 AM -- 8:30 AM
Peak 15-Min: 7:45 AM -- 8:00 AM

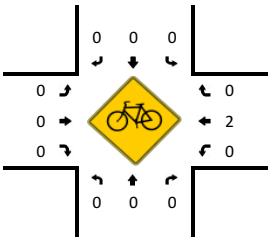


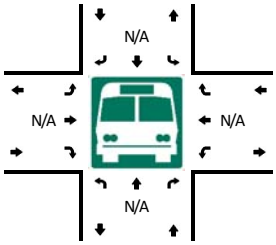


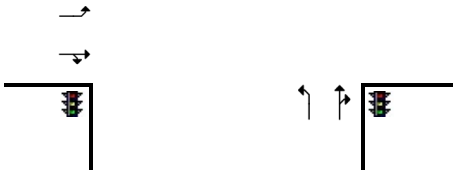
TRUE DATA TO IMPROVE MOBILITY

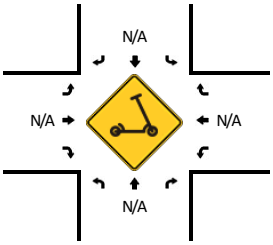












15-Min Count Period Beginning At	Teton Ave (Northbound)				Teton Ave (Southbound)				SW Herman Rd (Eastbound)				SW Herman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	40	13	2	0	1	17	1	0	1	41	31	0	3	41	0	0	191	
7:15 AM	47	10	5	0	2	33	1	0	2	42	49	0	6	55	1	0	253	
7:30 AM	64	18	8	0	5	41	0	0	1	42	56	0	6	53	3	0	297	
7:45 AM	69	28	6	0	2	47	4	0	4	62	52	0	9	66	4	0	353	1094
8:00 AM	54	52	9	0	5	52	1	0	1	50	47	0	4	54	1	0	330	1233
8:15 AM	65	46	13	0	3	66	1	0	4	47	43	0	4	47	1	0	340	1320
8:30 AM	61	20	4	0	2	57	1	0	0	58	31	0	4	51	2	0	291	1314
8:45 AM	45	28	9	0	4	32	3	0	1	46	42	0	3	54	2	0	269	1230

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	276	112	24	0	8	188	16	0	16	248	208	0	36	264	16	0	1412
Heavy Trucks	36	8	8		0	4	4		4	64	56		8	16	0		208
Buses																	
Pedestrians		0				4				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

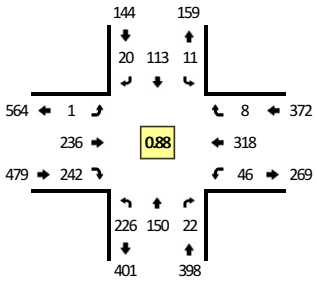
Report generated on 6/2/2025 1:12 PM

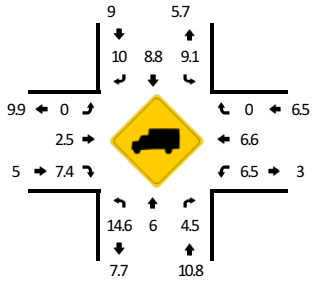
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

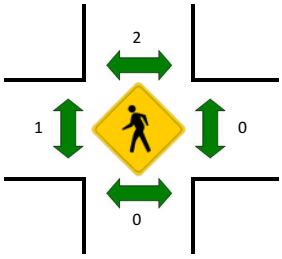
LOCATION: Teton Ave -- SW Herman Rd | **QC JOB #:** 17042820
CITY/STATE: Tualatin, OR | **DATE:** Tue, May 13 2025

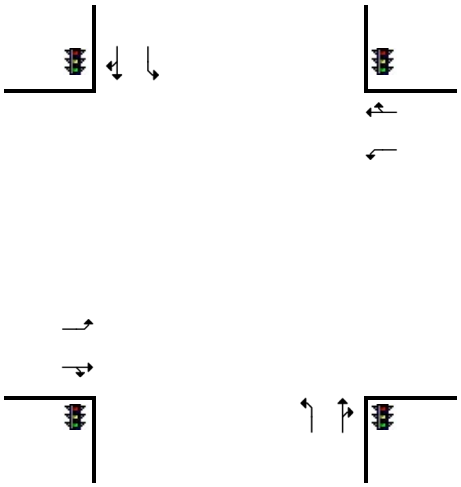
Peak-Hour: 4:00 PM -- 5:00 PM
Peak 15-Min: 4:30 PM -- 4:45 PM

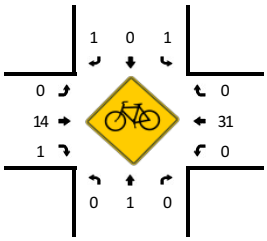


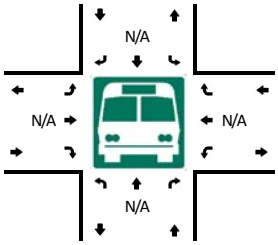


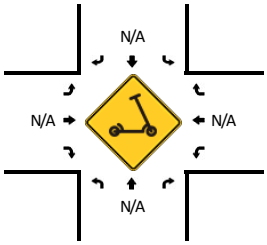
TRUE DATA TO IMPROVE MOBILITY











15-Min Count Period Beginning At	Teton Ave (Northbound)				Teton Ave (Southbound)				SW Herman Rd (Eastbound)				SW Herman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	48	50	4	0	2	30	5	0	0	79	66	0	5	85	3	0	377	
4:15 PM	53	43	7	0	1	28	5	0	0	63	58	0	8	72	2	0	340	
4:30 PM	73	34	5	0	4	28	9	0	0	45	69	0	30	96	3	0	396	
4:45 PM	52	23	6	0	4	27	1	0	1	49	49	0	3	65	0	0	280	1393
5:00 PM	36	46	8	0	1	23	3	0	0	79	66	0	8	62	3	0	335	1351
5:15 PM	26	25	3	0	3	21	3	0	0	58	63	0	7	80	0	0	289	1300
5:30 PM	39	39	3	0	2	23	0	0	1	47	54	0	4	49	2	0	263	1167
5:45 PM	23	18	4	0	0	16	2	0	0	34	44	0	5	28	4	0	178	1065

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	292	136	20	0	16	112	36	0	0	180	276	0	120	384	12	0	1584
Heavy Trucks	32	4	0		0	4	0		0	4	24		8	28	0		104
Buses																	
Pedestrians		0				4				0				0			4
Bicycles	0	0	0		0	0	4		0	8	0		0	120	0		132
Scooters																	

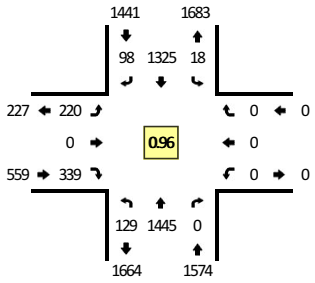
Comments:

Report generated on 6/2/2025 1:12 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

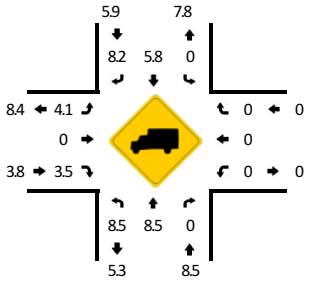
Type of peak hour being reported: System-wide Peak | Method for determining peak hour: Total Entering Volume

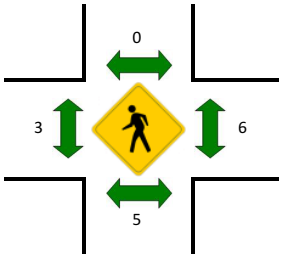
LOCATION: SW Pacific Hwy -- SW Fischer Dr | **QC JOB #:** 17042825
CITY/STATE: Washington County, OR | **DATE:** Tue, May 13 2025

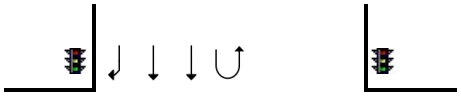
Peak-Hour: 7:30 AM -- 8:30 AM
Peak 15-Min: 7:45 AM -- 8:00 AM

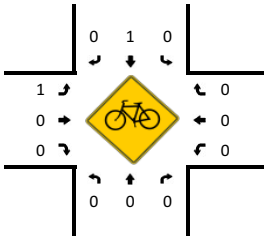


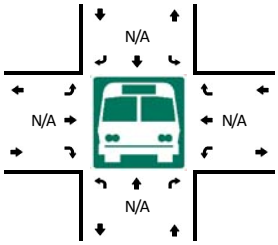
TRUE DATA TO IMPROVE MOBILITY

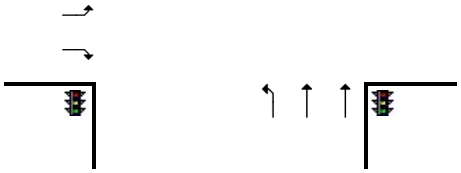


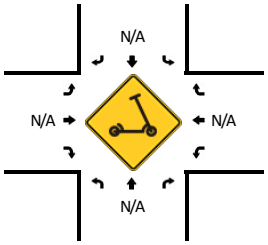












15-Min Count Period Beginning At	SW Pacific Hwy (Northbound)				SW Pacific Hwy (Southbound)				SW Fischer Dr (Eastbound)				SW Fischer Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	28	336	0	0	0	245	18	4	47	0	58	0	0	0	0	0	736	
7:15 AM	27	441	0	0	0	307	20	1	49	0	63	0	0	0	0	0	908	
7:30 AM	32	346	0	0	0	360	21	6	52	0	62	0	0	0	0	0	879	
7:45 AM	26	338	0	0	0	382	22	1	50	0	108	0	0	0	0	0	927	3450
8:00 AM	33	376	0	0	0	260	31	8	62	0	80	0	0	0	0	0	850	3564
8:15 AM	38	385	0	0	0	323	24	3	56	0	89	0	0	0	0	0	918	3574
8:30 AM	29	366	0	0	0	284	30	5	51	0	84	0	0	0	0	0	849	3544
8:45 AM	35	308	0	0	0	290	30	10	31	0	75	0	0	0	0	0	779	3396

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	104	1352	0	0	0	1528	88	4	200	0	432	0	0	0	0	0	3708
Heavy Trucks	0	112	0		0	60	12		4	0	8		0	0	0		196
Buses																	
Pedestrians		8				0				0				12			20
Bicycles	0	0	0		0	0	0		4	0	0		0	0	0		4
Scooters																	

Comments:

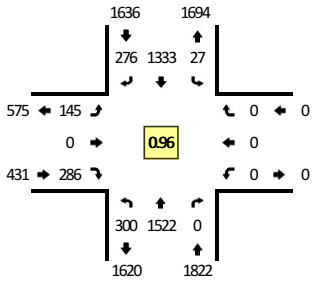
Report generated on 6/2/2025 1:03 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

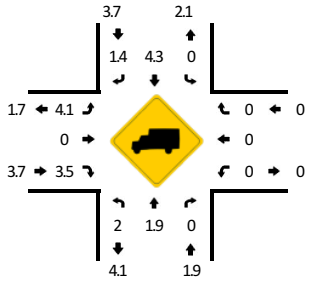
Type of peak hour being reported: System-wide Peak | Method for determining peak hour: Total Entering Volume

LOCATION: SW Pacific Hwy -- SW Fischer Dr
CITY/STATE: Washington County, OR

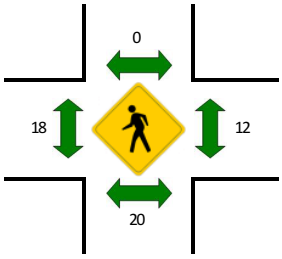
QC JOB #: 17042826
DATE: Tue, May 13 2025

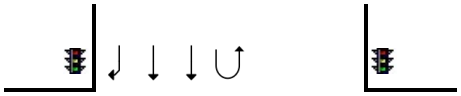
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 5:15 PM -- 5:30 PM

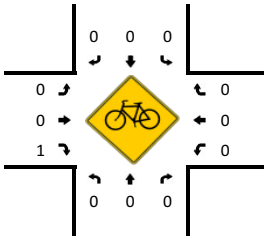


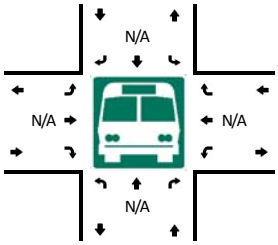


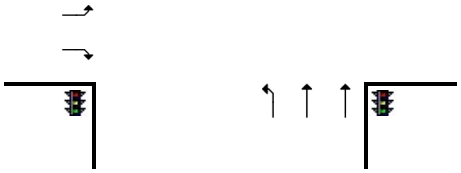
TRUE DATA TO IMPROVE MOBILITY

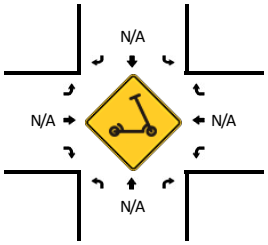












15-Min Count Period Beginning At	SW Pacific Hwy (Northbound)				SW Pacific Hwy (Southbound)				SW Fischer Dr (Eastbound)				SW Fischer Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	64	357	0	0	0	293	72	11	50	0	75	0	0	0	0	0	922	
4:15 PM	76	369	0	0	0	348	45	10	20	0	67	0	0	0	0	0	935	
4:30 PM	68	401	0	0	0	312	73	5	40	0	75	0	0	0	0	0	974	
4:45 PM	67	346	0	1	0	323	72	6	39	0	62	0	0	0	0	0	916	3747
5:00 PM	75	388	0	0	0	328	64	9	32	0	86	0	0	0	0	0	982	3807
5:15 PM	89	387	0	0	0	370	67	7	34	0	63	0	0	0	0	0	1017	3889
5:30 PM	79	324	0	0	0	303	68	14	41	0	56	0	0	0	0	0	885	3800
5:45 PM	78	290	0	0	0	236	51	13	39	0	43	0	0	0	0	0	750	3634

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	356	1548	0	0	0	1480	268	28	136	0	252	0	0	0	0	0	4068
Heavy Trucks	8	16	0		0	72	8		0	0	12		0	0	0		116
Buses																	
Pedestrians		0				0				0				8			8
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

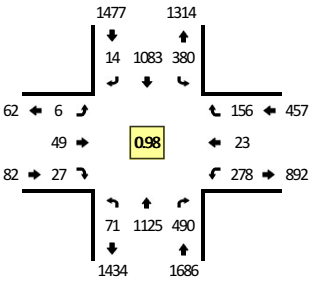
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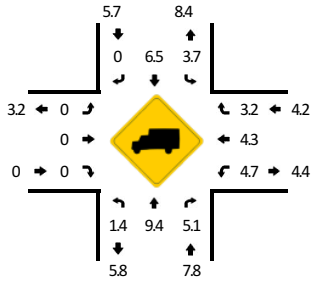
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

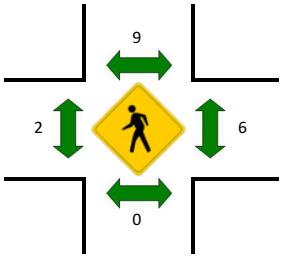
Type of peak hour being reported: System-wide Peak | Method for determining peak hour: Total Entering Volume

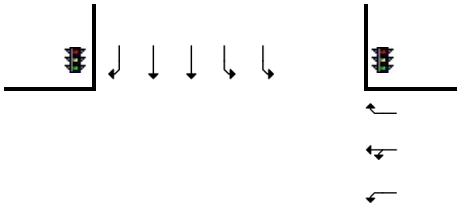
LOCATION: SW Pacific Hwy -- SW 116th Ave | **QC JOB #:** 17042823
CITY/STATE: King City, OR | **DATE:** Tue, May 13 2025

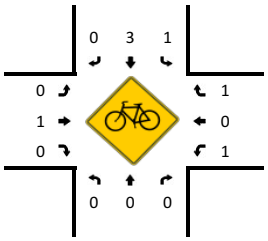
Peak-Hour: 7:30 AM -- 8:30 AM
Peak 15-Min: 7:30 AM -- 7:45 AM

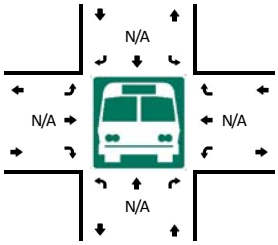


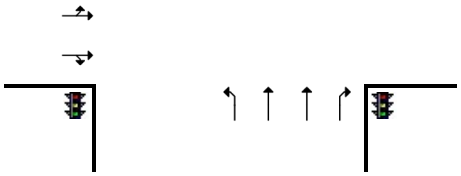


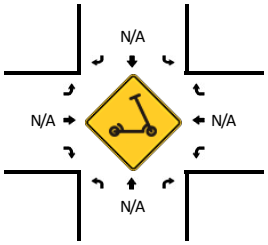












15-Min Count Period Beginning At	SW Pacific Hwy (Northbound)				SW Pacific Hwy (Southbound)				SW 116th Ave (Eastbound)				SW 116th Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	2	288	118	5	66	230	4	1	0	8	5	0	46	0	32	0	805	
7:15 AM	6	301	131	7	56	257	0	6	0	9	3	0	65	7	34	0	882	
7:30 AM	6	295	126	8	72	297	3	8	0	9	6	0	75	3	32	0	940	
7:45 AM	4	269	103	14	87	309	3	14	2	14	8	0	66	3	39	0	935	3562
8:00 AM	8	274	139	14	79	224	3	1	2	12	8	0	71	9	43	0	887	3644
8:15 AM	7	287	122	10	115	253	5	4	2	14	5	0	66	8	42	0	940	3702
8:30 AM	14	268	103	8	133	240	2	4	1	18	5	0	65	12	50	0	923	3685
8:45 AM	11	260	96	14	117	220	4	6	0	16	10	0	88	7	49	0	898	3648

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	24	1180	504	32	288	1188	12	32	0	36	24	0	300	12	128	0	3760
Heavy Trucks	0	120	20		8	80	0		0	0	0		12	0	4		244
Buses																	
Pedestrians		0				16				4				12			32
Bicycles	0	0	0		4	4	0		0	0	0		0	0	0		8
Scooters																	

Comments:

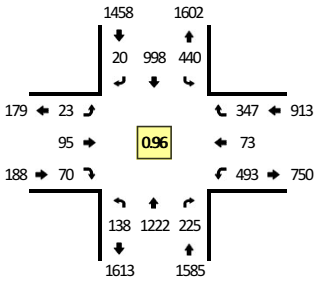
Report generated on 6/2/2025 1:03 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: System-wide Peak | Method for determining peak hour: Total Entering Volume

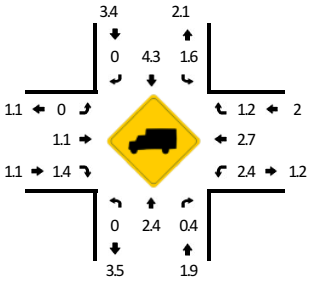
LOCATION: SW Pacific Hwy -- SW 116th Ave
CITY/STATE: King City, OR

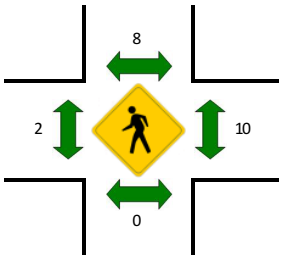
QC JOB #: 17042824
DATE: Tue, May 13 2025

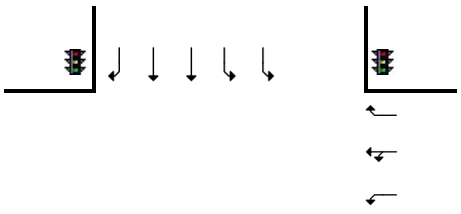
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 4:30 PM -- 4:45 PM

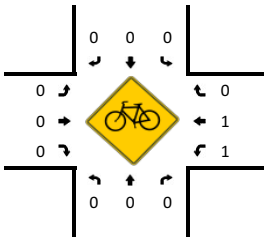


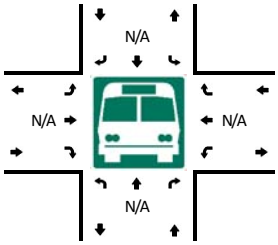


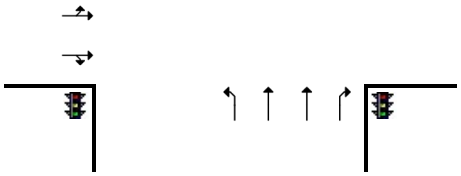


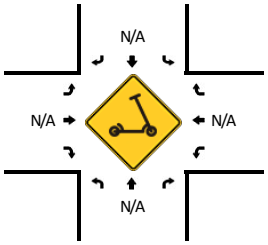












15-Min Count Period Beginning At	SW Pacific Hwy (Northbound)				SW Pacific Hwy (Southbound)				SW 116th Ave (Eastbound)				SW 116th Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	30	299	49	6	92	247	10	3	4	22	13	0	123	22	89	0	1009	
4:15 PM	28	258	52	11	90	227	6	3	6	30	14	0	138	29	79	0	971	
4:30 PM	23	315	67	17	119	280	11	2	5	22	17	0	117	15	74	0	1084	
4:45 PM	22	275	53	15	109	201	4	5	7	24	13	0	132	23	85	0	968	4032
5:00 PM	28	315	54	9	94	251	1	2	7	24	24	0	108	18	86	0	1021	4044
5:15 PM	13	317	51	11	108	266	4	1	4	25	16	0	136	17	102	0	1071	4144
5:30 PM	22	262	52	8	92	230	6	7	12	16	12	0	132	19	81	0	951	4011
5:45 PM	18	275	71	10	102	195	7	3	5	12	12	0	103	22	80	0	915	3958

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	92	1260	268	68	476	1120	44	8	20	88	68	0	468	60	296	0	4336
Heavy Trucks	0	40	0		4	64	0		0	4	0		20	4	0		136
Buses																	
Pedestrians		0				16				4				8			28
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 6/2/2025 1:04 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

APPENDIX E.

SEASONAL ADJUSTMENT DATA

SEASONAL TREND TABLE (Updated: 11/08/2023)																								Seasonal Trend Peak Period Factor
TREND	1-Jan	15-Jan	1-Feb	15-Feb	1-Mar	15-Mar	1-Apr	15-Apr	1-May	15-May	1-Jun	15-Jun	1-Jul	15-Jul	1-Aug	15-Aug	1-Sep	15-Sep	1-Oct	15-Oct	1-Nov	15-Nov	1-Dec	15-Dec	
INTERSTATE URBANIZED	1.0869	1.1041	1.0688	1.0335	1.0182	1.0028	0.9995	0.9962	0.9901	0.9840	0.9641	0.9443	0.9502	0.9562	0.9510	0.9458	0.9575	0.9692	0.9791	0.9891	1.0107	1.0324	1.0532	1.0739	0.9443
INTERSTATE NONURBANIZED	1.2459	1.2915	1.2286	1.1657	1.0907	1.0158	1.0059	0.9960	0.9728	0.9496	0.9128	0.8760	0.8650	0.8540	0.8612	0.8684	0.8905	0.9126	0.9488	0.9850	1.0336	1.0822	1.1717	1.2612	0.8540
COMMUTER	1.0905	1.0986	1.0636	1.0285	1.0162	1.0038	0.9959	0.9879	0.9814	0.9749	0.9631	0.9512	0.9614	0.9717	0.9608	0.9500	0.9548	0.9595	0.9634	0.9673	1.0090	1.0507	1.0733	1.0958	0.9500
COASTAL DESTINATION	1.2064	1.1715	1.1234	1.0753	1.0545	1.0337	1.0372	1.0407	1.0216	1.0024	0.9586	0.9147	0.8760	0.8372	0.8371	0.8370	0.8678	0.8985	0.9578	1.0170	1.0730	1.1290	1.1823	1.2357	0.8370
COASTAL DESTINATION ROUTE	1.3937	1.2897	1.2245	1.1594	1.1247	1.0901	1.0911	1.0921	1.0516	1.0111	0.9493	0.8875	0.8172	0.7469	0.7455	0.7440	0.7916	0.8391	0.9274	1.0158	1.1126	1.2094	1.3193	1.4291	0.7440
AGRICULTURE	1.4537	1.4624	1.3705	1.2786	1.2139	1.1492	1.1207	1.0923	1.0075	0.9226	0.8742	0.8258	0.8348	0.8439	0.8422	0.8405	0.7976	0.7547	0.8073	0.8598	1.0041	1.1484	1.3339	1.5194	0.7547
RECREATIONAL SUMMER	1.6049	1.5814	1.4924	1.4034	1.3208	1.2382	1.2380	1.2377	1.0939	0.9500	0.8669	0.7839	0.7392	0.6945	0.7065	0.7185	0.7404	0.7624	0.8468	0.9311	1.1270	1.3230	1.5054	1.6879	0.6945
RECREATIONAL SUMMER WINTER	1.0075	0.9570	0.9184	0.8799	0.9701	1.0603	1.0675	1.0747	1.0843	1.0939	1.0045	0.9151	0.8244	0.7336	0.7795	0.8254	0.9368	1.0482	1.1794	1.3105	1.4969	1.6833	1.3470	1.0108	0.7336
RECREATIONAL WINTER**	0.8059	0.6710	0.6475	0.6240	0.7462	0.8685	0.9307	0.9928	1.1496	1.3064	1.2173	1.1282	0.9996	0.8709	0.9526	1.0342	1.1225	1.2108	1.4061	1.6013	1.9826	2.3639	1.6332	0.9026	0.6240
SUMMER	1.2374	1.2352	1.1733	1.1114	1.0786	1.0459	1.0330	1.0202	0.9851	0.9500	0.9160	0.8819	0.8660	0.8501	0.8561	0.8620	0.8891	0.9161	0.9430	0.9698	1.0525	1.1352	1.2002	1.2653	0.8501
SUMMER < 2500	1.2836	1.2576	1.1943	1.1310	1.1011	1.0712	1.0448	1.0184	0.9633	0.9082	0.8861	0.8641	0.8609	0.8578	0.8695	0.8813	0.8874	0.8936	0.9165	0.9394	1.0500	1.1607	1.2535	1.3463	0.8578
										May 13th															

*** Seasonal Trend Table factors are based on previous year ATR data. The table is updated yearly.**

*** Grey shading indicates months were seasonal factor is greater than or less than 30%**

****Use Recreation Winter Trend with Caution! ATR site was down for most of of 2022 due to loop issues and was estimated while the site was down**

Seasonal Adjustment Factor (May 13th):	1.03

APPENDIX F.

CRASH DATA

CITY OF TUALATIN, WASHINGTON COUNTY

124TH AVE at PACIFIC HY 99W, City of Tualatin, Washington County, ALL Crashes Severity, ALL Crashes Circumstance, 01/01/2019 to 12/31/2023

1 - 4 of 13 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G	J N S	S H V	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES / LOC	PED ERROR	ACT EVENT	CAUSE
06440	Y	N	N	N			12/09/2023	14	SW PACIFIC HY 99W	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT									01,07,29
NONE							SA		SW 124TH AVE	NE		TRF SIGNAL	N	WET	REAR		PRVTE	NE-SW								000	00
N							UNK			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	45	M	OR-Y		047,026	000	01,07,29
N							45 23 21.44	-122 48 20.25	009100100S00															OR<25			
																02	NONE 0	STOP									
																	PRVTE	NE-SW								011	00
																	PSNGR CAR		01	DRVR	NONE	44	M	OR-Y		000	00
																								OR<25			
																02	NONE 0	STOP									
																	PRVTE	NE-SW								011	00
																	PSNGR CAR		02	PSNG	INJC	45	F		000	000	00
																02	NONE 0	STOP									
																	PRVTE	NE-SW								011	00
																	PSNGR CAR		03	PSNG	INJC	10	F		000	000	00
04948	N	N	N	N	N	N	09/26/2019	16	SW PACIFIC HY 99W	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 9	TURN-R									08
CITY							TH	0	SW 124TH AVE	E		TRF SIGNAL	N	DRY	SS-O		N/A	SE-NE								000	00
N							6A			09	1		N	DAWN	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK	000	000	00
N							45 23 20.82	-122 48 19.67																UNK			
																02	NONE 9	STOP									
																	N/A	SE-NE								011	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK	000	000	00
																								UNK			
06351	N	N	N	N			12/02/2019	16	SW PACIFIC HY 99W	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT									29
NONE							MO	0	SW 124TH AVE	SE		TRF SIGNAL	N	DRY	REAR		PRVTE	SE-NW								000	00
N							5P			09	1		N	DUSK	INJ		PSNGR CAR		01	DRVR	NONE	49	M	OR-Y	026	000	29
N							45 23 20.82	-122 48 19.67																OR<25			
																02	NONE 0	STOP									
																	PRVTE	SE-NW								011	00
																	PSNGR CAR		01	DRVR	INJC	47	M	OR-Y	000	000	00
																								OR<25			
00515	Y	N	N	N			02/14/2021	16	SW PACIFIC HY 99W	INTER	3-LEG	N	N	SNOW	S-1STOP	01	NONE	STRGHT									01,07
NONE							SU	0	SW 124TH AVE	SE		TRF SIGNAL	N	SNO	REAR		PRVTE	SE-NW								000	00
N							9A			09	1		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	00	M	OR-Y	026	000	01,07
N							45 23 20.84	-122 48 19.67																UNK			
																02	NONE	STOP									
																	PRVTE	SE-NW								012	00
																	PSNGR CAR		01	DRVR	INJC	66	F	OR-Y	000	000	00
																								OR<25			

Disclaimer: The information contained in this report is compiled from individual driver and police crash reports submitted to the Oregon Department of Transportation as required in ORS 811.720. The Crash Analysis and Reporting Unit is committed to providing the highest quality crash data to customers. However, because submittal of crash report forms is the responsibility of the individual driver, the Crash Analysis and Reporting Unit can not guarantee that all qualifying crashes are represented nor can assurances be made that all details pertaining to a single crash are accurate. Note: Legislative changes to DMV's vehicle crash reporting requirement, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

CITY OF TUALATIN, WASHINGTON COUNTY

124TH AVE at PACIFIC HY 99W, City of Tualatin, Washington County, ALL Crashes Severity, ALL Crashes Circumstance, 01/01/2019 to 12/31/2023

5 - 8 of 13 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G	J N V	S I H	C L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
01866	N	N	N	N	N	N	N	04/26/2022	16	SW PACIFIC HY 99W	INTER	3-LEG	N	N	RAIN	S-1STOP	01	NONE 9	STRGHT										07
CITY			TU		0				SW 124TH AVE	SE		TRF SIGNAL	N	WET	REAR			N/A	SE-NW									000		00
N			11A							06	1		N	DAY	PDO			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N			45 23 20.82		-122 48 19.67														UNK										
																	02	NONE 9	STOP										
																		N/A	SE-NW								011		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																			UNK										
05197	N	N	N	N				10/10/2019	14	SW PACIFIC HY 99W	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT									013	29
NONE			TH						SW 124TH AVE	SW		TRF SIGNAL	N	DRY	REAR			PRVTE	SW-NE								000		00
N			5P							06	1		N	DAY	INJ			PSNGR CAR		01	DRVR	INJC	43	F	OR-Y		026	000		29
N			45 23 20.82		-122 48 19.67				009100200S00										OR<25										
																	02	NONE 0	STOP										
																		PRVTE	SW-NE								011	013	00
																		PSNGR CAR		01	DRVR	NONE	51	M	OTH-Y		000	000		00
																			N-RES										
																	03	NONE 0	STOP										
																		PRVTE	SW-NE								022		00
																		PSNGR CAR		01	DRVR	NONE	26	F	OR-Y		000	000		00
																			OR<25										
02288	N	N	N	N				05/08/2019	14	SW PACIFIC HY 99W	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 9	STRGHT										29
NONE			WE						SW 124TH AVE	SW		TRF SIGNAL	N	DRY	REAR			N/A	SW-NE								000		00
N			5P							06	1		N	DAY	PDO			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N			45 23 20.82		-122 48 19.67				009100200S00										UNK										
																	02	NONE 9	STOP										
																		N/A	SW-NE								011		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																			UNK										
03031	Y	N	N	N	N	N		08/17/2020	14	SW PACIFIC HY 99W	INTER	3-LEG	N	Y	CLR	FIX OBJ	01	NONE 9	TURN-L									058	01
CITY			MO						SW 124TH AVE	SW		TRF SIGNAL	N	DRY	FIX			N/A	SE-SW								000		00
N			4P							05	0		N	DAY	PDO			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N			45 23 21.43		-122 48 20.24				009100100S00										UNK										
00854	N	Y	N	N				03/12/2021	14	SW PACIFIC HY 99W	INTER	3-LEG	N	N	CLD	S-1STOP	01	NONE	STRGHT										29,07
CITY			FR						SW 124TH AVE	SW		TRF SIGNAL	N	DRY	REAR			PRVTE	SW-NE								000		00
N			10P							06	1		N	DLIT	INJ			PSNGR CAR		01	DRVR	NONE	33	F	OR-Y		000,026	000		29,07
N			45 23 20.83		-122 48 19.67				009100200S00										OR<25										
																	02	NONE	STOP										
																		PRVTE	SW-NE								012		00
																		PSNGR CAR		01	DRVR	INJC	36	M	OTH-Y		000	000		00
																			N-RES										

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CITY OF TUALATIN, WASHINGTON COUNTY

124TH AVE at PACIFIC HY 99W, City of Tualatin, Washington County, ALL Crashes Severity, ALL Crashes Circumstance, 01/01/2019 to 12/31/2023

9 - 13 of 13 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J N S	S H V	W O R L	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																02	NONE PRVTE PSNGR CAR	STOP SW-NE	02	PSNG	INJC	26	F			000	012 000		00 00
05702	N	N	N	N	N	N	12/17/2021	14	SW PACIFIC HY 99W	INTER	3-LEG	N	N	CLD	S-OTHER	01	NONE 9	TURN-L											08
CITY			FR						SW 124TH AVE	SW		TRF SIGNAL	N	WET	TURN		N/A	SE-SW									000		00
N N			5A 45 23 20.82				-122 48 19.67		009100200S00	05	1		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000		00
																02	NONE 9 N/A PSNGR CAR	TURN-L SE-SW	01	DRVR	NONE	00	Unk	UNK UNK		000	000 000		00 00
03539	N	N	N	N	N	N	08/30/2021	14	SW PACIFIC HY 99W	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 9	STRGHT											07
CITY			MO						SW 124TH AVE	SW		TRF SIGNAL	N	DRY	REAR		N/A	SW-NE									000		00
N N			6P 45 23 20.58				-122 48 20.24		009100200S00	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000		00
																02	NONE 9 N/A PSNGR CAR	STOP SW-NE	01	DRVR	NONE	00	Unk	UNK UNK		000	011 000		00 00
04025	N	N	N	N	N	N	09/06/2022	14	SW PACIFIC HY 99W	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											04
CITY			TU						SW 124TH AVE	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	SE-NW									019		00
N N			8A 45 23 21.44				-122 48 20.25		009100100S00	02	1		Y	DAY	INJ		PSNGR CAR		01	DRVR	NONE	68	F	OR-Y OR<25		000	000		00
																02	NONE 0 PRVTE PSNGR CAR	TURN-L NE-SE	01	DRVR	INJC	40	M	OR-Y OR<25		003	000 000		00 04
91096	N	N	N	N			04/14/2022	14	SW PACIFIC HY 99W	INTER	3-LEG	N	N	CLR	S-OTHER	01	NONE 9	TURN-L											05,08
NO RPT			TH						SW 124TH AVE	CN		TRF SIGNAL	N	DRY	TURN		N/A	SE-SW									000		00
N N			9A 45 23 20.82				-122 48 19.67		009100200S00	03	0		N	DAY	PDO		SEMI TOW		01	DRVR	NONE	00	Unk	UNK UNK		000	000		00
																02	NONE 9 N/A PSNGR CAR	TURN-L SE-SW	01	DRVR	NONE	00	Unk	UNK UNK		000	000 000		00 00

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091: PACIFIC HIGHWAY WEST

Highway 091 MAINLINE, MP 11.45 to 11.49 01/01/2019 to 12/31/2023, Both Add and Non-Add mileage, ALL Crashes Severity, ALL Crashes Circumstance

1 - 4 of 33 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R G S	M J N V	S I H L	C N R K	O W	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TYPE / TRLR QTY / OWNER	MOVE / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
00635	N	N	N	N	N	N	N	02/24/2021	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	STRGHT									013	07,27
CITY								WE	TIGARD	MN 0		SW PACIFIC HY 99W	NE		TRF SIGNAL	N	WET	REAR		PRVTE	NE-SW							000		00
N								7P	PORTLAND UA	11.46		SW 116TH AVE	05	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	31	M	OR-Y		026	000		07,27
N								45 24 16.39	-122 47 49.13			009100100S00															OR<25					
																			02	NONE	STOP								012	013	00
																				PRVTE	NE-SW										
																				PSNGR CAR		01	DRVR	INJC	83	F	OR-Y		000	000		00
																											OR<25					
																			03	NONE	STOP										
																				PRVTE	NE-SW								022		00
																				PSNGR CAR		01	DRVR	NONE	00	M	UNK		000	000		00
																											UNK					
03418	N	N	N	N				07/03/2019	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT											29
NONE								WE	TIGARD	MN 0		SW PACIFIC HY 99W	NE		TRF SIGNAL	N	DRY	REAR		N/A	NE-SW							000		00
N								8A	PORTLAND UA	11.46		SW 116TH AVE	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 24 16.38	-122 47 49.12			009100100S00															UNK					
																			02	NONE 9	STOP										
																				N/A	NE-SW								012		00
																				PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																											UNK					
05377	N	N	N	N				12/06/2021	WASHINGTON	1	14		INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT									013	29
CITY								MO	TIGARD	MN 0		SW DURHAM RD	NE		TRF SIGNAL	N	WET	REAR		UNKN	NE-SW							000		00
N								3P	PORTLAND UA	11.46		SW PACIFIC HY 99W	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		026	000		29
N								45 24 16.37	-122 47 49.13			009100100S00															UNK					
																			02	NONE 0	STOP										
																				PRVTE	NE-SW								011	013	00
																				PSNGR CAR		01	DRVR	INJC	49	M	OR-Y		000	000		00
																											OR>25					
																			03	NONE 0	STOP										
																				UNKN	NE-SW								011		00
																				PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																											UNK					
04966	N	N	N	N				10/24/2022	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	S-STRGHT	01	NONE 0	STRGHT											13
NONE								MO	TIGARD	MN 0		SW DURHAM RD	NE		TRF SIGNAL	N	DRY	SS-O		UNKN	NE-SW							022		00
N								4P	PORTLAND UA	11.46		SW PACIFIC HY 99W	06	0		N	DAY	INJ		UNKNOWN		01	DRVR	NONE	00	Unk	UNK		045	000		13
N								45 24 16.38	-122 47 49.12			009100100S00															UNK					
																			02	NONE 0	STRGHT										
																				PRVTE	NE-SW								000		00
																				PSNGR CAR		01	DRVR	INJC	27	M	OR-Y		000	000		00
																											OR<25					
																			03	NONE 0	STOP										
																				PRVTE	NE-SW								011		00
																				PSNGR CAR		01	DRVR	NONE	26	M	OR-Y		000	000		00
																											OR<25					

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091: PACIFIC HIGHWAY WEST

Highway 091 MAINLINE, MP 11.45 to 11.49 01/01/2019 to 12/31/2023, Both Add and Non-Add mileage, ALL Crashes Severity, ALL Crashes Circumstance

5 - 9 of 33 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J N V	S H L	W R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# FC / COMPNT / MLG TYP / MILEPNT	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
05744	N	N	N	N	N	N	11/07/2023	WASHINGTON	1 14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT										001	07,29
CITY			TU				TIGARD		MN 0	SW PACIFIC HY 99W	NE		TRF SIGNAL	N	WET	REAR		PRVTE	NE-SW								006		00
N			8A				PORTLAND UA		11.46	SW 116TH AVE	06	0		N	DAY	INJ		MTRCYCLE		01	DRVR	INJA	35		OR-Y		043,026	000	001	07,29
N			45 24 16.38				-122 47 49.12			009100100S00															OR<25					
																	02	NONE 0	STOP											
																		PRVTE	NE-SW								011		00
																		PSNGR CAR		01	DRVR	NONE	57	M	OR-Y		000	000		00
																									OR<25					
01817	N	N	N	N			04/14/2023	WASHINGTON	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT											29
NONE			FR				TIGARD		MN 0	SW PACIFIC HY 99W	NE		TRF SIGNAL	N	DRY	REAR		N/A	NE-SW								000		00
N			UNK				PORTLAND UA		11.46	SW 116TH AVE	06	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N			45 24 16.38				-122 47 49.12			009100100S00															UNK					
																	02	NONE 9	STOP											
																		N/A	NE-SW								011		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																									UNK					
02454	N	N	N	N			05/18/2023	WASHINGTON	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT											29
NONE			TH				TIGARD		MN 0	SW PACIFIC HY 99W	NE		TRF SIGNAL	N	DRY	REAR		N/A	NE-SW								000		00
N			12P				PORTLAND UA		11.46	SW 116TH AVE	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N			45 24 16.38				-122 47 49.12			009100100S00															UNK					
																	02	NONE 9	STOP											
																		N/A	NE-SW								012		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																									UNK					
02737	N	N	N	N			06/02/2023	WASHINGTON	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT											27,29
NONE			FR				TIGARD		MN 0	SW PACIFIC HY 99W	NE		TRF SIGNAL	N	DRY	REAR		N/A	NE-SW								000		00
N			1P				PORTLAND UA		11.46	SW 116TH AVE	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N			45 24 16.38				-122 47 49.12			009100100S00															UNK					
04165	N	N	N	N	N	N	08/21/2023	WASHINGTON	1 14		INTER	CROSS	N	N	CLR	S-STRGHT	01	NONE 9	STRGHT											07,13
CITY			MO				TIGARD		MN 0	SW PACIFIC HY 99W	NE		TRF SIGNAL	N	DRY	REAR		N/A	NE-SW								000		00
N			4A				PORTLAND UA		11.46	SW 116TH AVE	06	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N			45 24 16.38				-122 47 49.12			009100100S00															UNK					
																	02	NONE 9	STRGHT											
																		N/A	NE-SW								006		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																									UNK					
01119	N	N	N	N			03/11/2021	WASHINGTON	1 14		INTER	CROSS	N	N	CLR	S-1TURN	01	NONE 9	TURN-R											08,14
NONE			TH				TIGARD		MN 0	SW PACIFIC HY 99W	CN		R-GRN-SIG	N	DRY	TURN		N/A	NE-NW								000		00
N			8A				PORTLAND UA		11.46	SW 116TH AVE	03	0		N	DAY	PDO		SEMI TOW		01	DRVR	NONE	00	Unk	UNK		000	000		00
N			45 24 16.39				-122 47 49.12			009100100S00															UNK					

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091: PACIFIC HIGHWAY WEST

Highway 091 MAINLINE, MP 11.45 to 11.49 01/01/2019 to 12/31/2023, Both Add and Non-Add mileage, ALL Crashes Severity, ALL Crashes Circumstance

10 - 14 of 33 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R U G	M J I N	S C H V	W O R L	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# FC / COMPNT / MLG TYP / MILEPNT	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS / RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																	02	NONE 9	TURN-R										
																		N/A	NE-NW									000		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																									UNK					
06279	N	N	N	N			12/04/2023	WASHINGTON	1 14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 9	U-TURN										08
NONE							MO	TIGARD	MN 0	SW PACIFIC HY 99W	CN		TRF SIGNAL	N	WET	TURN		N/A	SW-SW									000		00
N							6P	PORTLAND UA	11.46	SW 116TH AVE	03	0		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 24 16.38	-122 47 49.12		009100100S00															UNK					
																	02	NONE 9	TURN-R										
																		N/A	NW-SW									016		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																									UNK					
06946	N	N	N	N	N	N	12/29/2019	WASHINGTON	1 14		STRGHT		N	N	RAIN	S-STRGHT	01	NONE 9	STRGHT										13
CITY							SU		MN 0		UN	(DIVMD)	UNKNOWN	N	WET	SS-O		N/A	N -S									000		00
N							5A	PORTLAND UA	11.49		03			N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 24 14.92	-122 47 49.93		009100100S00		(04)													UNK					
																	02	NONE 9	STRGHT										
																		N/A	N -S									000		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																									UNK					
02017	N	N	N	N	N	N	05/27/2020	WASHINGTON	2 14		INTER	CROSS	N	N	CLR	PED	01	NONE 0	TURN-L										02
CITY							WE	TIGARD	MN 0	SW DURHAM RD	NE		TRF SIGNAL	N	DRY	PED		PRVTE	NW-NE									000		00
N							6A	PORTLAND UA	11.46	SW PACIFIC HY 99W	05	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	37	M	OR-Y		029	026		02
N							45 24 16.02	-122 47 47.92		009100200S00															OR<25					
																			-											
																			STRGHT		01	PED	INJB	36	M		I XWLK	000	035		00
																			SE NW											
05590	N	N	N	N	N	N	11/01/2023	WASHINGTON	2 14		INTER	CROSS	N	N	RAIN	PED	01	NONE 0	TURN-L										107	02
CITY							WE	TIGARD	MN 0	SW DURHAM RD	NE		L-GRN-SIG	N	WET	PED		PRVTE	NW-NE									000		00
N							2P	PORTLAND UA	11.46	SW PACIFIC HY 99W	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	41	F	NONE		029	000		02
N							45 24 16.02	-122 47 47.92		009100200S00															OR<25					
																			-											
																			STRGHT		01	CONV	INJB	58	M		I XWLK	000	000		00
																			SE NW											
06457	N	N	N	N			12/08/2023	WASHINGTON	2 14		INTER	CROSS	N	N	CLD	BIKE	01	NONE 0	TURN-R										27,02,15
CITY							FR	TIGARD	MN 0	SW DURHAM RD	SE		TRF SIGNAL	N	DRY	TURN		PRVTE	SE-NE									015		00
N							10P	PORTLAND UA	11.46	SW PACIFIC HY 99W	06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	17	F	OR-Y		027	038		27,02
N							45 24 16.02	-122 47 47.92		009100200S00															OR<25					

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091: PACIFIC HIGHWAY WEST

Highway 091 MAINLINE, MP 11.45 to 11.49 01/01/2019 to 12/31/2023, Both Add and Non-Add mileage, ALL Crashes Severity, ALL Crashes Circumstance

15 - 19 of 33 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R G S	M J N V	S I H L	W C O K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																				- STRGHT NE SW	01	BIKE	INJB	49	M		UNK	046	047		15
05771	N	N	N	N			11/10/2023	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
NONE							FR	TIGARD	MN 0		SW DURHAM RD	SE		TRF SIGNAL	N	DRY	REAR		PRVTE	SE-NW								000		00
N							8A	PORTLAND UA	11.46		SW PACIFIC HY 99W	06	0		N	DAWN	INJ		PSNGR CAR		01	DRVR	NONE	19	M	OR-Y		026	000		29
N							45 24 16.02	-122 47 47.92			009100200S00															OR<25					
																		02	NONE 0	STOP										
																			PRVTE	SE-NW								012		00
																			PSNGR CAR		01	DRVR	INJC	33	M	OR-Y		000	000		00
																										OR<25				
02933	N	N	N	N			08/14/2020	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	S-STRGHT	01	NONE 9	STRGHT										13
NONE							FR	TIGARD	MN 0		SW DURHAM RD	SW		UNKNOWN	N	DRY	SS-O		N/A	SW-NE								000		00
N							12P	PORTLAND UA	11.46		SW PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 24 16.04	-122 47 47.92			009100200S00															UNK					
																		02	NONE 9	STRGHT										
																			N/A	SW-NE								000		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK				
01980	N	N	N	N			04/24/2023	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	S-1TURN	01	NONE 9	STRGHT										29
NONE							MO	TIGARD	MN 0		SW DURHAM RD	SW		TRF SIGNAL	N	DRY	REAR		N/A	SW-NE								000		00
N							9A	PORTLAND UA	11.46		SW PACIFIC HY 99W	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 24 16.02	-122 47 47.92			009100200S00															UNK					
																		02	NONE 9	U-TURN										
																			N/A	SW-SW								000		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK				
02317	N	N	N	N			05/11/2023	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT									013	29
NONE							TH	TIGARD	MN 0		SW DURHAM RD	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW-NE								000		00
N							5P	PORTLAND UA	11.46		SW PACIFIC HY 99W	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	34	M	OR-Y		026	000		29
N							45 24 16.02	-122 47 47.92			009100200S00															OR<25					
																		02	NONE 0	STOP										
																			PRVTE	SW-NE								011	013	00
																			PSNGR CAR		01	DRVR	INJB	39	M	OR-Y		000	000		00
																										OR<25				
																		03	NONE 0	STOP										
																			PRVTE	SW-NE								022		00
																			PSNGR CAR		01	DRVR	NONE	43	M	OR-Y		000	000		00
																										OR<25				

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SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A L	M J U G	S V N H	W L R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
02345	N	N	N	N	N	06/29/2020	WASHINGTON	2	14		INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	TURN-L										04
CITY						MO	TIGARD	MN 0		SW DURHAM RD	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	SE-SW								000		00
N						9P	PORTLAND UA	11.46		SW PACIFIC HY 99W	02	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	28	M	OR-Y		097	000		00
N						45 24 16.02	-122 47 47.92			009100200S00															OR<25					
																	02	NONE 0	STRGHT									000		00
																		PRVTE	SW-NE											
																		PSNGR CAR		01	DRVR	NONE	18	M	OR-Y		097	000		00
																									OR<25					
																	02	NONE 0	STRGHT									000		00
																		PRVTE	SW-NE											
																		PSNGR CAR		02	PSNG	INJC	15	M			000	000		00
03133	N	N	N	N	N	08/03/2021	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											04
CITY						TU	TIGARD	MN 0		SW DURHAM RD	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	SW-NE								000		00
N						9A	PORTLAND UA	11.46		SW PACIFIC HY 99W	02	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	42	M	SUSP		020	000		04
N						45 24 16.04	-122 47 47.93			009100200S00															OR>25					
																	02	NONE 0	TURN-L									000		00
																		PRVTE	SE-SW											
																		PSNGR CAR		01	DRVR	INJC	42	M	OR-Y		000	000		00
																									OR<25					
00175	N	N	N	N		01/09/2020	WASHINGTON	2	14		INTER	CROSS	N	N	CLR	O-OTHER	01	NONE 9	TURN-L											02
NO RPT						TH	TIGARD	MN 0		SW PACIFIC HY 99W	CN		TRF SIGNAL	N	DRY	TURN		N/A	SE-SW								000		00
N						3P	PORTLAND UA	11.46		SW 116TH AVE	03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N						45 24 16.02	-122 47 47.92			009100200S00															UNK					
																	02	NONE 9	TURN-R									000		00
																		N/A	NW-SW											
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																									UNK					
01165	Y	N	N	N		03/13/2022	WASHINGTON	2	14		INTER	CROSS	N	N	RAIN	O-1 L-TURN	01	NONE	STRGHT										040,053,100	01,04
CITY						SU	TIGARD	MN 0		SW DURHAM RD	CN		L-GRN-SIG	N	WET	TURN		PRVTE	SW-NE								000	040,053,100	00
N						4A	PORTLAND UA	11.46		SW PACIFIC HY 99W	04	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	24	M	OR-Y		047,020	000		01,04
N						45 24 16.04	-122 47 47.93			009100200S00															OR<25					
																	02	NONE	TURN-L											
																		PRVTE	NE-SE								000		00
																		PSNGR CAR		01	DRVR	INJB	20	F	OR-Y		000	000		00
																									OR<25					
																	02	NONE	TURN-L											
																		PRVTE	NE-SE								000		00
																		PSNGR CAR		02	PSNG	INJA	20	F			000	000		00

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091: PACIFIC HIGHWAY WEST

Highway 091 MAINLINE, MP 11.45 to 11.49 01/01/2019 to 12/31/2023, Both Add and Non-Add mileage, ALL Crashes Severity, ALL Crashes Circumstance

24 - 28 of 33 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A C	M J U S	S I N V	W C H L	O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
04861	N	N	N	N			09/27/2023	WASHINGTON	2	14		STRGHT		N	N	CLR	S-1STOP	01	NONE 0	STRGHT										29,10
NONE							WE		MN 0			UN	(DIVMD)	UNKNOWN	N	DRY	REAR		PRVTE	S -N									000		00
N							12P	PORTLAND UA	11.48			00			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	54	M	OR-Y		026	000		29
N							45 24 15.05	-122 47 48.48			009100200S00		(04)													OR>25					
																		02	NONE 0	STOP										
																			PRVTE	S -N									011		00
																			PSNGR CAR		01	DRVR	INJC	63	F	OR-Y		000	000		00
																										OR<25					
05669	N	N	N	N			10/30/2019	WASHINGTON	2	14		STRGHT		N	N	CLR	S-STRGHT	01	NONE 9	STRGHT										13
NO RPT							WE		MN 0			UN	(DIVMD)	UNKNOWN	N	DRY	SS-O		N/A	S -N									000		00
N							3P	PORTLAND UA	11.48			03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 24 15.04	-122 47 48.46			009100200S00		(04)													UNK					
																		02	NONE 9	STRGHT										
																			N/A	S -N									000		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK					
03354	N	N	N	N			08/18/2021	WASHINGTON	2	14		STRGHT		N	N	CLR	S-STRGHT	01	NONE 9	STRGHT										27,29
NONE							WE		MN 0			UN	(DIVMD)	UNKNOWN	N	DRY	REAR		N/A	S -N									000		00
N							2P	PORTLAND UA	11.48			04			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 24 15.06	-122 47 48.47			009100200S00		(04)													UNK					
																		02	NONE 9	STRGHT										
																			N/A	S -N									000		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK					
02733	N	N	N	N			06/01/2023	WASHINGTON	2	14		STRGHT		Y	N	CLR	S-1STOP	01	NONE 0	STRGHT										27,29
NO RPT							TH		MN 0			UN	(DIVMD)	TRF SIGNAL	N	DRY	REAR		PRVTE	S -N									000		00
N							2P	PORTLAND UA	11.48			04			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	36	F	OR-Y		014,026	038		27,29
N							45 24 15.05	-122 47 48.48			009100200S00		(02)													OR<25					
																		02	NONE 0	STOP										
																			PRVTE	S -N									011		00
																			PSNGR CAR		01	DRVR	INJC	82	M	OTH-Y		000	000		00
																										N-RES					
																		02	NONE 0	STOP										
																			PRVTE	S -N									011		00
																			PSNGR CAR		02	PSNG	INJB	73	F			000	000		00
01367	Y	N	N	N			03/28/2022	WASHINGTON	2	14		STRGHT		Y	N	RAIN	S-1STOP	01	NONE 9	STRGHT										01,29
NONE							MO		MN 0			SW	(DIVMD)	TRF SIGNAL	N	WET	REAR		N/A	SW-NE									000		00
N							3P	PORTLAND UA	11.48			03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 24 15.05	-122 47 48.48			009100200S00		(02)													UNK					
																		02	NONE 9	STOP										
																			N/A	SW-NE									011		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK					
03158	N	N	N	N			08/05/2021	WASHINGTON	2	14		STRGHT		Y	N	CLR	S-1STOP	01	NONE 9	STRGHT										29
NO RPT							TH		MN 0			SW	(DIVMD)	TRF SIGNAL	N	DRY	REAR		N/A	SW-NE									000		00
N							12P	PORTLAND UA	11.48			04			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 24 15.1	-122 47 48.5			009100200S00		(02)													UNK					

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091: PACIFIC HIGHWAY WEST

Highway 091 MAINLINE, MP 11.45 to 11.49 01/01/2019 to 12/31/2023, Both Add and Non-Add mileage, ALL Crashes Severity, ALL Crashes Circumstance

29 - 33 of 33 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A L C	M J U G S	S N I V	W H C L	O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																		02	NONE 9	STOP										
																			N/A	SW-NE									011		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK					
06407	N	N	N	N			12/05/2019	WASHINGTON	2	14		STRGHT		N	N	CLR	S-STRGHT	01	NONE 9	STRGHT										13
NO RPT							TH		MN 0			UN	(DIVMD)	UNKNOWN	N	DRY	SS-O		N/A	S -N								000		00
N							4P	PORTLAND UA	11.49			03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 24 14.56	-122 47 48.76			009100200S00		(04)													UNK					
																		02	NONE 9	STRGHT										
																			N/A	S -N									000		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK					
00245	N	N	N	N	N	N	01/13/2023	WASHINGTON	2	14		STRGHT		N	N	RAIN	S-STRGHT	01	NONE 9	STRGHT										13
CITY							FR		MN 0			UN	(DIVMD)	UNKNOWN	N	WET	SS-O		N/A	S -N								000		00
N							4P	PORTLAND UA	11.49			03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 24 14.56	-122 47 48.76			009100200S00		(04)													UNK					
																		02	NONE 9	STRGHT										
																			N/A	S -N									000		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK					
04193	N	N	N	N			07/24/2023	WASHINGTON	2	14		STRGHT		N	N	CLR	S-STRGHT	01	NONE 9	STRGHT										13
NONE							MO		MN 0			UN	(DIVMD)	UNKNOWN	N	DRY	SS-O		N/A	S -N								000		00
N							5P	PORTLAND UA	11.49			03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 24 14.56	-122 47 48.76			009100200S00		(05)													UNK					
																		02	NONE 9	STRGHT										
																			N/A	S -N									000		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK					
02096	N	N	N	N			05/11/2022	WASHINGTON	2	14		STRGHT		Y	N	CLR	S-1STOP	01	NONE	STRGHT										29
COUNTY							WE		MN 0			UN	(DIVMD)	TRF SIGNAL	N	DRY	REAR		UNKN	S -N								000		00
N							4P	PORTLAND UA	11.49			04			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	00	M	UNK		026	000		29
N							45 24 14.56	-122 47 48.76			009100200S00		(02)													UNK					
																		02	NONE	STOP										
																			PRVTE	S -N									011		00
																			PSNGR CAR		01	DRVR	INJB	34	F	OR-Y		000	000		00
																										OR<25					
																		02	NONE	STOP										
																			PRVTE	S -N									011		00
																			PSNGR CAR		02	PSNG	INJB	12	F			000	000		00
																		02	NONE	STOP										
																			PRVTE	S -N									011		00
																			PSNGR CAR		03	PSNG	INJC	03	F			000	000		00

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091: PACIFIC HIGHWAY WEST

Highway 091 MAINLINE, MP 11.91 to 11.93 01/01/2019 to 12/31/2023, Both Add and Non-Add mileage, ALL Crashes Severity, ALL Crashes Circumstance

1 - 6 of 23 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R G S	M J N V	S I H L	C O R K	W	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# FC / COMPNT / MLG TYP / MILEPNT	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
01876	N	N	N	N				05/20/2021	WASHINGTON	1 14		STRGHT		Y	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
NONE								TH		MN 0		UN	(DIVMD)	R-GRN-SIG	N	DRY	REAR		PRVTE	N -S									000	00
N								4P	PORTLAND UA	11.91		03			N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	39	F	OR-Y		026	000		29,07
N								45 23 53.26	-122 47 55.79		009100100S00		(04)							OR<25										
																		02	NONE 0	STOP										
																			PRVTE	N -S									011	00
																			PSNGR CAR		01	DRVR	INJC	53	F	OR-Y		000	000		00
																				OR<25										
04923	Y	N	N	N	N	N		09/29/2023	WASHINGTON	1 14		STRGHT		Y	N	CLD	S-STRGHT	01	NONE 0	STRGHT										01,29
COUNTY								FR		MN 0		N	(DIVMD)	TRF SIGNAL	N	WET	REAR		PRVTE	N -S									000	00
N								5A	PORTLAND UA	11.91		06			N	DAWN	INJ		PSNGR CAR		01	DRVR	NONE	32	F	OR-Y		047,042	000		01,29
N								45 23 53.25	-122 47 55.79		009100100S00		(02)							OR<25										
																		02	NONE 0	STRGHT										
																			PRVTE	N -S									000	00
																			PSNGR CAR		01	DRVR	INJB	25	F	OR-Y		000	000		00
																				OR<25										
																		02	NONE 0	STRGHT										
																			PRVTE	N -S									000	00
																			PSNGR CAR		02	PSNG	INJB	25	F			000	000		00
04851	N	N	N	N				09/20/2019	WASHINGTON	1 14		INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
NO RPT								FR		MN 0		N		TRF SIGNAL	N	DRY	REAR		PRVTE	N -S									000	00
N								2P	PORTLAND UA	11.92		06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	23	F	OR-Y		026	000		29
N								45 23 52.73	-122 47 55.84		009100100S00									OR<25										
																		02	NONE 0	STOP										
																			PRVTE	N -S									011	00
																			PSNGR CAR		01	DRVR	INJC	29	F	OR-Y		000	000		00
																				OR<25										
06706	N	N	N	N				12/21/2023	WASHINGTON	1 14		INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 9	STRGHT										29
NONE								TH		MN 0		N		TRF SIGNAL	N	DRY	REAR		N/A	N -S									000	00
N								11A	PORTLAND UA	11.92		06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 23 52.73	-122 47 55.84		009100100S00									UNK										
																		02	NONE 9	STOP										
																			N/A	N -S									011	00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																				UNK										
00352	N	N	N	N				01/20/2019	WASHINGTON	1 14		INTER	3-LEG	N	N	UNK	PED	01	NONE 0	TURN-R										02
COUNTY								SU		MN 0		S		TRF SIGNAL	N	WET	PED		PRVTE	W -S									000	00
N								6A	PORTLAND UA	11.92		05	1		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	31	M	OR-Y		000	000		00
N								45 23 52.73	-122 47 55.84		009100100S00									OR>25										
																				-										
																				STRGHT		01	PED	INJB	23	M		I XWLK	028	035		02
																				W E										
04005	N	N	N	N				09/04/2022	WASHINGTON	1 14		INTER	CROSS	N	Y	CLR	FIX OBJ	01	NONE	TURN-L										092,079	26,40,08
NONE								SU		MN 0		S		TRF SIGNAL	N	DRY	FIX		PRVTE	E -S									000	092,079	00
N								9P	PORTLAND UA	11.92		05	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	60	M	OR-Y		080,081	027		26,40,08
N								45 23 52.73	-122 47 55.84		009100100S00									OR>25										

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091: PACIFIC HIGHWAY WEST

Highway 091 MAINLINE, MP 11.91 to 11.93 01/01/2019 to 12/31/2023, Both Add and Non-Add mileage, ALL Crashes Severity, ALL Crashes Circumstance

7 - 12 of 23 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R U G	M J I N	S C H	W O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
02462	N	N	N	N			05/15/2019	WASHINGTON	1	14		INTER	CROSS	N	N	CLD	PED	01	NONE 0	TURN-L											04
COUNTY							WE		MN 0			S		TRF SIGNAL	N	WET	PED		PRVTE	S -W									000		00
N							12P	PORTLAND UA	11.92			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	75	F	OR-Y		000	000		00
N							45 23 52.73	-122 47 55.84			009100100S00															OR<25					
																				-										
																				STRGHT	01	CONV	INJC	77	M		I XWLK	020	035		04
																				E W										
05923	N	N	N	N			11/12/2019	WASHINGTON	1	14		INTER	3-LEG	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT											27,29
NONE							TU		MN 0			S		TRF SIGNAL	N	WET	REAR		PRVTE	S -N									000		00
N							11A	PORTLAND UA	11.92			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	63	M	OR-Y		016,026	038		27,29
N							45 23 52.73	-122 47 55.84			009100100S00															OR>25					
																		02	NONE 0	STOP											
																			PRVTE	S -N									011		00
																			PSNGR CAR		01	DRVR	INJC	49	M	OR-Y		000	000		00
																										OR<25					
03096	N	N	N	N			08/04/2021	WASHINGTON	1	14		INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 9	STRGHT											29
NONE							WE		MN 0			S		TRF SIGNAL	N	DRY	REAR		N/A	S -N									000		00
N							6P	PORTLAND UA	11.92			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 23 52.73	-122 47 55.84			009100100S00															UNK					
																		02	NONE 9	STOP											
																			N/A	S -N									011		00
																			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																										UNK					
00550	N	Y	N	N	N	N	02/04/2022	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	STRGHT											07,29
COUNTY							FR		MN 0			S		L-GRN-SIG	N	DRY	REAR		PRVTE	S -N									000		00
N							7P	PORTLAND UA	11.92			06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	36	M	NONE		043,026	000		07,29
N							45 23 52.75	-122 47 55.84			009100100S00															OR<25					
																		02	NONE	STOP											
																			PRVTE	S -N									012		00
																			PSNGR CAR		01	DRVR	INJC	28	M	OR-Y		000	000		00
																										OR<25					
																		02	NONE	STOP											
																			PRVTE	S -N									012		00
																			PSNGR CAR		02	PSNG	INJC	29	F			000	000		00
01777	N	N	N	N	N	N	05/03/2020	WASHINGTON	1	14		INTER	3-LEG	N	Y	RAIN	FIX OBJ	01	NONE 9	TURN-R										100		27,08
COUNTY							SU		MN 0			W		TRF SIGNAL	N	WET	FIX		N/A	N -W									000		00
N							8A	PORTLAND UA	11.92			05	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 23 52.74	-122 47 55.84			009100100S00															UNK					
00942	N	N	N	N			02/23/2023	WASHINGTON	1	14		INTER	3-LEG	N	N	SNOW	ANGL-STP	01	NONE 0	TURN-R										124		08
NONE							TH		MN 0			W		TRF SIGNAL	N	ICE	TURN		PRVTE	N -W									000	124	00
N							8A	PORTLAND UA	11.92			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	38	M	OR-Y		007	000		08
N							45 23 52.73	-122 47 55.84			009100100S00															OR<25					
																		02	NONE 0	STOP											
																			PRVTE	W -E									011		00
																			PSNGR CAR		01	DRVR	INJC	52	M	OR-Y		000	000		00
																										OR<25					

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091: PACIFIC HIGHWAY WEST **Highway 091 MAINLINE, MP 11.91 to 11.93 01/01/2019 to 12/31/2023, Both Add and Non-Add mileage, ALL Crashes Severity, ALL Crashes Circumstance**

13 - 17 of 23 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P / E D	A	L G / C S	D M R / U N / G V	J / I / H / L	S / C / K	W / O / R	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG / MILEPNT	FC / TYP / PNT	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A GE	S EX	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
06740	Y	N	N	N				12/23/2023	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	ANGL-STP	01	NONE 0	TURN-R										080	08,05,01
NO RPT								SA		MN 0			W		TRF SIGNAL	N	DRY	TURN		PRVTE	N -W									000		00
N								2P	PORTLAND UA	11.92			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		001,080,047	000		08,05,01
N								45 23 52.73	-122 47 55.84			009100100S00															UNK					
																			02	NONE 0	STOP										012		00
																				PRVTE	W -E											
																				PSNGR CAR		01	DRVR	INJB	29	F	OR-Y		000	000		00
																											OR<25					
																			03	NONE 0	STOP										012	080	00
																				PRVTE	W -E											
																				PSNGR CAR		01	DRVR	NONE	46	F	OR-Y		000	000		00
																											OR<25					
03527	N	N	N	N	N	N		08/07/2022	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 9	STRGHT												04,27
COUNTY								SU		MN 0			CN		TRF SIGNAL	N	DRY	TURN		N/A	N -S									000		00
N								9P	PORTLAND UA	11.92			01	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 23 52.73	-122 47 55.84			009100100S00															UNK					
																			02	NONE 9	TURN-L												
																				N/A	S -W										000		00
																				PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																											UNK					
04734	N	N	N	N				08/22/2023	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT												04
NONE								TU		MN 0			CN		L-GRN-SIG	N	DRY	TURN		PRVTE	N -S									000		00
N								UNK	PORTLAND UA	11.92			01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	38	F	OR-Y		020,097	000		04
N								45 23 52.73	-122 47 55.84			009100100S00															OR<25					
																			02	NONE 0	TURN-L												
																				PRVTE	S -W										000		00
																				PSNGR CAR		01	DRVR	NONE	69	M	OR-Y		020,097	000		04
																											OR<25					
02689	N	N	N	N				05/29/2019	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT												04
COUNTY								WE		MN 0			CN		TRF SIGNAL	N	DRY	TURN		PRVTE	S -N									000		00
N								11P	PORTLAND UA	11.92			02	1		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	45	M	OR-Y		020	000		04
N								45 23 52.73	-122 47 55.84			009100100S00															OR<25					
																			02	NONE 0	U-TURN												
																				PRVTE	N -N										000		00
																				PSNGR CAR		01	DRVR	INJC	26	M	OR-Y		000	000		00
																											OR<25					
02954	N	N	N	N	N	N		07/03/2022	WASHINGTON	1	14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 9	STRGHT												02
COUNTY								SU		MN 0			CN		TRF SIGNAL	N	DRY	TURN		N/A	E -W									000		00
N								7P	PORTLAND UA	11.92			02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 23 52.73	-122 47 55.84			009100100S00															UNK					
																			02	NONE 9	TURN-L												
																				N/A	W -N										000		00
																				PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																											UNK					
01353	N	N	N	N				03/17/2019	WASHINGTON	1	14		INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 9	STRGHT												02
NONE								SU		MN 0			CN		TRF SIGNAL	N	DRY	TURN		N/A	N -S									000		00
N								12P	PORTLAND UA	11.92			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 23 52.73	-122 47 55.84			009100100S00															UNK					

Disclaimer: The information contained in this report is compiled from individual driver and police crash reports submitted to the Oregon Department of Transportation as required in ORS 811.720. The Crash Analysis and Reporting Unit is committed to providing the highest quality crash data to customers. However, because submittal of crash report forms is the responsibility of the individual driver, the Crash Analysis and Reporting Unit can not guarantee that all qualifying crashes are represented nor can assurances be made that all details pertaining to a single crash are accurate. Note: Legislative changes to DMV's vehicle crash reporting requirement, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

091: PACIFIC HIGHWAY WEST

Highway 091 MAINLINE, MP 11.91 to 11.93 01/01/2019 to 12/31/2023, Both Add and Non-Add mileage, ALL Crashes Severity, ALL Crashes Circumstance

18 - 22 of 23 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R J U G	S N I V	C H L	W O R K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / COMPNT / MLG TYP / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																		02	NONE 9 N/A PSNGR CAR	TURN-R W -S	01	DRVR	NONE	00	Unk	UNK UNK		000	000		00 00
04228 COUNTY N N	N	N	N	N			09/17/2022 SA 12P 45 23 52.73	WASHINGTON PORTLAND UA -122 47 55.84	1 14 MN 0 11.92		 009100100S00	INTER CN 03	CROSS 0	N TRF SIGNAL	N N N	CLR DRY DAY	ANGL-OTH TURN INJ	01	NONE PRVTE PSNGR CAR	TURN-R W -S	01	DRVR	NONE	19	M	OR-Y OR<25		020	000 038		04,02,27 00 04,02,27
																		02	NONE PRVTE MTRCYCLE	STRGHT N -S	01	DRVR	INJA	47	M	OTH-Y N-RES		000	000 000		00 00
03891 COUNTY N N	N	N	N	N	N	N	10/01/2020 TH 8A 45 23 52.71	WASHINGTON PORTLAND UA -122 47 54.8	2 14 MN 0 11.92		 SW FISCHER RD SW PACIFIC HY 99W 009100200S00	INTER S 06	CROSS 0	N UNKNOWN	N N N	CLD DRY DAY	S-STRGHT REAR PDO	01	NONE 9 N/A PSNGR CAR	STRGHT S -N	01	DRVR	NONE	00	Unk	UNK UNK		000	000 000		27,29 00 00
																		02	NONE 9 N/A PSNGR CAR	STRGHT S -N	01	DRVR	NONE	00	Unk	UNK UNK		006	000		00 00
06106 NONE N N	N	N	N	N			11/25/2023 SA 2P 45 23 53.07	WASHINGTON PORTLAND UA -122 47 54.78	2 14 MN 0 11.92		 009100200S00	INTER S 06	CROSS 0	N TRF SIGNAL	N N N	CLR DRY DAY	S-1STOP REAR INJ	01	NONE PRVTE PSNGR CAR	STRGHT S -N	01	DRVR	INJC	47	F	OR-Y OR<25		014,026	000 026		40,10,29 00 40,10,29
																		01	NONE PRVTE PSNGR CAR	STRGHT S -N	02	PSNG	INJC	38	F			000	000 000		00 00
																		02	NONE 0 PRVTE PSNGR CAR	STOP S -N	01	DRVR	NONE	41	M	OR-Y OR>25		000	011 000		00 00
05263 COUNTY N N	Y	N	N	N			10/16/2023 MO 6A 45 23 53.07	WASHINGTON PORTLAND UA -122 47 54.78	2 14 MN 0 11.92		 009100200S00	INTER CN 02	CROSS 0	N TRF SIGNAL	N N N	RAIN WET DLIT	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT S -N	01	DRVR	NONE	22	M	OR-Y OR<25		047,026	000 000		01,07,29 00 01,07,29
																		02	NONE 0 RENTL PSNGR CAR	STOP S -N	01	DRVR	INJC	21	F	OR-Y OR<25		000	011 000		00 00
05097 COUNTY N N	N	N	N	N	N	N	11/20/2021 SA 11A 45 23 52.75	WASHINGTON PORTLAND UA -122 47 54.8	2 14 MN 0 11.93		 009100200S00	INTER CN 04	CROSS 0	N TRF SIGNAL	N N N	CLR DRY DAY	ANGL-OTH TURN INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT S -N	01	DRVR	INJB	22	M	OR-Y OR<25		000	000 000		02,04 00 00
																		02	NONE 0 PRVTE PSNGR CAR	TURN-L W -N	01	DRVR	INJC	23	F	OR-Y OR<25		028,020	000 000		00 02,04

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091: PACIFIC HIGHWAY WEST **Highway 091 MAINLINE, MP 11.91 to 11.93 01/01/2019 to 12/31/2023, Both Add and Non-Add mileage, ALL Crashes Severity, ALL Crashes Circumstance**

23 - 23 of 23 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R J U G S V	S N H L	W I C R K	O	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# FC / COMPNT / MLG TYP / MILEPNT	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																	02	NONE 0	TURN-L											
																		PRVTE	W -N									000		00
																		PSNGR CAR		02	PSNG	INJC	23	M			000	000		00

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OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANAYLYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF TUALATIN, WASHINGTON COUNTY

108TH AVE at HERMAN RD, City of Tualatin, Washington County, ALL Crashes Severity, ALL Crashes Circumstance, 01/01/2019 to 12/31/2023

1 - 1 of 1 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R U G S	M J I N V	S C H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
00130	N	N	N	N			01/07/2020	17	SW HERMAN RD	INTER	3-LEG	N	N	RAIN	S-1STOP	01	NONE 9	STRGHT										29
NONE							TU	0	SW 108TH AVE	NE		TRF SIGNAL	N	WET	REAR		N/A	NE-SW									000	00
N							4P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							45 23 1.12	-122 47 15.52																UNK				
																02	NONE 9	STOP										
																	N/A	NE-SW									011	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				

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CITY OF TUALATIN, WASHINGTON COUNTY

TETON AVE at HERMAN RD, City of Tualatin, Washington County, ALL Crashes Severity, ALL Crashes Circumstance, 01/01/2019 to 12/31/2023

1 - 5 of 6 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R J U G	S N H V	W O R L	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
03890	N	N	N N	N N	N	08/01/2019	17	SW HERMAN RD	INTER	CROSS	N	N	CLR	S-OTHER	01	NONE 1	TURN-L										05
CITY			TH				0	SW TETON AVE	N		L-GRN-SIG	N	DRY	TURN		PRVTE	N -NE									000		00
N			12P						06	2		N	DAY	INJ		SEMI TOW		01	DRVR	NONE	51	M	OR-Y		080	000		05
N			45 23 5.35				-122 47 1.5																OR<25					
															02	NONE 0	STOP											
																PRVTE	N -S									011		00
																PSNGR CAR		01	DRVR	INJC	60	F	OR-Y		000	000		00
																							OR<25					
00751	Y	N	N N			02/16/2022	17	SW HERMAN RD	INTER	CROSS	N	N	FOG	S-1STOP	01	NONE	STRGHT										124,015	01,07
NONE			WE				0	SW TETON AVE	S		TRF SIGNAL	N	WET	REAR		PRVTE	S -N									001	124	00
N			6A						06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	32	M	OR-Y		026	000		01,07
N			45 23 5.37				-122 47 1.51																OR<25					
															02	NONE	STOP											
																PRVTE	S -N									011		00
																PSNGR CAR		01	DRVR	INJC	43	M	OR-Y		000	000		00
																							OR>25					
01792	N	N	N N	N N	N	04/11/2023	17	SW HERMAN RD	INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT											27
CITY			TU				0	SW TETON AVE	S		TRF SIGNAL	N	WET	REAR		PRVTE	S -N									000		00
N			7A						06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	46	F	OR-Y		016,026	038		27
N			45 23 5.35				-122 47 1.5																OR<25					
															02	NONE 0	STOP											
																PRVTE	S -N									011		00
																PSNGR CAR		01	DRVR	NONE	30	F	OR-Y		000	000		00
																							OR<25					
															02	NONE 0	STOP											
																PRVTE	S -N									011		00
																PSNGR CAR		02	PSNG	INJC	39	F			000	000		00
03558	Y	Y	N N	N N	N	09/01/2021	17	SW HERMAN RD	INTER	CROSS	N	Y	CLR	FIX OBJ	01	NONE 9	TURN-R										043	01,08
CITY			WE				0	SW TETON AVE	W		UNKNOWN	N	DRY	FIX		N/A	SW-S									000		00
N			8P						09	2		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N			45 23 5.35				-122 47 1.5																UNK					
05774	N	N	N N	N N	N	11/04/2019	17	SW HERMAN RD	INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT											27,04
CITY			MO				0	SW TETON AVE	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	N -S									000		00
N			11A						03	2		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	33	M	OR-Y		000	000		00
N			45 23 5.35				-122 47 1.5																OR<25					
															02	NONE 0	STRGHT											
																RENTL	SW-NE									000		00
																PSNGR CAR		01	DRVR	INJC	33	F	OR-Y		016,020	038		27,04
																							OR>25					

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CITY OF TUALATIN, WASHINGTON COUNTY

TETON AVE at HERMAN RD, City of Tualatin, Washington County, ALL Crashes Severity, ALL Crashes Circumstance, 01/01/2019 to 12/31/2023

6 - 6 of 6 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J I N V	S C H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
00417	N	N	N	N			02/06/2021	17	SW HERMAN RD	INTER	CROSS	N	N	RAIN	O-1 L-TURN	01	NONE 9	STRGHT										02
CITY							SA	0	SW TETON AVE	CN		L-GRN-SIG	N	WET	TURN		N/A	N -S									000	00
N							1P			01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							45 23 5.39	-122 47 1.52																UNK				
																02	NONE 9	TURN-L										
																	N/A	S -SW									000	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				

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CITY OF TUALATIN, WASHINGTON COUNTY

HAZELBROOK RD at PACIFIC HY 99W, City of Tualatin, Washington County, ALL Crashes Severity, ALL Crashes Circumstance, 01/01/2019 to 12/31/2023

1 - 4 of 4 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R G S	J N V	I H L	C O R K	W	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC / INJ / SVRTY	A G E	S E X	LICNS / RES	PED LOC	ERROR	ACT	EVENT	CAUSE
04361	N	N	N	N	N	N	N	06/13/2019	14	SW HAZELBROOK RD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 9	TURN-R									07
CITY			TH							SW PACIFIC HY 99W	E		STOP SIGN	N	DRY	REAR		N/A	E -N								000	00
N			7A								09	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N			45 23 33.16					-122 47 59.48		009100200S00															UNK				
																	02	NONE 9	STOP										
																		N/A	E -N								011	00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																									UNK				
04015	N	N	N	N				09/05/2022	18	SW HAZELBROOK RD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE	STRGHT									07
CITY			MO						0	SW PACIFIC HY 99W	E		STOP SIGN	N	DRY	REAR		PRVTE	E -W								000	00
N			3P								06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	21	M	NONE		043	000	07
N			45 23 33.45					-122 47 59.22																	OR>25				
																	02	NONE	STOP										
																		PRVTE	E -W								011	00
																		PSNGR CAR		01	DRVR	INJB	49	F	OR-Y		000	000	00
																									OR<25				
04025	N	N	N	N	N	N	N	11/03/2020	14	SW HAZELBROOK RD	INTER	3-LEG	N	N	RAIN	ANGL-OTH	01	NONE 0	TURN-R									08
CITY			TU							SW PACIFIC HY 99W	CN		STOP SIGN	N	WET	TURN		PRVTE	E -N								000	00
N			8P								02	0		N	DARK	INJ		PSNGR CAR		01	DRVR	INJC	23	F	OR-Y		007	000	08
N			45 23 33.16					-122 47 59.48		009100200S00															OR<25				
																	02	NONE 0	STRGHT										
																		PRVTE	S -N								000	00
																		PSNGR CAR		01	DRVR	INJC	24	F	OR-Y		000	000	00
																									OR<25				
05919	N	N	N	N	N	N	N	12/13/2022	14	SW HAZELBROOK RD	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 9	STRGHT									02
CITY			TU							SW PACIFIC HY 99W	CN		STOP SIGN	N	DRY	TURN		N/A	W -E								000	00
N			5A								02	1		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N			45 23 33.62					-122 47 59.07		009100200S00															UNK				
																	02	NONE 9	TURN-R										
																		N/A	S -E								015	00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																									UNK				

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CITY OF TUALATIN, WASHINGTON COUNTY

LEVETON DR at 124TH AVE, City of Tualatin, Washington County, ALL Crashes Severity, ALL Crashes Circumstance, 01/01/2019 to 12/31/2023

1 - 5 of 8 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G	J N S	S H V	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC / INJ / SVRTY	A G E	S E X	LICNS / RES / LOC	PED / ERROR	ACT EVENT	CAUSE
05935	N	N	N	N			11/12/2019	16	SW LEVETON DR	INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 9	STRGHT								29
NONE							TU	0	124TH AVE	N		TRF SIGNAL	N	WET	REAR		N/A	N -S							000	00
N							8A			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK	000	000	00
N							45 23 5.63	-122 48 14.95																UNK			
																02	NONE 9	STOP								
																	N/A	N -S							011	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK	000	000	00
																								UNK			
04719	N	N	N	N			12/22/2020	16	SW LEVETON DR	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT								29
NONE							TU	0	124TH AVE	N		TRF SIGNAL	N	DRY	REAR		N/A	N -S							000	00
N							12P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK	000	000	00
N							45 23 5.63	-122 48 14.95																UNK			
																02	NONE 9	STOP								
																	N/A	N -S							011	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK	000	000	00
																								UNK			
06451	N	N	N	N			11/21/2023	16	SW LEVETON DR	INTER	CROSS	N	N	CLR	O-OTHER	01	NONE 9	TURN-L								08
NONE							TU	0	124TH AVE	N		TRF SIGNAL	N	DRY	TURN		N/A	W -N							000	00
N							4P			05	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK	000	000	00
N							45 23 5.63	-122 48 14.95																UNK			
																02	NONE 9	TURN-R								
																	N/A	E -N							000	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK	000	000	00
																								UNK			
04159	Y	N	N	N	N	N	08/16/2019	16	SW LEVETON DR	INTER	CROSS	N	N	CLR	OVERTURN	01	NONE 0	TURN-L								01
CITY							FR	0	124TH AVE	E		TRF SIGNAL	N	DRY	NCOL		PRVTE	N -E							000	00
N							6P			05	0		N	DAY	INJ		TRUCK		01	DRVR	INJB	25	M	OTH-Y	047	000	01
N							45 23 5.63	-122 48 14.95																N-RES			
05424	N	N	N	N			10/04/2019	16	SW LEVETON DR	INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 0	STRGHT								04
NO RPT							FR	0	124TH AVE	CN		TRF SIGNAL	N	WET	TURN		PRVTE	W -E							000	00
N							11A			04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	57	M	OR-Y	020	000	04
N							45 23 5.63	-122 48 14.95																OR<25			
																02	NONE 0	TURN-L								
																	PRVTE	S -W							000	00
																	PSNGR CAR		01	DRVR	INJC	63	F	OR-Y	000	000	00
																								OR<25			

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SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R G S	J N V	S H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC / TYPE	INJ / SVRTY	A G E	S E X	LICNS / RES	PED LOC	ERROR	ACT EVENT	CAUSE
01884	N	N	N	N			04/15/2019	16	SW LEVETON DR	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 9	TURN-L										02
NO RPT							MO	0	124TH AVE	CN		TRF SIGNAL	N	DRY	TURN		N/A	N -E									000	00
N							2P			04	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							45 23 5.63	-122 48 14.95																UNK				
																02	NONE 9	STRGHT										
																	N/A	S -N									000	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				
01646	N	N	N	N			04/14/2022	16	SW LEVETON DR	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 9	TURN-L										08
CITY							TH	0	124TH AVE	CN		TRF SIGNAL	N	DRY	TURN		N/A	E -S									000	00
N							9A			04	0		N	DAY	PDO		SEMI TOW		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							45 23 5.63	-122 48 14.95																UNK				
																02	NONE 9	TURN-R										
																	N/A	S -E									000	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				
03841	N	N	N	N	N	N	08/03/2023	16	SW LEVETON DR	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE	STRGHT										32,04,02
CITY							TH	0	124TH AVE	CN		L-GRN-SIG	N	DRY	TURN		PRVTE	N -S									000	00
N							2P			01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	41	F	OR-Y	000	000	00
N							45 23 5.63	-122 48 14.95																OR<25				
																01	NONE	STRGHT										
																	PRVTE	N -S									000	00
																	PSNGR CAR		02	PSNG	INJA	55	M		000	000	00
																01	NONE	STRGHT										
																	PRVTE	N -S									000	00
																	PSNGR CAR		03	PSNG	INJB	13	F		000	000	00
																02	NONE	TURN-L										
																	PRVTE	S -W									000	00
																	PSNGR CAR		01	DRVR	INJC	21	F	OR-Y	052	000	32,04,02
																								OR<25				

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OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANAYLYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF TUALATIN, WASHINGTON COUNTY

LEVETON DR and Intersectional Crashes at LEVETON DR, City of Tualatin, Washington County, ALL Crashes Severity, ALL Crashes Circumstance, 01/01/2019 to 12/31/2023

1 - 5 of 13 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R G	J N H	S V L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / TYPE / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
01547	N	N	N	N			03/28/2023	17	SW LEVETON DR	INTER	3-LEG	N	N	RAIN	ANGL-OTH	01	NONE	TURN-R										03,02
CITY			TU				0	SW 108TH AVE	CN		STOP SIGN	N	WET	TURN			PRVTE	W -S									015	00
N			3P						03	0		N	DAY	INJ			PSNGR CAR		01	DRVR	NONE	53	F	OR-Y		021,028	000		03,02
N			45 23 9.64				-122 47 15.67																	OR<25					
																02	NONE	STRGHT											
																	PRVTE	N -S									000		00
																	PSNGR CAR		01	DRVR	INJC	56	M	OR-Y		000	000		00
																								OR<25					
05415	N	N	N	N	N	N	11/15/2022	17	SW LEVETON DR	ALLEY		N	N	CLR	O-1 L-TURN	01	NONE 9	STRGHT											02
CITY			TU				995	SW 108TH AVE	W	(NONE)	UNKNOWN	N	DRY	TURN			N/A	E -W									000		00
N			5P						07			N	DLIT	PDO			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N			45 23 9.71				-122 47 29.92				(02)													UNK					
																02	NONE 9	TURN-L											
																	N/A	W -N									019		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																								UNK					
04242	N	N	N	N	N	N	09/18/2022	17	SW LEVETON DR	ALLEY		N	Y	CLR	BIKE	01	NONE	TURN-R											02
CITY			SU				1013	SW 108TH AVE	W	(NONE)	UNKNOWN	N	DRY	ANGL			PRVTE	N -W									018		00
Y			11A						07			Y	DAY	INJ			PSNGR CAR		01	DRVR	NONE	33	F	OR-Y		027	000		02
N			45 23 9.72				-122 47 30.44				(02)													OR>25					
																		- STRGHT	01	BIKE	INJA	72	F		SIDEWK	000	000		00
																		E W											
05211	N	N	N	N			10/12/2023	17	SW LEVETON DR	ALLEY		N	N	CLR	ANGL-OTH	01	NONE 0	TURN-L											02
NONE			TH				252	SW 118TH AVE	W	(NONE)	UNKNOWN	N	DRY	TURN			PRVTE	S -W									018		00
N			5P						07			N	DAY	INJ			PSNGR CAR		01	DRVR	NONE	37	M	OR-Y		028	000		02
N			45 23 5.47				-122 48 .99				(02)													OR>25					
																02	NONE 0	TURN-L											
																	PRVTE	E -S									019		00
																	PSNGR CAR		01	DRVR	INJC	27	M	OR-Y		000	000		00
																								OR>25					
01340	N	N	N	N	N	N	03/16/2019	17	SW LEVETON DR	STRGHT		N	Y	CLR	FIX OBJ	01	NONE 9	STRGHT										059,003	10
CITY			SA				240	SW 118TH AVE	W	(NONE)	UNKNOWN	N	DRY	FIX			N/A	W -E									000		00
Y			5P						08			N	DAY	PDO			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N			45 23 5.51				-122 48 .59				(02)													UNK					

Leveton & 108th

Center Access

Center Access

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CITY OF TUALATIN, WASHINGTON COUNTY

LEVETON DR and Intersectional Crashes at LEVETON DR, City of Tualatin, Washington County, ALL Crashes Severity, ALL Crashes Circumstance, 01/01/2019 to 12/31/2023

6 - 10 of 13 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R J U G S V	I N H L	C S O R K	W	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
05935	N	N	N N				11/12/2019	16	SW LEVETON DR	INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 9	STRGHT										29
NONE							TU	0	124TH AVE	N		TRF SIGNAL	N	WET	REAR		N/A	N -S									000	00
N							8A			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							45 23 5.63	-122 48 14.95																UNK				
																02	NONE 9	STOP										
																	N/A	N -S									011	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				
04719	N	N	N N				12/22/2020	16	SW LEVETON DR	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT										29
NONE							TU	0	124TH AVE	N		TRF SIGNAL	N	DRY	REAR		N/A	N -S									000	00
N							12P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							45 23 5.63	-122 48 14.95																UNK				
																02	NONE 9	STOP										
																	N/A	N -S									011	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				
06451	N	N	N N				11/21/2023	16	SW LEVETON DR	INTER	CROSS	N	N	CLR	O-OTHER	01	NONE 9	TURN-L										08
NONE							TU	0	124TH AVE	N		TRF SIGNAL	N	DRY	TURN		N/A	W -N									000	00
N							4P			05	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							45 23 5.63	-122 48 14.95																UNK				
																02	NONE 9	TURN-R										
																	N/A	E -N									000	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				
04159	Y	N	N N	N	N	N	08/16/2019	16	SW LEVETON DR	INTER	CROSS	N	N	CLR	OVERTURN	01	NONE 0	TURN-L										01
CITY							FR	0	124TH AVE	E		TRF SIGNAL	N	DRY	NCOL		PRVTE	N -E									000	00
N							6P			05	0		N	DAY	INJ		TRUCK		01	DRVR	INJB	25	M	OTH-Y		047	000	01
N							45 23 5.63	-122 48 14.95																N-RES				
05424	N	N	N N				10/04/2019	16	SW LEVETON DR	INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 0	STRGHT										04
NO RPT							FR	0	124TH AVE	CN		TRF SIGNAL	N	WET	TURN		PRVTE	W -E									000	00
N							11A			04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	57	M	OR-Y		020	000	04
N							45 23 5.63	-122 48 14.95																OR<25				
																02	NONE 0	TURN-L										
																	PRVTE	S -W									000	00
																	PSNGR CAR		01	DRVR	INJC	63	F	OR-Y		000	000	00
																								OR<25				

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CITY OF TUALATIN, WASHINGTON COUNTY

LEVETON DR and Intersectional Crashes at LEVETON DR, City of Tualatin, Washington County, ALL Crashes Severity, ALL Crashes Circumstance, 01/01/2019 to 12/31/2023

11 - 13 of 13 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R G S	M J N V	S I H L	W C O K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC / TYPE	INJ / SVRTY	A G E	S E X	LICNS / RES	PED LOC	ERROR	ACT	EVENT	CAUSE
01884	N	N	N	N			04/15/2019	16	SW LEVETON DR	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 9	TURN-L										02
NO RPT							MO	0	124TH AVE	CN		TRF SIGNAL	N	DRY	TURN		N/A	N -E									000	00
N							2P			04	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							45 23 5.63	-122 48 14.95																UNK				
																02	NONE 9	STRGHT										
																	N/A	S -N									000	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				
01646	N	N	N	N			04/14/2022	16	SW LEVETON DR	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 9	TURN-L										08
CITY							TH	0	124TH AVE	CN		TRF SIGNAL	N	DRY	TURN		N/A	E -S									000	00
N							9A			04	0		N	DAY	PDO		SEMI TOW		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							45 23 5.63	-122 48 14.95																UNK				
																02	NONE 9	TURN-R										
																	N/A	S -E									000	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				
03841	N	N	N	N	N	N	08/03/2023	16	SW LEVETON DR	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE	STRGHT										32,04,02
CITY							TH	0	124TH AVE	CN		L-GRN-SIG	N	DRY	TURN		PRVTE	N -S									000	00
N							2P			01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	41	F	OR-Y	000	000	000	00
N							45 23 5.63	-122 48 14.95																OR<25				
																01	NONE	STRGHT										
																	PRVTE	N -S									000	00
																	PSNGR CAR		02	PSNG	INJA	55	M		000	000	000	00
																01	NONE	STRGHT										
																	PRVTE	N -S									000	00
																	PSNGR CAR		03	PSNG	INJB	13	F		000	000	000	00
																02	NONE	TURN-L										
																	PRVTE	S -W									000	00
																	PSNGR CAR		01	DRVR	INJC	21	F	OR-Y	052	000	000	32,04,02
																								OR<25				

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CITY OF TUALATIN, WASHINGTON COUNTY

TUALATIN RD at 108TH AVE, City of Tualatin, Washington County, ALL Crashes Severity, ALL Crashes Circumstance, 01/01/2019 to 12/31/2023

1 - 5 of 5 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R G S	J N V	S H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
00057	Y	N	N N				01/04/2023	17	SW TUALATIN RD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE	STRGHT										01
NONE							WE	0	SW 108TH AVE	S		STOP SIGN	N	DRY	REAR		PRVTE	S -N									000	00
N							5P			06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	52	M	OR-Y		047,026	000	01
N							45 23 23.11	-122 47 15.82																OR<25				
																02	NONE	STOP										
																	PRVTE	S -N									011	00
																	PSNGR CAR		01	DRVR	INJC	65	M	OR-Y		000	000	00
																								OR<25				
01097	N	N	N N	N	N	N	02/25/2020	17	SW TUALATIN RD	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										02
CITY							TU	0	SW 108TH AVE	CN		STOP SIGN	N	DRY	TURN		PRVTE	W -E									000	00
N							11P			04	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	55	M	OR-Y		000	000	00
N							45 23 23.11	-122 47 15.82																OR<25				
																02	NONE 0	TURN-L										
																	PRVTE	S -W									015	00
																	PSNGR CAR		01	DRVR	INJC	22	M	OR-Y		028	000	02
																								OR<25				
05023	N	N	N N	N	N	N	11/17/2021	17	SW TUALATIN RD	INTER	3-LEG	N	N	CLR	S-1TURN	01	NONE 0	STRGHT										08
CITY							WE	0	SW 108TH AVE	CN		STOP SIGN	N	DRY	TURN		PRVTE	W -E									000	00
N							10A			04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	16	M	OR-Y		000	000	00
N							45 23 23.11	-122 47 15.82																OR<25				
																02	NONE 0	U-TURN										
																	PRVTE	W -W									000	00
																	PSNGR CAR		01	DRVR	NONE	92	M	OR-Y		008	000	08
																								OR<25				
04259	N	N	N N				08/15/2022	17	SW TUALATIN RD	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 9	STRGHT										02
NONE							MO	0	SW 108TH AVE	CN		STOP SIGN	N	DRY	TURN		N/A	W -E									000	00
N							8A			04	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							45 23 23.11	-122 47 15.82																UNK				
																02	NONE 9	TURN-L										
																	N/A	S -W									000	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				
01471	Y	N	N N	N	N	N	03/24/2023	17	SW TUALATIN RD	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE	STRGHT										03,02,30
CITY							FR	0	SW 108TH AVE	CN		STOP SIGN	N	WET	TURN		PRVTE	W -E									000	00
N							4P			04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	31	M	OR-Y		050	000	30
N							45 23 23.11	-122 47 15.82																OR<25				
																02	NONE	TURN-L										
																	PRVTE	S -W									015	00
																	PSNGR CAR		01	DRVR	INJB	73	M	OR-Y		021,028	000	03,02
																								OR<25				

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OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANAYLYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF TUALATIN, WASHINGTON COUNTY

TUALATIN RD at 115TH AVE, City of Tualatin, Washington County, ALL Crashes Severity, ALL Crashes Circumstance, 01/01/2019 to 12/31/2023

1 - 1 of 1 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R U G S	M J I N V	S C H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
06703	N	N	N	N	N	N	12/22/2023	17	SW TUALATIN RD	INTER	3-LEG	N	N	CLD	ANGL-OTH	01	NONE 9	TURN-L										03
CITY			FR				0	SW 115TH AVE	CN		STOP SIGN	N	WET	TURN			N/A	N -E									000	00
N			4P						01	0		N	DUSK	PDO			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N			45 23 23.12				-122 47 43.4																	UNK				
																02	NONE 9	STRGHT										
																	N/A	E -W									000	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				

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CITY OF TUALATIN, WASHINGTON COUNTY

TUALATIN RD at 124TH AVE, City of Tualatin, Washington County, ALL Crashes Severity, ALL Crashes Circumstance, 01/01/2019 to 12/31/2023

1 - 5 of 16 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R J U G	S N I V	W H L	O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
01730	N	N	N	N			02/01/2019	16	SW TUALATIN RD	INTER	3-LEG	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										29
NONE							FR	0	SW 124TH AVE	E		TRF SIGNAL	N	WET	REAR		PRVTE	E -W									000	00
N							UNK			06	0		N	UNK	INJ		PSNGR CAR		01	DRVR	INJC	34	M	OR-Y		026	000	29
N							45 23 16.36	-122 48 15.23																OR<25				
																02	NONE 0	STOP										
																	UNKN	E -W									011	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				
02835	N	N	N	N			08/07/2020	16	SW TUALATIN RD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
NONE							FR	0	SW 124TH AVE	E		TRF SIGNAL	N	DRY	REAR		PRVTE	E -W									000	00
N							3P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	18	F	OR-Y		026	000	29
N							45 23 16.36	-122 48 15.23																OR<25				
																02	NONE 0	STOP										
																	PRVTE	E -W									012	00
																	PSNGR CAR		01	DRVR	INJC	53	M	OR-Y		000	000	00
																								OR<25				
04115	N	N	N	N			08/13/2019	16	SW TUALATIN RD	INTER	3-LEG	N	N	CLR	PED	01	NONE 0	TURN-R										02
NONE							TU	0	SW 124TH AVE	CN		TRF SIGNAL	N	DRY	PED		PRVTE	E -N									000	00
N							6A			02	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	38	M	OTH-Y		029	000	02
N							45 23 16.36	-122 48 15.23																N-RES				
																		- STRGHT		01	PED	INJC	28	M		I XWLK	000	035	00
																		N S										
01501	N	N	N	N	N	N	03/26/2019	16	SW TUALATIN RD	INTER	3-LEG	N	N	CLR	O-1 L-TURN	01	NONE 9	TURN-L										02
CITY							TU	0	SW 124TH AVE	CN		TRF SIGNAL	N	DRY	TURN		N/A	N -E									000	00
N							3P			04	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							45 23 16.36	-122 48 15.23																UNK				
																02	NONE 9	STRGHT										
																	N/A	S -N									000	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				
02476	N	N	N	N	N	N	06/25/2021	16	SW TUALATIN RD	INTER	3-LEG	N	N	CLR	O-1 L-TURN	01	NONE	STRGHT										04,08,27
CITY							FR	0	SW 124TH AVE	CN		L-GRN-SIG	N	DRY	TURN		PRVTE	S -N									000	00
N							8A			04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	38	M	OR-Y		000	000	00
N							45 23 16.39	-122 48 15.25																OR<25				
																02	NONE	TURN-L										
																	PRVTE	N -E									000	00
																	PSNGR CAR		01	DRVR	INJC	75	F	OR-Y		004,028	000	04,07,27
																								OR<25				

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CITY OF TUALATIN, WASHINGTON COUNTY

TUALATIN RD at 124TH AVE, City of Tualatin, Washington County, ALL Crashes Severity, ALL Crashes Circumstance, 01/01/2019 to 12/31/2023

6 - 9 of 16 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R G S	J N V	S H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
02512	N	N	N	N			06/27/2021	16	SW TUALATIN RD	INTER	3-LEG	N	N	CLR	O-1 L-TURN	01	NONE	STRGHT											02
NO RPT							SU	0	SW 124TH AVE	CN		L-GRN-SIG	N	DRY	TURN		PRVTE	S -N									000	00
N							11A			04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	00	M	UNK		000	000	00
N							45 23 16.38	-122 48 15.24																OR<25				
																02	NONE	TURN-L										
																	PRVTE	N -E									000	00
																	PSNGR CAR		01	DRVR	INJB	34	F	OR-Y		004,028	000	02
																								OR<25				
03913	N	N	N	N	N	N	09/20/2021	16	SW TUALATIN RD	INTER	3-LEG	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT											02
CITY							MO	0	SW 124TH AVE	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	S -N									000	00
N							5P			04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	22	M	OR-Y		000	000	00
N							45 23 16.36	-122 48 15.23																OR<25				
																02	NONE 0	TURN-L										
																	PRVTE	N -E									000	00
																	PSNGR CAR		01	DRVR	INJC	19	M	OR-Y		028,004	000	02
																								OR<25				
92512	N	N	N	N			06/27/2021	16	SW TUALATIN RD	INTER	3-LEG	N	N	CLR	O-1 L-TURN	01	NONE 9	STRGHT											08,02
CITY							SU	0	SW 124TH AVE	CN		L-GRN-SIG	N	DRY	TURN		N/A	S -N									000	00
N							11A			04	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							45 23 16.39	-122 48 15.24																UNK				
																02	NONE 9	TURN-L										
																	N/A	N -E									000	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				
03078	N	N	N	N	N	N	07/11/2022	18	SW TUALATIN RD	INTER	3-LEG	N	N	CLR	O-1 L-TURN	01	NONE	STRGHT											02
CITY							MO	0	SW 124TH AVE	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	S -N									000	00
N							2P			04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	42	M	OR-Y		000	000	00
N							45 23 16.36	-122 48 15.23																OR<25				
																01	NONE	STRGHT										
																	PRVTE	S -N									000	00
																	PSNGR CAR		02	PSNG	INJB	51	F			000	000	00
																02	NONE	TURN-L										
																	PRVTE	N -E									000	00
																	PSNGR CAR		01	DRVR	INJA	92	F	OR-Y		004,028	000	02
																								OR<25				
03835	N	Y	N	N	N	N	08/24/2022	16	SW TUALATIN RD	INTER	3-LEG	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT											02,04
CITY							WE	0	SW 124TH AVE	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	S -N									000	00
N							8P			04	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	NONE	33	M	OR-Y		000	000	00
N							45 23 16.36	-122 48 15.23																OR<25				

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SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J N S	I H V	S C L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
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																		PSNGR CAR		02	PSNG	INJB	29	F			000	000		00
04348	N	N	N	N	N	N	09/23/2022	16	SW TUALATIN RD	INTER	3-LEG	N	N	CLR	O-1 L-TURN	01	NONE 0	TURN-L										013	02,04
CITY			FR					0	SW 124TH AVE	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	N -E									000		00
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																									OR<25					
00497	N	N	N	N	N	N	02/01/2022	16	SW TUALATIN RD	INTER	3-LEG	N	N	RAIN	O-1 L-TURN	01	NONE 9	STRGHT												02,04
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05431	N	N	N	N	N	N	11/16/2022	16	SW TUALATIN RD	INTER	3-LEG	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT												02,04
CITY			WE					0	SW 124TH AVE	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	S -N									000		00
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CITY OF TUALATIN, WASHINGTON COUNTY

TUALATIN RD at 124TH AVE, City of Tualatin, Washington County, ALL Crashes Severity, ALL Crashes Circumstance, 01/01/2019 to 12/31/2023

14 - 16 of 16 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G	J N V	S I H L	C O R K	W	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC / TYPE	INJ / SVRTY	AGE	SEX	LICNS / RES	PED LOC	ERROR	ACT	EVENT	CAUSE
01759	N	N	N	N				04/11/2023	16	SW TUALATIN RD	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 9	TURN-R										04
NONE								TU	0	SW 124TH AVE	CN		TRF SIGNAL	N	DRY	TURN		N/A	E -N									000		00
N								6A			02	0		N	DAWN	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 23 16.36	-122 48 15.23																UNK					
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																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
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04866	N	N	N	N	N	N	N	09/26/2023	18	SW TUALATIN RD	INTER	3-LEG	N	N	CLD	O-1 L-TURN	01	NONE 0	STRGHT											04,02,08
CITY								TU	0	SW 124TH AVE	CN		L-GRN-SIG	N	WET	TURN		PRVTE	S -N									000		00
N								9A			04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	70	M	OR-Y		000	000		00
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																		PRVTE	N -E									000		00
																		PSNGR CAR		01	DRVR	NONE	46	M	OR-Y		020,028,004	000		04,02,08
																									OR<25					
01043	N	N	N	N	N	N	N	02/27/2023	16	SW TUALATIN RD	INTER	3-LEG	N	N	SNOW	O-1 L-TURN	01	NONE 0	STRGHT											02,04,22
CITY								MO	0	SW 124TH AVE	CN		TRF SIGNAL	N	WET	TURN		PRVTE	S -N									000		22
N								4P			04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	41	M	OR-Y		028,020	000		02,04
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																		PRVTE	N -E									000		00
																		PSNGR CAR		01	DRVR	NONE	37	M	OR-Y		000	000		00
																									OR>25					

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CITY OF TUALATIN, WASHINGTON COUNTY

TUALATIN RD at TETON AVE, City of Tualatin, Washington County, ALL Crashes Severity, ALL Crashes Circumstance, 01/01/2019 to 12/31/2023

1 - 3 of 3 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J N V	S H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR / OWNER / TYPE	QTY	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
05073	N	N	N N N	N	N	N	10/05/2019	17	SW TUALATIN RD	INTER	3-LEG	N	Y	CLR	FIX OBJ	01	NONE	0	TURN-L										091	27,16,32
CITY			SA	0	SW TETON AVE	S		STOP SIGN	N	DRY	FIX		PRVTE		E -S												000	091	00
N			3A			05	0		N	DARK	INJ		PSNGR CAR			01	DRVR	INJC	30	M	OR-Y		016,081,052	038		27,16,32
N			45 23 23.07	-122 47 1.88																		OR>25						
00851	N	N	N N N	N	N	N	02/19/2019	17	SW TUALATIN RD	INTER	3-LEG	N	N	CLD	ANGL-OTH	01	NONE	9	TURN-L											02
CITY			TU	0	SW TETON AVE	CN		STOP SIGN	N	DRY	TURN		N/A		S -W												015		00
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																02	NONE	9	STRGHT										
																	N/A		W -E								000		00
																	PSNGR CAR			01	DRVR	NONE	00	Unk	UNK		000	000		00
																									UNK					
03228	N	N	N N N	N	N	N	06/28/2023	17	SW TUALATIN RD	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE	0	STRGHT											03,02,08
CITY			WE	0	SW TETON AVE	CN		STOP SIGN	N	DRY	TURN		PRVTE		W -E												000		00
N			1P			03	0		N	DAY	INJ		PSNGR CAR			01	DRVR	INJB	16	F	OR-Y		000	000		00
N			45 23 23.07	-122 47 1.88																		OR<25						
																02	NONE	0	TURN-L										
																	PRVTE		S -W								015		00
																	PSNGR CAR			01	DRVR	NONE	18	F	OR-Y		021,028,004	000		00
																									OR>25					

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APPENDIX G.

IN-PROCESS DATA

124th Business Park

Transportation Impact Analysis

Tualatin, Oregon

Date:
April 18, 2023
Prepared for:
VLMK Engineering & Design
Prepared by:
Myla Cross
Jennifer Danziger, PE



RENEWS: 12/31/2023

Site Trips

Trip Generation

To estimate trips that will be generated by the development, trip rates from the *Trip Generation Manual*[1] were used. Specifically, data from the land use code 110, *General Light Industrial*, was used based on the square footage of the development. The 124th Business Park proposes to develop the site with three industrial buildings enclosing a total of 199,170 SF of gross floor area.

The trip generation calculations show that the 124th Business Park site is projected to generate 147 trips during the morning peak hour, 129 trips during the evening peak hour, and 970 trips during the average weekday. Table 3 summarizes the estimated net trip generation of the site with the land use assumptions discussed above.

Table 3: Trip Generation Summary

Land Use	ITE Code	Size	AM Peak Hour			PM Peak Hour			Weekday Total
			In	Out	Total	In	Out	Total	
General Light Industrial (All Vehicles)	110	199,170 SF	129	18	147	18	111	129	970
General Light Industrial (Trucks)	110	199,170 SF	1	1	2	1	1	2	50

Trip Distribution and Assignment

The directional distribution of site trips to/from the project site is necessary to identify intersections to be included in the study area of the TIA. The following trip distribution was estimated based on the locations of likely trip destinations and locations of major transportation facilities in the site vicinity:

- Approximately 30 percent of site trips will travel to/from the south along SW 124th Avenue
- Approximately 20 percent of site trips will travel to/from the west along SW Tualatin-Sherwood Road
- Approximately 30 percent of site trips will travel to/from the east along SW Tualatin-Sherwood Road
- Approximately 20 percent of site trips will travel to/from the north along SW 124th Avenue

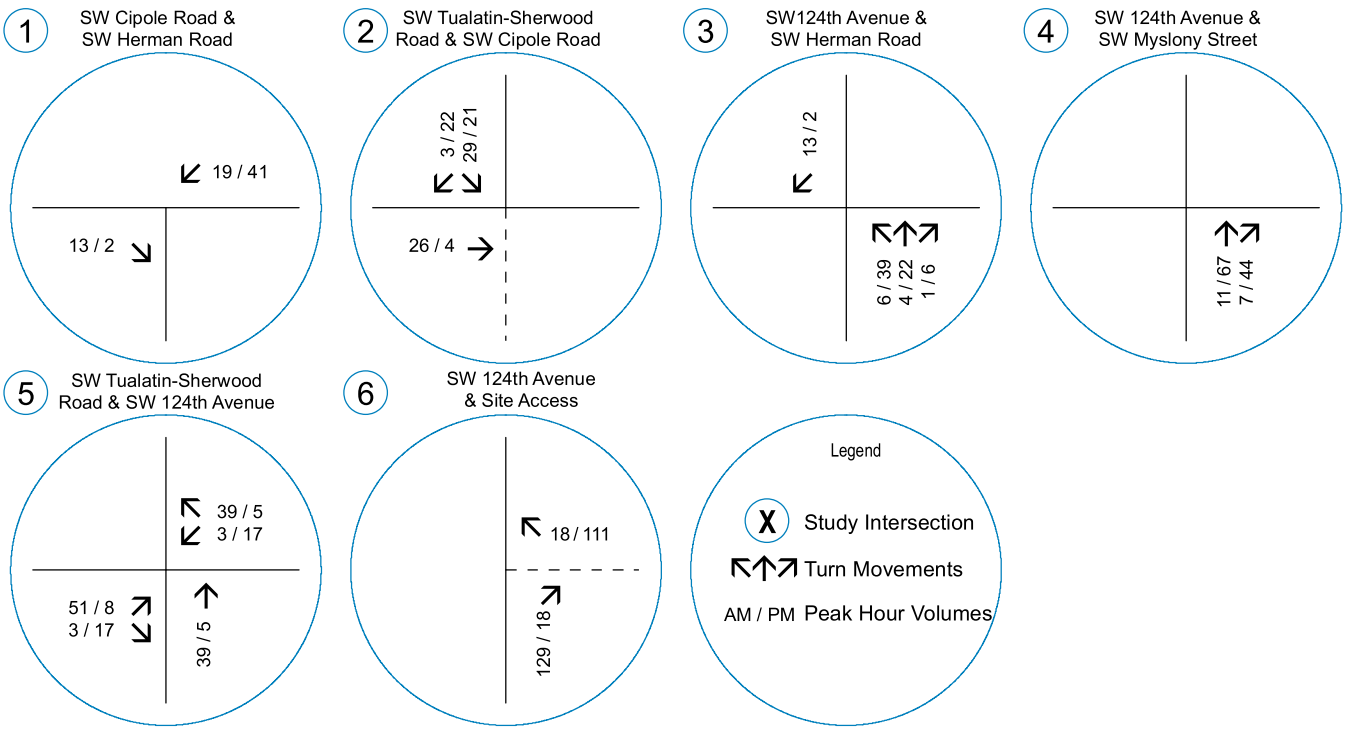
To address the right-in/right-out access on SW 124th Avenue, some of the traffic will not be able to travel along the most direct route to the site. Inbound traffic from the north will need to travel southward to SW Tualatin-Sherwood Road by another route and then turn northward on SW 124th Avenue. Outbound traffic destined for locations south, west, or east of the site will need to travel northward on SW 124th Avenue and then travel southward to SW Tualatin-Sherwood Road by an alternate route.

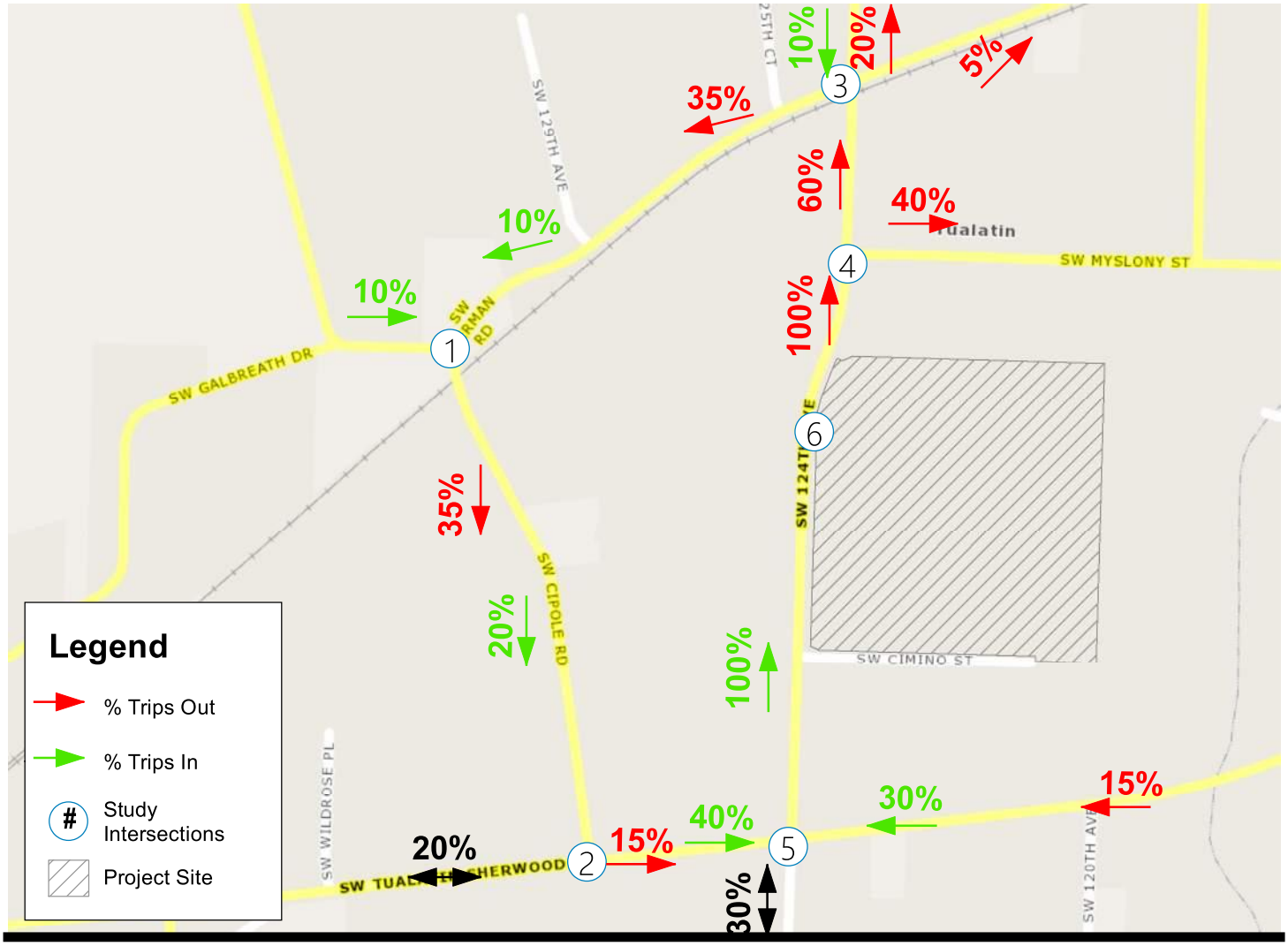
[1] Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 11th Edition, 2022.

The following indirect routes are assumed:

- Approximately half, 10 percent, of the inbound traffic from the north is assumed to use to SW Cipole Road from OR 99E instead of SW 124th Avenue.
- The remaining 10 percent from the north is assumed to travel along SW 124th Avenue to SW Herman Road to SW Cipole Road.
- Approximately 40 percent of the outbound traffic is assumed to travel northward along SW 124th Avenue, turn right onto SW Myslony Street, and travel to SW Tualatin-Sherwood Road.
- Approximately 5 percent of the outbound traffic is assumed to travel northward on SW 124th Avenue and turn east on SW Herman Road to access SW Tualatin-Sherwood Road via SW Teton Avenue or other connecting roadways.
- Approximately 35 percent of the outbound traffic is assumed to travel northward on SW 124th Avenue and turn west on SW Herman Road and turn south on SW Cipole Road to SW Tualatin-Sherwood Road.

The resulting trip assignment is shown in Figure 3.





Traffic Volumes Trip Distribution & Assignment

NOT TO SCALE

Figure 3
124th Business Park TIA
7/25/2022

MACKENZIE.



TRANSPORTATION IMPACT ANALYSIS

To
City of Tualatin

For
Lam Research

Dated
August 12, 2022

Project Number
2220087.00

MACKENZIE
Since 1960

RiverEast Center | 1515 SE Water Avenue, Suite 100, Portland, OR 97214
PO Box 14310, Portland, OR 97293 | T 503.224.9560 | www.mcknze.com

IV. SITE DEVELOPMENT

The trip-making characteristics of the proposed development are described below.

Trip Generation

The proposed 120,000 SF office building will provide space for office staff generally working between 8 AM and 5 PM. Up to 600 employees will be added to the campus with the new office building. Most new office staff are anticipated to work from the office in the future. Trip generation estimates were developed with the use of the Institute of Transportation Engineers' (ITE) *Trip Generation Manual,* 11th Edition. The City requires the reasonable worst case for trip generation be analyzed. Therefore, trip rates for ITE's "General Office Building" (LUC 710) using building area were utilized in this study.

Table 4 presents the trip generation estimates for the proposed office building.

TABLE 4 – TRIP GENERATION

ITE Code	ITE Land Use	Size	Trip Type	AM Peak Hour			PM Peak Hour			Daily
				In	Out	Total	In	Out	Total	
710	General Office Building	120.0 KSF	Total	172	24	196	33	160	193	1,360

Trip Distribution and Assignment

Trip distribution for the proposed office building was estimated by reviewing the existing distribution from recent and existing counts at the site driveways in conjunction with review of previous trip distribution assumptions for the Lam Research campus. The following trip distribution was assumed:

- 15% to/from the south on Highway 99W
- 25% to/from the north on Highway 99W
- 5% to/from the east on SW Tualatin Road
- 15% to/from the south on SW 124th Avenue
- 5% to/from the south on SW 118th Avenue
- 35% to/from the east on SW Herman Road

Figure 10 presents the trip distribution and traffic assignment for the AM and PM peak hours.

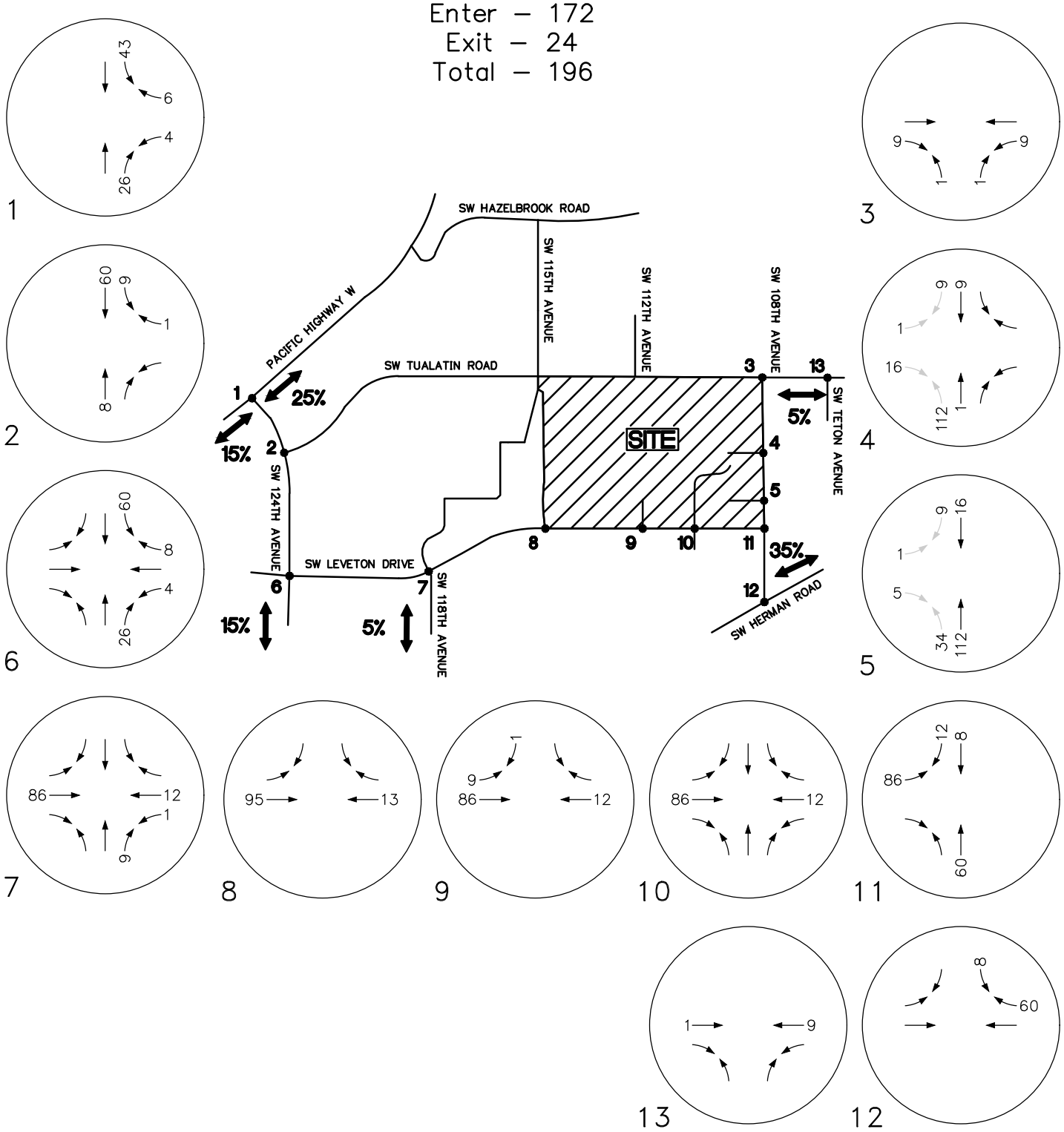
East Access Reroutes

With the proposed building, other site changes including additional parking along SW 108th Avenue, two (2) new driveways on SW 108th Avenue, and limiting the East Access on SW Leveton Drive to trucks are proposed. With the closure of the East Access to passenger vehicle traffic, existing site trips that currently utilize this driveway are anticipated to reroute to the proposed driveways on SW 108th Avenue to access the expanded parking area. Figure 11 presents the East Access trip reroutes for the AM and PM peak hours.

NOT TO SCALE

AM PEAK HOUR

Enter – 172
Exit – 24
Total – 196



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MACKENZIE

DATE: 08.10.22
DRAWN BY: CNL
CHECKED BY: JTJ
JOB NO: 222008700

PRIMARY TRIP DISTRIBUTION + TRAFFIC ASSIGNMENT - AM PEAK HOUR

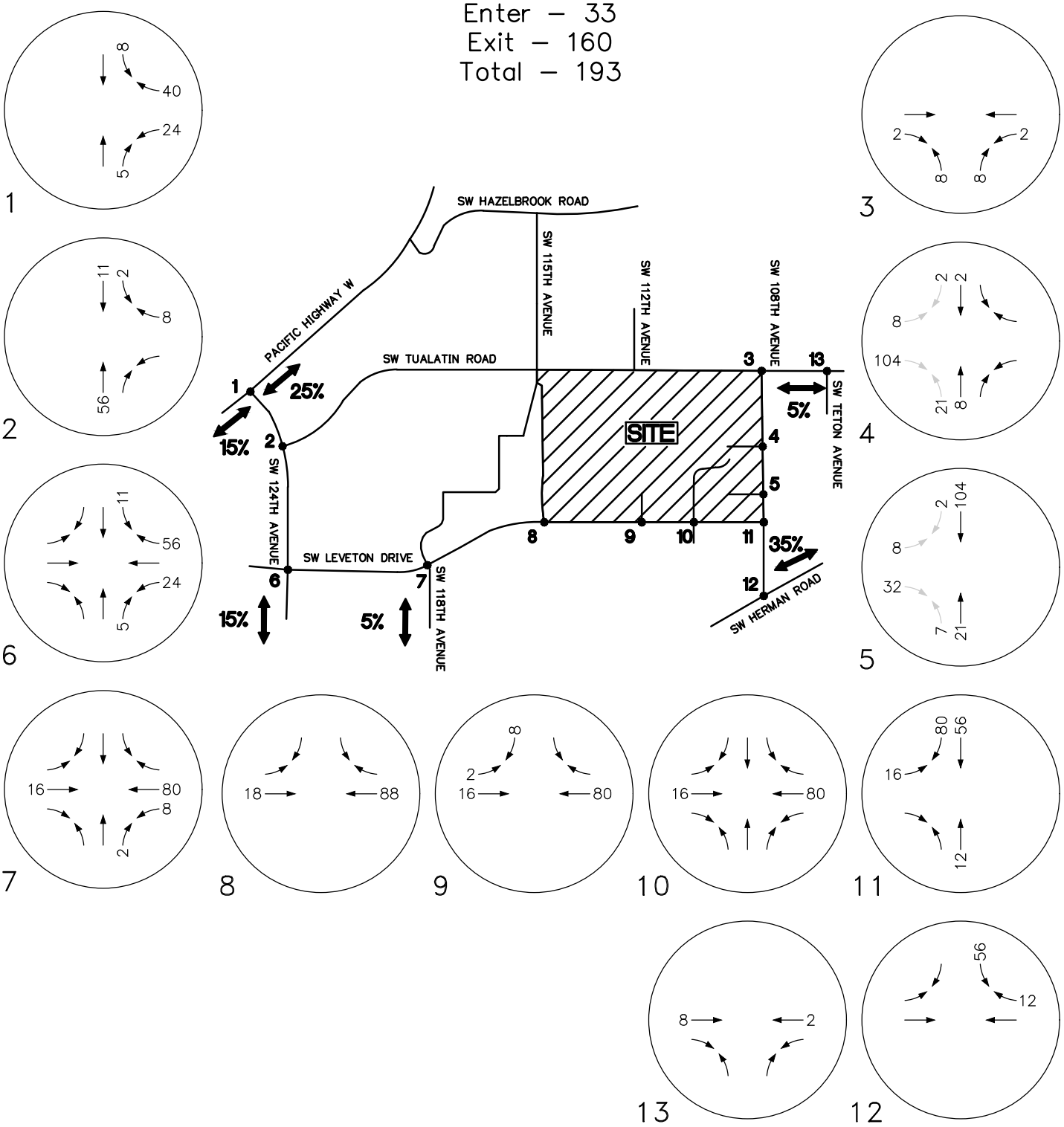
LAM RESEARCH NEW OFFICE BUILDING
TUALATIN, OREGON

FIGURE
11A

NOT TO SCALE

PM PEAK HOUR

Enter – 33
Exit – 160
Total – 193



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MACKENZIE

DATE: 08.10.22
DRAWN BY: CNL
CHECKED BY: JTJ
JOB NO: 222008700

PRIMARY TRIP DISTRIBUTION + TRAFFIC ASSIGNMENT - PM PEAK HOUR

LAM RESEARCH NEW OFFICE BUILDING
TUALATIN, OREGON

FIGURE
11B

lancaster mobley

1130 SW Morrison St., Suite 318
Portland, OR 97205
503.248.0313
lancastermobley.com

Memorandum

To: Mike McCarthy, Tony Doran, City of Tualatin

Copy: Chris Walker, CIDA

From: Ken Kim, PE

Date: December 16, 2024

Subject: KAI USA Warehouse Expansion
Trip Generation and Distribution Memorandum



Introduction

This memorandum provides trip generation and distribution for the proposed KAI USA Warehouse Expansion located at 18600 SW Teton Avenue in Tualatin, Oregon. The results are compared with City standards to demonstrate that no further analysis is necessary.

Project Location and Description

The project site is located on Tax Lot 2S123B0-00701 in Tualatin, Oregon. A vicinity map is shown in Figure 1 with the subject site highlighted in yellow.



Figure 1: Project Location (image from Google Earth)

The site is currently developed with a KAI USA Warehouse building. The project proposes the construction of an 18,430-square foot (SF) addition to the existing building. As shown in Figure 1, access to the site is provided via three existing roadway connections (yellow arrows) along SW Teton Avenue and SW Herman Road. A site plan is attached to this memo.

Trip Generation

The proposed development will include the construction of an 18,430-SF addition to the KAI USA Warehouse building. To estimate the number of trips that will be generated by the proposed use, rates from the *Trip Generation Manual*[1] were used. Data from Land Use Code (LUC) 150, *Warehousing* was used to estimate trip generation of the existing use.

The trip generation calculations show that the proposed project is projected to generate an additional 3 morning peak hour trips, 3 evening peak hour trips, and 32 average weekday trips. The trip generation estimates are summarized in Table 1. Detailed trip generation calculations are included as an attachment to this memorandum.

Table 1: Trip Generation Summary

Land Use Assumption (ITE Code)	Intensity	Morning Peak Hour			Evening Peak Hour			Weekday Trips
		In	Out	Total	In	Out	Total	
Warehousing (150) – Truck	18,430 SF	0	0	0	1	0	1	12
Warehousing (150) – Total	18,430 SF	2	1	3	1	2	3	32

Trip Distribution

A preliminary directional distribution of site trips was estimated based on locations of likely trip origins and destinations, and locations of major transportation facilities in the site vicinity.

The following trip distribution was estimated and applied to the proposed development:

- Approximately 35% of site trips will travel to/from the east along SW Herman Road.
- Approximately 30% of site trips will travel to/from the north along SW Teton Avenue
- Approximately 20% of site trips will travel to/from the west along SW Herman Road.
- Approximately 15% of site trips will travel to/from the south along SW Teton Avenue.

[1] Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 11th Edition, 2021.

Comparison to Agency TIA Standards

Tualatin Traffic Study Requirements outlines two levels of traffic analysis that may be required based on the development type and size.

A Trip Generation and Distribution Description is required for any development that, in the judgement of City staff, would generate 100 or more new daily trips. Developments anticipated to generate this level of traffic, and thus require a Trip Generation and Distribution Description, include:

a. 10 or more single-family homes
b. 15 or more multi-family units
c. Industrial buildings 15,000 SF or larger
d. Office buildings 8,000 SF or larger
e. Any use with customers or public coming to the site (such as retail, restaurant, school, medical office, recreation, etc.)

A full Transportation Impact Analysis is required for cases (in staff's judgement) that would be anticipated to generate more than 500 vehicle trip ends per day and/or more than 60 vehicle trip ends in the morning or evening peak hour and/or more than 100 vehicle trip ends during the peak hour of development traffic. Developments anticipated to generate this amount of traffic (and thus require a Transportation Impact Analysis) include:

a. 50 or more single-family residences
b. 80 or more multi-family residences
c. 75,000 SF or more of industrial space
d. 40,000 SF or more of office space
e. 10,000 SF or more of retail space
f. Any restaurant, convenience market, or gas station
g. Any development with a drive-through

Although the size of development will be above the 15,000-SF threshold of industrial building size for a trip generation and distribution requirement, the trip generation for the proposed expansion will fall below any of these trip generation thresholds. However, this memorandum provides the trip generation and trip distribution; therefore, no further traffic study is required beyond the provided analysis in this memo.

Conclusions

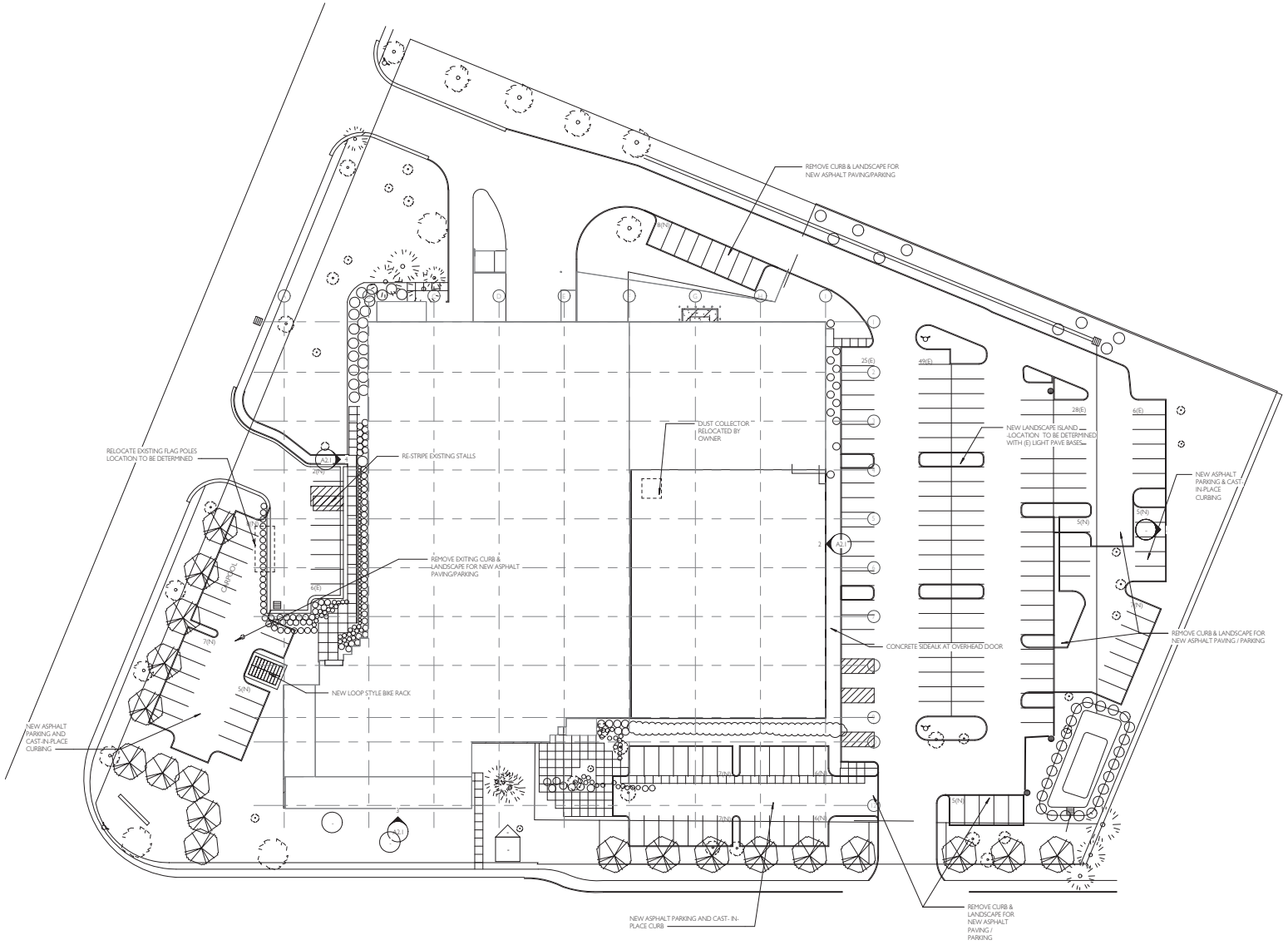
Based on the trip generation calculations, the project site with the expansion of the KAI USA Warehouse is projected to generate an additional of 3 morning peak hour trips, 3 evening peak hour trips, and 32 average weekday trips. These estimates fall below the Trip Generation and Distribution threshold of 100 ADT and TIA threshold of 60 morning, evening peak hour trips, and 32 ADT; therefore, no further traffic study is required.

SITE PLAN NOTES

EDIT AS REQUIRED-- SAVE TO YOUR PROJECT LIBRARY

1. RADIUS AT PARKING AREA TO BE 3'-0" UNLESS NOTED OTHERWISE.
2. EXISTING CONDITIONS SHOWN ARE BASED ON SURVEY DONE BY --- AND DATED ---.
3. CONTRACTOR TO CONFIRM EXISTING CONDITION SHOWN ON IMPLIED PRIOR TO START OF CONSTRUCTION AND NOTIFY A/E OF ANY DISCREPANCIES.

KEYNOTES



NORTH 1 A0.1 **ARCHITECTURAL SITE PLAN**

1" = 30'-0"

PRELIMINARY PLAN ONLY- NOT FOR CONSTRUCTION

ISSUE DATE

1 GC PRICING PRICING 9/13/22

CIDA
ARCHITECTURE
ENGINEERING
PLANNING
INTERIORS
LANDSCAPE
15895 SW 72ND AVE SUITE 200
PORTLAND, OREGON 97224
TEL: 503.226.1285
FAX: 503.226.1670
WWW.CIDAINC.COM

ADDITIONS FOR:

KIA - USA

PROJECT ADDRESS - TUALATIN, OREGON

SITE PLAN

A0.1

220127.01

© 2022 CIDA PLCCIDA ALL RIGHTS RESERVED

9/13/2022 4:06:09 PM

TRIP GENERATION CALCULATIONS

Source: Trip Generation Manual, 11th Edition

Land Use:	Warehousing
Land Use Code:	150
Land Use Subcategory:	All Sites
Setting/Location	General Urban/Suburban
Variable:	1000 SF GFA
Trip Type:	Vehicle
Formula Type:	Rate
Variable Quantity:	18.43

AM PEAK HOUR

Trip Rate: 0.17

	Enter	Exit	Total
Directional Split	77%	23%	
Trip Ends	2	1	3

PM PEAK HOUR

Trip Rate: 0.18

	Enter	Exit	Total
Directional Split	28%	72%	
Trip Ends	1	2	3

WEEKDAY

Trip Rate: 1.71

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	16	16	32

SATURDAY

Trip Rate: 0.15

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	1	1	2

TRIP GENERATION CALCULATIONS

Source: Trip Generation Manual, 11th Edition

Land Use:	Warehousing
Land Use Code:	150
Land Use Subcategory:	All Sites
Setting/Location	General Urban/Suburban
Variable:	1000 SF GFA
Trip Type:	Truck
Formula Type:	Rate
Variable Quantity:	18.43

AM PEAK HOUR

Trip Rate: 0.02

	Enter	Exit	Total
Directional Split	52%	48%	
Trip Ends	0	0	0

PM PEAK HOUR

Trip Rate: 0.03

	Enter	Exit	Total
Directional Split	52%	48%	
Trip Ends	1	0	1

WEEKDAY

Trip Rate: 0.6

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	6	6	12

SATURDAY

Trip Rate: 0

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	NA	NA	NA

MACKENZIE.

September 14, 2023 ***(Revised October 11, 2023)***

City of Tualatin
Attention: Tony Doran
18880 SW Martinazzi Avenue
Tualatin, OR 97062

Re: **Fujimi Facility Expansion**
Trip Generation and Distribution
Project Number 2210148.00

Dear Tony:

Mackenzie has prepared this trip generation letter for the proposed two-story, 70,000-square-foot (SF) expansion of the existing Fujimi facility located at 11200 SW Leveton Drive in Tualatin, Oregon.

PROJECT DESCRIPTION

The proposed building addition, located at the southeast corner of the existing Fujimi building, will be two stories with a gross floor area of up to 70,000 SF. The proposed addition will include manufacturing space, clean rooms, laboratories, and some office area. With the expansion, approximately 10-20 new employees will be added over time. This project will include associated site work, including approximately 30 additional parking spaces. The project will also add a new hammerhead fire turnaround at the southeast corner of the site. Per the City of Tualatin Traffic Study Requirements, a full Transportation Impact Analysis (TIA) is required for any development that generates 500 or more new daily trips. The proposed expansion is estimated to add approximately 333 new daily trips, so this letter presents the information required for a Trip Generation and Distribution Description letter.

TRIP GENERATION

Trip generation estimates were reviewed using trip rates published in the Institute of Transportation Engineers' (ITE) *Trip Generation Manual,* 11th Edition for the "General Light Industrial" (LUC 110) land use, as required by the "Tualatin Traffic Study Requirements" document (updated March 16, 2022). In addition, we surveyed the existing Fujimi site to better understand the site's actual trip generation compared with existing ITE data for not only the "General Light Industrial" use, but also the "Manufacturing" (LUC 140) use.

Existing Site Trips

The existing Fujimi site on SW Leveton Drive was surveyed for trip generation on Tuesday, October 3, 2023 during the AM and PM peak hours of the street. The generation summary for the existing 175,000 SF building is summarized in Table 1.

TABLE 1 – EXISTING TRIP GENERATION SUMMARY								
Trip Type	Size (KSF)	AM Peak Hour			PM Peak Hour			Daily
		In	Out	Total	In	Out	Total	
Total	175.0	40	6	46	10	24	34	238[a]
Trucks		2	0	2	0	0	0	24[b]
Passenger Cars		38	6	44	10	24	34	214

As presented in Table 1, the site currently generates 46 AM peak hour and 34 PM peak hour. A total daily trip estimate of 238 was derived by assuming a 7x ratio to the PM peak hour trips comparable to ITE trip data for the "General Light Industrial" and "Manufacturing" uses. Fujimi notes they have on average 8-12 trucks per day for deliveries. Based on the trip data above, the site-specific trip rates for all vehicles are 0.26 AM trips/KSF, 0.19 PM trips/KSF, and 1.36 daily trips/KSF.

Proposed Site Trips

We reviewed the proposed building expansion's trip generation utilizing the site-specific trip rates noted above, as well as ITE trip rates for "General Light Industrial" and "Manufacturing" uses. The trip generation comparison is presented in Table 2 below.

TABLE 2 – TOTAL TRIP GENERATION COMPARISON FOR EXPANSION									
ITE Code	Land Use	Size (KSF)	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
N/A	Fujimi Site	70.0	16	2	18	4	9	13	91
110	General Light Industrial		45	6	51	6	40	46	341
140	**Manufacturing**		**40**	**12**	**52**	**13**	**30**	**43**	**333**

As presented in Table 2, the ITE trip rates for the "General Light Industrial" and "Manufacturing" uses likely overestimate the site's trip impact for the proposed expansion by a factor of 2-3 times. We note the ITE trip generation estimates grossly overestimate the expected trip generation with the expansion as only 10-20 employees will be added with the proposal; however, as a worst-case scenario, we propose estimating the site's trip generation using ITE trip data for the "Manufacturing" (LUC 140) use for purposes of calculating the proposed expansion's Transportation Development Tax (TDT) imposed by Washington County.

The existing site trip rates yield an expected impact of only 18 AM peak hour and 13 PM peak hour trips forecasted with the expansion. Therefore, a Transportation Impact Analysis (TIA) is not warranted with the approximately 70,000 SF addition.

[a] Assumes total daily trips are 7x PM peak hour trips based on ITE data for "General Light Industrial" and "Manufacturing."
[b] Based on existing Fujimi delivery activity consisting of 8-12 trucks per day, on average.

Truck Trips

Table 3 presents the truck trip generation estimates associated with the proposed expansion utilizing ITE "Manufacturing" truck trip rates.

TABLE 3 – TRUCK TRIP GENERATION COMPARISON FOR EXPANSION

ITE Code	Land Use	Size (KSF)	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
110	General Light Industrial	70.0	0	1	1	0	1	1	18
140	Manufacturing		1	1	2	1	1	2	32

The additional truck trips associated with the expansion are estimated to be 2 AM peak hour, 2 PM peak hour, and 32 daily trips, per trip data for ITE's "Manufacturing" land use. Note these truck trip estimates are included in the total trip estimates presented in Table 2 and are not in addition to those estimates. The truck trip generation estimates for the "Manufacturing" use are significantly higher than those based on ITE's "General Light Industrial" use. Similar to the total site-specific trip estimates, ITE truck trip generation estimates grossly overestimate the expected growth in truck trips associated with the expansion. Therefore, we do not recommend further analysis based on truck trip generation.

Pedestrians, Bicycles, and Transit

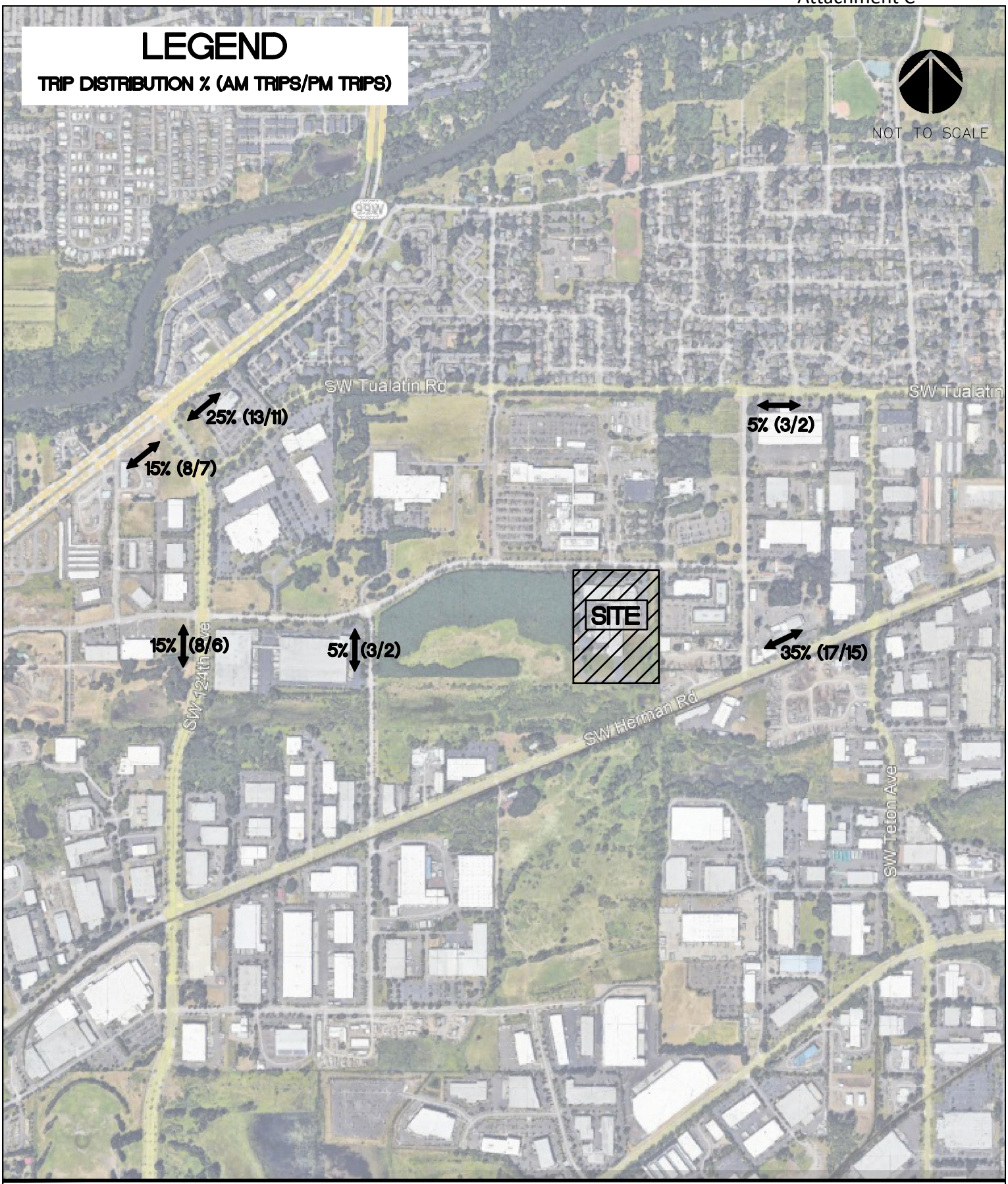
Sidewalks are provided along the site's SW Leveton Drive frontage. Sidewalks continue along SW 108th Avenue which provides a pedestrian connection to the nearby Hazelbrook neighborhood located north of SW Tualatin Road, and to SW Herman Road which has a Tualatin Ride Connection Blue Line Shuttle stop east of SW 108th Avenue. Data provided by Fujimi shows that their current workforce has a 0% pedestrian mode share. This is not expected to change with the proposed expansion.

The Tualatin Ride Connection Blue Line Shuttle provides transit service to the site, with a stop along the site's SW Leveton Drive frontage. The Blue Line runs only during weekday peak hours, with a headway of approximately 45 minutes. Data provided by Fujimi shows that their current workforce has a 0% transit mode share. This is not expected to change with the proposed expansion.

Bike lanes are provided on all non-residential roads in the site vicinity. There is currently an outdoor 5-position bicycle rack on the site, in addition to available indoor bike parking. Data provided by Fujimi shows that their current workforce has a 5% bicycle mode share. This is not expected to change with the proposed expansion, which corresponds to a maximum of 2 additional daily bike trips with the addition of 20 employees. Based on this estimate, it is not expected the proposed expansion will have a significant impact on the bicycle infrastructure in the vicinity of the site.

TRIP DISTRIBUTION

Trip distribution for the new trips generated by the proposed expansion was estimated by reviewing the existing distribution from recent and existing counts at surrounding intersections in conjunction with review of previous trip



Portland 503.224.9560 Vancouver 360.695.7879 Seattle 206.749.9993
www.mcknze.com
Architecture • Interiors
Planning • Engineering
MACKENZIE.

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DATE: 9.14.2023
DRAWN BY: LCB
CHECKED BY: JTJ
JOB NO: 221014800

TRIP DISTRIBUTION + ASSIGNMENT

FUJIMI FACILITY EXPANSION
TUALATIN, OR

FIGURE 1

APPENDIX H.

SIGNAL INFORMATION

14329

ENGLISH

SIGNAL MODIFICATION PLAN
PACIFIC HWY WEST AT SW 124TH AVE
OR 99W, M.P. 12.66

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION PLANNING/TRAFFIC ENGINEERING

9+79

PACIFIC HIGHWAY WEST
(OR 99W)

NOTE: ALL EXISTING WIRING WILL BE REMOVED AND REPLACED AS SHOWN.

POLE NO. 4
STA. 10+05, 18'RT

EX. POLE NO. 3

POLE NO. 5
STA. 9+20, 24'RT

EX. POLE NO. 2

9+00

POLE NO. 8
STA. 8+72, 23'RT

POLE NO. 9
STA. 8+59, 12'RT

EX. POLE NO. 1

POLE NO. 1
STA. 8+41, 98'LT

POLE NO. 6
STA. 8+55, 93'RT

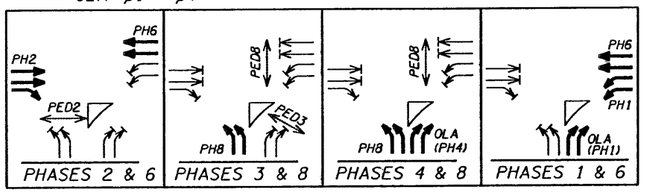
POLE NO. 7
STA. 8+31, 59'RT

SW 124TH AVE.

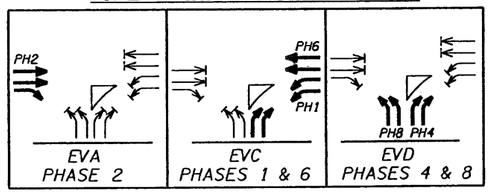
SCALE 0 10 20 40 FEET

NORMAL PHASE ROTATION
(STATE SUPPLIED W41KS SOFTWARE)

OLA= Ø1 + Ø4



FIRE PREEMPTION OPERATION



Thomas Sahlin
Traffic Engineering Operation Section Approval

ODOT TEOS DWG NO. 14329

REGISTERED PROFESSIONAL ENGINEER
19283PE
OREGON
JULY 17, 1997
CHARLES W RADOSTA
EXPIRES 12/31/06
8/2/06

TUALATIN DEVELOPMENT COMMISSION

SW 124TH AVE TURN LANE AT 99W
CITY OF TUALATIN
WASHINGTON COUNTY

Reviewed By - C. Radosta
Designed By - M. Stansell
Drafted By - M. Stansell

SIGNAL MODIFICATION PLAN

SHEET NO. S-2

TS&L PLANS

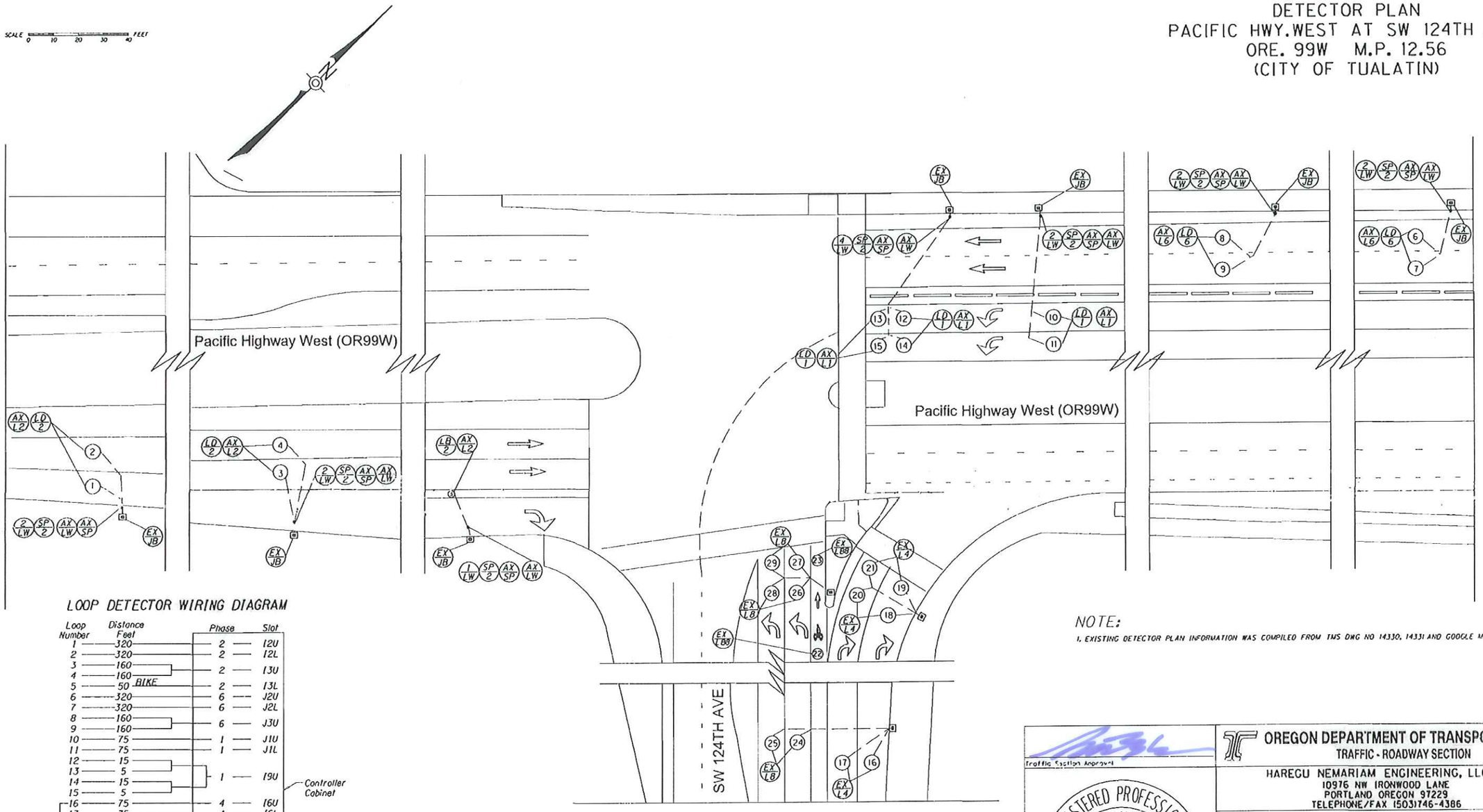
H:\proj\file\6562\dgn\6562ts-1.dgn 8/2/2006 8:15:02 AM

VIEW 1

16698

DETECTOR PLAN
PACIFIC HWY.WEST AT SW 124TH AVE.
ORE. 99W M.P. 12.56
(CITY OF TUALATIN)

SCALE 0 10 20 30 40 FEET



LOOP DETECTOR WIRING DIAGRAM

Loop Number	Distance Feet		Phase	Slot	
1	320		2	12U	
2	320		2	12L	
3	160		2	13U	
4	160	BIKE	2	13L	
5	50		6	J2U	
6	320		6	J2L	
7	320		6	J3U	
8	160		1	J1U	
9	160		1	J1L	
10	75		1	19U	Controller Cabinet
11	75				
12	15				
13	5				
14	15				
15	5				
16	75		4	16U	
17	75		4	16L	
18	15		4	17U	
19	5				
20	15		4	17L	
21	5				
22	50	BIKE	8	J7L	No-Work
23	5				
24	75		8	J6U	
25	75		8	J6L	
26	15		8	J8U	
27	5				
28	15		8	J7U	
29	5				

NOTE:
1. EXISTING DETECTOR PLAN INFORMATION WAS COMPILED FROM TMS DWG NO 14330, 14331 AND GOOGLE MAP.

"UTILITIES NOT SHOWN"
Contractor to contact utility companies for field locations.

NOTE:
See T.R.S. Dwg. 16697 for Legend

NOTE:
Field Verify Measurements Before Construction

Traffic Section Approval

REGISTERED PROFESSIONAL ENGINEER
67133
Haregu Nemariam
OREGON
May 10, 2005
HAREGU NEMARIAM
Expires Dec. 31, 2012

OREGON DEPARTMENT OF TRANSPORTATION
TRAFFIC - ROADWAY SECTION

HAREGU NEMARIAM ENGINEERING, LLC.
10976 NW IRONWOOD LANE
PORTLAND OREGON 97229
TELEPHONE/FAX (503)746-4386

OR99W: TUALATIN RIVER BR-SUNSET BLVD. SEC.
PACIFIC HIGHWAY WEST
WASHINGTON COUNTY

DESIGNED BY: TN
REVIEWED BY: HN
DRAWN BY: TN
FC: 91 MP: 12.56

DETECTOR PLAN

ISSUE No. ____ T.R.S. DWG. NO. 16698

C:\user\Haregu\Contract 29885 Projects\TA2 Loop Replacement\SW 124th_St_08-08-2012

Table: Phase Timing Plans [Timing Plan: 1]

Phase	1	2	3	4	6	8
Walk	0	9	7	0	0	8
Ped Clear	0	22	6	0	0	27
Min Green	4	10	4	6	10	6
Passage	2.3	5.4	0.2	2.3	5.4	2.3
Max 1	30	50	10	20	50	20
Max 2	40	60	10	20	60	20
Max 3	0	0	0	0	0	0
Yellow Change	4.5	5	4	4	5	4
Red Clear	1.1	1	0	1	1	2
Added Initial	0	1.2	0	0	1.2	0
Maximum Initial	4	21	4	6	21	6
Time Before Reduction	8	10	0	8	10	8
Time To Reduce	3	20	0	3	20	3
Minimum Gap	0.5	3.4	0.2	0.5	3.4	0.5
Dynamic Max Limit	45	0	0	0	0	0
Dynamic Max Step	5	0	0	0	0	0

Table: Phase Options Plans [Phase Plan: 1]

Phase	1	2	3	4	5	6	7	8
Enable	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE
Auto Flash Entry	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE
Auto Flash Exit	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
Non Actuated 1	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Non Actuated 2	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Non Lock Detector	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Min Vehicle Recall	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Max Vehicle Recall	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Ped Recall	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Soft Vehicle Recall	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Dual Entry	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE
Disable Simultaneous Gap	TRUE	FALSE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE
Guaranteed Passage	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Actuated Rest in Walk	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Conditional Service Enable	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Add Initial Calculation	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE

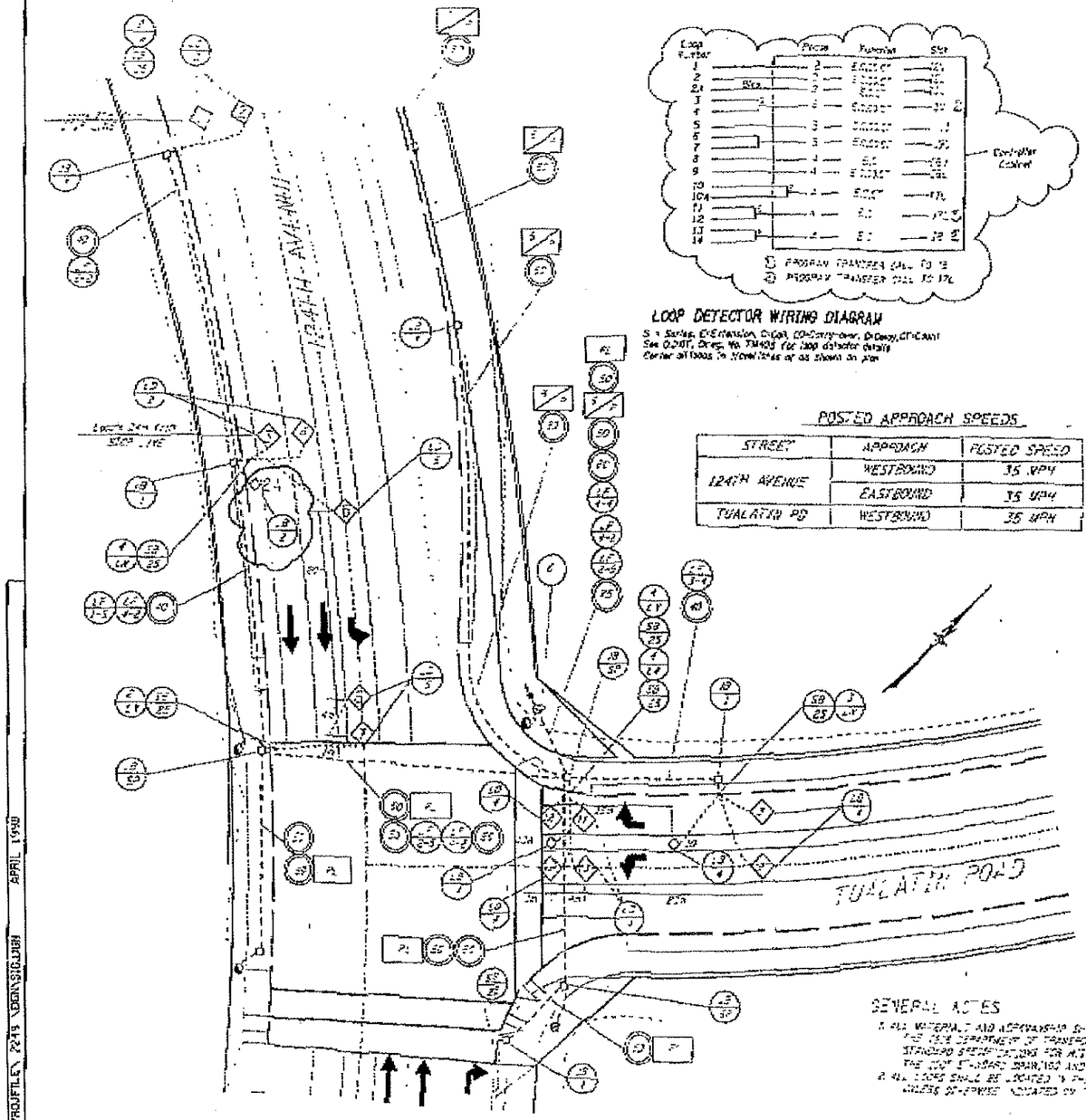
Table: Global Phase Recalls

Phase	2	6
Min	TRUE	TRUE
Max	FALSE	FALSE
Ped	FALSE	FALSE
Act. Walk Re	FALSE	FALSE

Table: Day Plan Events [Day Plan: 1]

Event	Hour	Minute	Action	Description
1	0	0	21	Coord Free - Max 1
2	5	45	22	Coord Free - Max 2
3	8	0	21	Coord Free - Max 1
4	15	0	22	Coord Free - Max 2
5	18	0	21	Coord Free - Max 1

124TH AT TUALATIN RD
DETECTOR & INTERCONNECT PLAN



LOOP DETECTOR WIRING DIAGRAM

S = Series, E=Extension, D=Diff, C=Carry-over, D-Delay, CH=Chan
See D.D.&T. Dwg. No. TM-909 for loop detector details
Center all loops in travel lanes or as shown on plan

POSTED APPROACH SPEEDS

STREET	APPROACH	POSTED SPEED
124TH AVENUE	WESTBOUND	35 MPH
	EASTBOUND	35 MPH
TUALATIN RD	WESTBOUND	35 MPH

LEGEND

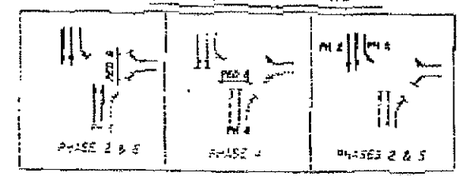
- C — CONTROLLER (See Signal Plan)
- JB — Junction box (See Signal Plan)
- 2#14 on 1#8 on 1-2IC on 1#10 on 1#14 Grounded — Install #10 on 1 2IC on 1 3IS on 1#14 Grounded Around concrete Junction box
- 6 — Install 6 feet of diamond vehicle detector loop
- 6P — Install 6 feet (PAT) of diamond bicycle detector loop
- 2S — Install (2) 2 pole Terminal Facility Socket
- 2#14 — Install (2) pair of loop wires
- C — Install (1) one electrical conduit
- 2C — Electrical conduit (See Signal Plan)
- 2#14 — Install (2) twisted pair interconnect cable
- PE — Install only pull line if no wire is to be placed

ABBREVIATIONS

3 = TYPE SHOWN	6 = #6 SIZE SHOWN
P4 = 4-PAIR SHOWN	S = SIZE SHOWN
4 = NUMBER OF CABLES SHOWN	R = STANDARD FOUNDATION
E = ELEVATED FOUNDATION	CH = CHANNEL SHOWN
H = HORNS SHOWN	L = LENGTH SHOWN
# = NUMBER SHOWN	PW = PEDESTRIAN WIDTH

REVISED AS CONSTRUCTED
28-June-1999 CONTRACT 12044
8/16/99 Add Bike Loop

NORMAL PHASE ROTATION



GENERAL NOTES

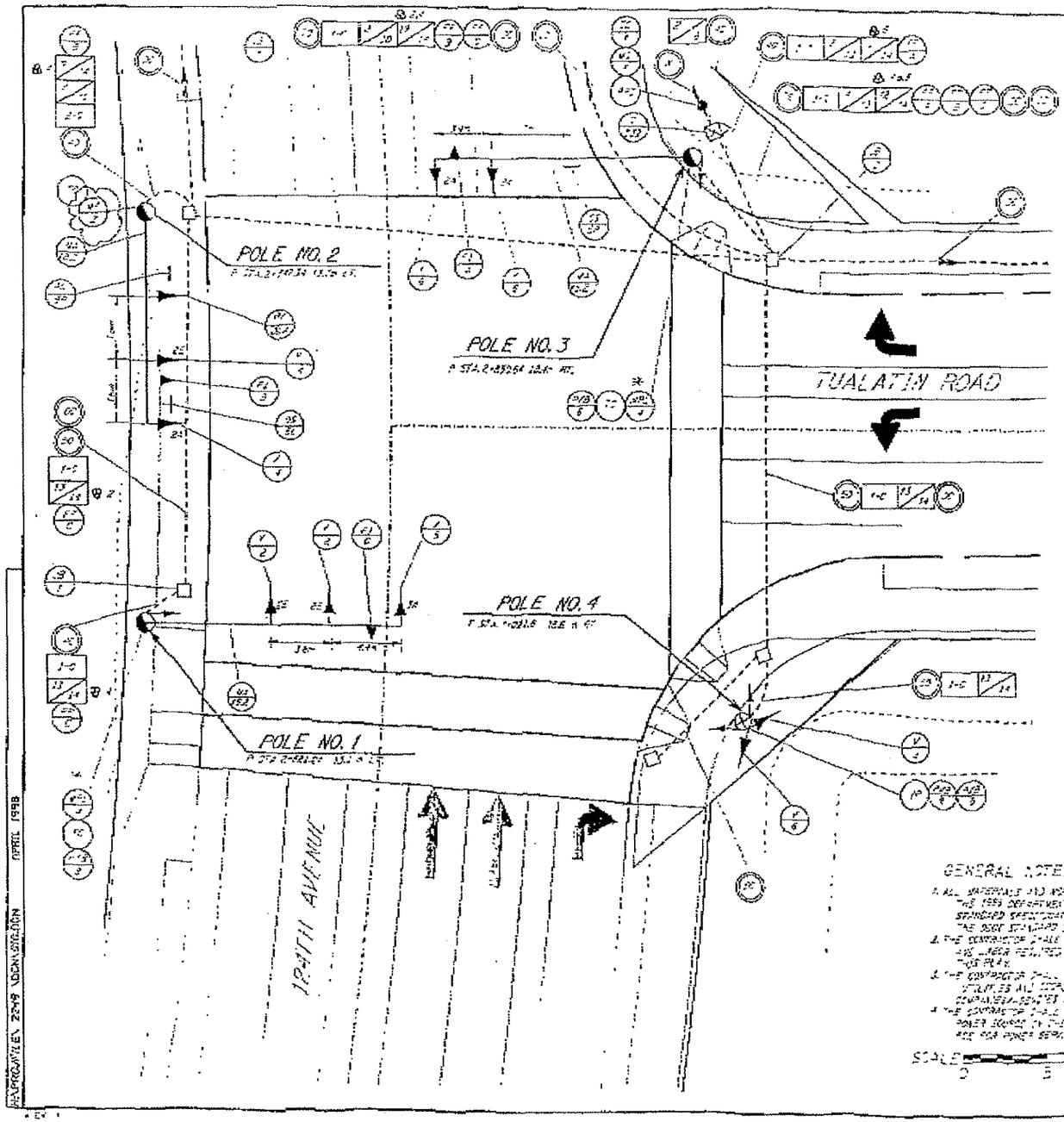
1. ALL MATERIALS AND WORKMANSHIP SHALL BE GOVERNED BY THE OREGON DEPARTMENT OF TRANSPORTATION (ODOT) STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION AND THE ODOT STANDARD DRAWINGS AND SPECIAL PROVISIONS.
2. ALL LOOPS SHALL BE LOCATED IN THE CENTER OF THE LANE UNLESS OTHERWISE INDICATED ON THE DETECTOR PLAN

TRAFFIC SIGNAL INSTALLATION
124TH AVENUE & TUALATIN-SHERWOOD RD
PACIFIC HIGHWAY WEST
WASHINGTON COUNTY

FEDERAL HIGHWAY ADMINISTRATION		PROJECT NUMBER	SHEET NO.
REGION 10	OREGON DIVISION		TS 5

N:\PROJFILE\ 2245 \DGN\SIG1.DGN APRIL 1998

01/25/00 15:37 P.003/006



LEGEND

- Install mast arm assembly in pedestal as shown with 4 feet arm, 4 meter mast (Cantilever as shown)
- Install type 9 standard traffic signal mast arm pole
- Install 1 way traffic signal mast arm
- Install pedestrian push pedestal with tangible type
- Install conduit (GALVD) or rigid fibre bituminous conduit
- Install weather power service post
- Install phase (PH) vehicle signal with LED's
  R = 300mm R 305mm Y 305mm G
  S = 305mm R STA 305mm Y STA 305mm G STA
- Install phase (PH) pedestrian signal with LED retrofit kit
- Install phase (PH) pedestrian signal with LED retrofit with pushbutton and pushbutton decal
- Install functional address
- Install vehicle detector loop
- Install 100 watt meter base
- Install 440 mm x 265 mm x 305 mm (min. dimension) precast concrete junction box
- Install 560 mm x 305 mm x 356 mm (min. dimension) precast concrete junction box
- Install (4) No. 8 type THWN (Signal system common)
- Install (4) No. 12 type THWN wires
- Include 3 spare wires for phase (PH)
- Install (5) 4mm electrical conduit
- Controller cabinet (See Controller Plan)
- Interconnect conduit (See Controller Plan)
- Install standard (GALVD) pre-emption detector (radio unit)
- Install standard unit wire as required by power company
- Install standard illuminated 250 mm x 900 mm right arrow "ONLY" sign
- Install standard illuminated 750 mm x 900 mm right arrow "ONLY" sign
- Install vehicle signal pedestal with transformer base

SEE LIGHTING PLAN FOR ANY ILLUMINATION INSTALLATION DETAILS

ABBREVIATIONS

T = TYPE SHOWN	S = ANC SIZE SHOWN
PH = PHASE SHOWN	S = SIZE SHOWN
J = WIDTH OF CABLE SHOWN	A = SERVICED FLUORIZER
E = ELEVATION NUMBER	CH = CHANGE SHOWN
H = HEIGHT SHOWN	L = LENGTH SHOWN
N = NUMBER SHOWN	PM = POLE MOUNTED

GENERAL NOTES

1. ALL MATERIALS AND WORKMANSHIP SHALL BE CONFORM TO THE 1996 DEPARTMENT OF TRANSPORTATION OREGON STANDARD SPECIFICATION FOR HIGHWAY CONSTRUCTION AND THE SIGNAL STANDARD DRAWINGS AND SPECIAL PROVISIONS.
2. THE CONTRACTOR SHALL CLEAR ALL EXISTING MATERIALS AND LABOR REQUIRED FOR THE FINAL OPERATIONS SHOWN ON THIS PLAN.
3. THE CONTRACTOR SHALL NOTIFY THE CITY 24 HR PRIOR TO STARTING WORK UNLESS ALL WORK IS COMPLETED WITHIN THE CITY'S NORMAL WORKING HOURS.
4. THE CONTRACTOR SHALL CONTACT PGE TO INSTALL THE POWER SERVICE IN THE FIELD AND COORDINATE A TIME WITH PGE FOR POWER SERVICE "TURN ON".

SCALE 0 5 10 20 METERS

124TH AT TUALATIN RD
SIGNAL PLAN

KEEP

KITTELSON & ASSOCIATES, INC.
610 SW ALDER, SUITE 700
PORTLAND, OREGON 97205
(503) 228-5230

POLE ENTRANCE CHART

POLE NUMBER	1	2	3	4
LUMINAIRE ARM	90	—	—	—
MAST ARM	3	3	7	—
PEDESTRIAN SIGNAL PLAN SHEET	1	—	3	33
PEDESTRIAN PSE DETAIL	38	—	35	41,5L
PEDESTAL CABINET	2	1	3	—

REVISED AS CONSTRUCTED
28-June-1999 CONTRACT 12044

TRAFFIC SIGNAL INSTALLATION
124th AT 124TH AVENUE & TUALATIN RD RELIGHT
PACIFIC HIGHWAY WEST
WASHINGTON COUNTY

FEDERAL HIGHWAY ADMINISTRATION		PROJECT NUMBER	SHEET NO.
REGION 10	OREGON DIVISION		TS 4

APPROVED 2000 WORKSTATION APRIL 1998

01/25/00 15:36 P.002/005

Q-Free MAXTIME Database Print Out

338 - 124th Avenue (PRE/PRI) & Tualatin Road

Agency Washington County

Database Description 332_WashCo_FYA-NotPed

Basic Timing Parameters - Phase Plan 1

Timings

Phases	1	2	3	4	5	6	7	8
Enable		X		X	X	X		X
Walk Time	0	0	0	0	0	10	0	9
Clear Time	0	0	0	0	0	15	0	23
Stdy Don't Walk	0	0	0	0	0	0	0	0
Min Green	5	10	5	5	10	10	5	0
Min Green 2	0	0	0	0	0	0	0	0
Min B4 FO	0	0	0	0	0	0	0	0
Passage	1.5	4.5	1.5	4.0	4.0	4.5	1.5	2.0
Passage 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max 1	15	50	15	15	40	50	15	30
Max 2	15	50	15	15	40	50	15	30
Max 3	0	0	0	0	0	0	0	0
Conditional Max	0	0	0	0	0	0	0	0
Yel Change	3.5	4.5	3.5	4.0	4.0	4.5	3.5	3.0
Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Add Red Clear	0	0	0	0	0	0	0	0
Red Revert	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Added Initial	0.0	1.0	0.0	0.0	1.0	1.0	0.0	0.0
Max Initial	0	10	0	0	10	10	0	0
Time B4 Reduce	0	0	0	0	0	0	0	0
Cars B4 Reduce	0	0	0	0	0	0	0	0
Time To Reduce	0	0	0	0	0	0	0	0
Reduce By	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Min Gap	0.0	3.0	0.0	0.0	3.0	3.0	0.0	0.0
Dyn Max Limit	0	0	0	0	0	0	0	0
Dyn Max Step	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0
Advance Walk	0	0	0	0	0	0	0	0
Delayed Walk	0	0	0	0	0	0	0	0
Alt Walk	0	0	0	0	0	0	0	0
Alt Ped Clr	0	0	0	0	0	0	0	0
Ped Service Limit	0	0	0	0	0	0	0	0
Pre Green	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pre Clearance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pre Clearance 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Clear Ext Pass	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Clear Ext Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Jump	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Adv Warning Ext	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pri Walk	0	0	0	0	0	0	0	0
Call Phases								
Walk Ext	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0
Wait Cars B4 Sev	0	0	0	0	0	0	0	0
Ped Clear Thru	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Options

Phases	1	2	3	4	5	6	7	8
Enable		X		X	X	X		X
Auto Flash Ent.		X				X		
Auto Flash Exit		X				X		
Non Actuated I								
Non Actuated II								
Non Lock Mem	X	X	X	X	X	X	X	X
Min Veh Recall		X				X		
Max Veh Recall								
Ped Recall								
Soft Veh Recall								
Dual Entry		X		X		X		X
Sim Gap Dis	X		X		X		X	
Guaranteed Pass								
Act Rest Walk								
Cond Service								
Add Initial								
Ped Clr During Yel								
Ped Clr During Red								
Cond Reservice								
Yel Min Override								
No Startup Call								
Adv. Warn Flasher								
No Ped Str Up Call								
Ped Clr OVTG								
Flash Exit Call								
Flash Exit Ped Call								
MinGreen2								
MaxGreen2								
MaxGreen3								
Ped2								
Ped Clear Pre Clear								
Ped NA+ Mode								
Red Rest								
Serve Evy Oth Even								
Serve Evy Oth Odd								
Coord Ped Yield								
Ped Recycle								
Coutdown								
Simult Start								
Simult Ped Term								

Phase Parameters - Plan 1 (Extended Phases)

Timings

Phases	9	10	11	12	13	14	15	16
Enable								
Walk Time	0	0	0	0	0	0	0	0
Clear Time	0	0	0	0	0	0	0	0
Stdy Don't Walk	0	0	0	0	0	0	0	0
Min Green	5	1	1	1	1	1	1	1
Min Green 2	0	0	0	0	0	0	0	0
Min B4 FO	0	0	0	0	0	0	0	0
Passage	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Passage 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max 1	15	0	0	0	0	0	0	0
Max 2	15	0	0	0	0	0	0	0
Max 3	0	0	0	0	0	0	0	0
Conditional Max	0	0	0	0	0	0	0	0
Yel Change	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Add Red Clear	0	0	0	0	0	0	0	0
Red Revert	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Added Initial	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Initial	0	0	0	0	0	0	0	0
Time B4 Reduce	0	0	0	0	0	0	0	0
Cars B4 Reduce	0	0	0	0	0	0	0	0
Time To Reduce	0	0	0	0	0	0	0	0
Reduce By	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dyn Max Limit	0	0	0	0	0	0	0	0
Dyn Max Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advance Walk	0	0	0	0	0	0	0	0
Delayed Walk	0	0	0	0	0	0	0	0
Alt Walk	0	0	0	0	0	0	0	0
Alt Ped Clr	0	0	0	0	0	0	0	0
Ped Service Limit	0	0	0	0	0	0	0	0
Pre Green	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pre Clearance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pre Clearance 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Clear Ext Pass	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Clear Ext Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Jump	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Adv Warning Ext	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pri Walk	0	0	0	0	0	0	0	0
Call Phases								
Walk Ext	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0
Wait Cars B4 Sev	0	0	0	0	0	0	0	0
Ped Clear Thru	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Options

Phases	9	10	11	12	13	14	15	16
Enable								
Auto Flash Ent.								
Auto Flash Exit								
Non Actuated I								
Non Actuated II								
Non Lock Mem								
Min Veh Recall								
Max Veh Recall								
Ped Recall								
Soft Veh Recall								
Dual Entry								
Sim Gap Dis								
Guaranteed Pass								
Act Rest Walk								
Cond Service								
Add Initial								
Ped Clr During Yel								
Ped Clr During Red								
Cond Reservice								
Yel Min Override								
No Startup Call								
Adv. Warn Flasher								
No Ped Str Up Call								
Ped Clr OVTG								
Flash Exit Call								
Flash Exit Ped Call								
MinGreen2								
MaxGreen2								
MaxGreen3								
Ped2								
Ped Clear Pre Clear								
Ped NA+ Mode								
Red Rest								
Serve Evy Oth Even								
Serve Evy Oth Odd								
Coord Ped Yield								
Ped Recycle								
Coutdown								
Simult Start								
Simult Ped Term								

IP Settings

Adapter	IP Address	Subnet Mask	Default Gateway	ARP	Mode
1				Disable	Static
2				Disable	Static

Default Free Parameters

Seq	Phs Pln	Det Pln	Ped Pln	Ovlp Pln	Pri Pln
1	1	1	1	1	1

Serial Ports

Port	Description	Function	Address	Baud	Bits	Stop	Parity	Flow	CTS	RTS
1	Port 2/C21S	None	1	9600	8	1	None	None	0	0
2	Aux_P3/C22S	None	1	9600	8	1	None	None	0	0
3	SDLC Port 1	None	1	9600	8	1	None	None	0	0
4	Com A/C50S	None	1	9600	8	1	None	None	0	0
5	FIO	None	1	9600	8	1	None	None	0	0
6	DISPLAY/C60M	None	1	9600	8	1	None	None	0	0
7	SP7	None	1	9600	8	1	None	None	0	0
8	SP8/Com B	None	1	9600	8	1	None	None	0	0

Unit Parameters

Startup Parameters

Start Fls Mode	Cabinet
Start Fls Time	0
Clearce Hold	6
Start Yellow	0.0
Start Red	6.0

Timing/Freq Parameters

Backup Time	600
Red Revert	4.0
Master By TOD	Disable
Grn Flash Freq.	60
Yel Flash Freq.	60

Flash Parameters

All Red Entry	0
All Red Exit	8
Auto Flash CVM	Disable
AR Flsh Sense	Enable
Dk Flsh Sense	Disable

Other Parameters

Preempt Lock	0
3 Phs Dia Seq	
4 Phs Dia Seq	
Sep Dia Seq	

Manual Control

MCE Enab	Enable
MCE Seq.	1
Auto Ped	Enable

Sequence Configuration

Sequence 1

Ring	Phases
1	2,a,4,b
2	5,6,a,8,b
3	
4	

Sequence 2

Ring	Phases
1	2,a,4,b
2	6,5,a,8,b
3	
4	

Sequence 3

Ring	Phases
1	1,2,a,3,4,b
2	6,5,a,8,7,b
3	
4	

Sequence 4

Ring	Phases
1	2,1,a,4,3,b
2	5,6,a,7,8,b
3	
4	

Sequence 5

Ring	Phases
1	1,2,a,3,4,b
2	6,5,a,7,8,b
3	
4	

Sequence 6

Ring	Phases
1	2,1,a,4,b,8,c
2	6,5,a,b,c
3	
4	

Sequence 7

Ring	Phases
1	1,2,a,4,3,b
2	6,5,a,7,8,b
3	
4	

Sequence 8

Ring	Phases
1	2,1,a,4,3,b
2	6,5,a,7,8,b
3	
4	

Sequence 9

Ring	Phases
1	1,2,a,3,4,b
2	5,6,a,8,7,b
3	
4	

Sequence 10

Ring	Phases
1	2,1,a,3,4,b
2	5,6,a,8,7,b
3	
4	

Sequence 11

Ring	Phases
1	1,2,a,4,3,b
2	5,6,a,8,7,b
3	
4	

Sequence 12

Ring	Phases
1	2,1,a,4,3,b
2	5,6,a,8,7,b
3	
4	

Sequence 13

Ring	Phases
1	1,2,a,3,4,b
2	6,5,a,8,7,b
3	
4	

Sequence 14

Ring	Phases
1	2,1,a,3,4,b
2	6,5,a,8,7,b
3	
4	

Sequence 15

Ring	Phases
1	1,2,a,4,3,b
2	6,5,a,8,7,b
3	
4	

Sequence 16

Ring	Phases
1	2,1,a,4,3,b
2	6,5,a,8,7,b
3	
4	

Phase Configuration

Ph.	Startup	Ring	Concurrent	Startup Min	Description
1	Phase Not On	0		0	NBL
2	Green No Walk	1	5,6	0	SB
3	Phase Not On	0		0	EBL
4	Phase Not On	1	8	0	WB

5	Phase Not On	2	2	0	SBL
6	Green No Walk	2	2	0	NB
7	Phase Not On	0		0	WBL
8	Phase Not On	2	4	0	EB

No Serve Phases

Sequence 1	
P	No Srv P
1	
2	
3	
4	
5	
6	
7	
8	

Sequence 2	
P	No Srv P
1	
2	
3	
4	
5	
6	
7	
8	

Sequence 3	
P	No Srv P
1	
2	
3	
4	
5	
6	
7	
8	

Sequence 4	
P	No Srv P
1	
2	
3	
4	
5	
6	
7	
8	

Sequence 5	
P	No Srv P
1	
2	
3	
4	
5	
6	
7	
8	

Sequence 6	
P	No Srv P
1	
2	
3	
4	
5	
6	
7	
8	

Sequence 7	
P	No Srv P
1	
2	
3	
4	
5	
6	
7	
8	

Sequence 8	
P	No Srv P
1	
2	
3	
4	
5	
6	
7	
8	

Backup Prevent

Sequence 1

	No Backup Phase								Call
	1	2	3	4	5	6	7	8	
1									
2									
3									
4									
5									
6									
7									
8									
All Red 2 BU				No					

Sequence 2

	No Backup Phase								Call
	1	2	3	4	5	6	7	8	
1									
2									
3									
4									
5									
6									
7									
8									
All Red 2BU				No					

Sequence 3

	No Backup Phase								Call
	1	2	3	4	5	6	7	8	
1									
2									
3									
4									
5									
6									
7									
8									
All Red 2BU				No					

Sequence 4

	No Backup Phase								Call
	1	2	3	4	5	6	7	8	
1									
2									
3									
4									
5									
6									
7									
8									
All Red 2BU				No					

Global Phase Recalls

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Min		X				X														
Max																				
Ped																				
Act Walk Rest																				

Global Veh Det Diagnostics

Global No Activity	0
Global Max Presence	0
Global Erractic Count	0
Global Failed Recall	Max Recall
Detector Reset Enable	Enabled

Global Ped Det Diagnostics

Global No Activity	0
Global Max Pres	60
Global Err Count	0

Global Pri/Pre Det Diag

Global No Activity	0
Global Max Presence	0
Global Erractic Count	0

Data Collection

Vehicle Coll. Period	0
Comb. Veh Periods	1
Vehicle Period V3	0
Ped Coll. Period	0

Vehicle Detection Parameters

Plan 1

Det.	Call Phs	Call Ped	Call Ovl	Add Call Phases	Sw Phs	+Call Ovl	Dly Ovl	Delay	Extend	Queue Limit	Ext Hold	No Act.	Max Pres	Errat Count	Fail Time	Fail Recal	Fail Link	Description
1	1	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	I1U
2	2	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	I2U
3	2	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	I2L
4	2	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	I3U
5	2	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	I3L

Det.	Call Phs	Call Ped	Call Ovl	Add Call Phases	Sw Phs	+Call Ovl	Dly Ovl	Delay	Extend	Queue Limit	Ext Hold	No Act.	Max Pres	Errat Count	Fail Time	Fail Recall	Fail Link	Description
6	2	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	I4U
7	3	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	I5U
8	4	0	0		0			8.0	0.0	0	0.0	0	0	0	0	None	0	I6U
9	4	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	I6L
10	4	0	0		0			8.0	0.0	0	0.0	0	0	0	0	None	0	I7U
11	4	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	I7L
12	4	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	I8U
13	1	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	I9U
14	3	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	I9L
15	5	0	0		0			10.0	0.0	0	0.0	0	0	0	0	None	0	J1U
16	6	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	J2U
17	6	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	J2L
18	6	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	J3U
19	6	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	J3L
20	6	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	J4U
21	7	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	J5U
22	8	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	J6U
23	8	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	J6L
24	8	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	J7U
25	8	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	J7L
26	8	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	J8U
27	5	0	0		0			10.0	0.0	0	0.0	0	0	0	0	None	0	J9U
28	7	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	J9L
29	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	
30	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	
31	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	
32	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	
33	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	
34	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	
35	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	
36	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	
37	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	
38	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	
39	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	
40	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	
41	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	
42	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	
43	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	
44	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	
45	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	
46	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	
47	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	
48	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	

Vehicle Detectors (Continued) Plan 1

Det.	Call Phs	Call Ped	Call Ovl	Add Call Phases	Sw Phs	+Call Ovl	Dly Ovl	Delay	Extend	Queue Limit	Ext Hold	No Act.	Max Pres	Errat Count	Fail Time	Fail Recall	Fail Link	Description
49	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	
50	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	
51	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	
52	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	
53	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	
54	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	
55	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0	

56	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0			
57	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0			
58	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0			
59	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0			
60	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0			
61	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0			
62	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0			
63	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0			
64	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0			
65	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0			
66	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0			
67	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0			
68	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0			
69	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0			
70	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0			
71	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0			
72	0	0	0		0			0.0	0.0	0	0.0	0	0	0	0	None	0			

Vehicle Detection Options Plan 1

Detector	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Volume Detector																				
Occupancy																				
Yellow Lock Call																				
Red Lock Call																				
Extend	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Added Initial																				
Queue																				
Call	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Terminate																				
Min Green 2																				
Protected Perm																				
Disable Dly Lead																				
Disable TS2 Diag																				
Disable Det Diag																				
Passage 2																				
Red Clear Ext																				
Ovl Add Int Delay																				
Ovl Gap Delay																				
Wait Car Count																				
Dly During Green																				

Vehicle Detection Options (Continued) Plan 1

Detector	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Volume Detector																				
Occupancy																				
Yellow Lock Call																				
Red Lock Call																				
Extend	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Added Initial																				
Queue																				
Call	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Terminate																				
Min Green 2																				
Protected Perm																				

Disable Dly Lead																			
Disable TS2 Diag																			
Disable Det Diag																			
Passage 2																			
Red Clear Ext																			
Ovl Add Int Delay																			
Ovl Gap Delay																			
Wait Car Count																			
Dly During Green																			

Detector	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Volume Detector	X	X	X	X	X	X	X	X												
Occupancy	X	X	X	X	X	X	X	X												
Yellow Lock Call																				
Red Lock Call																				
Extend									X	X	X	X	X	X	X	X				
Added Initial																				
Queue																				
Call																				
Terminate																				
Min Green 2																				
Protected Perm																				
Disable Dly Lead																				
Disable TS2 Diag																				
Disable Det Diag																				
Passage 2																				
Red Clear Ext																				
Ovl Add Int Delay																				
Ovl Gap Delay																				
Wait Car Count																				
Dly During Green																				

Vehicle Detection Options (Continued) Plan 1

Detector	61	62	63	64	65	66	67	68	69	70	71	72
Volume Detector												
Occupancy												
Yellow Lock Call												
Red Lock Call												
Extend												
Added Initial												
Queue												
Call												
Terminate												
Min Green 2												
Protected Perm												
Disable Dly Lead												
Disable TS2 Diag												

Disable Det Diag												
Passage 2												
Red Clear Ext												
Ovl Add Int Delay												
Ovl Gap Delay												
Wait Car Count												
Dly During Green												

Speed Detectors

Det	Enable	Type	Units	Min Log	Max Log	Car Length	Det Length	Trail Det	Trap Length
1		Single	Inches	5	80	0	0	0	0
2		Single	Inches	5	80	0	0	0	0
3		Single	Inches	5	80	0	0	0	0
4		Single	Inches	5	80	0	0	0	0
5		Single	Inches	5	80	0	0	0	0
6		Single	Inches	5	80	0	0	0	0
7		Single	Inches	5	80	0	0	0	0
8		Single	Inches	5	80	0	0	0	0

Pedestrian Detectors

Det	Call Phs	Call Ovlp	Cancel Phs	Add Call Phs	Add Call Ovlp	Walk 2	Clear 2	No Act	Max Pres	Erratic Count	Walk Extension
1	0	0				0	0	0	0	0	
2	2	0				0	0	0	0	0	
3	0	0				0	0	0	0	0	
4	4	0				0	0	0	0	0	
5	0	0				0	0	0	0	0	
6	6	0				0	0	0	0	0	
7	0	0				0	0	0	0	0	
8	8	0				0	0	0	0	0	
9	0	0				0	0	0	0	0	
10	0	0				0	0	0	0	0	
11	0	0				0	0	0	0	0	
12	0	0				0	0	0	0	0	
13	0	0				0	0	0	0	0	
14	0	0				0	0	0	0	0	

Overlaps Plan 1

OLP	Enabled	Type	Included Phs	Modifier Phs	Modifier Ovlps	Neg Phases	Description
1	Disabled	FYA - 4 Sec	2	1			FYA - 4 Section
2	Disabled	Thru FYA Ped	2		1		Thru FYA Ped
3	Disabled	Off					FYA - 4 Section
4	Disabled	Off					Thru FYA Ped
5	Enabled	FYA - 4 Sec	6	5			FYA - 4 Section
6	Enabled	Thru FYA Ped	6		5		Thru FYA Ped
7	Disabled	Off					
8	Disabled	Off					
9	Enabled	Normal	4,5				
10	Disabled	Off					
11	Disabled	Off					
12	Disabled	Off					

	1	2	3	4	5	6	7	8	9	10	11	12

	Enabled	Disabled	Disabled	Disabled	Disabled	Enabled	Enabled	Disabled	Disabled	Enabled	Disabled	Disabled	Disabled
Trail Green	0	0	0	0	0	0	0	0	0	0	0	0	
Add Trail Green	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Trail Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Trail Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Walk	0	0	0	0	0	0	0	0	0	0	0	0	
Ped Clear	0	0	0	0	0	0	0	0	0	0	0	0	
Delay	3.0	0.0	3.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	
Flash	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	
Inhibit Neg Phs													
Neg Ovlps													
TrG Omit Phs													
Negitive Peds	2				6		8		4				
Neg Ped Ovlps													
Grn Sup Phs													
N Ped Phs Calls													
Call Phases													
Walk 2	0	0	0	0	0	0	0	0	0	0	0	0	
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	
Min Green	0	0	0	0	0	0	0	0	5	0	0	0	
Max Green Ext	0	0	0	0	0	0	0	0	0	0	0	0	
Red Revert	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
LRT P2G Time	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
FYA Ped Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Add Init Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Gap Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Max Delay	0	0	0	0	0	0	0	0	0	0	0	0	
Flash Inactive	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	
Flash Alt	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	
Grn Flash Freq	0	0	0	0	0	0	0	0	0	0	0	0	
Ylw Flash Freq	0	0	0	0	0	0	0	0	0	0	0	0	
Walk Rest	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	

Overlap Settings Plan 1

	1	2	3	4	5	6	7	8	9	10	11	12
Startup Call												
Recall												
No Veh Reserv												
No Hold Trail Exit												
Ped Recycle		X				X						
No Yellow Protect												
No Bridging												
LRT Prepare Go												
Call for Service												
Trail Grn Bridge												
FYA Prot. Red Cl												
Phs Intvl Override												
Queue Jump												
No FYA Ped Wlk												
Term After Call												
FYA Ped No Prt Rtn												
Neg Ped Allow												
All Include Start												

Queue Jump Ext												
Disable Sim Gap												
Thru FYA Ped Term												

Custom Overlap Rules

Rule	Custom Ovlp	Incl. State	Mod. Phase State	Mod. OL State	Neg. State	Output	Flash
1	Cust 1	Green	Any	Any	Any	Blank	Not Set
2	Disable	Any	Any	Any	Any	Not Set	Not Set
3	Disable	Any	Any	Any	Any	Not Set	Not Set
4	Disable	Any	Any	Any	Any	Not Set	Not Set
5	Disable	Any	Any	Any	Any	Not Set	Not Set
6	Disable	Any	Any	Any	Any	Not Set	Not Set
7	Disable	Any	Any	Any	Any	Not Set	Not Set
8	Disable	Any	Any	Any	Any	Not Set	Not Set
9	Disable	Any	Any	Any	Any	Not Set	Not Set
10	Disable	Any	Any	Any	Any	Not Set	Not Set

Coordination Parameters

Operational Mode	Automatic
Coordination Mode	Auto Permissive
Correction Mode	Shortway (Auto)

Maximum Mode	Per Pattern
Force Mode	Fixed
Transition Cover Ped	Pattern

Max Cyc Limit %	20
Min Cyc Limit %	20
Max Dwell	0

Patterns

		Offset					Ref	Coord	Force	Max	Trans	Min	Phs	Det	Ped	Ovlp	Pri	
Patt.	Cycle	1	2	3	Split	Seq	Col	Mode	Mode	Mode	Ped	Perm	Pln	Pln	Pln	Pln	Pln	Description
1	0	0	0	0	1	1	Grn	Auto	Fixed	Max1	None	Phs Only	1	1	1	1	1	Stgandard Phasing
2	0	0	0	0	1	2	Grn	Auto	Fixed	Max1	None	Phs Only	1	1	1	1	1	Lag Ph5
3	0	0	0	0	3	1	Grn	Auto	Fixed	Max1	None	Phs Only	1	1	1	1	1	
4	0	0	0	0	4	1	Grn	Auto	Fixed	Max1	None	Phs Only	1	1	1	1	1	
5	0	0	0	0	5	1	Grn	Auto	Fixed	Max1	None	Phs Only	1	1	1	1	1	
6	0	0	0	0	0	0	Yel	Auto	Fixed	Inh	Phase	Phs Only	1	1	1	1	1	
7	0	0	0	0	0	0	Yel	Auto	Fixed	Inh	Phase	Phs Only	1	1	1	1	1	
8	0	0	0	0	0	0	Yel	Auto	Fixed	Inh	Phase	Phs Only	1	1	1	1	1	
9	0	0	0	0	0	0	Yel	Auto	Fixed	Inh	Phase	Phs Only	1	1	1	1	1	
10	0	0	0	0	0	0	Yel	Auto	Fixed	Inh	Phase	Phs Only	1	1	1	1	1	
11	0	0	0	0	0	0	Yel	Auto	Fixed	Inh	Phase	Phs Only	1	1	1	1	1	
12	0	0	0	0	0	0	Yel	Auto	Fixed	Inh	Phase	Phs Only	1	1	1	1	1	
13	0	0	0	0	0	0	Yel	Auto	Fixed	Inh	Phase	Phs Only	1	1	1	1	1	
14	0	0	0	0	0	0	Yel	Auto	Fixed	Inh	Phase	Phs Only	1	1	1	1	1	
15	0	0	0	0	0	0	Yel	Auto	Fixed	Inh	Phase	Phs Only	1	1	1	1	1	

16	0	0	0	0	0	0	Yel	Auto	Fixed	Inh	Phase	Phs Only	1	1	1	1	1	
17	0	0	0	0	0	0	Yel	Auto	Fixed	Inh	Phase	Phs Only	1	1	1	1	1	
18	0	0	0	0	0	0	Yel	Auto	Fixed	Inh	Phase	Phs Only	1	1	1	1	1	
19	0	0	0	0	0	0	Yel	Auto	Fixed	Inh	Phase	Phs Only	1	1	1	1	1	
20	0	0	0	0	0	0	Yel	Auto	Fixed	Inh	Phase	Phs Only	1	1	1	1	1	Free Operation

Split Parameters

Split 1				Coord	Ref	Cover	Force Off		Pri	Pri	Pri
PH.	Time	Min	Max	PH	PH	Ped	Mode	Mode	Min	Max	F. Off
1	0	0	0				Fix	None	0	0	Float
2	0	0	0	X	X		Fix	Min Rcl	0	0	Float
3	0	0	0				Fix	None	0	0	Float
4	0	0	0				Fix	None	0	0	Float
5	0	0	0				Fix	None	0	0	Float
6	0	0	0	X	X		Fix	Min Rcl	0	0	Float
7	0	0	0				Fix	None	0	0	Float
8	0	0	0				Fix	None	0	0	Float

Split 2				Coord	Ref	Cover	Force Off		Pri	Pri	Pri
PH.	Time	Min	Max	PH	PH	Ped	Mode	Mode	Min	Max	F. Off
1	0	0	0				Fix	None	0	0	Float
2	0	0	0				Fix	Min Rcl	0	0	Float
3	0	0	0				Fix	None	0	0	Float
4	0	0	0	X	X		Fix	None	0	0	Float
5	0	0	0				Fix	None	0	0	Float
6	0	0	0				Fix	Min Rcl	0	0	Float
7	0	0	0				Fix	None	0	0	Float
8	0	0	0	X	X		Fix	None	0	0	Float

Split Tables (continued)

Split 3				Coord	Ref	Cover	Force Off		Pri	Pri	Pri
PH.	Time	Min	Max	PH	PH	Ped	Mode	Mode	Min	Max	F. Off
1	0	0	0				Fix	None	0	0	Float
2	0	0	0	X	X		Fix	Min Rcl	0	0	Float
3	0	0	0				Fix	None	0	0	Float
4	0	0	0				Fix	None	0	0	Float
5	0	0	0				Fix	None	0	0	Float
6	0	0	0	X	X		Fix	Min Rcl	0	0	Float
7	0	0	0				Fix	None	0	0	Float
8	0	0	0				Fix	None	0	0	Float

Split 4				Coord	Ref	Cover	Force Off		Pri	Pri	Pri
PH.	Time	Min	Max	PH	PH	Ped	Mode	Mode	Min	Max	F. Off
1	0	0	0				Fix	None	0	0	Float
2	0	0	0				Fix	None	0	0	Float
3	0	0	0				Fix	None	0	0	Float
4	0	0	0	X	X		Fix	None	0	0	Float
5	0	0	0				Fix	None	0	0	Float
6	0	0	0				Fix	None	0	0	Float
7	0	0	0				Fix	None	0	0	Float
8	0	0	0	X	X		Fix	None	0	0	Float

Split 5				Coord	Ref	Cover	Force Off		Pri	Pri	Pri

PH.	Time	Min	Max	PH	PH	Ped	Mode	Mode	Min	Max	F. Off
1	14	0	0				Fix	None	0	0	Float
2	38	0	0				Fix	None	0	0	Float
3	17	0	0				Fix	None	0	0	Float
4	31	0	0	X	X		Fix	Min Rcl	0	0	Float
5	14	0	0				Fix	None	0	0	Float
6	38	0	0				Fix	None	0	0	Float
7	14	0	0				Fix	None	0	0	Float
8	34	0	0	X	X		Fix	Min Rcl	0	0	Float

Split 6				Coord	Ref	Cover	Force Off		Pri	Pri	Pri
PH.	Time	Min	Max	PH	PH	Ped	Mode	Mode	Min	Max	F. Off
1	0	0	0				Fix	None	0	0	Float
2	0	0	0				Fix	None	0	0	Float
3	0	0	0				Fix	None	0	0	Float
4	0	0	0				Fix	None	0	0	Float
5	0	0	0				Fix	None	0	0	Float
6	0	0	0				Fix	None	0	0	Float
7	0	0	0				Fix	None	0	0	Float
8	0	0	0				Fix	None	0	0	Float

Split Tables (continued)

Split 7				Coord	Ref	Cover	Force Off		Pri	Pri	Pri
PH.	Time	Min	Max	PH	PH	Ped	Mode	Mode	Min	Max	F. Off
1	0	0	0				Fix	None	0	0	Float
2	0	0	0				Fix	None	0	0	Float
3	0	0	0				Fix	None	0	0	Float
4	0	0	0				Fix	None	0	0	Float
5	0	0	0				Fix	None	0	0	Float
6	0	0	0				Fix	None	0	0	Float
7	0	0	0				Fix	None	0	0	Float
8	0	0	0				Fix	None	0	0	Float

Split 8				Coord	Ref	Cover	Force Off		Pri	Pri	Pri
PH.	Time	Min	Max	PH	PH	Ped	Mode	Mode	Min	Max	F. Off
1	0	0	0				Fix	None	0	0	Float
2	0	0	0				Fix	None	0	0	Float
3	0	0	0				Fix	None	0	0	Float
4	0	0	0				Fix	None	0	0	Float
5	0	0	0				Fix	None	0	0	Float
6	0	0	0				Fix	None	0	0	Float
7	0	0	0				Fix	None	0	0	Float
8	0	0	0				Fix	None	0	0	Float

Split 9				Coord	Ref	Cover	Force Off		Pri	Pri	Pri
PH.	Time	Min	Max	PH	PH	Ped	Mode	Mode	Min	Max	F. Off
1	0	0	0				Fix	None	0	0	Float
2	0	0	0				Fix	None	0	0	Float

3	0	0	0				Fix	None	0	0	Float
4	0	0	0				Fix	None	0	0	Float
5	0	0	0				Fix	None	0	0	Float
6	0	0	0				Fix	None	0	0	Float
7	0	0	0				Fix	None	0	0	Float
8	0	0	0				Fix	None	0	0	Float

Split 10				Coord	Ref	Cover	Force Off		Pri	Pri	Pri
PH.	Time	Min	Max	PH	PH	Ped	Mode	Mode	Min	Max	F. Off
1	0	0	0				Fix	None	0	0	Float
2	0	0	0				Fix	None	0	0	Float
3	0	0	0				Fix	None	0	0	Float
4	0	0	0				Fix	None	0	0	Float
5	0	0	0				Fix	None	0	0	Float
6	0	0	0				Fix	None	0	0	Float
7	0	0	0				Fix	None	0	0	Float
8	0	0	0				Fix	None	0	0	Float

Pattern Advanced Options

Pattern	1	2	3	4	5	6	7	8	9	10
Ring Plan	1	1	1	1	1	0	0	0	0	0
Allow Split Underrun	X	X	X	X	X					
Allow Split Overrun	X	X	X	X	X					
Allow No Coord Ph										
Coord Now										

Ring Plans

Plan 1

Ring	1	2	3	4
Offset	0	0	0	0
Early Coord Gap Out	0	0	0	0
Early Coord FO	0	0	0	0

Plan 2

Ring	1	2	3	4
Offset	0	0	0	0
Early Coord Gap Out	5	5	0	0
Early Coord FO	5	5	0	0

Plan 3

Ring	1	2	3	4
Offset	0	0	0	0
Early Coord Gap Out	7	7	0	0
Early Coord FO	7	0	0	0

Plan 4

Ring	1	2	3	4
Offset	0	0	0	0
Early Coord Gap Out	5	5	0	0
Early Coord FO	5	0	0	0

Schedules

Schedule 1 Enable On Day Plan 1 Description Weekday Day Plan

Month of Year

J	F	M	A	M	J
X	X	X	X	X	X
J	A	S	O	N	D
X	X	X	X	X	X

Days of Week

S	M	T	W	T	F	S
	X	X	X	X	X	

Days of Month

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

Schedule 2 Enable On Day Plan 2 Description Weekend Day Plan

Month of Year

J	F	M	A	M	J
X	X	X	X	X	X
J	A	S	O	N	D
X	X	X	X	X	X

Days of Week

S	M	T	W	T	F	S
X						X

Days of Month

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

Schedule 3 Enable On Day Plan 3 Description

Month of Year

J	F	M	A	M	J
X	X	X	X	X	X
J	A	S	O	N	D
X	X	X	X	X	X

Days of Week

S	M	T	W	T	F	S
X	X	X	X	X	X	X

Days of Month

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

Schedule 4 Enable On Day Plan 4 Description

Month of Year

J	F	M	A	M	J
X	X	X	X	X	X
J	A	S	O	N	D
X	X	X	X	X	X

Days of Week

S	M	T	W	T	F	S
X	X	X	X	X	X	X

Days of Month

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

Schedule 5 Enable On Day Plan 5 Description

Month of Year

J	F	M	A	M	J
X	X	X	X	X	X
J	A	S	O	N	D
X	X	X	X	X	X

Days of Week

S	M	T	W	T	F	S
X	X	X	X	X	X	X

Days of Month

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

Schedules (continued)

Schedule 6 Enable On Day Plan 6 Description

Month of Year

J	F	M	A	M	J
X	X	X	X	X	X
J	A	S	O	N	D
X	X	X	X	X	X

Days of Week

S	M	T	W	T	F	S
X	X	X	X	X	X	X

Days of Month

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

Schedule 7 Enable On Day Plan 7 Description

Month of Year

J	F	M	A	M	J
X	X	X	X	X	X
J	A	S	O	N	D
X	X	X	X	X	X

Days of Week

S	M	T	W	T	F	S
X	X	X	X	X	X	X

Days of Month

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

Schedule 8 Enable On Day Plan 8 Description

Month of Year

J	F	M	A	M	J
X	X	X	X	X	X
J	A	S	O	N	D
X	X	X	X	X	X

Days of Week

S	M	T	W	T	F	S
X	X	X	X	X	X	X

Days of Month

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

Schedule 9 Enable On Day Plan 9 Description

Month of Year

J	F	M	A	M	J
X	X	X	X	X	X
J	A	S	O	N	D
X	X	X	X	X	X

Days of Week

S	M	T	W	T	F	S
X	X	X	X	X	X	X

Days of Month

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

Schedule 10 Enable On Day Plan 10 Description

Month of Year

Days of Week

Days of Month

J	F	M	A	M	J
X	X	X	X	X	X
J	A	S	O	N	D
X	X	X	X	X	X

S	M	T	W	T	F	S
X	X	X	X	X	X	X

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

Schedule 11 Enable On Day Plan 0 Description

Month of Year

J	F	M	A	M	J
J	A	S	O	N	D

Days of Week

S	M	T	W	T	F	S

Days of Month

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	

Schedule 12 Enable On Day Plan 0 Description

Month of Year

J	F	M	A	M	J
J	A	S	O	N	D

Days of Week

S	M	T	W	T	F	S

Days of Month

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	

Day Plan 1

Event	Hour	Min.	Act
1	6	0	20
2	20	0	20
3	0	0	
4	0	0	
5	0	0	
6	0	0	
7	0	0	
8	0	0	
9	0	0	
10	0	0	

Day Plan 2

Event	Hour	Min.	Act
1	6	0	2
2	20	0	20
3	0	0	
4	0	0	
5	0	0	
6	0	0	
7	0	0	
8	0	0	
9	0	0	
10	0	0	

Day Plan 3

Event	Hour	Min.	Act
1	0	0	
2	0	0	
3	0	0	
4	0	0	
5	0	0	
6	0	0	
7	0	0	
8	0	0	
9	0	0	
10	0	0	

Day Plan 4

Event	Hour	Min.	Act
1	0	0	
2	0	0	
3	0	0	
4	0	0	
5	0	0	
6	0	0	
7	0	0	
8	0	0	
9	0	0	
10	0	0	

Day Plan 5

Event	Hour	Min.	Act
1	0	0	
2	0	0	
3	0	0	
4	0	0	
5	0	0	
6	0	0	
7	0	0	
8	0	0	
9	0	0	
10	0	0	

Day Plan 6

Event	Hour	Min.	Act
1	0	0	
2	0	0	
3	0	0	
4	0	0	
5	0	0	
6	0	0	
7	0	0	
8	0	0	
9	0	0	
10	0	0	

Day Plan 7

Event	Hour	Min.	Act
1	0	0	
2	0	0	
3	0	0	
4	0	0	
5	0	0	
6	0	0	
7	0	0	
8	0	0	
9	0	0	
10	0	0	

Day Plan 8

Event	Hour	Min.	Act
1	0	0	
2	0	0	
3	0	0	
4	0	0	
5	0	0	
6	0	0	
7	0	0	
8	0	0	
9	0	0	
10	0	0	

Day Plan 9

Event	Hour	Min.	Act
1	0	0	
2	0	0	
3	0	0	
4	0	0	
5	0	0	
6	0	0	
7	0	0	

Day Plan 10

Event	Hour	Min.	Act
1	0	0	
2	0	0	
3	0	0	
4	0	0	
5	0	0	
6	0	0	
7	0	0	

Day Plan 11

Event	Hour	Min.	Act
1	0	0	
2	0	0	
3	0	0	
4	0	0	
5	0	0	
6	0	0	
7	0	0	

Day Plan 12

Event	Hour	Min.	Act
1	0	0	
2	0	0	
3	0	0	
4	0	0	
5	0	0	
6	0	0	
7	0	0	

8	0	0		8	0	0		8	0	0		8	0	0	
9	0	0		9	0	0		9	0	0		9	0	0	
10	0	0		10	0	0		10	0	0		10	0	0	

Actions

		Aux.			Special Functions						
Act	Pattern	1	2	3	1	2	3	4	5	6	7	8
1	Pattern 1											
2	Pattern 2											
3	Pattern 3											
4	Pattern 4											
5	Pattern 5											
6	Pattern 6											
7	Pattern 7											
8	Pattern 8											
9	Pattern 9											
10	Pattern 10											

Actions

		Aux.			Special Functions						
Act	Pattern	1	2	3	1	2	3	4	5	6	7	8
11	None											
12	None											
13	Free											
14	None											
15	None											
16	None											
17	None											
18	None											
19	None											
20	Free	X										

Actions

		Aux.			Special Functions						
Act	Pattern	1	2	3	1	2	3	4	5	6	7	8
21	None											
22	None											
23	None											
24	None											
25	None											
26	None											
27	None											
28	None											
29	None											
30	None											
31	None											
32	None											
33	None											
34	None											
35	None											

Actions

		Aux.			Special Functions						
Act	Pattern	1	2	3	1	2	3	4	5	6	7	8
36	None											
37	None											
38	None											
39	None											
40	None											
41	None											
42	None											
43	None											
44	None											
45	None											
46	None											
47	None											
48	None											
49	None											
50	None											

Action Commands

Action 1

Cmd	Command	Indexes
1	None	
2	None	
3	None	
4	None	
5	None	
6	None	
7	None	
8	None	

Action 2

Cmd	Command	Indexes
1	None	
2	None	
3	None	
4	None	
5	None	
6	None	
7	None	
8	None	

Action 3

Cmd	Command	Indexes
1	None	
2	None	
3	None	

Action 4

Cmd	Command	Indexes
1	None	
2	None	
3	None	

4	None	

4	None	

Action 5

Cmd	Command	Indexes
1	None	
2	None	
3	None	
4	None	

Action 6

Cmd	Command	Indexes
1	None	
2	None	
3	None	
4	None	

Action 7

Cmd	Command	Indexes
1	None	
2	None	
3	None	
4	None	

Action 8

Cmd	Command	Indexes
1	None	
2	None	
3	None	
4	None	

Master Sections By TOD

Action	1	2	3	4	5	6	7	8	9	10
Master Section 1										
Master Section 2										
Master Section 3										
Master Section 4										
Master Section 5										
Master Section 6										
Master Section 7										
Master Section 8										
Master Section 9										
Master Section 10										
Master Section 11										
Master Section 12										
Master Section 13										
Master Section 14										
Master Section 15										
Master Section 16										

Queue Responsive By TOD

Action	1	2	3	4	5	6	7	8	9	10
Queue Resp Plan 1										
Queue Resp Plan 2										
Queue Resp Plan 3										
Queue Resp Plan 4										
Queue Resp Plan 5										
Queue Resp Plan 6										
Queue Resp Plan 7										
Queue Resp Plan 8										
Queue Resp Plan 9										
Queue Resp Plan 10										
Queue Resp Plan 11										
Queue Resp Plan 12										
Queue Resp Plan 13										
Queue Resp Plan 14										
Queue Resp Plan 15										
Queue Resp Plan 16										

Preemption Parameters

Preempt	1	2	3	4	5	6	7	8
Enabled	Disabled	Disabled	Enabled	Enabled	Enabled	Enabled	Disabled	Disabled
Type	Rail Road	Rail Road	Emerg Veh	Emerg Veh	Emerg Veh	Emerg Veh	Emerg Veh	Emerg Veh
Description			Phases 2 & 5	Phase 4	Phases 6	Phase 8		
Gate Description								
Hold Delay Phases								
Entry Override Phs								
Track Phases								
Track Peds								
Track Overlaps								
Track 2 Phases								
Track 2 Peds								
Track 2 Overlaps								
Dwell Phase			2,5	4	6	8		
Dwell Ped								
Dwell Overlaps			2,5		5,6			
Cycling Phases								
Cycling Peds								

Cycling Overlaps								
Exit Phases			2,5	4	6	8		
Exit Overlaps					5,6			
Recovery Omit Phs								
Max Pres Action	255	255	255	255	255	255	0	0
Normal Input Fault	Flash	Flash	Flash	Flash	Flash	Flash	Flash	Flash
Exit Type	Exit Phases	Exit Phases	Exit Phases	Exit Phases	Exit Phases	Exit Phases	Exit Phases	Exit Phases
Exit Max Mode	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Exit Veh Calls								
Exit Ped Calls								

Preemption Parameters (Continued)

Preempt	1	2	3	4	5	6	7	8
Link	0	0	0	0	0	0	0	0
Delay	0	0	0	0	0	0	0	0
Min Duration	1	1	1	1	1	1	0	0
Min Presence	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Presence	255	255	255	255	255	255	0	0
Reservice Lockout	0	0	0	0	0	0	0	0
Sequence	0	0	0	0	0	0	0	0
Enter Min Green	5	5	5	5	5	5	0	0
Enter Walk	1	1	1	1	1	1	0	0
Ent. Ped Clear	255	255	255	255	255	255	255	255
Enter Yellow	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5
Ent. Red Clear	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5
Track Green	0	0	0	0	0	0	0	0
Max Track Grn	0	0	0	0	0	0	0	0
Track Walk	255	255	255	255	255	255	255	255
Track Ped Clr	255	255	255	255	255	255	255	255
Track Yellow	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5
Track Red Clear	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5

Preempt	1	2	3	4	5	6	7	8
Hold Delay Time	0	0	0	0	0	0	0	0
Track 2 Green	0	0	0	0	0	0	0	0
Track 2 Walk	255	255	255	255	255	255	255	255
Track 2 Ped Clr	255	255	255	255	255	255	255	255
Track 2 Yellow	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5
Track 2 Red	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5
Track Ext Gate Dn	0	0	0	0	0	0	0	0
Dwell Green	5	5	5	5	5	5	0	0
Exit Min Green	255	255	255	255	255	255	255	255
Exit Walk	255	255	255	255	255	255	255	255
Exit Ped Clear	255	255	255	255	255	255	255	255
Exit Yellow	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5
Exit Red	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5
Dwell Ext Time	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Exit Max Green	0	0	0	0	0	0	0	0
Exit Max Mode Time	0	0	0	0	0	0	0	0
Exit Free Time	0	0	0	0	0	0	0	0

Preemption Options

Preempt	1	2	3	4	5	6	7	8
Non Lock Mem	X	X	X	X	X	X		
Not Overide Flash								
NotOverideNextPre	X	X	X	X	X	X		
Flash Dwell								
Ped Recycle in Dwell								
Imm Ped Clear							X	X
Dwell Only Status								
All Red Flash Dwell								
Allow All Overlaps								
Req All Red Entry								
Req Gate Dwn Trck Exit								
Req Gate Up Dwl Exit								
Normal On/Off Input								
Track Clear Override								
Non-Locking Gate Down								
Ped Clear During Yellow								

Aux Function 1								
Aux Function 2								
Aux Function 3								
Special Function 1								
Special Function 2								
Special Function 3								
Special Function 4								
Special Function 5								
Special Function 6								
Special Function 7								
Special Function 8								
Special Function 9								
Special Function 10								
Special Function 11								
Special Function 12								
Special Function 13								
Special Function 14								

Require CRC
Disabled

Entry Override All-Red							
Sep Entry Phase/Ped							
Latching Flash Dwell							
Entry Omit OLTG							

Special Function 15							
Special Function 16							

Channel Configuration

Channel	Control Type	Cntrl Src	Flash Ylw	Flash Red	Flash Alt	MMU Channel	Green Type	Grn Included
1	Phs Veh	1		X	X	1	Other	
2	Phs Veh	2		X		2	Other	
3	Phs Veh	3		X		3	Other	
4	Phs Veh	4		X	X	4	Other	
5	Olp	5		X	X	5	Other	
6	Olp	6		X		6	Other	
7	Phs Veh	7		X		7	Other	
8	Phs Veh	8		X	X	8	Other	
9	Olp	9		X	X	9	Other	
10	Olp	10		X		10	Other	
11	Olp	11		X	X	11	Other	
12	Olp	12		X		12	Other	
13	Phs Ped	2				13	Other	
14	Phs Ped	4				14	Other	
15	Phs Ped	6				15	Other	
16	Phs Ped	8				16	Other	

Cabinet Configuration

IO Modul	Type
1	ODOT 332
2	None
3	None
4	None
5	None
6	None
7	None
8	None
9	None
10	None

Advanced Cabinet Options

ITS Cabinet on Port 1	No	Enable TS2/ATC St Time	
ITS Cabinet on Port C13S	No	Disable TS2 Startup Call	
33X Input Leading Edge Filter	5	Disable TS2 Fault Flash	
33X Input Trailing Edge Filter	5	Disable TS2 Cabinet Alarms	
		Disable ATC Cabinet Alarms	

Phase Intervals

Interval	Description	Red	Yel	Grn	Type
1	Not Act	On	Off	Off	Red
2	Adv Wlk	On	Off	Off	Red
3	Pre Grn	Off	Off	On	Green
4	Min Grn	Off	Off	On	Green
5	Grn Ext	Off	Off	On	Green
6	Grn Dwell	Off	Off	On	Green

Interval	Description	Red	Yel	Grn	Type
7	Pre Clr	Off	Off	On	Green
8	Yel Change	Off	On	Off	Yellow
9	Red Clr	On	Off	Off	Red
10	Red Dwell	On	Off	Off	Red
11	Barrier	On	Off	Off	Red
12	Pre Clr 2	Off	Off	Off	Not Def.

Pedestrian Intervals

Interval	Description	DWK	CLR	Wlk	Type

Alarm Config

Alarm	Name

Alarm	Name

1	Not Active	On	Off	Off	Dont Walk
2	Dly Walk	On	Off	Off	Dont Walk
3	Walk	Off	Off	On	Walk
4	Walk Dwell	Off	Off	On	Walk
5	Flsh DWalk	Flash	On	Off	Ped Clear
6	DWalk	On	Off	Off	Dont Walk

1	
2	
3	
4	
5	

6	
7	
8	
9	
10	

Manual Control Phase Groups

Grp 1		Grp 2		Grp 3		Grp 4		Grp 5		Grp 6		Grp 7		Grp 8	
Ring	Ph	Ring	Ph	Ring	Ph	Ring	Ph	Ring	Ph	Ring	Ph	Ring	Ph	Ring	Ph
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0
2	0	2	0	2	0	2	0	2	0	2	0	2	0	2	0
3	0	3	0	3	0	3	0	3	0	3	0	3	0	3	0
4	0	4	0	4	0	4	0	4	0	4	0	4	0	4	0
5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0
6	0	6	0	6	0	6	0	6	0	6	0	6	0	6	0
7	0	7	0	7	0	7	0	7	0	7	0	7	0	7	0
8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0
9	0	9	0	9	0	9	0	9	0	9	0	9	0	9	0
10	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0
11	0	11	0	11	0	11	0	11	0	11	0	11	0	11	0
12	0	12	0	12	0	12	0	12	0	12	0	12	0	12	0
13	0	13	0	13	0	13	0	13	0	13	0	13	0	13	0
14	0	14	0	14	0	14	0	14	0	14	0	14	0	14	0
15	0	15	0	15	0	15	0	15	0	15	0	15	0	15	0
16	0	16	0	16	0	16	0	16	0	16	0	16	0	16	0

Prioritor Settings

Enabled	Lock Out Time	PRS Time to Live
Yes	0	300

Prioritor	Enabled	Priority	Priority Phs	Skipped Phs	Skip Peds	Dly Time	Arrv Time	Mx Presence	Flush/Veh	Max Flush
1	On	1	2,6	4,5,8	8	0	0	30	0.0	0
2	On	0				0	0	0	0.0	0
3	On	0				0	0	0	0.0	0
4	On	0				0	0	0	0.0	0
5	On	0				0	0	0	0.0	0
6	On	0				0	0	0	0.0	0
7	On	0				0	0	0	0.0	0
8	On	0				0	0	0	0.0	0

Prioritor	Res. Lockout	Free Pri Min	Free Pri Max	Description
1	0	Min Green	Max Green	
2	0	Min Green	Max Green	
3	0	Min Green	Max Green	
4	0	Min Green	Max Green	
5	0	Min Green	Max Green	
6	0	Min Green	Max Green	
7	0	Min Green	Max Green	
8	0	Min Green	Max Green	

Prioritor	1	2	3	4	5	6	7	8
Lock After First Serve								
Pres. Only Check-in	X							
Extend Walk Rest								
Use Phase History								

PRS Reservice Times

Class	1	2	3	4	5	6	7	8	9	10
Time	0	0	0	0	0	0	0	0	0	0

Peer Configuration

Ctrl	Peer ID	Device Type	IP address	IP Port	Http Port	Serial Port	Serial Addr.	Master Sect.	P2P TO	Description
1	0	Peer MaxTime		161	80	0	0	0	15	
2	0	Peer MaxTime		161	80	0	0	0	15	
3	0	Peer MaxTime		161	80	0	0	0	15	
4	0	Peer MaxTime		161	80	0	0	0	15	
5	0	Peer MaxTime		161	80	0	0	0	15	
6	0	Peer MaxTime		161	80	0	0	0	15	
7	0	Peer MaxTime		161	80	0	0	0	15	
8	0	Peer MaxTime		161	80	0	0	0	15	
9	0	Peer MaxTime		161	80	0	0	0	15	
10	0	Peer MaxTime		161	80	0	0	0	15	

Master Section Configuration

Section	Control	Poll	Req #	Fail Time	Algorithm Period	Description
1	None	60	1	300	240	
2	None	60	1	300	240	
3	None	60	1	300	240	
4	None	60	1	300	240	
5	None	60	1	300	240	
6	None	60	1	300	240	
7	None	60	1	300	240	
8	None	60	1	300	240	
9	None	60	1	300	240	
10	None	60	1	300	240	
11	None	60	1	300	240	
12	None	60	1	300	240	
13	None	60	1	300	240	
14	None	60	1	300	240	
15	None	60	1	300	240	
16	None	60	1	300	240	

User Program Info

Pgrm	Description
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	

Pgrm	Description
17	
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	
29	

14	
15	
16	

30	
31	
32	

SIGNAL PLAN
124TH AVENUE AT LEVETON DRIVE
WORK CHANGE DIRECTIVE NO. 1

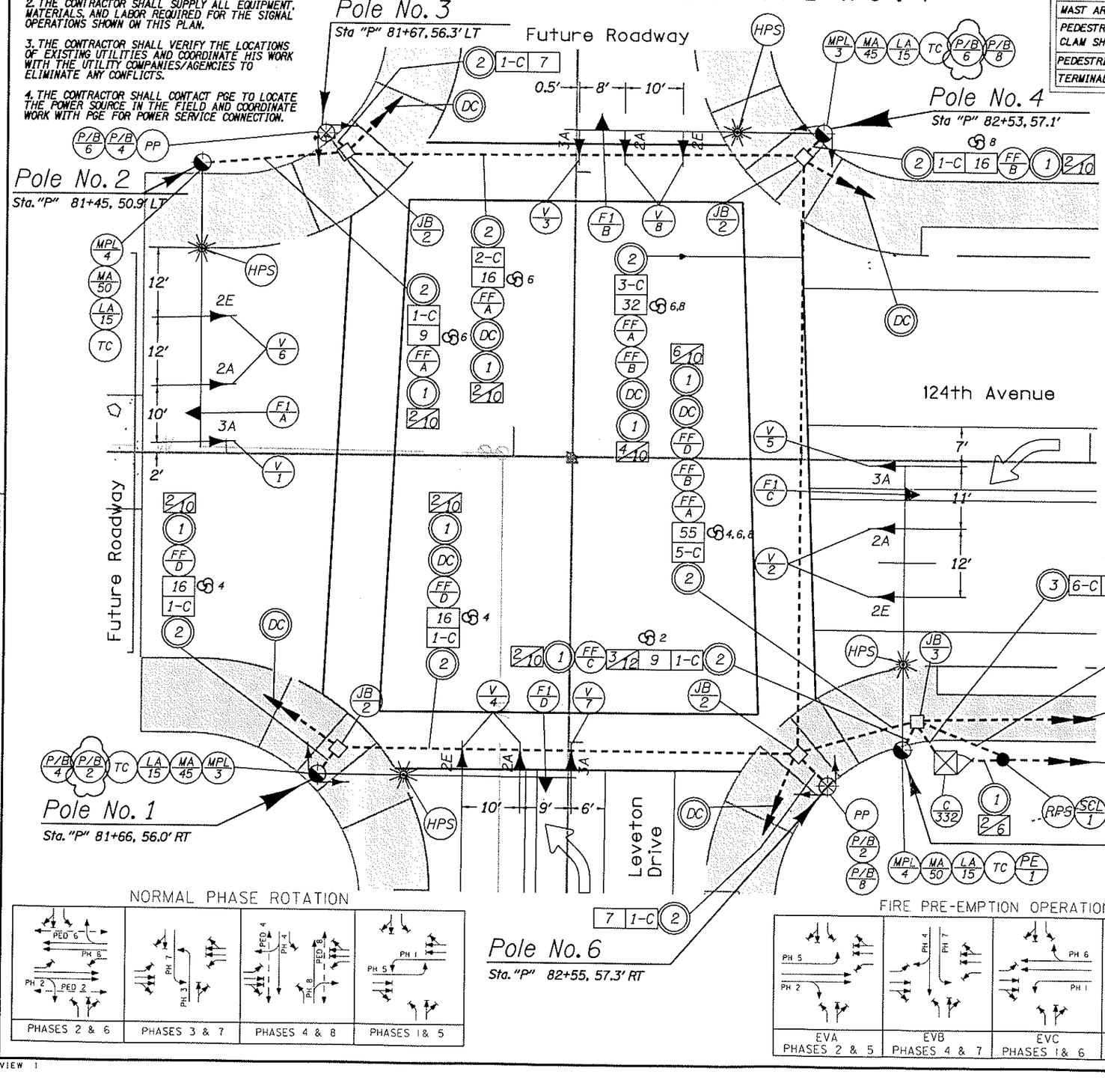
GENERAL NOTES:

1. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE 1996 OREGON DEPARTMENT OF TRANSPORTATION (ODOT) STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION AND THE ODOT STANDARD DRAWINGS.

2. THE CONTRACTOR SHALL SUPPLY ALL EQUIPMENT, MATERIALS, AND LABOR REQUIRED FOR THE SIGNAL OPERATIONS SHOWN ON THIS PLAN.

3. THE CONTRACTOR SHALL VERIFY THE LOCATIONS OF EXISTING UTILITIES AND COORDINATE HIS WORK WITH THE UTILITY COMPANIES/AGENCIES TO ELIMINATE ANY CONFLICTS.

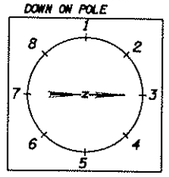
4. THE CONTRACTOR SHALL CONTACT PGE TO LOCATE THE POWER SOURCE IN THE FIELD AND COORDINATE WORK WITH PGE FOR POWER SERVICE CONNECTION.



POLE ENTRANCE CHART

POLE NUMBER	1	2	3	4	5	6
LUMINARE ARM	3	5	-	7	1	-
MAST ARM	3	5	-	7	1	-
PEDESTRIAN SIGNAL CLAM SHELL	5,7	-	1,7	1,3	-	3,5
PEDESTRIAN PB/DECAL	1,3	-	3,5	5,7	-	1,7
TERMINAL CABINET	7	1	-	3	5	-

ORIENTATION LOOKING DOWN ON POLE

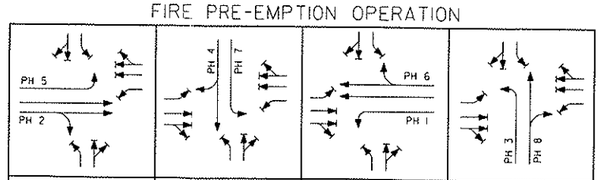


ABBREVIATIONS:

T = Type shown
Ph = Phase shown
N = Number shown
H = Height shown
L = Length shown
S = Size shown
G = AWG size shown
Ch = Channel shown
A = Standard plumbizer
E = Elevator plumbizer
X = Number of cables shown

NORMAL PHASE ROTATION

FIRE PRE-EMPTION OPERATION



CH2MHILL
L E G E N D

- (C/332) Install model 170 controller in model 332 cabinet with riser frame, orient front(louvered) door as shown
- (MPL/T) Install type (T) standard traffic signal mast arm pole with luminaire pole extension (40 ft. mounting ht.)
- (MA/L) Install (L) feet traffic signal mast arm
- (LA/L) Install (L) feet luminaire arm
- (PP) Install pedestrian signal pedestal
- (RPS) Install remote power service post
- (HPS) Install 400 watt high pressure sodium luminaire, type M-N-IV, 120, 208, 240, 277 multi-volt mag-regulator ballast
- (PE/1) Install photoelectric cell on pole (20' – 35' above pole base)
- (TC) Install terminal cabinet
- (SCL/1) Install service cabinet, 120 volt, for both signal and illumination circuits
- (MS/1) Install 120 volt meter base
- (V/Ph) Install phase (Ph) vehicle signal with LED's
  2 = 12" R, 12" Y, 12" G
  3 = 12" RLTA, 12" YLTA, 12" GLTA
- (Ph) Includes 3 spare wires for phase (Ph) as per table
- (P/B Ph) Install phase (Ph) pedestrian signal with LED's, pushbutton and instruction decal
- (JB/2) Install 22" x 12" x 12" (min. dimension) precast concrete junction box
- (JB/2A) Install 22" x 12" x 12" (min. dimension) precast concrete junction box with concrete apron
- (JB/3) Install 30" x 17" x 12" (min. dimension) precast concrete junction box with concrete apron
- (S) Install (S) inch electrical conduit
- (DC) Detector conduit (See Detector Plan)
- (IC) Interconnect conduit (See Interconnect Plan)
- (W) Install conduit and wire as required by power company
- (N-C) Install (N) No. 8 type THWN (Signal system common)
- (N) Install (N) No. 14 type THWN wires
- (N/G) Install (N) No. (G) type THWN wires
- (FF/Ch) Install channel (Ch) fire pre-emption detector feeder cable
- (EN/Ch) Install channel(Ch), (N) barrel fire pre-emption detector unit

0 10 20 30 40 50
FEET

Revised June 30, 1999

SIGNAL PLANS & DETAILS

The Contract Document Drawings are the printed documents dated May 1999 as subsequently officially amended, which define the scope, extent, and character of the work. This originally issued Contract Document Drawing was sealed and signed by Belying Wang P.E. No. 17,847

Jennifer Ringert - Designed
Gary D. Gray - Drafter
Belying Wang - Checked

S.W. 124TH AVENUE / S.W. LEVETON DRIVE
TRAFFIC SIGNAL PLAN
S.W. 124TH AVE. AND W. LEVETON DRIVE
WASHINGTON COUNTY

TUALATIN DEVELOPMENT COMMISSION

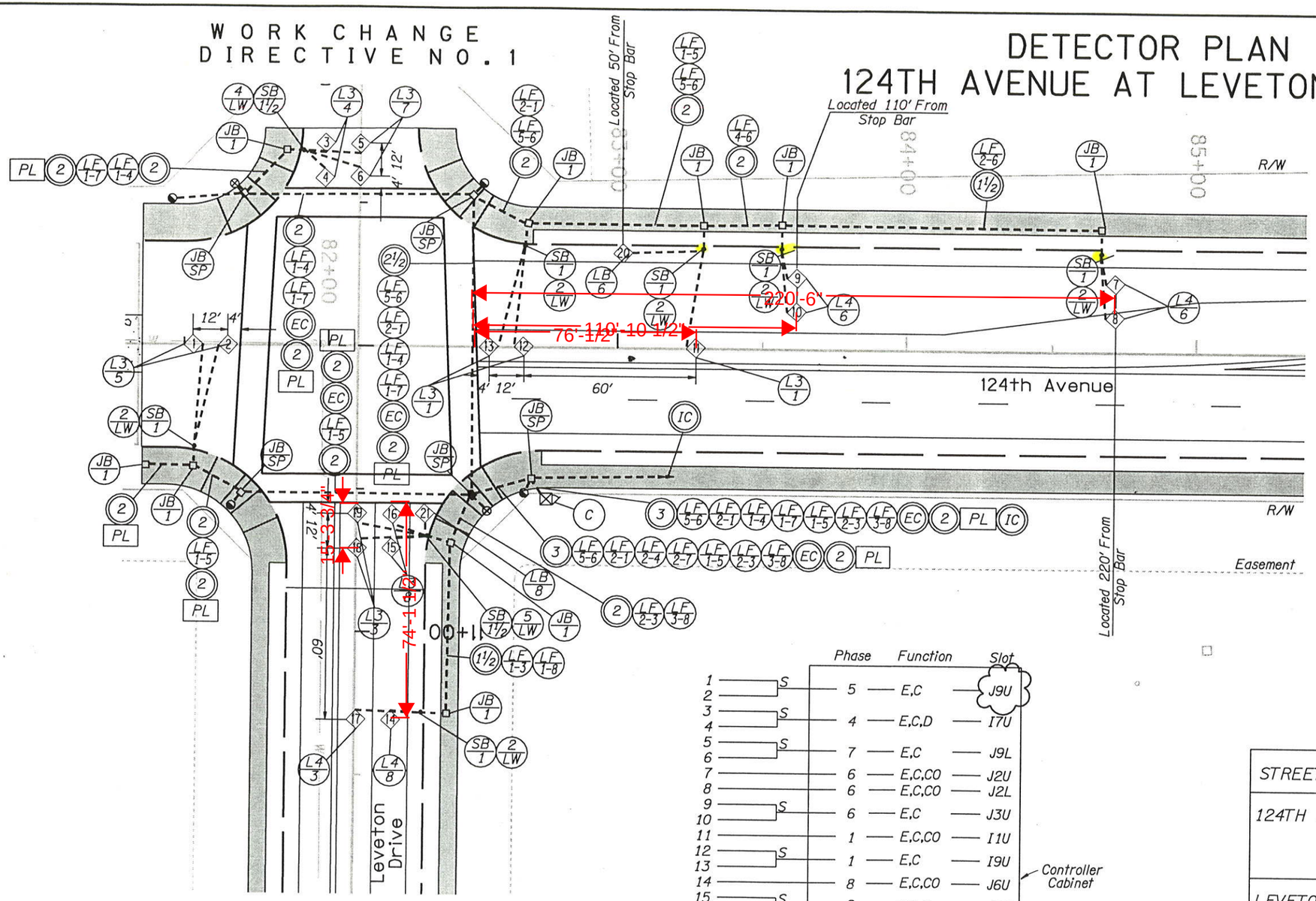
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VIEW 1

WORK CHANGE DIRECTIVE NO. 1

DETECTOR PLAN
124TH AVENUE AT LEVETON DRIVE

CH2MHILL



LEGEND

C	Controller (See Signal Plan)
S	Install (S) inch electrical conduit
EC	Electrical conduit (See Signal Plan)
IC	Interconnect conduit (See Interconnect Plan)
LB Ph	Install phase (Ph) 2½FT. diamond bicycle detector loop
L3 Ph	Install phase (Ph) 3 FT. diamond vehicle detector loop
L4 Ph	Install phase (Ph) 4 FT. diamond vehicle detector loop
LF X-Ph	Install (X) phase (Ph) loop feeder cables
N LW	Install (N) pair of loop wires
SB S	Install 4" x4" x4" galv. cast iron street box with (S) inch conduit to junction box
JB 1	Install 17" x 10" x 12" (min. dimension) precast concrete junction box
JB 1A	Install 17" x 10" x 12" (min. dimension) precast concrete junction box with concrete apron
JB SP	Junction box (See Signal Plan)
PL	Install poly pull line (1 kn min-strength)

ABBREVIATIONS:
PH= Phase Shown
S = Size Shown
X = Number Of Cables Shown
N = Number Shown

Phase	Function	Slot
1 S 2	5 — E,C	J9U
3 S 4	4 — E,C,D	I7U
5 S 6	7 — E,C	J9L
7	6 — E,C,CO	J2U
8	6 — E,C,CO	J2L
9 S 10	6 — E,C	J3U
11	1 — E,C,CO	I1U
12 S 13	1 — E,C	I9U
14	8 — E,C,CO	J6U
15 S 16	8 — E,C,D	J7U
17	3 — E,C,CO	I5U
18 S 19	3 — E,C	I9L
20	6 — E	J3L
21	8 — E,C	J7L*

Controller Cabinet

* PROGRAM TRANSFER CALL TO J8U

POSTED APPROACH SPEEDS

STREET	APPROACH	POSTED SPEED
124TH AVENUE	NORTHBOUND	35 MPH
	SOUTHBOUND	35 MPH
LEVETON DRIVE	WESTBOUND	35 MPH

N

0 20 40 60 80 100
FEET

Revised June 30, 1999

GENERAL NOTES:

1. All Loops Are To Be Individually Wound Clockwise And Series Wired At Junction Boxes Or Controller, As Shown On The Loop Detector Wiring Diagram.
2. All Detector Loops Shall Be Located In The Center Of The Lane Unless Otherwise Indicated On The Detector Plan.
3. All Materials And Workmanship Shall Conform To The 1996 Oregon Department Of Transportation (ODOT) Standard Specifications For Highway Construction And The ODOT Standard Drawings And Special Provisions.

LOOP DETECTOR WIRING DIAGRAM

S = Series, E=Extension, C=Call, CO=Carry-over, D=Delay
See T.E.S. Drwg. No. TM408 for loop detector details
Center all loops in travel lanes or as shown on plan

STATE is using cold mix, epoxy boxes.

TRAFFIC ENGINEER	S.W. 124TH AVENUE / S.W. LEVETON DRIVE DETECTOR PLAN S.W. 124TH AVE. AND W. LEVETON DRIVE WASHINGTON COUNTY
The Contract Document Drawings are the printed documents dated May 1999 as subsequently officially amended, which define the scope, extent, and character of the work. This originally issued Contract Document Drawing was sealed and signed by Beiying Wang P.T.E. No. 17,047	TUALATIN DEVELOPMENT COMMISSION
	SHEET NO. 15A

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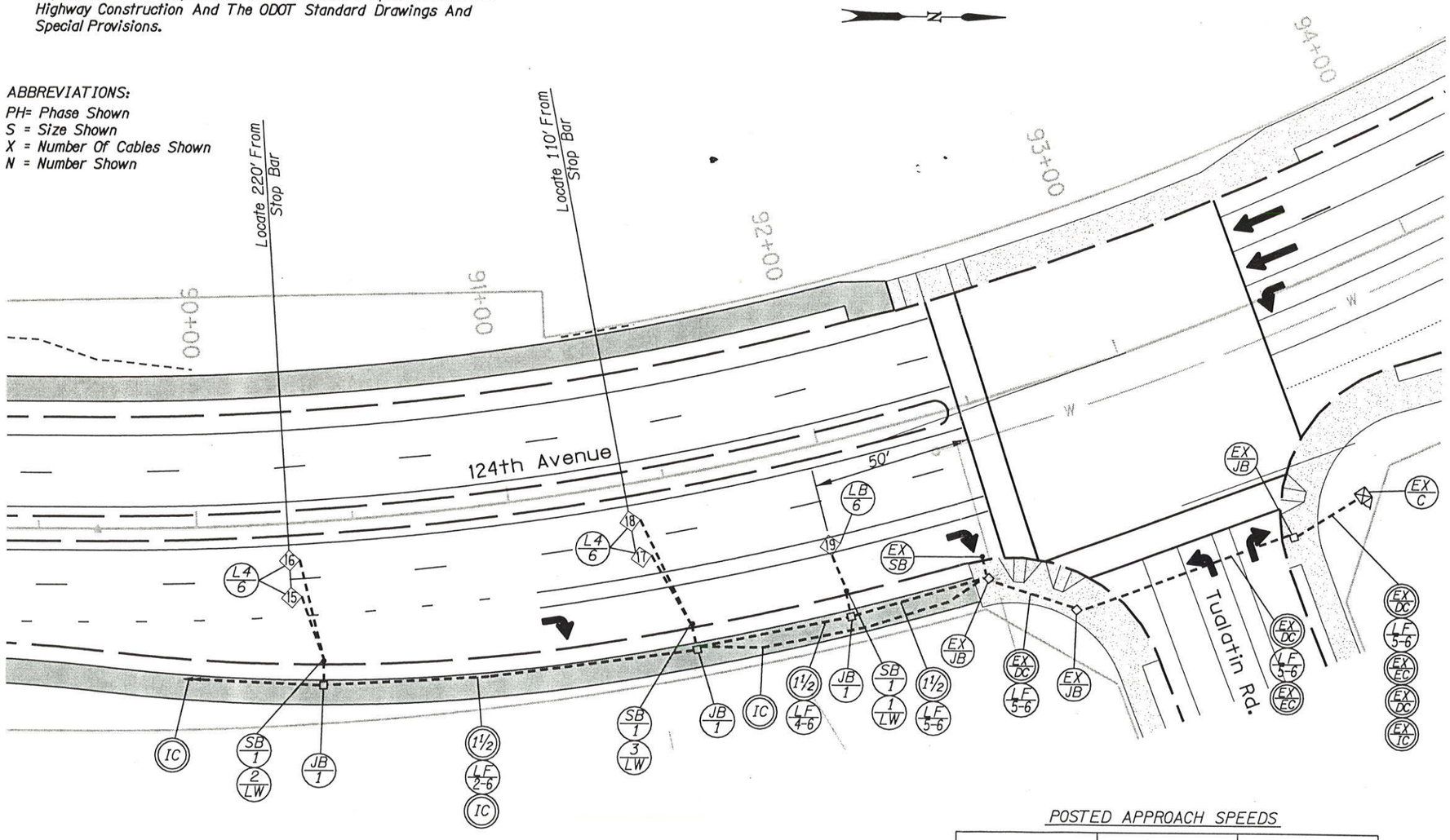
VIEW 1

CH2MHILL

DETECTOR PLAN
124TH AVENUE AT TUALATIN ROAD

GENERAL NOTES:
1. All Loops Are To Be Individually Wound Clockwise And Series Wired At Junction Boxes Or Controller, As Shown On The Loop Detector Wiring Diagram.
2. All Detector Loops Shall Be Located In The Center Of The Lane Unless Otherwise Indicated On The Detector Plan.
3. All Materials And Workmanship Shall Conform To The 1996 Oregon Department Of Transportation (ODOT) Standard Specifications For Highway Construction And The ODOT Standard Drawings And Special Provisions.

ABBREVIATIONS:
PH= Phase Shown
S = Size Shown
X = Number Of Cables Shown
N = Number Shown



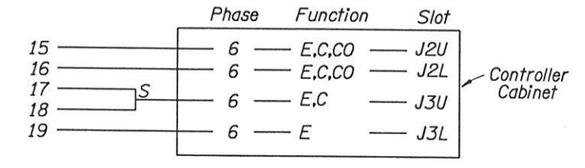
0 20 40 60 80 100
FEET

POSTED APPROACH SPEEDS

STREET	APPROACH	POSTED SPEED
124TH AVENUE	NORTHBOUND	35 MPH
	SOUTHBOUND	35 MPH
TUALATIN ROAD	WESTBOUND	35 MPH

LEGEND

- C — Controller (See Signal Plan)
- S — Install (S) inch electrical conduit
- IC — Interconnect conduit (See Interconnect Plan)
- L3/Ph — Install phase (Ph) 3 FT. diamond vehicle detector loop
- L4/Ph — Install phase (Ph) 4 FT. diamond vehicle detector loop
- LF/X-Ph — Install (X) phase (Ph) loop feeder cables
- N/LW — Install (N) pair of loop wires
- SB/S — Install 4" x4" x4" galv. cast iron street box with (S) inch conduit to junction box
- JB/1 — Install 17" x 10" x 12" (min. dimension) precast concrete junction box
- JB/1A — Install 17" x 10" x 12" (min. dimension) precast concrete junction box with concrete apron
- JB/SP — Junction box (See Signal Plan)
- EX/JB — Retain and protect existing junction box
- EX/C — Retain and protect existing Model 170 controller and Model 332 cabinet
- EX/EC — Retain and protect existing electrical conduit
- EX/DC — Retain and protect existing detector conduit
- EX/IC — Retain and protect existing interconnect conduit
- EX/SB — Retain and protect existing galv. cast iron street box with 1" conduit to junction box



LOOP DETECTOR WIRING DIAGRAM

S = Series, E=Extension, C=Call, CO=Carry-over, D=Delay
See T.E.S. Drwg. No. TM408 for loop detector details
Center all loops in travel lanes or as shown on plan

Cold mix in Epoxy Boxes ?

TRAFFIC ENGINEER
OREGON PROFESSIONAL ENGINEER PE 17647 Benjamin Wang 1994 REGISTERED
Exp. 6/30/00
4/30/99

S.W. 124TH AVENUE / S.W. LEVETON DRIVE
DETECTOR PLAN
S.W. 124TH AVE. AND TUALATIN ROAD
WASHINGTON COUNTY

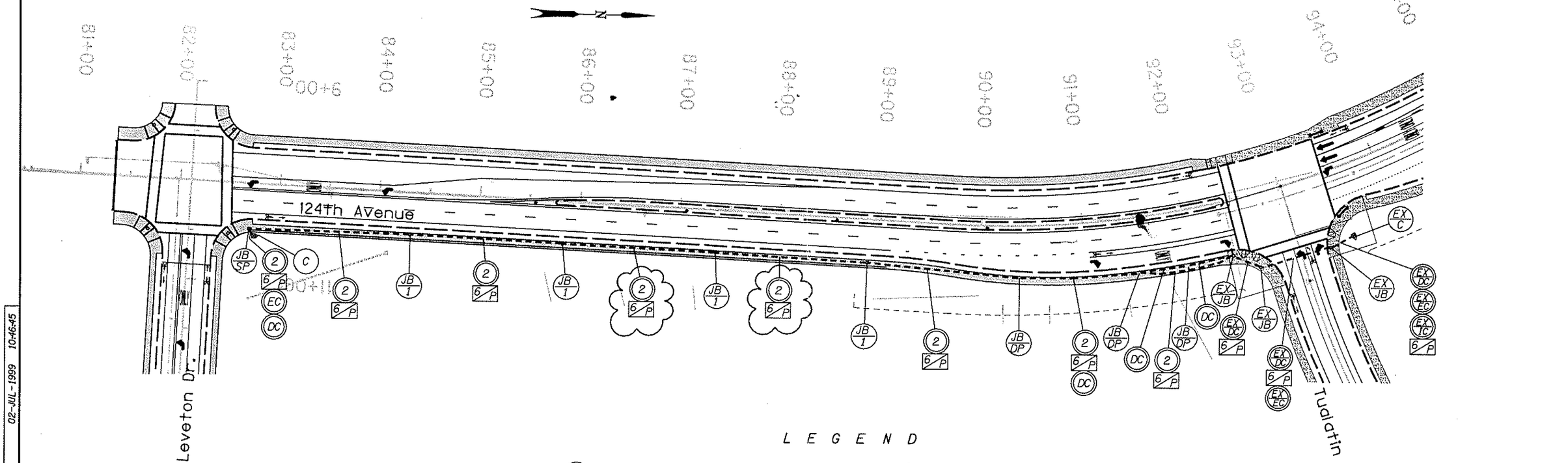
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VIEW 1

CH2MHILL

INTERCONNECT PLAN
124TH AVENUE AT LEVETON DRIVE
WORK CHANGE DIRECTIVE NO. 1



GENERAL NOTES

1. All Material And Workmanship Shall Conform To The 1996 Standard Specifications For Highway Construction Of The Oregon Department Of Transportation And The Special Provisions.
2. All Electrical Equipment Shall Conform To The Current Standards Of the National Electrical Manufacturers Association (NEMA) And The Underwriters Laboratories, Inc. (U.L.). Wherever Applicable. In Addition To The Requirements Of All The Plans, Standars Specifications, And The Special Provisions, All Materials and Workmanship Shall Conform To The Current Requirements Of The National Electrical Code (NEC) The National Electrical Safety Code, Standards Of The American National Standards Institute (ANSI), And Any Local Ordinances Which May Apply.
3. Location Of Interconnect Conduits And Junction Boxes Are Approximate. Contractor Shall Coordinate With Other Utilities To Proper Installation.
4. Rigid Non-metallic Electrical Conduit Shall Be Acceptable For Interconnect Conduit

L E G E N D

- (C) Controller (See Signal Plan)
- (S) Install (S) inch electrical conduit
- (DC) Detector conduit (See Detector Plan)
- (EC) Electrical conduit (See Signal Plan)
- (JB/1) Install 17" x 10" x 12" (min. dimension) precast concrete junction box
- (JB/1A) Install 17" x 10" x 12" (min. dimension) precast concrete junction box with concrete apron
- (JB/SP) Junction box (See Signal Plan)
- (JB/DP) Junction box (See Detector Plan)
- (EX/JB) Retain and protect existing junction box
- (EX/EC) Retain and protect existing electrical conduit
- (EX/DC) Retain and protect existing detector conduit
- (EX/TC) Retain and protect existing interconnect conduit
- (N/G) Install (N) No. (G) type THWN wires
- (EX/C) Retain and protect existing controller and cabinet

0' 50' 100' 150'

Revised June 30, 1999

TRAFFIC ENGINEER

The Contract Document Drawings are the printed documents dated May 1999 as subsequently officially amended, which define the scope, extent, and character of the work. This originally issued Contract Document Drawing was sealed and signed by Beiying Wang P.T.E. No. 17,047

S.W. 124TH AVENUE / S.W. LEVETON DRIVE
SYSTEM INTERCONNECT PLAN
124th AVE. @ LEVETON DR.
WASHINGTON COUNTY

TUALATIN DEVELOPMENT COMMISSION

SHEET NO. 15C

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VIEW 1

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11/6/13 Timing Changes

W4IKS Table 1 Page 0
Date: Wednesday, February 06, 2013 Time: 07:36 AM
Intersection #139 124th @ Leviton

(0+KEY)

FUNCTIONS	KEY	12345678
Veh Recall	0	_2___6__
Ped Recall	1	_____
Red Lock	2	_____
Yellow Lock	3	_____
Permit	4	12345678
Ped Phases	5	_2_4_6_8
Lead Phases	6	1_3_5_7_
Double Entry	7	___4___8
Sequential Timing	8	_____
Startup Green	9	_2___6__
Overlap A	A	12_____
Overlap B	B	_____
Overlap C	C	____56__
Overlap D	D	_____
Exclusive	E	_____
Simultaneous Gap	F	_2___6__

(PHASE+KEY)

FUNCTIONS	KEY	PH1	PH2	PH3	PH4	PH5	PH6	PH7	PH8
Max I	0	25	25	10	30	20	40	15	30
Max II	1	25	25	10	30	20	40	15	30
Walk	2	0	7	0	8 X	0	7	0	8 X
Flash DW	3	0	~~17~~ 14	0	~~20~~ 23	0	~~16~~ 14	0	23
Max Initial	4	0	0	0	0	5	0	0	0
Min Green	5	8	~~12~~ 10	7	6	5	~~12~~ 10	4	6
TBR	6	0	0	0	0	0	0	0	0
TTR	7	0	0	0	0	0	0	0	0
Observe Gap	8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Passage	9	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Min Gap	A	1.0	3.0	1.0	1.0	1.0	3.0	1.0	1.0
Added Actuation	B	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Yellow	C	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Red Clear	D	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Revert	E	5.0	5.0	5.0	5.0	0.0	5.0	5.0	5.0
Walk II	F	0	0	0	0	0	0	0	0

W4IKS Table 1 Page 1
Date: Wednesday, February 06, 2013 Time: 07:36 AM
Intersection #139 124th @ Leviton

(D+C+0+KEY)

FUNCTIONS	KEY	12345678
Veh Recall	0	_____
Ped Recall	1	_____
Red Lock	2	_____
Yellow Lock	3	_____
Permit	4	_____
Ped Phases	5	_____
Lead Phases	6	_____
Double Entry	7	_____
Sequential Timing	8	_____
Startup Green	9	_____
Overlap A	A	_____
Overlap B	B	_____
Overlap C	C	_____
Overlap D	D	_____
Exclusive	E	_____
Simultaneous Gap	F	_____

(D+C+PHASE+KEY)

FUNCTIONS	KEY	PH1	PH2	PH3	PH4	PH5	PH6	PH7	PH8
Max I	0	0	0	0	0	0	0	0	0
Max II	1	0	0	0	0	0	0	0	0
Walk	2	0	0	0	0	0	0	0	0
Flash DW	3	0	0	0	0	0	0	0	0
Max Initial	4	0	0	0	0	0	0	0	0
Min Green	5	0	0	0	0	0	0	0	0
TBR	6	0	0	0	0	0	0	0	0
TTR	7	0	0	0	0	0	0	0	0
Observe Gap	8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Passage	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Min Gap	A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Added Actuation	B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Clear	D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	E	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Walk II	F	0	0	0	0	0	0	0	0

W4IKS Table 1 Page 2
Date: Wednesday, February 06, 2013 Time: 07:36 AM
Intersection #139 124th @ Leviton

(D+D+0+KEY)

FUNCTIONS	KEY	12345678
Veh Recall	0	_____
Ped Recall	1	_____
Red Lock	2	_____
Yellow Lock	3	_____
Permit	4	_____
Ped Phases	5	_____
Lead Phases	6	_____
Double Entry	7	_____
Sequential Timing	8	_____
Startup Green	9	_____
Overlap A	A	_____
Overlap B	B	_____
Overlap C	C	_____
Overlap D	D	_____
Exclusive	E	_____
Simultaneous Gap	F	_____

(D+D+PHASE+KEY)

FUNCTIONS	KEY	PH1	PH2	PH3	PH4	PH5	PH6	PH7	PH8
Max I	0	0	0	0	0	0	0	0	0
Max II	1	0	0	0	0	0	0	0	0
Walk	2	0	0	0	0	0	0	0	0
Flash DW	3	0	0	0	0	0	0	0	0
Max Initial	4	0	0	0	0	0	0	0	0
Min Green	5	0	0	0	0	0	0	0	0
TBR	6	0	0	0	0	0	0	0	0
TTR	7	0	0	0	0	0	0	0	0
Observe Gap	8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Passage	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Min Gap	A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Added Actuation	B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Clear	D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	E	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Walk II	F	0	0	0	0	0	0	0	0

ENGLISH

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION PLANNING/TRAFFIC ENGINEERING

LEGEND

CONTROLLERS

EX C — Retain and protect existing 332 cabinet

POLES

EX MP — Retain and protect existing traffic signal mast arm pole

EX MPL — Retain and protect existing traffic signal mast arm pole with luminaire arm extension

EX MA — Retain and protect existing traffic signal mast arm

EX LA — Retain and protect existing luminaire arm

RR PP — Remove and relocate existing pedestrian signal pedestal with frangible base

RI PP — Remove and relocate existing pedestrian signal pedestal with frangible base

SIGNALS

EX VPh — Retain and protect existing phase (Ph=phase) vehicle signal

EX P/B — Retain and protect existing pedestrian signal, pushbutton and instructions

V Ph — Install phase (Ph=phase) vehicle signal

RR VPh — Remove and relocate existing phase (Ph=phase) vehicle signal

RR P/B — Remove and relocate existing pedestrian signal, pushbutton and instructions

RI VPh — Reinstall existing phase (Ph=phase) vehicle signal

RI P/B — Reinstall existing pedestrian signal, pushbutton and instructions

SIGNS

EX AL — Retain and protect existing aluminum sign

EX SNS — Retain and protect existing street name sign

LEGEND CONTINUED

CABINETS

EX RPS — Retain and protect existing remote power source

EX SC — Retain and protect existing service cabinet

EX MS — Retain and protect existing meter base

EX TC — Retain and protect existing terminal cabinet

JUNCTION BOXES

EX JB — Retain and protect existing junction box

RX JB — Remove existing junction box

JB 2 — Install 22"x12"x12" (min. dimension) precast concrete junction box

JB 3A — Install 30"x17"x12" (min. dimension) precast concrete junction box with concrete apron

VIDEO DETECTION

VDZ PH — Video detection zone for phase (PH).

EX VDC — Retain and protect existing video detection camera

WIRES

EX W — Retain and protect existing wiring

RX W — Remove existing wiring

RI W — Reinstall existing wiring

#-12C — Install (N=number) No. 12 type THWN (Pedestrian signal system common)

N/G — Install (N=number) No. (G=AWG wire size) type THWN wires

LEGEND CONTINUED

CONDUITS

EX EC — Retain and protect existing electrical conduit

AX EC — Abandon existing electrical conduit

S — Install (S=size) inch electrical conduit

IC — Interconnect conduit (See Interconnect Plan)

CJ — Splice new electrical conduit to existing electrical conduit

FIRE PREEMPTION

EX FD — Retain and protect existing fire preemption detector

MISCELLANEOUS

EX HPS — Retain and protect existing high pressure sodium luminaire

EX PE — Retain and protect existing photoelectric control

CW — Install crosswalk closure barricades with signs (both sides of barricade)

SIGNAL MOUNTING OPTIONS
B = Adjustable bracket assembly w/rain cap(s) (install 1" metallic chase nipple in lieu of tenon when required for wiring)

SIGNAL HEAD TYPES
2 = 12" R, 12" Y, 12" G
6L = 12" GLTA, 12" YLTA, 12" FYLTA, 12" GLTA

6L = 

CONSTRUCTION NOTES:

1. Remove existing wiring for existing pedestrian post. Retain all other existing wiring.
2. Install 4-#14 wires to operate the Eastbound left-turn signal.
3. Intercept existing conduit and install junction box. Relocate existing wiring into new conduit as shown. Abandon existing unused conduit.
4. Replace existing controller unit with a new 2070L unit.
5. Terminate phase 5 flashing yellow indication to phase 6 pedestrian yellow switchpack output. Terminate Conflict Monitor channel 11 (pin 5) wire to Output File terminal 120.
6. Re-establish telephone connection with local company after completion of utility pole relocation.

REGISTERED PROFESSIONAL ENGINEER
19283PE
OREGON
JULY 17, 1997
CHARLES W RADOSTA
8/27/08
EXPIRES 12/31/08

TUALATIN DEVELOPMENT COMMISSION

S.W. HERMAN RD. - S.W. 124TH AVE. TO S.W. TETON AVE.
WASHINGTON COUNTY

Reviewed By - C. Radosta
Designed By - C. Tiesler
Drafted By - J. Henriksen

SW HERMAN RD/SW 108TH AVE
LEGEND SHEET

SHEET NO. TS-11

$DATE$ $FILE$ $TIME$ $FILEABBREV$ $USER$

ENGLISH

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION PLANNING/TRAFFIC ENGINEERING

59+00

60+00

61+00

SW 108TH AVE

HR.

SW HERMAN ROAD

P&W RR

POLE #C3
"HR" 60+14
47' LT

EX. POLE #C2

EX. POLE #C1

EX. POLE #C4

0 10 20 30
Scale In Feet

N

REGISTERED PROFESSIONAL ENGINEER
19283PE
OREGON
JULY 17, 1997
CHARLES W RADOSTA
EXPIRES 12/31/08
8/27/08

TUALATIN DEVELOPMENT COMMISSION

S.W. HERMAN RD. - S.W. 124TH AVE. TO S.W. TETON AVE.

WASHINGTON COUNTY

Reviewed By - C. Radosta
Designed By - C. Tiesler
Drafted By - J. Henriksen

SW HERMAN RD/SW 108TH AVE SIGNAL PLAN

SHEET NO. TS-12

$DATE$ $FILE$ $TIME$ $FILEABBREV$ $USER$

ENGLISH

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION PLANNING/TRAFFIC ENGINEERING

TYPICAL VIDEO DETECTION ZONE PLACEMENT

VIDEO DETECTION WIRING DIAGRAM

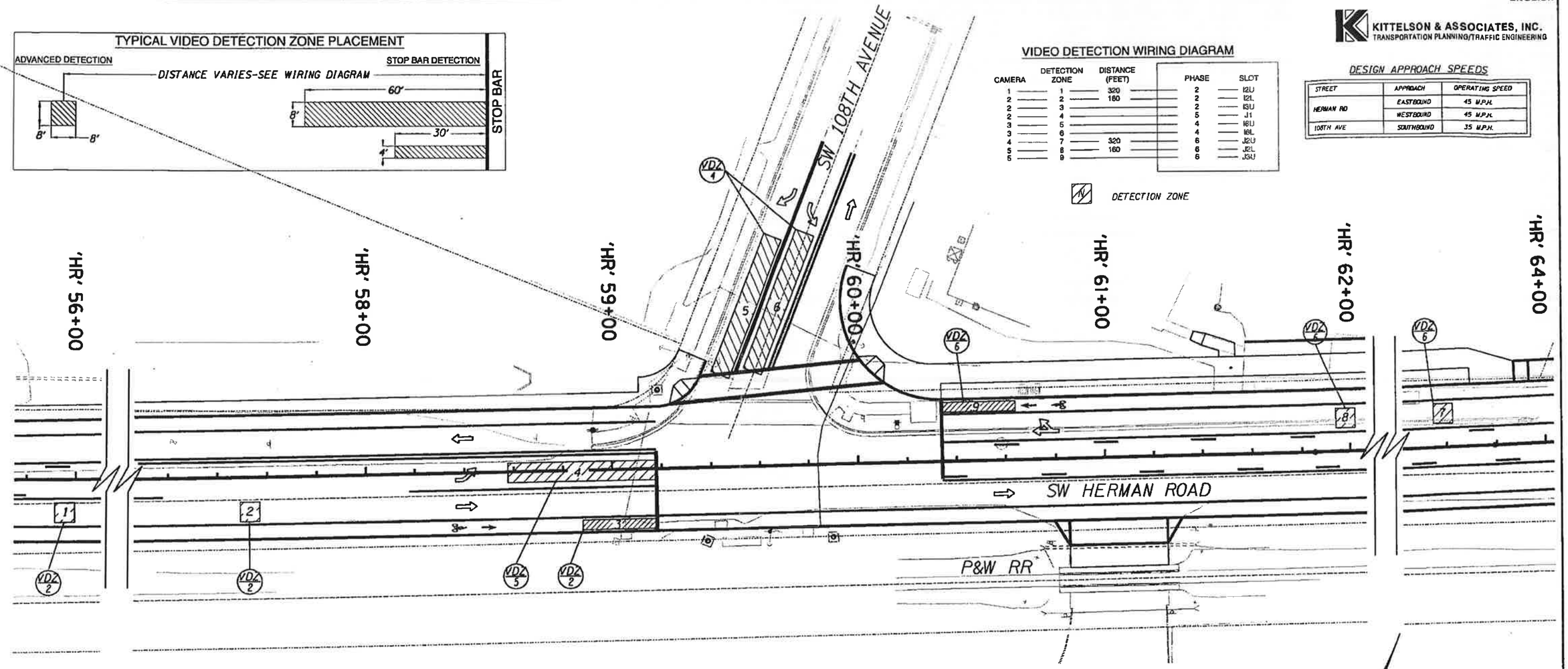
CAMERA	DETECTION ZONE	DISTANCE (FEET)
1	1	320
2	2	160
2	3	
2	4	
3	5	
3	6	
4	7	320
5	8	160
5	9	

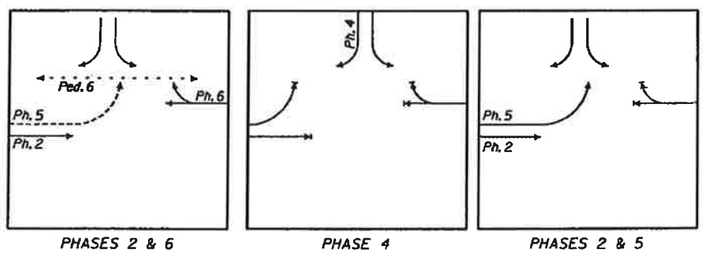
PHASE	SLOT
2	I2U
2	I2L
2	I3U
5	J1
4	I6U
4	I6L
6	J2U
6	J2L
6	J3U

DETECTION ZONE

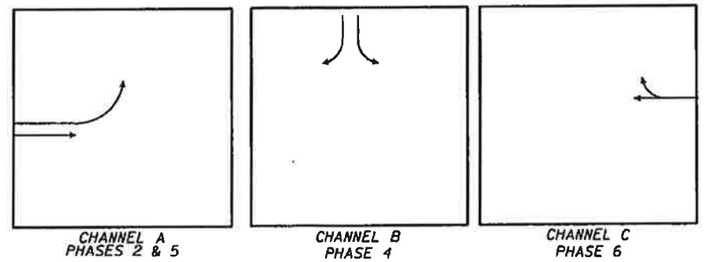
DESIGN APPROACH SPEEDS

STREET	APPROACH	OPERATING SPEED
HERMAN RD	EASTBOUND	45 M.P.H.
	WESTBOUND	45 M.P.H.
108TH AVE	SOUTHBOUND	35 M.P.H.





NORMAL PHASE ROTATION



FIRE PREEMPTION DIAGRAM

REGISTERED PROFESSIONAL ENGINEER
19283PE
OREGON
JULY 17, 1997
CHARLES W RADOSTA
5/27/08
EXPIRES 12/31/08

TUALATIN DEVELOPMENT COMMISSION

S.W. HERMAN RD. - S.W. 124TH AVE. TO S.W. TETON AVE.

WASHINGTON COUNTY

Reviewed By - C. Radosta
Designed By - C. Tiesler
Drafted By - J. Henriksen

SW HERMAN RD/SW 108TH AVE DETECTOR PLAN

SHEET NO. TS-13

$DATE$ $FILE$ $TIME$ $FILEABBREV$ $USER$

W4IKS Table 1 Page 0
Date: Wednesday, July 25, 2012 Time: 09:52 AM
Intersection #125 HERMAN RD @ 108TH

(0+KEY)

FUNCTIONS	KEY	12345678
Veh Recall	0	_2___6__
Ped Recall	1	________
Red Lock	2	________
Yellow Lock	3	________
Permit	4	_2_456__
Ped Phases	5	_____6__
Lead Phases	6	_2_4_6__
Double Entry	7	_2___6__
Sequential Timing	8	________
Startup Green	9	_2___6__
Overlap A	A	________
Overlap B	B	________
Overlap C	C	____56__
Overlap D	D	________
Exclusive	E	________
Simultaneous Gap	F	_2___6__

(PHASE+KEY)

FUNCTIONS	KEY	PH1	PH2	PH3	PH4	PH5	PH6	PH7	PH8
Max I	0	0	45	0	30	10	45	0	0
Max II	1	0	45	0	30	10	45	0	0
Walk	2	0	0	0	0	0	7	0	0
Flash DW	3	0	0	0	0	0	12	0	0
Max Initial	4	0	0	0	0	0	0	0	0
Min Green	5	0	5	0	5	5	10	0	0
TBR	6	0	10	0	5	5	10	0	0
TTR	7	0	15	0	10	5	15	0	0
Observe Gap	8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Passage	9	0.0	3.1	0.0	2.6	2.0	3.1	0.0	0.0
Min Gap	A	0.0	1.1	0.0	1.0	1.1	1.1	0.0	0.0
Added Actuation	B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	C	0.0	4.0	0.0	4.0	4.0	4.0	0.0	0.0
Red Clear	D	0.0	1.4	0.0	2.5	1.4	1.4	0.0	0.0
Red Revert	E	0.0	5.0	0.0	5.0	5.0	5.0	0.0	0.0
Walk II	F	0	0	0	0	0	0	0	0

W4IKS Table 1 Page 1
Date: Wednesday, July 25, 2012 Time: 09:52 AM
Intersection #125 HERMAN RD @ 108TH

(D+C+0+KEY)

FUNCTIONS	KEY	12345678
Veh Recall	0	________
Ped Recall	1	________
Red Lock	2	________
Yellow Lock	3	________
Permit	4	________
Ped Phases	5	________
Lead Phases	6	________
Double Entry	7	________
Sequential Timing	8	________
Startup Green	9	________
Overlap A	A	________
Overlap B	B	________
Overlap C	C	________
Overlap D	D	________
Exclusive	E	________
Simultaneous Gap	F	________

(D+C+PHASE+KEY)

FUNCTIONS	KEY	PH1	PH2	PH3	PH4	PH5	PH6	PH7	PH8
Max I	0	0	0	0	0	0	0	0	0
Max II	1	0	0	0	0	0	0	0	0
Walk	2	0	0	0	0	0	0	0	0
Flash DW	3	0	0	0	0	0	0	0	0
Max Initial	4	0	0	0	0	0	0	0	0
Min Green	5	0	0	0	0	0	0	0	0
TBR	6	0	0	0	0	0	0	0	0
TTR	7	0	0	0	0	0	0	0	0
Observe Gap	8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Passage	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Min Gap	A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Added Actuation	B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Clear	D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	E	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Walk II	F	0	0	0	0	0	0	0	0

W4IKS Table 1 Page 2
Date: Wednesday, July 25, 2012 Time: 09:52 AM
Intersection #125 HERMAN RD @ 108TH

(D+D+0+KEY)

FUNCTIONS	KEY	12345678
Veh Recall	0	________
Ped Recall	1	________
Red Lock	2	________
Yellow Lock	3	________
Permit	4	________
Ped Phases	5	________
Lead Phases	6	________
Double Entry	7	________
Sequential Timing	8	________
Startup Green	9	________
Overlap A	A	________
Overlap B	B	________
Overlap C	C	________
Overlap D	D	________
Exclusive	E	________
Simultaneous Gap	F	________

(D+D+PHASE+KEY)

FUNCTIONS	KEY	PH1	PH2	PH3	PH4	PH5	PH6	PH7	PH8
Max I	0	0	0	0	0	0	0	0	0
Max II	1	0	0	0	0	0	0	0	0
Walk	2	0	0	0	0	0	0	0	0
Flash DW	3	0	0	0	0	0	0	0	0
Max Initial	4	0	0	0	0	0	0	0	0
Min Green	5	0	0	0	0	0	0	0	0
TBR	6	0	0	0	0	0	0	0	0
TTR	7	0	0	0	0	0	0	0	0
Observe Gap	8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Passage	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Min Gap	A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Added Actuation	B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Clear	D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	E	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Walk II	F	0	0	0	0	0	0	0	0

W4IKS Table 2 Page 0
Date: Wednesday, July 25, 2012 Time: 09:52 AM
Intersection #125 HERMAN RD @ 108TH

(9+KEY)

FUNCTIONS	KEY	VALUE
Short Power Down	0	0
Long Power Down	1	0
EVA Delay Type	2	1
EVB Delay Type	3	1
EVC Delay Type	4	1
EVD Delay Type	5	0
RR Delay Type	6	0
Ped Inhibit	7	0
OLA Green	8	0.0
OLA Yellow	9	0.0
OLB Green	A	0.0
OLB Yellow	B	0.0
OLC Green	C	0.0
OLC Yellow	D	0.0
OLD Green	E	0.0
OLD Yellow	F	0.0

(C+F+KEY)

FUNCTIONS	KEY	VALUE
Page ID	0	0
Future	1	0
Future	2	0
Future	3	0
OLA Red	4	0.0
OLB Red	5	0.0
OLC Red	6	0.0
OLD Red	7	0.0
Overlap E	8	
Overlap F	9	
Red Rest	A	
Max Recall	B	
Flash Green	C	
Flash Walk	D	
Advance Walk	E	
Restrictive Phase	F	

W4IKS Table 2 Page 1
Date: Wednesday, July 25, 2012 Time: 09:52 AM
Intersection #125 HERMAN RD @ 108TH

(D+C+9+KEY)

FUNCTIONS	KEY	VALUE
Short Power Down	0	0
Long Power Down	1	0
EVA Delay Type	2	0
EVB Delay Type	3	0
EVC Delay Type	4	0
EVD Delay Type	5	0
RR Delay Type	6	0
Ped Inhibit	7	0
OLA Green	8	0.0
OLA Yellow	9	0.0
OLB Green	A	0.0
OLB Yellow	B	0.0
OLC Green	C	0.0
OLC Yellow	D	0.0
OLD Green	E	0.0
OLD Yellow	F	0.0

(D+C+B+KEY)

FUNCTIONS	KEY	VALUE
Page ID	0	1
Future	1	0
Future	2	0
Future	3	0
OLA Red	4	0.0
OLB Red	5	0.0
OLC Red	6	0.0
OLD Red	7	0.0
Overlap E	8	
Overlap F	9	
Red Rest	A	
Max Recall	B	
Flash Green	C	
Flash Walk	D	
Advance Walk	E	
Restrictive Phase	F	

W4IKS Table 2 Page 2
Date: Wednesday, July 25, 2012 Time: 09:52 AM
Intersection #125 HERMAN RD @ 108TH

(D+D+9+KEY)

FUNCTIONS	KEY	VALUE
Short Power Down	0	0
Long Power Down	1	0
EVA Delay Type	2	0
EVB Delay Type	3	0
EVC Delay Type	4	0
EVD Delay Type	5	0
RR Delay Type	6	0
Ped Inhibit	7	0
OLA Green	8	0.0
OLA Yellow	9	0.0
OLB Green	A	0.0
OLB Yellow	B	0.0
OLC Green	C	0.0
OLC Yellow	D	0.0
OLD Green	E	0.0
OLD Yellow	F	0.0

(D+D+B+KEY)

FUNCTIONS	KEY	VALUE
Page ID	0	2
Future	1	0
Future	2	0
Future	3	0
OLA Red	4	0.0
OLB Red	5	0.0
OLC Red	6	0.0
OLD Red	7	0.0
Overlap E	8	
Overlap F	9	
Red Rest	A	
Max Recall	B	
Flash Green	C	
Flash Walk	D	
Advance Walk	E	
Restrictive Phase	F	

W4IKS Table 3
Date: Wednesday, July 25, 2012 Time: 09:52 AM
Intersection #125 HERMAN RD @ 108TH

(C+KEY)

FUNCTIONS	KEY	VALUE
Year	0	12
Month	1	7
Day of Month	2	24
Day of Week	3	4
Hour	4	9
Minute	5	47
Second	6	13
Reserved	7	4
Trigs On In Flash	8	0
Startup Yellow	9	
EVA Phases	A	2 5
EVB Phases	B	4 7
EVC Phases	C	1 6
EVD Phases	D	3 8
Handicap Ped	E	

(E+KEY)

FUNCTIONS	KEY	VALUE
EVA Delay	0	0
EVA Min	1	1
EVB Delay	2	0
EVB Min	3	1
EVC Delay	4	0
EVC Min	5	1
EVD Delay	6	0
EVD Min	7	1
OL Red Revert	8	5.0
RR Delay	9	0
RR Clear	A	0
RR Clear Phases	B	
RR Permit	C	
RR OL Permit	D	
NEMA Hold Phases	E	

W4IKS Table 4 Part 1
Date: Wednesday, July 25, 2012 Time: 09:52 AM
Intersection #125 HERMAN RD @ 108TH

(D+COL+KEY)

DETECTOR TYPE		DELAY				CARRYOVER			
COLUMN NUM		2		3		4		5	
FUNCTIONS	KEY	PH	TIME	PH	TIME	PH	TIME	PH	TIME
------	(1)0	1	0.0	5	10.0	1	0.0	5	0.0
Upper	(9)1	1	0.0	5	5.0	1	0.0	5	0.0
Upper	(2)2	2	0.0	6	0.0	2	2.0	6	2.0
Lower	(2)3	2	0.0	6	0.0	2	0.0	6	0.0
Upper	(3)4	2	0.0	6	0.0	2	0.0	6	0.0
Lower	(3)5		0.0		0.0	2	0.0	6	0.0
------	(4)6	2	0.0	6	0.0	2*	0.0	6*	0.0
------	(5)7	3	0.0	7	0.0	3	0.0	7	0.0
Lower	(9)8	3	0.0	7	0.0	3	0.0	7	0.0
Upper	(6)9	4	0.0	8	0.0	4	1.6	8	0.0
Lower	(6)A	4	0.0	8	0.0	4	0.0	8	0.0
Upper	(7)B	4	0.0	8	0.0	4	0.0	8	0.0
Lower	(7)C		0.0		0.0	4	0.0	8	0.0
------	(8)D	4	0.0	8	0.0	4*	0.0	8*	0.0
CABINET FILE		I		J		I		J	

Note: () = Slot Number * = Set Type 3 Detector

W4IKS Table 4 Part 2
Date: Wednesday, July 25, 2012 Time: 09:52 AM
Intersection #125 HERMAN RD @ 108TH

(D+9+4+KEY)

FUNCTIONS	KEY	VALUE
Detector Fail On	0	0
Detector Fail Off	1	0
Fail Det Backup	2	0
Max II In Delay	3	0
Max II In Carryover	4	0
Plan 9 In Delay	5	0
Plan 9 In Carryover	6	0
Plan 18 In Delay	7	0
Plan 18 In Carryover	8	0
TT Page 1 Delay	9	0
TT Page 1 Carryover	A	0
TT Page 2 Delay	B	0
TT Page 2 Carryover	C	0
NOVRAM	D	0
Computran	E	217
Release	F	0

(D+9+5+KEY)

FUNCTIONS	KEY	VALUE
DF 01 Min	0	0
DF 02 Min	1	0
DF 03 Min	2	0
DF 04 Min	3	0
DF 05 Min	4	0
DF 06 Min	5	0
DF 07 Min	6	0
DF 08 Min	7	0
DF 01 Max	8	0
DF 02 Max	9	0
DF 03 Max	A	0
DF 04 Max	B	0
DF 05 Max	C	0
DF 06 Max	D	0
DF 07 Max	E	0
DF 08 Max	F	0

W4IKS Table 5 Sheet 1
Date: Wednesday, July 25, 2012 Time: 09:52 AM
Intersection #125 HERMAN RD @ 108TH

(A+CODE)

EVENT	1234567	HR	MIN	FUNC	CODE	EVENT	1234567	HR	MIN	FUNC	CODE
1	_____	0	0	0	80-83	17	_____	0	0	0	C0-C3
2	_____	0	0	0	84-87	18	_____	0	0	0	C4-C7
3	_____	0	0	0	88-8B	19	_____	0	0	0	C8-CB
4	_____	0	0	0	8C-8F	20	_____	0	0	0	CC-CF
5	_____	0	0	0	90-93	21	_____	0	0	0	D0-D3
6	_____	0	0	0	94-97	22	_____	0	0	0	D4-D7
7	_____	0	0	0	98-9B	23	_____	0	0	0	D8-DB
8	_____	0	0	0	9C-9F	24	_____	0	0	0	DC-DF
9	_____	0	0	0	A0-A3	25	_____	0	0	0	E0-E3
10	_____	0	0	0	A4-A7	26	_____	0	0	0	E4-E7
11	_____	0	0	0	A8-AB	27	_____	0	0	0	E8-EB
12	_____	0	0	0	AC-AF	28	_____	0	0	0	EC-EF
13	_____	0	0	0	B0-B3	29	_____	0	0	0	F0-F3
14	_____	0	0	0	B4-B7	30	_____	0	0	0	F4-F7
15	_____	0	0	0	B8-BB	31	_____	0	0	0	F8-FB
16	_____	0	0	0	BC-BF	32	_____	0	0	0	FC-FF

W4IKS Table 5 Sheet 2
Date: Wednesday, July 25, 2012 Time: 09:52 AM
Intersection #125 HERMAN RD @ 108TH

(D+8+CODE)

EVENT	1234567	HR	MIN	FUNC	CODE	EVENT	1234567	HR	MIN	FUNC	CODE
33	_____	0	0	0	80-83	49	_____	0	0	0	C0-C3
34	_____	0	0	0	84-87	50	_____	0	0	0	C4-C7
35	_____	0	0	0	88-8B	51	_____	0	0	0	C8-CB
36	_____	0	0	0	8C-8F	52	_____	0	0	0	CC-CF
37	_____	0	0	0	90-93	53	_____	0	0	0	D0-D3
38	_____	0	0	0	94-97	54	_____	0	0	0	D4-D7
39	_____	0	0	0	98-9B	55	_____	0	0	0	D8-DB
40	_____	0	0	0	9C-9F	56	_____	0	0	0	DC-DF
41	_____	0	0	0	A0-A3	57	_____	0	0	0	E0-E3
42	_____	0	0	0	A4-A7	58	_____	0	0	0	E4-E7
43	_____	0	0	0	A8-AB	59	_____	0	0	0	E8-EB
44	_____	0	0	0	AC-AF	60	_____	0	0	0	EC-EF
45	_____	0	0	0	B0-B3	61	_____	0	0	0	F0-F3
46	_____	0	0	0	B4-B7	62	_____	0	0	0	F4-F7
47	_____	0	0	0	B8-BB	63	_____	0	0	0	F8-FB
48	_____	0	0	0	BC-BF	64	_____	0	0	0	FC-FF

W4IKS Table 6
Date: Wednesday, July 25, 2012 Time: 09:52 AM
Intersection #125 HERMAN RD @ 108TH

(B+0+KEY)

FUNCTIONS	KEY	VALUE
Present Plan	0	0
TOD/DOW Plan	1	0
Hardwire Plan	2	0
Modem Plan	3	0
Mode (0-4)	4	0
Master (0-OFF)	5	0
Master Clock	6	0
Local Clock	7	0
Dwell Clock	8	0
Future	9	0
Future	A	0
Future	B	0
Future	C	_____
NEMA CNA Phases	D	_____
Adv Warning Phases	E	_____
MRI Phases	F	_2_4_6__

(D+KEY1+KEY2)

FUNCTIONS	KEY	VALUE
Floating Ped	2E	0
ID Number	2F	125
No Coord Ped Recall	3E	0
Rest In Walk	3F	0
Adv Warning EOG	4E	0
Adv Warning SOG	4F	0
RR Red Clear	5E	0
RR Clear Color	5F	0
Bus Delay	6D	0.0
Bus Free T1	6E	0
Bus Free T3	6F	0
EV Min Aft Clear	7E	0
EV Indicators	7F	0
NEMA Inputs	66	0.0

W4IKS Table 7 Sheet 1
Date: Wednesday, July 25, 2012 Time: 09:52 AM
Intersection #125 HERMAN RD @ 108TH

(B+PLAN+KEY)

FUNCTION	KEY	Plan 1	Plan 2	Plan 3	Plan 4	Plan 5	Plan 6	Plan 7	Plan 8	Plan 9
Cycle Length	0	0	0	0	0	0	0	0	0	0
Forceoff 01	1	0	0	0	0	0	0	0	0	0
Forceoff 02	2	0	0	0	0	0	0	0	0	0
Forceoff 03	3	0	0	0	0	0	0	0	0	0
Forceoff 04	4	0	0	0	0	0	0	0	0	0
Forceoff 05	5	0	0	0	0	0	0	0	0	0
Forceoff 06	6	0	0	0	0	0	0	0	0	0
Forceoff 07	7	0	0	0	0	0	0	0	0	0
Forceoff 08	8	0	0	0	0	0	0	0	0	0
Offset	9	0	0	0	0	0	0	0	0	0
Perm Length	A	0	0	0	0	0	0	0	0	0
Max Dwell	B	0	0	0	0	0	0	0	0	0
Lead Phases	C									
Coord Phases	D									
Perm 2 Phases	E									
Min Recall	F									

W4IKS Table 7 Sheet 2
Date: Wednesday, July 25, 2012 Time: 09:52 AM
Intersection #125 HERMAN RD @ 108TH

(B+D+KEY1+KEY2)

	KEY1	7	8	9	A	B	C	D	E	F
FUNCTION	KEY2	Plan 10	Plan 11	Plan 12	Plan 13	Plan 14	Plan 15	Plan 16	Plan 17	Plan 18
Cycle Length	0	0	0	0	0	0	0	0	0	0
Forceoff 01	1	0	0	0	0	0	0	0	0	0
Forceoff 02	2	0	0	0	0	0	0	0	0	0
Forceoff 03	3	0	0	0	0	0	0	0	0	0
Forceoff 04	4	0	0	0	0	0	0	0	0	0
Forceoff 05	5	0	0	0	0	0	0	0	0	0
Forceoff 06	6	0	0	0	0	0	0	0	0	0
Forceoff 07	7	0	0	0	0	0	0	0	0	0
Forceoff 08	8	0	0	0	0	0	0	0	0	0
Offset	9	0	0	0	0	0	0	0	0	0
Perm Length	A	0	0	0	0	0	0	0	0	0
Max Dwell	B	0	0	0	0	0	0	0	0	0
Lead Phases	C									
Coord Phases	D									
Perm 2 Phases	E									
Min Recall	F									

W4IKS Table 8
Date: Wednesday, July 25, 2012 Time: 09:52 AM
Intersection #125 HERMAN RD @ 108TH

(B+A+KEY)

FUNCTIONS	KEY	VALUE
Bus P1 T1	0	0
Bus P1 T2	1	0
Bus P1 T3	2	0
Bus P2 T1	3	0
Bus P2 T2	4	0
Bus P2 T3	5	0
Bus P3 T1	6	0
Bus P3 T2	7	0
Bus P3 T3	8	0
Perm 2 P1	9	0
Perm 2 P2	A	0
Perm 2 P3	B	0
Flash Yellow	C	
Flash Circuit	D	
TOD/DOW Max	E	
OLB Switchpack	F	

(B+B+KEY)

FUNCTIONS	KEY	VALUE
Bus P4 T1	0	0
Bus P4 T2	1	0
Bus P4 T3	2	0
Bus P5 T1	3	0
Bus P5 T2	4	0
Bus P5 T3	5	0
Bus P6 T1	6	0
Bus P6 T2	7	0
Bus P6 T3	8	0
Perm 2 P4	9	0
Perm 2 P5	A	0
Perm 2 P6	B	0
OL Flash Yellow	C	
OL Flash Clear	D	
TOD/DOW Ped	E	
OLC Switchpack	F	

(B+C+KEY)

FUNCTIONS	KEY	VALUE
Bus P7 T1	0	0
Bus P7 T2	1	0
Bus P7 T3	2	0
Bus P8 T1	3	0
Bus P8 T2	4	0
Bus P8 T3	5	0
Bus P9 T1	6	0
Bus P9 T2	7	0
Bus P9 T3	8	0
Perm 2 P7	9	0
Perm 2 P8	A	0
Perm 2 P9	B	0
Coord Max	C	
TOD Red Rest	D	
OLA Switchpack	E	
OLD Switchpack	F	

W4IKS Table 9 Page 0
Date: Wednesday, July 25, 2012 Time: 09:52 AM
Intersection #125 HERMAN RD @ 108TH

(A+4+KEY)

C1 PIN	KEY	CODE
39	0	0
40	1	0
41	2	0
42	3	0
43	4	0
44	5	0
45	6	0
46	7	0
47	8	0
48	9	0
49	A	0
50	B	0
51	C	0
52	D	0
53	E	0
54	F	0

(A+5+KEY)

C1 PIN	KEY	CODE
55	0	0
56	1	0
57	2	0
58	3	0
59	4	0
60	5	0
61	6	0
62	7	0
	8	0
	9	0
	A	0
	B	0
63	C	0
64	D	0
65	E	0
66	F	0

(A+6+KEY)

C1 PIN	KEY	CODE
67	0	0
68	1	0
69	2	0
70	3	0
71	4	0
72	5	0
73	6	0
74	7	0
75	8	0
76	9	0
77	A	0
78	B	0
79	C	0
80	D	0
81	E	0
82	F	0

W4IKS Table 9 Page 1
Date: Wednesday, July 25, 2012 Time: 09:52 AM
Intersection #125 HERMAN RD @ 108TH

(D+A+4+KEY)

C1 PIN	KEY	CODE
39	0	0
40	1	0
41	2	0
42	3	0
43	4	0
44	5	0
45	6	0
46	7	0
47	8	0
48	9	0
49	A	0
50	B	0
51	C	0
52	D	0
53	E	0
54	F	0

(D+A+5+KEY)

C1 PIN	KEY	CODE
55	0	0
56	1	0
57	2	0
58	3	0
59	4	0
60	5	0
61	6	0
62	7	0
	8	0
	9	0
	A	0
	B	0
63	C	0
64	D	0
65	E	0
66	F	0

(D+A+6+KEY)

C1 PIN	KEY	CODE
67	0	0
68	1	0
69	2	0
70	3	0
71	4	0
72	5	0
73	6	0
74	7	0
75	8	0
76	9	0
77	A	0
78	B	0
79	C	0
80	D	0
81	E	0
82	F	0

W4IKS Table 9 Page 2
Date: Wednesday, July 25, 2012 Time: 09:52 AM
Intersection #125 HERMAN RD @ 108TH

(D+A+B+KEY)

C1 PIN	KEY	CODE
39	0	0
40	1	0
41	2	0
42	3	0
43	4	0
44	5	0
45	6	0
46	7	0
47	8	0
48	9	0
49	A	0
50	B	0
51	C	0
52	D	0
53	E	0
54	F	0

(D+A+C+KEY)

C1 PIN	KEY	CODE
55	0	0
56	1	0
57	2	0
58	3	0
59	4	0
60	5	0
61	6	0
62	7	0
	8	0
	9	0
	A	0
	B	0
63	C	0
64	D	0
65	E	0
66	F	0

(D+A+D+KEY)

C1 PIN	KEY	CODE
67	0	0
68	1	0
69	2	0
70	3	0
71	4	0
72	5	0
73	6	0
74	7	0
75	8	0
76	9	0
77	A	0
78	B	0
79	C	0
80	D	0
81	E	0
82	F	0

W4IKS Table 10 Page 0
Date: Wednesday, July 25, 2012 Time: 09:52 AM
Intersection #125 HERMAN RD @ 108TH

(A+0+KEY)

FUNCTION	KEY	CODE
04 D/W	0	0
04 Walk	1	0
04 Red	2	0
04 Yellow	3	0
04 Green	4	0
03 Red	5	0
03 Yellow	6	0
03 Green	7	0
02 D/W	8	0
02 Walk	9	0
02 Red	A	0
02 Yellow	B	0
02 Green	C	0
01 Red	D	0
01 Yellow	E	0
01 Green	F	0

(A+1+KEY)

FUNCTION	KEY	CODE
08 D/W	0	0
08 Walk	1	0
08 Red	2	0
08 Yellow	3	0
08 Green	4	0
07 Red	5	0
07 Yellow	6	0
07 Green	7	0
06 D/W	8	0
06 Walk	9	0
06 Red	A	0
06 Yellow	B	0
06 Green	C	0
05 Red	D	99
05 Yellow	E	99
05 Green	F	99

(A+2+KEY)

FUNCTION	KEY	CODE
02 Ped Y	0	0
06 Ped Y	1	99
04 Ped Y	2	0
08 Ped Y	3	0
03 Ped Y	4	0
01 Ped Y	5	0
Flash	6	0
Watchdog	7	0
03 D/W	8	0
03 Walk	9	0
OLD Red	A	0
OLD Yellow	B	0
OLD Green	C	0
OLC Red	D	0
OLC Yellow	E	0
OLC Green	F	0

(A+3+KEY)

FUNCTION	KEY	CODE
01 D/W	0	0
01 Walk	1	0
OLB Red	2	0
OLB Yellow	3	0
OLB Green	4	0
OLA Red	5	0
OLA Yellow	6	0
OLA Green	7	0
	8	0
SD	9	0
LTT	A	0
High Byte IDC		0

W4IKS Table 10 Page 1
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Intersection #125 HERMAN RD @ 108TH

(D+A+0+KEY)

FUNCTION	KEY	CODE
04 D/W	0	0
04 Walk	1	0
04 Red	2	0
04 Yellow	3	0
04 Green	4	0
03 Red	5	0
03 Yellow	6	0
03 Green	7	0
02 D/W	8	0
02 Walk	9	0
02 Red	A	0
02 Yellow	B	0
02 Green	C	0
01 Red	D	0
01 Yellow	E	0
01 Green	F	0

(D+A+1+KEY)

FUNCTION	KEY	CODE
08 D/W	0	0
08 Walk	1	0
08 Red	2	0
08 Yellow	3	0
08 Green	4	0
07 Red	5	0
07 Yellow	6	0
07 Green	7	0
06 D/W	8	0
06 Walk	9	0
06 Red	A	0
06 Yellow	B	0
06 Green	C	0
05 Red	D	0
05 Yellow	E	0
05 Green	F	0

(D+A+2+KEY)

FUNCTION	KEY	CODE
02 Ped Y	0	0
06 Ped Y	1	0
04 Ped Y	2	0
08 Ped Y	3	0
03 Ped Y	4	0
01 Ped Y	5	0
Flash	6	0
Watchdog	7	0
03 D/W	8	0
03 Walk	9	0
OLD Red	A	0
OLD Yellow	B	0
OLD Green	C	0
OLC Red	D	0
OLC Yellow	E	0
OLC Green	F	0

(D+A+3+KEY)

FUNCTION	KEY	CODE
01 D/W	0	0
01 Walk	1	0
OLB Red	2	0
OLB Yellow	3	0
OLB Green	4	0
OLA Red	5	0
OLA Yellow	6	0
OLA Green	7	0
	8	0
SD	9	0
LTT	A	0

W4IKS Table 10 Page 2
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Intersection #125 HERMAN RD @ 108TH

(D+A+7+KEY)

FUNCTION	KEY	CODE
04 D/W	0	0
04 Walk	1	0
04 Red	2	0
04 Yellow	3	0
04 Green	4	0
03 Red	5	0
03 Yellow	6	0
03 Green	7	0
02 D/W	8	0
02 Walk	9	0
02 Red	A	0
02 Yellow	B	0
02 Green	C	0
01 Red	D	0
01 Yellow	E	0
01 Green	F	0

(D+A+8+KEY)

FUNCTION	KEY	CODE
08 D/W	0	0
08 Walk	1	0
08 Red	2	0
08 Yellow	3	0
08 Green	4	0
07 Red	5	0
07 Yellow	6	0
07 Green	7	0
06 D/W	8	0
06 Walk	9	0
06 Red	A	0
06 Yellow	B	0
06 Green	C	0
05 Red	D	0
05 Yellow	E	0
05 Green	F	0

(D+A+9+KEY)

FUNCTION	KEY	CODE
02 Ped Y	0	0
06 Ped Y	1	0
04 Ped Y	2	0
08 Ped Y	3	0
03 Ped Y	4	0
01 Ped Y	5	0
Flash	6	0
Watchdog	7	0
03 D/W	8	0
03 Walk	9	0
OLD Red	A	0
OLD Yellow	B	0
OLD Green	C	0
OLC Red	D	0
OLC Yellow	E	0
OLC Green	F	0

(D+A+A+KEY)

FUNCTION	KEY	CODE
01 D/W	0	0
01 Walk	1	0
OLB Red	2	0
OLB Yellow	3	0
OLB Green	4	0
OLA Red	5	0
OLA Yellow	6	0
OLA Green	7	0
	8	0
SD	9	0
LTT	A	0

W4IKS Table 11 Page 0
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Intersection #125 HERMAN RD @ 108TH

(D+B+0+KEY)

FUNCTIONS	KEY	VALUE
05 D/W	0	0
05 Walk	1	0
OLL Red	2	0
OLL Yellow	3	0
OLL Green	4	0
OLK Red	5	0
OLK Yellow	6	0
OLK Green	7	0
07 D/W	8	0
07 Walk	9	0
OLJ Red	A	0
OLJ Yellow	B	0
OLJ Green	C	0
OLH Red	D	0
OLH Yellow	E	0
OLH Green	F	0

(D+B+1+KEY)

FUNCTIONS	KEY	VALUE
OLE Green	0	0
OLF Green	1	0
OLE Yellow	2	0
OLF Yellow	3	0
Adv Warning	4	0
RR Fl Yellow	5	0
Det Reset	6	0
RR On	7	0
EVA On	8	0
EVB On	9	0
EVC On	A	0
EVD On	B	0
Ring 1 Bit B	C	0
Ring 1 Bit C	D	0
Ring 2 Bit B	E	0
Ring 2 Bit C	F	0

(D+B+2+KEY)

FUNCTIONS	KEY	VALUE
Cycle 2	0	0
Cycle 3	1	0
Offset 1	2	0
Offset 2	3	0
Offset 3	4	0
------	5	0
Free	6	0
Flash	7	0
Coord Plan 1 2 3	8	0
Coord Plan 4 5 6	9	0
Coord Plan 7 8 9	A	0
Coord Plan 10 11 12	B	0
Coord Plan 13 14 15	C	0
Coord Plan 16 17 18	D	0
Future	E	0
Future	F	0

W4IKS Table 11 Page 1
Date: Wednesday, July 25, 2012 Time: 09:52 AM
Intersection #125 HERMAN RD @ 108TH

(D+B+4+KEY)

FUNCTIONS	KEY	VALUE
05 D/W	0	0
05 Walk	1	0
OLL Red	2	0
OLL Yellow	3	0
OLL Green	4	0
OLK Red	5	0
OLK Yellow	6	0
OLK Green	7	0
07 D/W	8	0
07 Walk	9	0
OLJ Red	A	0
OLJ Yellow	B	0
OLJ Green	C	0
OLH Red	D	0
OLH Yellow	E	0
OLH Green	F	0

(D+B+5+KEY)

FUNCTIONS	KEY	VALUE
OLE Green	0	0
OLF Green	1	0
OLE Yellow	2	0
OLF Yellow	3	0
Adv Warning	4	0
RR Fl Yellow	5	0
Det Reset	6	0
RR On	7	0
EVA On	8	0
EVB On	9	0
EVC On	A	0
EVD On	B	0
Ring 1 Bit B	C	0
Ring 1 Bit C	D	0
Ring 2 Bit B	E	0
Ring 2 Bit C	F	0

(D+B+6+KEY)

FUNCTIONS	KEY	VALUE
Cycle 2	0	0
Cycle 3	1	0
Offset 1	2	0
Offset 2	3	0
Offset 3	4	0
------	5	0
Free	6	0
Flash	7	0
Coord Plan 1 2 3	8	0
Coord Plan 4 5 6	9	0
Coord Plan 7 8 9	A	0
Coord Plan 10 11 12	B	0
Coord Plan 13 14 15	C	0
Coord Plan 16 17 18	D	0
Future	E	0
Future	F	0

W4IKS Table 11 Page 2
Date: Wednesday, July 25, 2012 Time: 09:52 AM
Intersection #125 HERMAN RD @ 108TH

(D+B+8+KEY)

FUNCTIONS	KEY	VALUE
05 D/W	0	0
05 Walk	1	0
OLL Red	2	0
OLL Yellow	3	0
OLL Green	4	0
OLK Red	5	0
OLK Yellow	6	0
OLK Green	7	0
07 D/W	8	0
07 Walk	9	0
OLJ Red	A	0
OLJ Yellow	B	0
OLJ Green	C	0
OLH Red	D	0
OLH Yellow	E	0
OLH Green	F	0

(D+B+9+KEY)

FUNCTIONS	KEY	VALUE
OLE Green	0	0
OLF Green	1	0
OLE Yellow	2	0
OLF Yellow	3	0
Adv Warning	4	0
RR Fl Yellow	5	0
Det Reset	6	0
RR On	7	0
EVA On	8	0
EVB On	9	0
EVC On	A	0
EVD On	B	0
Ring 1 Bit B	C	0
Ring 1 Bit C	D	0
Ring 2 Bit B	E	0
Ring 2 Bit C	F	0

(D+B+A+KEY)

FUNCTIONS	KEY	VALUE
Cycle 2	0	0
Cycle 3	1	0
Offset 1	2	0
Offset 2	3	0
Offset 3	4	0
------	5	0
Free	6	0
Flash	7	0
Coord Plan 1 2 3	8	0
Coord Plan 4 5 6	9	0
Coord Plan 7 8 9	A	0
Coord Plan 10 11 12	B	0
Coord Plan 13 14 15	C	0
Coord Plan 16 17 18	D	0
Future	E	0
Future	F	0

W4IKS Table 12
Date: Wednesday, July 25, 2012 Time: 09:52 AM
Intersection #125 HERMAN RD @ 108TH

(D+8+KEY1+KEY2)

KEY1 = 0			KEY1 = 1			KEY1 = 2			KEY1 = 3		
FUNCTION	KEY2	VALUE	FUNCTION	KEY2	VALUE	FUNCTION	KEY2	VALUE	FUNCTION	KEY2	VALUE
1/Month	0	0	3/Hour On	0	0	5/Hour Off	0	0	7/Plan	0	0
1/DOM	1	0	3/Min On	1	0	5/Min Off	1	0	8/Month	1	0
1/Hour On	2	0	3/Hour Off	2	0	5/Plan	2	0	8/DOM	2	0
1/Min On	3	0	3/Min Off	3	0	6/Month	3	0	8/Hour On	3	0
1/Hour Off	4	0	3/Plan	4	0	6/DOM	4	0	8/Min On	4	0
1/Min Off	5	0	4/Month	5	0	6/Hour On	5	0	8/Hour Off	5	0
1/Plan	6	0	4/DOM	6	0	6/Min On	6	0	8/Min Off	6	0
2/Month	7	0	4/Hour On	7	0	6/Hour Off	7	0	8/Plan	7	0
2/DOM	8	0	4/Min On	8	0	6/Min Off	8	0	9/Month	8	0
2/Hour On	9	0	4/Hour Off	9	0	6/Plan	9	0	9/DOM	9	0
2/Min On	A	0	4/Min Off	A	0	7/Month	A	0	9/Hour On	A	0
2/Hour Off	B	0	4/Plan	B	0	7/DOM	B	0	9/Min On	B	0
2/Min Off	C	0	5/Month	C	0	7/Hour On	C	0	9/Hour Off	C	0
2/Plan	D	0	5/DOM	D	0	7/Min On	D	0	9/Min Off	D	61
3/Month	E	0	5/Hour On	E	0	7/Hour Off	E	0	9/Plan	E	0
3/DOM	F	0	5/Min On	F	0	7/Min Off	F	0			

W4IKS Table 13
Date: Wednesday, July 25, 2012 Time: 09:52 AM
Intersection #125 HERMAN RD @ 108TH

(D+9+0+KEY)

FUNCTION	KEY	VALUE
Overlap H	0	_____
Overlap J	1	_____
Overlap K	2	_____
Overlap L	3	_____
OLH Switchpack	4	_____
OLJ Switchpack	5	_____
OLK Switchpack	6	_____
OLL Switchpack	7	_____
Reserved	8	_____
Reserved	9	_____
All Red Before EV	A	_____

(D+9+3+KEY)

FUNCTION	KEY	VALUE
OLH Green	0	0.0
OLH Yellow	1	0.0
OLH Red	2	0.0
OLJ Green	3	0.0
OLJ Yellow	4	0.0
OLJ Red	5	0.0
OLK Green	6	0.0
OLK Yellow	7	0.0
OLK Red	8	0.0
OLL Green	9	0.0
OLL Yellow	A	0.0
OLL Red	B	0.0

(E+F+KEY)

FUNCTION	KEY	VALUE
RR Max II	0	0
Ped Perm Pl 1	1	0
Ped Perm Pl 2	2	0
Ped Perm Pl 3	3	0
Ped Perm Pl 4	4	0
Ped Perm Pl 5	5	0
Ped Perm Pl 6	6	0
Ped Perm Pl 7	7	0
Ped Perm Pl 8	8	0
Ped Perm Pl 9	9	0
# of Lng Pwrouts	A	0
# pf Sht Pwrouts	B	0
Failed Det	C	0
Max II On	D	0
No Daylite Save	E	0
Revision Level	F	17

W4IKS Table 14 Sheet 1
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Intersection #125 HERMAN RD @ 108TH

(D+9+KEY1+KEY2)

KEY1 = 8		KEY1 = 9		KEY1 = A		KEY1 = B	
KEY2	CODE	KEY2	CODE	KEY2	CODE	KEY	CODE
0	205	0	205	0	6	0	23
1	146	1	146	1	14	1	67
2	23	2	23	2	20	2	20
3	45	3	66	3	23	3	26
4	20	4	205	4	68	4	6
5	27	5	146	5	20	5	205
6	5	6	21	6	24	6	148
7	205	7	5	7	27	7	21
8	146	8	14	8	5	8	5
9	21	9	20	9	205	9	11
A	6	A	21	A	147	A	209
B	14	B	5	B	21	B	5
C	20	C	13	C	5	C	24
D	24	D	205	D	12	D	21
E	26	E	11	E	205	E	6
F	6	F	21	F	147	F	14

W4IKS Table 14 Sheet 2
Date: Wednesday, July 25, 2012 Time: 09:52 AM
Intersection #125 HERMAN RD @ 108TH

(D+9+KEY1+KEY2)

KEY1 = C		KEY1 = D		KEY1 = E		KEY1 = F	
KEY2	CODE	KEY2	CODE	KEY2	CODE	KEY	CODE
0	209	0	29	0	0	0	0
1	6	1	7	1	0	1	0
2	24	2	20	2	0	2	0
3	27	3	24	3	0	3	0
4	5	4	25	4	0	4	0
5	208	5	6	5	0	5	0
6	5	6	210	6	0	6	0
7	30	7	6	7	0	7	0
8	26	8	24	8	0	8	0
9	5	9	21	9	0	9	0
A	210	A	6	A	0	A	0
B	5	B	14	B	0	B	0
C	23	C	0	C	0	C	0
D	45	D	0	D	0	D	0
E	20	E	0	E	0	E	0
F	24	F	0	F	0	F	0

W4IKS Table 14 Sheet 3
Date: Wednesday, July 25, 2012 Time: 09:52 AM
Intersection #125 HERMAN RD @ 108TH

(D+E+KEY1+KEY2)

KEY1 = 0		KEY1 = 1		KEY1 = 2		KEY1 = 3	
KEY2	CODE	KEY2	CODE	KEY2	CODE	KEY	CODE
0	0	0	0	0	0	0	0
1	0	1	0	1	0	1	0
2	0	2	0	2	0	2	0
3	0	3	0	3	0	3	0
4	0	4	0	4	0	4	0
5	0	5	0	5	0	5	0
6	0	6	0	6	0	6	0
7	0	7	0	7	0	7	0
8	0	8	0	8	0	8	0
9	0	9	0	9	0	9	0
A	0	A	0	A	0	A	0
B	0	B	0	B	0	B	0
C	0	C	0	C	0	C	0
D	0	D	0	D	0	D	0
E	0	E	0	E	0	E	0
F	0	F	0	F	0	F	0

W4IKS Table 14 Sheet 4
Date: Wednesday, July 25, 2012 Time: 09:52 AM
Intersection #125 HERMAN RD @ 108TH

(D+E+KEY1+KEY2)

KEY1 = 4		KEY1 = 5		KEY1 = 6		KEY1 = 7	
KEY2	CODE	KEY2	CODE	KEY2	CODE	KEY	CODE
0	0	0	0	0	0	0	0
1	0	1	0	1	0	1	0
2	0	2	0	2	0	2	0
3	0	3	0	3	0	3	0
4	0	4	0	4	0	4	0
5	0	5	0	5	0	5	0
6	0	6	0	6	0	6	0
7	0	7	0	7	0	7	0
8	0	8	0	8	0	8	0
9	0	9	0	9	0	9	0
A	0	A	0	A	0	A	0
B	0	B	0	B	0	B	0
C	0	C	0	C	0	C	0
D	0	D	0	D	0	D	0
E	0	E	0	E	0	E	0
F	0	F	0	F	0	F	0

W4IKS Table 14 Sheet 5
Date: Wednesday, July 25, 2012 Time: 09:52 AM
Intersection #125 HERMAN RD @ 108TH

(D+E+KEY1+KEY2)

KEY1 = 8		KEY1 = 9		KEY1 = A		KEY1 = B	
KEY2	CODE	KEY2	CODE	KEY2	CODE	KEY	CODE
0	0	0	0	0	0	0	0
1	0	1	0	1	0	1	0
2	0	2	0	2	0	2	0
3	0	3	0	3	0	3	0
4	0	4	0	4	0	4	0
5	0	5	0	5	0	5	0
6	0	6	0	6	0	6	0
7	0	7	0	7	0	7	0
8	0	8	0	8	0	8	0
9	0	9	0	9	0	9	0
A	0	A	0	A	0	A	0
B	0	B	0	B	0	B	0
C	0	C	0	C	0	C	0
D	0	D	0	D	0	D	0
E	0	E	0	E	0	E	0
F	0	F	0	F	0	F	0

W4IKS Table 14 Sheet 6
Date: Wednesday, July 25, 2012 Time: 09:52 AM
Intersection #125 HERMAN RD @ 108TH

(D+E+KEY1+KEY2)

KEY1 = C		KEY1 = D		KEY1 = E		KEY1 = F	
KEY2	CODE	KEY2	CODE	KEY2	CODE	KEY	CODE
0	0	0	0	0	0	0	0
1	0	1	0	1	0	1	0
2	0	2	0	2	0	2	0
3	0	3	0	3	0	3	0
4	0	4	0	4	0	4	0
5	0	5	0	5	0	5	0
6	0	6	0	6	0	6	0
7	0	7	0	7	0	7	0
8	0	8	0	8	0	8	0
9	0	9	0	9	0	9	0
A	0	A	0	A	0	A	0
B	0	B	0	B	0	B	0
C	0	C	0	C	0	C	0
D	0	D	0	D	0	D	0
E	0	E	0	E	0	E	0
F	0	F	0	F	0	F	0

W4IKS Table 15
Date: Wednesday, July 25, 2012 Time: 09:52 AM
Intersection #125 HERMAN RD @ 108TH

(D+B+3+KEY)

FUNCTION	KEY	VALUE
CB Output #1	0	0
CB Output #2	1	0
CB Output #3	2	0
CB Output #4	3	0
CB Output #5	4	0
CB Output #6	5	0
CB Output #7	6	0
CB Output #8	7	0
CB Flash Out #9	8	0
CB Flash Out #10	9	0
CB Flash Out #11	A	52
CB Flash Out #12	B	0

Page ID - 0

(D+B+7+KEY)

FUNCTION	KEY	VALUE
CB Output #1	0	0
CB Output #2	1	0
CB Output #3	2	0
CB Output #4	3	0
CB Output #5	4	0
CB Output #6	5	0
CB Output #7	6	0
CB Output #8	7	0
CB Flash Out #9	8	0
CB Flash Out #10	9	0
CB Flash Out #11	A	0
CB Flash Out #12	B	0

Page ID - 1

(D+B+B+KEY)

FUNCTION	KEY	VALUE
CB Output #1	0	0
CB Output #2	1	0
CB Output #3	2	0
CB Output #4	3	0
CB Output #5	4	0
CB Output #6	5	0
CB Output #7	6	0
CB Output #8	7	0
CB Flash Out #9	8	0
CB Flash Out #10	9	0
CB Flash Out #11	A	0
CB Flash Out #12	B	0

Page ID - 2

ENGLISH

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION PLANNING/TRAFFIC ENGINEERING

LEGEND

CONTROLLERS

(C / 332) Install model 2070L controller in model 332 cabinet & control equipment with riser frame, orient louvered door as shown

POLES

(MA / L) Install (L=length) foot mast arm

(MPL / X) Install special (X = non-standard) traffic signal mast arm pole with luminaire pole extension (See, "Pole Entrance Chart)

(LA / L) Install (L=length) foot luminaire arm

(VP) Install vehicle signal pedestal with transformer base

(PP) Install pedestrian signal pedestal with frangible base

SIGNALS

(V / Ph) Install phase (Ph=phase) vehicle signal

(C/B / Ph) Install phase (Ph=phase) countdown pedestrian signal with clamshell mount and pushbutton with 'H' mount

SIGNS

(AL / 3) Install aluminum (30"x36", type "W7") "NO TURN ON RED" sign

(PR / 3) Install (30" x 36") "NO RIGHT TURN" part time restriction sign

(SNS / N) Install street name sign (N) on mast arm pole, use 12" 0.125mm flat blade aluminum blanks mounted to mast arm with stainless steel bands and hardware (Diamond Grade Sheeting).
1 = SW Herman Rd 4 = SW Teton Ave

LEGEND CONTINUED

CABINETS

(TC) Install terminal cabinet

(BMCL) Install base mounted service cabinet, 120/240 volt metered, for signal and signal pole mounted illumination systems

JUNCTION BOXES

(JB / 2) Install 22"x12"x12" (min. dimension) precast concrete junction box

(JB / 2A) Install 22"x12"x12" (min. dimension) precast concrete junction box with concrete apron

(JB / 3) Install 30"x17"x12" (min. dimension) precast concrete junction box

VIDEO DETECTION

(VDC / N) Install video camera (N), mounting bracket and post

(VDF / N) Install video camera feeder (N)

(VDZ / PH) Video detection zone for phase (PH).

WIRES

[N-C] Install (N=number) No. 8 type THWN (Signal system common)

[N-12C] Install (N=number) No. 12 type THWN (Pedestrian signal system common)

[N / G] Install (N=number) No. (G=AWG wire size) type THWN wires

[N G] Install (N=number) No. (G=AWG wire size) type XHHW wires

(Ph) Includes 3 spare wires for phase (Ph=phase) as per table

LEGEND CONTINUED

CONDUITS

(S) Install (S=size) inch electrical conduit

(IC) Interconnect conduit (See Interconnect Plan)

FIRE PREEMPTION

(FN / Ch) Install channel (Ch=channel), (N=number) barrel fire preemption detector unit

(FF / Ch) Install channel (Ch=channel) fire preemption detector feeder cable

MISCELLANEOUS

(PE / 1) Install photocontrol electronic relay on pole, as per T.M.S. Drg. No. TM465

(HPS) Install 200 watt high pressure sodium luminaire, type M-C-III, 120/240 dual voltage ballast

SIGNAL MOUNTING OPTIONS
B = Adjustable bracket assembly w/rain cap(s) (install 1" metallic chase nipple in lieu of tenon when required for wiring)
P = Side pole mount
T = Pole top mount

SIGNAL HEAD TYPES
2 = 12" R, 12" Y, 12" G
6L = 12" FLTA, 12" YLTA, 12" FYLTA, 12" GLTA

CAMERA MOUNTING OPTIONS
LA = Luminaire arm mount
MA = Mast arm mount

CONSTRUCTION NOTE:

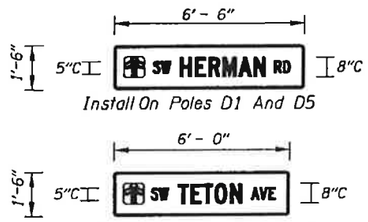
(1) Terminate phase 1 flashing yellow indication to phase 2 pedestrian yellow switchpack output. Terminate Conflict Monitor channel 9 (pin 13) wire to Output File terminal 114.

Terminate phase 3 flashing yellow indication to phase 4 pedestrian yellow switchpack output. Terminate Conflicting Monitor channel 10 (pin R) wire to Output File terminal 105.

Terminate phase 5 flashing yellow indication to phase 6 pedestrian yellow switchpack output. Terminate Conflict Monitor channel 11 (pin S) wire to Output File terminal 120.

Terminate phase 7 flashing yellow indication to phase 8 pedestrian yellow switchpack output. Terminate Conflicting Monitor channel 12 (pin V) wire to Output File terminal 111.

STREET NAME SIGNS



NOTES:
1. All signs shall be type "G2".
2. Contact Traffic Safety Supply Co. at (503)-235-8531 for size and layout information.

6L =



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OREGON
JULY 17, 1997
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8/27/98
EXPIRES 12/31/08

TUALATIN DEVELOPMENT COMMISSION

S.W. HERMAN RD. - S.W. 124TH AVE. TO S.W. TETON AVE.
WASHINGTON COUNTY

Reviewed By - C. Radosta
Designed By - C. Tiesler
Drafted By - J. Henriksen

SW HERMAN RD/SW TETON AVE
LEGEND SHEET

SHEET NO. TS-15

DATE *FILE* *TIME* *FILEABBREV* *USER*

ENGLISH

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION PLANNING/TRAFFIC ENGINEERING

69+00

SW TETON AVENUE

SW HERMAN ROAD

P&W RR

POLE #D3 "HR" 69+91 35.0' LT

POLE #D4 "HR" 70+22 48.5' LT

POLE #D5 "HR" 70+75 36.5' LT

POLE #D6 "HR" 70+65 38.0' RT

POLE #D7 "HR" 70+55 41.0' RT

POLE #D2 "HR" 69+88 31.5' RT

POLE #D1 "HR" 39+58 72.3' RT

RAILROAD TO INSTALL RIGID CONDUITS FOR SIGNAL BENEATH TRACKS. CONNECT TO CONDUITS 15' EITHER SIDE OF CENTERLINE OF TRACKS.

RR CONTROLLER

ESMT

R/W

Scale In Feet 0 10 20 30

N

Revised	DATE	APPROVED	REVISION
1	11/21	CWR	Revised by Addendum #1

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19283PE
OREGON
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11/21/08
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TUALATIN DEVELOPMENT COMMISSION

S.W. HERMAN RD. - S.W. 124TH AVE. TO S.W. TETON AVE.

WASHINGTON COUNTY

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Designed By - C. Tiesler
Drafted By - J. Henriksen

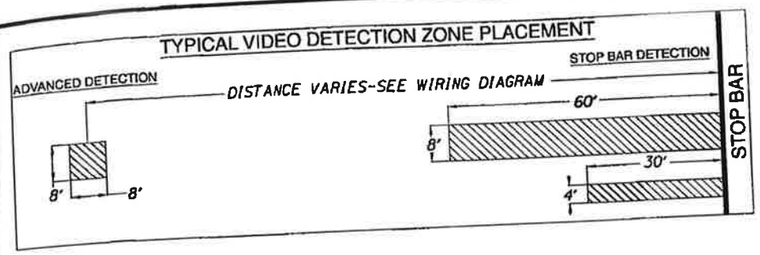
SW HERMAN RD/SW TETON AVE SIGNAL PLAN

SHEET NO. TS-16

ENGLISH

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION PLANNING/TRAFFIC ENGINEERING

TYPICAL VIDEO DETECTION ZONE PLACEMENT



VIDEO DETECTION WIRING DIAGRAM

CAMERA	DETECTION ZONE	DISTANCE (FEET)
1	1	320
2	2	160
2	3	
2	4	
3	5	220
3	6	110
3	7	
3	8	
4	9	320
5	10	180
5	11	
5	12	
6	13	220
6	14	110
6	15	
6	16	

PHASE	SLOT
2	I2U
2	I2L
2	I3U
5	J1
4	I6U
4	I6L
4	I7U
7	J5
8	J2U
8	J2L
1	J3U
1	J1
8	J6U
8	J6L
3	J7U
3	I5

N DETECTION ZONE

DESIGN APPROACH SPEEDS

STREET	APPROACH	OPERATING SPEED
HERMAN RD	EASTBOUND	45 M.P.H.
	WESTBOUND	45 M.P.H.
TETON AVE	NORTHBOUND	35 M.P.H.
	SOUTHBOUND	35 M.P.H.

'HR' 68+00

'HR' 69+00

'HR' 70+00

SW TETON AVENUE

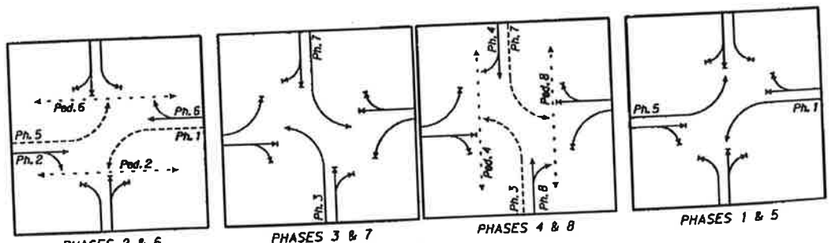
END Sta. 'HR' 70+87.50

SW HERMAN ROAD

P&W RR

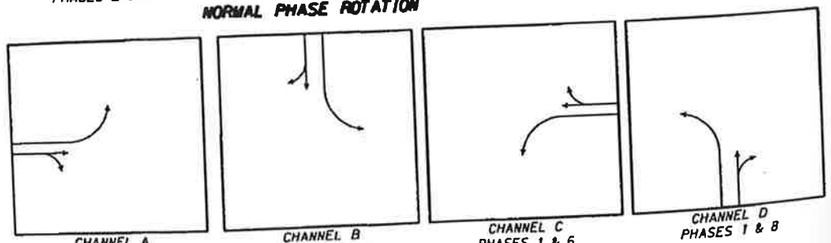
320

160



PHASES 2 & 6 | PHASES 3 & 7 | PHASES 4 & 8 | PHASES 1 & 5

NORMAL PHASE ROTATION



CHANNEL A PHASES 2 & 5 | CHANNEL B PHASES 4 & 7 | CHANNEL C PHASES 1 & 6 | CHANNEL D PHASES 1 & 8

FIRE PREEMPTION DIAGRAM

0 20 40 60
Scale in Feet

REGISTERED PROFESSIONAL ENGINEER
19283PE
OREGON
JULY 17, 1997
CHARLES W RADOSTA
EXPIRES 12/31/08
6/27/08

TUALATIN DEVELOPMENT COMMISSION

S.W. HERMAN RD. - S.W. 124TH AVE. TO S.W. TETON AVE.

WASHINGTON COUNTY

Reviewed By - C. Radosta
Designed By - C. Tiesler
Drafted By - J. Henriksen

SW HERMAN RD/SW TETON AVE DETECTOR PLAN

SHEET NO. TS-17

DATE *FILE* *TIME* *FILEABBREV* *USER*

ENGLISH

RETURN TO NORMAL PHASE ROTATION AFTER PREEMPTION

SIGNAL INDICATION ACTIVE WHEN PED INHIBIT IS INITIATED

Ph. No.	NORMAL PHASE ROTATION									
2	G	G	Y	R	R	R	R	R	R	R
6	G	G	Y	R	R	R	R	R	R	R
3	R	R	R	G	Y	FY	FY	Y	R	R
7	R	R	R	G	Y	FY	FY	Y	R	R
4	R	R	R	R	R	G	G	Y	R	R
8	R	R	R	R	R	G	G	Y	R	R
1	FY	FY	Y	R	R	R	R	R	G	Y
5	FY	FY	Y	R	R	R	R	R	G	Y
Ped. 2+6	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW
Ped. 4+8	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW
PTR	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

SIGNAL INDICATION ACTIVE WHEN RAILROAD PREEMPTION INITIATED

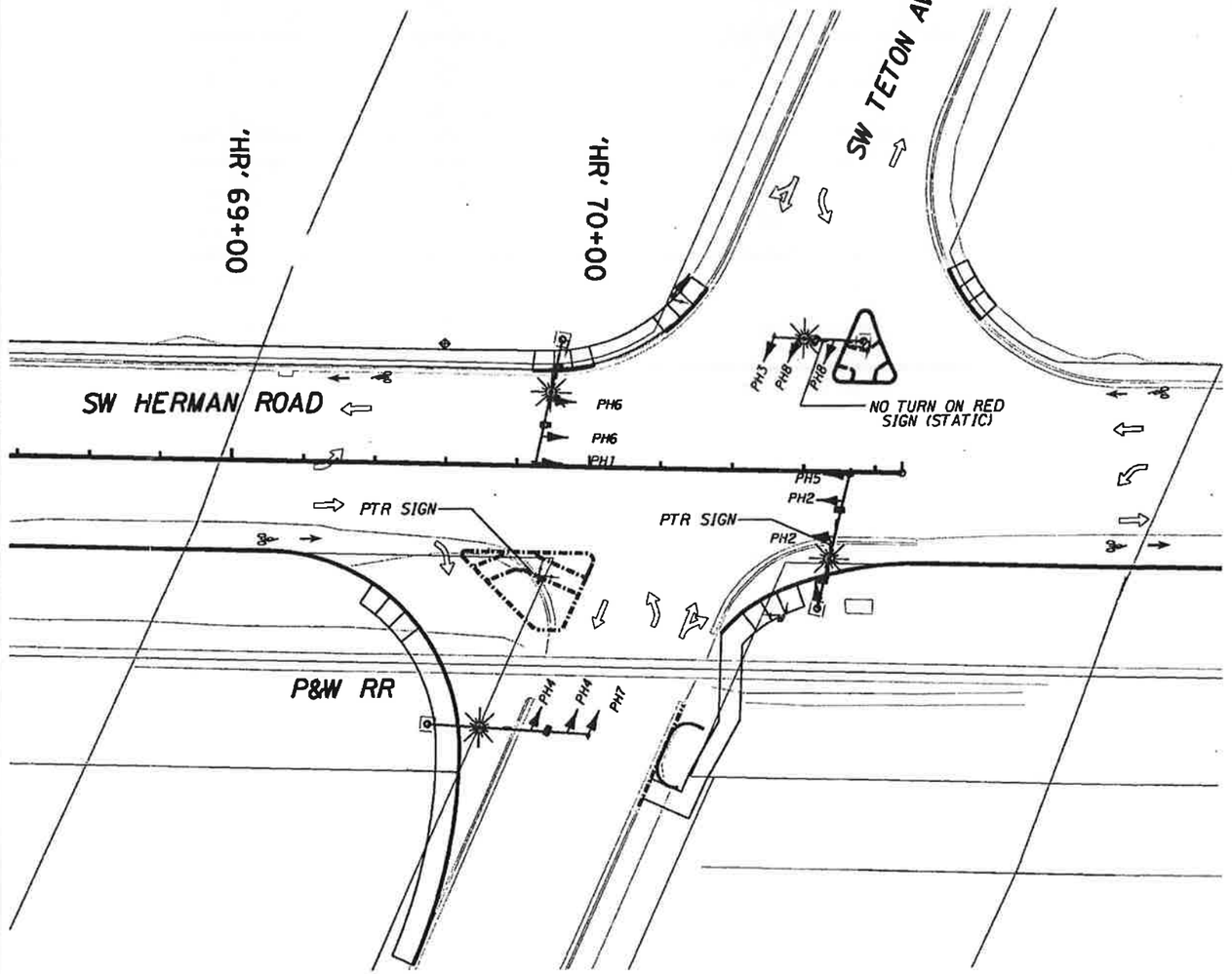
Ph. No.									
2	G	Y	R	R	R	R	R	R	R
6	G	Y	R	R	R	R	R	R	R
3	R	R	G	Y	FY	Y	R	R	
7	R	R	G	Y	FY	Y	R	R	
4	R	R	R	R	G	Y	R	R	
8	R	R	R	R	G	Y	R	R	
1	FY	Y	R	R	R	R	G	Y	
5	FY	Y	R	R	R	R	G	Y	
Ped. 2+6	FDW	DW	DW	DW	DW	DW	DW	DW	DW
Ped. 4+8	DW	DW	DW	DW	FDW	DW	DW	DW	
PTR	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

SERVE ALL NON-CONFLICTING PHASES (PHASES 2,5,6,&7), ALL FLASHING YELLOW ARROWS INHIBITED

2	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
6	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
3	R	G	Y	G	G	Y	Y	R	G	Y	R	G	Y	R	G	Y	R	G	Y	R	G	Y	R	G	Y
7	R	R	R	Y	R	R	Y	R	R	Y	R	R	Y	R	R	R	R	R	R	R	R	R	R	R	R
4	R	R	R	R	R	R	R	R	R	R	R	R	G	G	Y	R	R	R	R	R	R	R	R	R	R
8	R	G	Y	R	G	Y	R	R	G	Y	R	G	Y	R	G	Y	R	G	Y	R	G	Y	R	G	Y
1	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
5	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Ped. 2+6	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW
Ped. 4+8	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW
PTR	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON

8 PHASE

RAILROAD PREEMPTION MATRIX



P.C.O.I. Time Required: 14 Seconds

0 20 40 60
Scale In Feet

N

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TRANSPORTATION PLANNING/TRAFFIC ENGINEERING

REGISTERED PROFESSIONAL ENGINEER
19283PE
OREGON
JULY 17, 1997
CHARLES W RADOSTA
EXPIRES 12/31/08
8/27/08

TUALATIN DEVELOPMENT COMMISSION

S.W. HERMAN RD. - S.W. 124TH AVE. TO S.W. TETON AVE.

WASHINGTON COUNTY

Reviewed By - C. Radosta
Designed By - C. Tiesler
Drafted By - J. Henriksen

SW HERMAN RD/SW TETON AVE RAILROAD PREEMPTION PLAN

SHEET NO. TS-18

ENGLISH

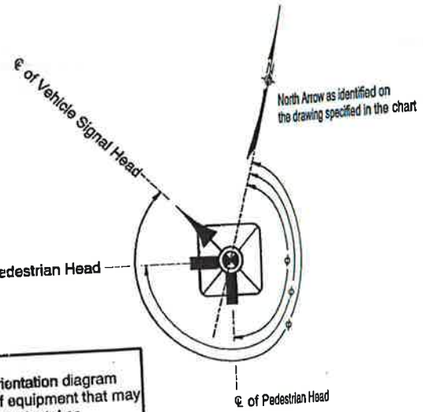
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POLE ENTRANCE CHART

EQUIPMENT ON POLE					EQUIPMENT ON MAST ARM (Length in Feet and Equipment Type)									LUMINAIRES					
																		FIXTURE	
PED. SIGNAL DEG.	TERM. CABINET DEG.	SIGN DEG.	TRAFFIC SIGNAL DEG.	PHOTO ELECTRIC CELL	ARM LENGTH	D1	D2	D3	D4	D5	D6	D7	D8	ARM LENGTH	ARM DEG.	MOUNTING HEIGHT	TYPE	TYPE	WATTAGE
	180				45	0.5 / V6L	0.5 / F	8.0 / V2	11.0 / C	16.0 / V2	22.5 / ST	———	———	15	0	35	HPS	M-C-III	200
						———	———	———	———	———	———	———	———						
250 & 340		250			35	0.5 / V6L	0.5 / F	8.0 / V2	11.0 / C	18.0 / V2	25.0 / ST	27.5 / C	———	15	0	35	HPS	M-C-III	200
270	180			180		———	———	———	———	———	———	———	———						
180			0		25	0.5 / V6L	0.5 / F	7.0 / V2	12.0 / C	14.0 / SA	17.0 / V2	21.0 / ST	———	15	0	35	HPS	M-C-III	200
195 & 285	180				40	0.5 / F	2.0 / V6L	9.0 / V2	12.0 / C	16.0 / ST	19.0 / V2	22.0 / PR	32.0 / C	15	0	35	HPS	M-C-III	200
-	180		345			———	———	———	———	———	———	———	———						
90 & 345																			

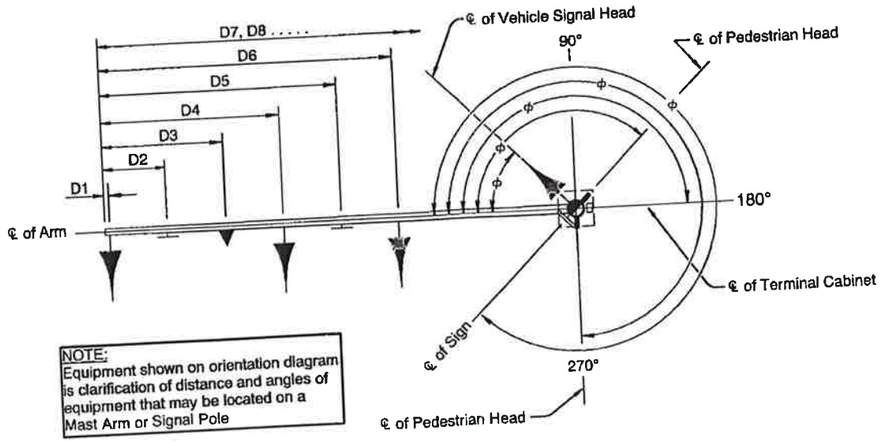
djustable Bracket Mount Tenon Not Required (See Std. Dwg. TM462)
Adjustable Bracket Mount Tenon Not Required (See Std. Dwg. TM462)
m w/Adjustable Bracket Mount Tenon Not Required (See Std Dwg TM465)
minum w/Stainless Steel Bands

. Dwg. TM465)
I.S. Dwg. 00000)
Sign (see Std. Dwg. TM465)



NOTE:
Equipment shown on the orientation diagram is a clarification of angles of equipment that may be located on a Pedestrian Pedestal or Vehicle Pedestal

PEDESTRIAN PEDESTAL / VEHICLE PEDESTAL ORIENTATION DIAGRAM



NOTE:
Equipment shown on orientation diagram is clarification of distance and angles of equipment that may be located on a Mast Arm or Signal Pole

MAST ARM POLE ORIENTATION DIAGRAM

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JULY 17, 1997
CHARLES W RADOSTA
6/27/08
EXPIRES 12/31/08

TUALATIN DEVELOPMENT COMMISSION

S.W. HERMAN RD. - S.W. 124TH AVE. TO S.W. TETON AVE.

WASHINGTON COUNTY

Reviewed By - C. Radosta
Designed By - C. Tiesler
Drafted By - J. Henriksen

SW HERMAN RD/SW TETON AVE SIGNAL PLAN DETAILS

SHEET NO. TS-19

$TIME$ $FILEABBREV$ $USER$

WASHI

Wednesday, October 02, 2013 15:53

Intersection Name	*6 - Herman_Teton*	**Local ID**	*6*
Intersection Telephone Number			
System Name	*102 - City of Tualatin*	**System ID**	*102*
Controller Type	*Voyage - C1-C11*		
Controller Serial Number		**Installation Date**	
Programmed by		**Programmed Date**	

Graphic Map Background	**Phase Rotation Diagram**

Control Data (next/2/2)

Controller Function and Timing (next/2/1, next/2/2)

Security, Sequence, Initialization

Security Code	****	0 = disabled, or 1000-9999
Sequence	*7*	0 = sequential, 1 = quad left turn, 2-6 = special A-E, 7 = lead lag

Lead Lag (next/2/2/3)			
Phases 1 - 2	**Phases 3 - 4**	**Phases 5 - 6**	**Phases 7 - 8**
0	*0*	*0*	*0*
0 = no reversal, 1 = reversal, 2 = by coord plan or clock			

Initialization and Flash (next/2/2/5)

	Initialization	**Flash Entry**	**Flash Exit**	
Ring 1 Phase	*1*	*0*	*1*	phase 1-8
Ring 2 Phase	*5*	*0*	*5*	phase 1-8
Interval	*0*	*0*	*0*	0 = red, 1 = yellow, 2 = green

Power up Flash	*0.0*	0.0 - 25.5 seconds		**First All Red**	*6.0*	0.0 - 25.5 seconds

Soft Flash (next/2/2/5)

Phase	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	0 = dark, 1=flash yel WIG, 2 = flash yel WAG, 3 = flash red WIG, 4 = flash red WAG				
	3	*4*	*3*	*4*	*3*	*4*	*3*	*4*					
Overlap	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	
	3	*4*	*3*	*4*	*3*	*4*	*3*	*4*	*3*	*4*	*3*	*4*	same as phase
Internal Logic Output	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 = normal, 1 = dark, 2 = flash WIG

Per Phase Functions (next/2/2/3, next/2/2/1)

	1	2	3	4	5	6	7	8	
Phases Used	X	X	X	X	X	X	X	X	X = on
Restricted Phases									X = on (Sequence 2, 6, 7 only)
Exclusive Phases									X = on (Sequence 7 only)
Yellow Lock									
Min Recall		X				X			
Max Recall									
Ped Recall									
Red Lock									
Max Out Recall Inhibit	X		X	X	X		X	X	X = on
Soft Recall									
Free Walk Rest									
Conditional Ped									
Disable Inhibit Max Termination									
Call to Non Act 1									
Call to Non Act 2									

Dual Entry (next/2/2/9/3)

Mode	1	0 = off, 1 = on, 2 = Not Used, 3 = by coord plan, 4 = by time clock circuit 61

Dual Entry Phase -->	1	2	3	4	5	6	7	8	
Phase	0	0	0	8	0	0	0	4	0 = none, 1-8 = phase 1-8

Conditional Service, Five Section Head

Conditional Service (next/2/2/9/3)

	Mode	CS Max Time
Phase 1	0	0
Phase 3	0	0
Phase 5	0	0
Phase 7	0	0

0 = off, 1 = C.S.On. 2 = C.S. on by TOD circuit 57, 3 = N/A, 4 = C.S. and C.R. On, 5 = C.R. on by TOD circuit 57.

5 Section Head Logic (next/2/2/9/4)

X Omits Y		Anti-Trap			Yellow Blanking LT	
		Trap Protected Phase		Next Phase	Phase	
X : Y						
6 : 1	0	1		< (5)	1	
8 : 3	0	3		< (7)	3	
2 : 5	0	5		< (1)	5	
4 : 7	0	7		< (3)	7	
0=off, 1=side call, 2=no side call		X = On				

Phase Times (next/2/2/2, next/2/2/9/5)									
	1	2	3	4	5	6	7	8	
Movement									
Minimum Green	5	10	5	10	5	10	5	10	0 - 255 sec
Passage	2.0	3.2	2.0	3.2	2.0	3.2	2.0	3.2	0.0 - 25.5 sec
Yellow	3.0	4.5	3.0	4.0	3.0	4.5	3.0	4.0	0.0 - 25.5 sec
Red Clearance	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0 - 25.5 sec or 0 - 255 sec
Max 1	20	40	20	40	20	40	20	40	0 - 255 sec
Max 2	20	40	20	40	20	40	20	40	0 - 255 sec
Walk	0	5	0	5	0	5	0	5	0 - 255 sec
Ped Clear	0	8	0	9	0	7	0	12	0 - 255 sec
Seconds Per Actuation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec
Time Before Reduction	0	0	0	0	0	0	0	0	0 - 255 sec
Time to Reduce	0	0	0	0	0	0	0	0	0 - 255 sec
Minimum Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec
Max Variable Initial	0	0	0	0	0	0	0	0	0 - 255 sec
Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec
Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Inhibit Min Yellow									X = On
Red Decimal Off									X = On
Advance Walk	0	0	0	0	0	0	0	0	0 - 255 sec
Other Controller Functions (next/2/2/9)									
Phase -->	1	2	3	4	5	6	7	8	
Inhibit Simultaneous Gap Out	X		X		X		X		X = On
Last Car Passage	2	0 = recall phase, 1 = last car passage, 2 = NOT recall - Not last car passage							
Red Revert (+2 seconds)	3.0	0 - 25.5 sec							
Auto Ped Clear		X = On							
Flashing Don't Walk Into Yellow		X = On							
Soft Recall / Red Rest Delay	0.0	0 - 25.5 sec							
Ped Pushbutton	0	0 - 5 sec, 0 = disable							
Advance Flash Rate	0	0 = disable, 1 = 120 FPM							
Change Sequence		X = On (After a download with a power on - off cycle)							
Phase -->	1	2	3	4	5	6	7	8	
Red Clear Extension Detector	0	0	0	0	0	0	0	0	0 = none 1 - 32 = detector 1 - 32
Red Clear Extension Red Time	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec.

Local Detectors (next/2/2/4)

Detector Data

	Yellow Lock	Detector Inhibit	Call Phase	Extend Phase	Switch Phase	Delay Time	Stretch / Disconnect Time	Delay or Disconnect Mode
Detector 1 - I1			*1*	*1*	*0*	*0*	*0.0*	*0*
Detector 2 - I9U			*1*	*1*	*0*	*0*	*0.0*	*0*
Detector 3 - I5			*3*	*3*	*0*	*0*	*0.0*	*0*
Detector 4 - I9L			*3*	*3*	*0*	*0*	*0.0*	*0*
Detector 5 - J1			*5*	*5*	*0*	*0*	*0.0*	*0*
Detector 6 - J9U			*5*	*5*	*0*	*0*	*0.0*	*0*
Detector 7 - J5			*7*	*7*	*0*	*0*	*0.0*	*0*
Detector 8 - J9L			*7*	*7*	*0*	*0*	*0.0*	*0*
Detector 9 - I2U			*2*	*2*	*0*	*0*	*0.0*	*0*
Detector 10 - I2L			*2*	*2*	*0*	*0*	*0.0*	*0*
Detector 11 - I3U			*2*	*2*	*0*	*0*	*0.0*	*0*
Detector 12 - I3L			*0*	*2*	*0*	*0*	*0.0*	*0*
Detector 13 - I4			*2*	*0*	*0*	*0*	*0.0*	*0*
Detector 14 - I6U			*4*	*4*	*0*	*5*	*0.0*	*0*
Detector 15 - I6L			*4*	*4*	*0*	*0*	*0.0*	*0*
Detector 16 - I7U			*4*	*4*	*0*	*0*	*0.0*	*0*
Detector 17 - I7L			*0*	*4*	*0*	*0*	*0.0*	*0*
Detector 18 - I8			*4*	*0*	*0*	*0*	*0.0*	*0*
Detector 19 - J2U			*6*	*6*	*0*	*0*	*0.0*	*0*
Detector 20 - J2L			*6*	*6*	*0*	*0*	*0.0*	*0*
Detector 21 - J3U			*6*	*6*	*0*	*0*	*0.0*	*0*
Detector 22 - J3L			*0*	*6*	*0*	*0*	*0.0*	*0*
Detector 23 - J4			*6*	*0*	*0*	*0*	*0.0*	*0*
Detector 24 - J6U			*8*	*8*	*0*	*5*	*0.0*	*0*
Detector 25 - J6L			*8*	*8*	*0*	*0*	*0.0*	*0*
Detector 26 - J7U			*8*	*8*	*0*	*0*	*0.0*	*0*
Detector 27 - J7L			*0*	*8*	*0*	*0*	*0.0*	*0*
Detector 28 - J8			*8*	*0*	*0*	*0*	*0.0*	*0*
Detector 29 -			*0*	*0*	*0*	*0*	*0.0*	*0*
Detector 30 -			*0*	*0*	*0*	*0*	*0.0*	*0*
Detector 31 -			*0*	*0*	*0*	*0*	*0.0*	*0*
Detector 32 -			*0*	*0*	*0*	*0*	*0.0*	*0*

yellow lock, detector inhibit, - X = On; call, extend, phase - 0 = none 1 - 8 = phase 1 - 8 ; delay time - 0 - 255 sec
stretch / disconnect time - 0.0 - 25.5 sec.; delay or disconnect Mode - 0 -13

Detector Plans (next/2/2/4/5)

	Loop Number									
	Plan Detectors	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 32, 0 = none, 1 -3 2 = detectors 1 - 32
Detector Plan 1	**Call Phase**									0 - 8, 0 = none, 1 - 8 = phase 1 - 8
	Extend Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Switch Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Delay Time	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec
	Stretch/Disconnect Time	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec
	Delay/ Disconnect Mode	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 13
Detector Plan 2	**Call Phase**									0 - 8, 0 = none, 1 - 8 = phase 1 - 8
	Extend Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Switch Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Delay Time	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec
	Stretch/Disconnect Time	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec
	Delay/ Disconnect Mode	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 13
Detector Plan 3	**Call Phase**									0 - 8, 0 = none, 1 - 8 = phase 1 - 8
	Extend Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Switch Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Delay Time	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec
	Stretch/Disconnect Time	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec
	Delay/ Disconnect Mode	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 13

Detector Fail Monitor (next/2/2/4/3)					Detectors 33-64 (next/2/2/4/6)		
	Fail Monitor Enable	Recall Phase	Min Counts	Max Counts		Call Phase	Extend Phase
Detector 1 - I1		*0*	*0*	*0*	Detector 33 -	0	0
Detector 2 - I9U		*0*	*0*	*0*	Detector 34 -	0	0
Detector 3 - I5		*0*	*0*	*0*	Detector 35 -	0	0
Detector 4 - I9L		*0*	*0*	*0*	Detector 36 -	0	0
Detector 5 - J1		*0*	*0*	*0*	Detector 37 -	0	0
Detector 6 - J9U		*0*	*0*	*0*	Detector 38 -	0	0
Detector 7 - J5		*0*	*0*	*0*	Detector 39 -	0	0
Detector 8 - J9L		*0*	*0*	*0*	Detector 40 -	0	0
Detector 9 - I2U		*0*	*0*	*0*	Detector 41 -	0	0
Detector 10 - I2L		*0*	*0*	*0*	Detector 42 -	0	0
Detector 11 - I3U		*0*	*0*	*0*	Detector 43 -	0	0
Detector 12 - I3L		*0*	*0*	*0*	Detector 44 -	0	0
Detector 13 - I4		*0*	*0*	*0*	Detector 45 -	0	0
Detector 14 - I6U		*0*	*0*	*0*	Detector 46 -	0	0
Detector 15 - I6L		*0*	*0*	*0*	Detector 47 -	0	0
Detector 16 - I7U		*0*	*0*	*0*	Detector 48 -	0	0
Detector 17 - I7L		*0*	*0*	*0*	Detector 49 -	0	0
Detector 18 - I8		*0*	*0*	*0*	Detector 50 -	0	0
Detector 19 - J2U		*0*	*0*	*0*	Detector 51 -	0	0
Detector 20 - J2L		*0*	*0*	*0*	Detector 52 -	0	0
Detector 21 - J3U		*0*	*0*	*0*	Detector 53 -	0	0
Detector 22 - J3L		*0*	*0*	*0*	Detector 54 -	0	0
Detector 23 - J4		*0*	*0*	*0*	Detector 55 -	0	0
Detector 24 - J6U		*0*	*0*	*0*	Detector 56 -	0	0
Detector 25 - J6L		*0*	*0*	*0*	Detector 57 -	0	0
Detector 26 - J7U		*0*	*0*	*0*	Detector 58 -	0	0
Detector 27 - J7L		*0*	*0*	*0*	Detector 59 -	0	0
Detector 28 - J8		*0*	*0*	*0*	Detector 60 -	0	0
Detector 29 -		*0*	*0*	*0*	Detector 61 -	0	0
Detector 30 -		*0*	*0*	*0*	Detector 62 -	0	0
Detector 31 -		*0*	*0*	*0*	Detector 63 -	0	0
Detector 32 -		*0*	*0*	*0*	Detector 64 -	0	0
fail monitor enable - X = On, recall phase - 0 = none 1 - 8 = phase 1 - 8, min, max					call / extend phase - 0 = none 1 - 8 = phase 1 - 8		

Detector Fail Sample Period (all detectors)	*0*	0 - 255 minutes

Video Fail Inputs (next/2/2/4/3) -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Phase Recalled	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 = none, 1 - 8 = phase 1 - 8

System Detectors (next/2/2/4/4)

System Detectors -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Local Detector	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 = none, 1 - 32 = phase 1 - 32

Overlaps / FYLTA (next/2/2/8)

Vehicle Overlaps		Phase or Movement	Phases 1	2	3	4	5	6	7	8	Extension Green	Clearance Yellow	Red
Overlaps	A		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	B		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	C		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	D		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	E		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	F		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	G		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	H		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	I		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	J		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	K		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	L		0	0	0	0	0	0	0	0	0.0	0.0	0.0

A - D
0 = none
1 = overlap
2 = 60 FPM
3 = Not ped
4=Comp. Ph.
5=Prevent. Ext.
6=Not Veh.
7=Adv. FF

E - L
0 = no Overlap
1 = Overlap

Green,Yellow Red

Not Ped - Ped Overlaps (next/2/2/8/5)

Ped Overlaps ->		A	B	C	D	E	F	G	H
Overlaps	A								
	B								
	C								
	D								

X = Nor Ped Ped Overlap

Advance Warning (next/2/2/8/3)

	E	F	G	H	I	J	K	L	
Enable	0	0	0	0	0	0	0	0	0 = disabled, 1 = enabled
1st Conditional Overlap	0	0	0	0	0	0	0	0	0 = none, 1 - overlap E, 2 = overlap F, etc.
2nd Conditional Overlap	0	0	0	0	0	0	0	0	
Advance Deactivation Delay	0	0	0	0	0	0	0	0	0 - 99 seconds

Ped Overlaps (next/2/2/8/5)

Phase -->		1	2	3	4	5	6	7	8	Walk	Ped Clear	Ped Recall
Ped Overlap	A									0	0	
	B									0	0	
	C									0	0	
	D									0	0	
	E									0	0	
	F									0	0	
	G									0	0	
	H									0	0	

Phase, Ped Recall: X = on

Walk, Ped Clear: 0 - 255 seconds

Flashing Yellow Left Turn Arrow (FYLTA) (next/2/2/8/6)

Phase Pairs -->	1 - 2	3 - 4	5 - 6	7 - 8	
Enable	4	4	4	4	0 = off, 3 = 3 outputs, 4 = 4 outputs, 5 = 5 outputs
Even Omits Odd	1	1	1	1	0 = off, 1 = on, 2 = on, place call across barrier
Detector Switch Odd / Even	X	X	X	X	X = on, odd phase must be omitted
Red Transition	3.0	3.0	3.0	3.0	0.0 or 2.0 - 25.5 sec
Red Extension	3.0	3.0	3.0	3.0	0.0 - 25.5 sec
Return to GLTA	0	0	0	0	0 = off, 1 = max out, 2 = yellow lock

Flashing Yellow Left Turn Arrow (FYLTA) - Continued on last page

Service Plans (next/2/2/6)

		1	2	3	4	5	6	7	8	
	Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Service Plan 1	**Call Mode**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Passage	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Yellow	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 or 3.0 - 25.5
	Red	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Walk	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Pedestrian Clearance	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Service Plan 2	**Call Mode**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Passage	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Yellow	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 or 3.0 - 25.5
	Red	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Walk	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Pedestrian Clearance	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Service Plan 3	**Call Mode**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Passage	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Yellow	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 or 3.0 - 25.5
	Red	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Walk	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Pedestrian Clearance	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Service Plan 4	**Call Mode**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Passage	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Yellow	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 or 3.0 - 25.5
	Red	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Walk	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Pedestrian Clearance	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Service Plan 5	**Call Mode**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Passage	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Yellow	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 or 3.0 - 25.5
	Red	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Walk	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Pedestrian Clearance	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Service Plan 6	**Call Mode**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Passage	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Yellow	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 or 3.0 - 25.5
	Red	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec.
	Walk	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.
	Pedestrian Clearance	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.

Service Plans Cont.

	Phase -->	1	2	3	4	5	6	7	8	
Service Plan 7	Call Mode	0	0	0	0	0	0	0	0	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	0	0	0	0	0	0	0	0	0 - 255 sec.
	Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 or 3.0 - 25.5
	Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Walk	0	0	0	0	0	0	0	0	0 - 255 sec.
	Pedestrian Clearance	0	0	0	0	0	0	0	0	0 - 255 sec.

	Phase -->	1	2	3	4	5	6	7	8	
Service Plan 8	Call Mode	0	0	0	0	0	0	0	0	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	0	0	0	0	0	0	0	0	0 - 255 sec.
	Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 or 3.0 - 25.5
	Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Walk	0	0	0	0	0	0	0	0	0 - 255 sec.
	Pedestrian Clearance	0	0	0	0	0	0	0	0	0 - 255 sec.

Max Plans (next/2/2/7)

	Phase -->	1	2	3	4	5	6	7	8	
Max Plan 1	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 2	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 3	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 4	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 5	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 6	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 7	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 8	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec

Coordination Data (next/2/3)

Coordination Modes (next/2/3/1, next/2/3/4/1, next/2/3/4/3)

Flash Mode	*33*	0=off, 1=on, 33=time clock, 34=comm, 35=hardwire
Coordination Plan Mode	*33*	0=free, 1-32 = coord plan 1-32, 33=time clock, 34=comm, 35=hardwire
Offset Seeking Mode	*2*	0=add only, 1=dwell, 2=fastway
Late Ped	*0*	0 = off, 1 = on
Coord Walk Rest	*0*	0 = off, 1 = on, 2 = by TOD circuit 160, 3 = end of walk, 4 = coord ped during perms
Repeated Phase Service	*0*	0=off, 1=on (no coord ped), 2=on (beginning green coord ped), 3=on (coord ped always)
Zero Mode (TS2 only)	*1*	0=start of main street, 1=end of main street, 2=by TOD circuit 144

Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	0 = service allowed 1 = service prevented
Omit Phase During Repeated Phase Service	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
Auto Permissive Min Green	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 seconds

Coordination Plans (next/2/3/2)

Coord Plan	**Coordination Phases**		**Cycle Length**	**Offset Time**	**Min Cycle Length Dwell Time**	**Permissive**	**Service Plan**	**Max Plan**
	Ring 1	**Ring 2**						
1 -	*2*	*6*	*90*	*0*	*0*	*0*	*0*	*0*
2 -	*2*	*6*	*100*	*0*	*0*	*0*	*0*	*0*
3 -	*2*	*6*	*110*	*0*	*0*	*0*	*0*	*0*
4 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
5 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
6 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
7 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
8 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
9 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
10 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
11 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
12 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
13 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
14 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
15 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
16 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
17 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
18 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
19 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
20 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
21 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
22 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
23 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
24 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
25 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
26 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
27 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
28 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
29 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
30 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
31 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
32 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0 - 8		0 - 255 sec.				0 - 8	

Coordination Plans cont.

Coord Plan	* = Force Offs / Split Times (TS2)								* = Yield Points / Actuated Times (TS2)	
	1	2	3	4	5	6	7	8	Ring 1	Ring 2
1 -	12	32	19	27	12	32	19	27	0	0
2 -	15	35	20	30	15	35	20	30	0	0
3 -	16	40	21	33	16	40	21	33	0	0
4 -	0	0	0	0	0	0	0	0	0	0
5 -	0	0	0	0	0	0	0	0	0	0
6 -	0	0	0	0	0	0	0	0	0	0
7 -	0	0	0	0	0	0	0	0	0	0
8 -	0	0	0	0	0	0	0	0	0	0
9 -	0	0	0	0	0	0	0	0	0	0
10 -	0	0	0	0	0	0	0	0	0	0
11 -	0	0	0	0	0	0	0	0	0	0
12 -	0	0	0	0	0	0	0	0	0	0
13 -	0	0	0	0	0	0	0	0	0	0
14 -	0	0	0	0	0	0	0	0	0	0
15 -	0	0	0	0	0	0	0	0	0	0
16 -	0	0	0	0	0	0	0	0	0	0
17 -	0	0	0	0	0	0	0	0	0	0
18 -	0	0	0	0	0	0	0	0	0	0
19 -	0	0	0	0	0	0	0	0	0	0
20 -	0	0	0	0	0	0	0	0	0	0
21 -	0	0	0	0	0	0	0	0	0	0
22 -	0	0	0	0	0	0	0	0	0	0
23 -	0	0	0	0	0	0	0	0	0	0
24 -	0	0	0	0	0	0	0	0	0	0
25 -	0	0	0	0	0	0	0	0	0	0
26 -	0	0	0	0	0	0	0	0	0	0
27 -	0	0	0	0	0	0	0	0	0	0
28 -	0	0	0	0	0	0	0	0	0	0
29 -	0	0	0	0	0	0	0	0	0	0
30 -	0	0	0	0	0	0	0	0	0	0
31 -	0	0	0	0	0	0	0	0	0	0
32 -	0	0	0	0	0	0	0	0	0	0
	0 - 255 sec * = force offs and yield points									

Circuit Mapping (next/2/3/3)

Circuit Map	Coord Plan	Time Clock Circuit		Time Clock Circuit		Time Clock Circuit		Time Clock Circuit		Time Clock Circuit		Time Clock Circuit		Time Clock Circuit		Time Clock Circuit	
1	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
2	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
3	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
4	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
5	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
6	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
7	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
8	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
9	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
10	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
11	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
12	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
13	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
14	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
15	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
16	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
17	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
18	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
19	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
20	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U

coord plan - 0 = free, 1 - 32 = coord plan 1 - 32, 33 = any, 34 none selected
time clock circuits - 0 = not used, or circuits 6 - 196

Dynamic Phase Length (next/2/3/4/4)

Phase -->		1	2	3	4	5	6	7	8	
Back Detector		0	0	0	0	0	0	0	0	0 = none, 1-32 = detector 1-32
Lane Factor		0	0	0	0	0	0	0	0	0 = none, 1.0 - 5.0
Check Out Detector		0	0	0	0	0	0	0	0	0 = none, 1-32 = detector 1-32
Coord Delta Force Off	Set A	0	0	0	0	0	0	0	0	0 - 255 sec
	Set B	0	0	0	0	0	0	0	0	
	Set C	0	0	0	0	0	0	0	0	
	Set D	0	0	0	0	0	0	0	0	
Free Delta Max	Set A	0	0	0	0	0	0	0	0	
	Set B	0	0	0	0	0	0	0	0	
	Set C	0	0	0	0	0	0	0	0	
	Set D	0	0	0	0	0	0	0	0	

Platoon Progression (next/2/3/4/5)

Entry Local Only			Master Local Only		
Platoon Max	0	0 - 255 sec	Smoothing Factor	0.0	0.0 - 1.0
Min Platoon Green	0	0 - 255 sec			
Entry Detector Gap	0.0	0.0 - 25.5			
Min Platoon Cycle	0	0 - 255 sec			

Inbound			Outbound		
Only for Entry Inbound Local or Master Local			Only for Entry Outbound Local or Master Local		
Entry IB Local also Last OB Local	0	0 - 50	Entry OB Local also Last IB Local	0	0 - 50
Speed	0	0 - 55 mph	Speed	0	0 - 55 mph
Distance from Entry Local	0	0 - 65000 feet	Distance from Entry Local	0	0 - 65000 feet

Entry Local Only				Entry Local Only			
Distance from Entry Local Detector	0	0 - 999 feet		Distance from Entry Local Detector	0	0 - 999 feet	
Entry Local Detector	0	0	0 - 32	Entry Local Detector	0	0	0 - 32

Master Local				Master Local			
Master Mid - System Critical Detectors	0	0	0 - 16	Master Mid - System Critical Detectors	0	0	0 - 16

Force Off Percents

Inbound	1	3	4	5	7	8	Outbound	1	3	4	5	7	8
Split 1	0	0	0	0	0	0	Split 1	0	0	0	0	0	0
Split 2	0	0	0	0	0	0	Split 2	0	0	0	0	0	0
	0 - 100 %							0 - 100 %					

Time of Day Data (next/2/4)

Day Program (next/2/4/1)

	Day Prog.	Time	Coord Plan	Coord Plan or Circuit		State On / Off		Day Prog.	Time	Coord Plan	Coord Plan or Circuit		State On/Off
1							51						
2							52						
3							53						
4							54						
5							55						
6							56						
7							57						
8							58						
9							59						
10							60						
11							61						
12							62						
13							63						
14							64						
15							65						
16							66						
17							67						
18							68						
19							69						
20							70						
21							71						
22							72						
23							73						
24							74						
25							75						
26							76						
27							77						
28							78						
29							79						
30							80						
31							81						
32							82						
33							83						
34							84						
35							85						
36							86						
37							87						
38							88						
39							89						
40							90						
41							91						
42							92						
43							93						
44							94						
45							95						
46							96						
47							97						
48							98						
49							99						
50							100						
	1 - 15	hh : mm	X = on	coord plan 0 - 32 or circuit 1-196		X = on		1 - 15	hh : mm	X = on	coord plan 0 - 32 or circuit 1-196		X = on

Day Program cont.														
	Day Prog.	Time	Coord Plan	Coord Plan or Circuit		State On / Off		Day Prog.	Time	Coord Plan	Coord Plan or Circuit		State On / Off
101							151						
102							152						
103							153						
104							154						
105							155						
106							156						
107							157						
108							158						
109							159						
110							160						
111							161						
112							162						
113							163						
114							164						
115							165						
116							166						
117							167						
118							168						
119							169						
120							170						
121							171						
122							172						
123							173						
124							174						
125							175						
126							176						
127							177						
128							178						
129							179						
130							180						
131							181						
132							182						
133							183						
134							184						
135							185						
136							186						
137							187						
138							188						
139							189						
140							190						
141							191						
142							192						
143							193						
144							194						
145							195						
146							196						
147							197						
148							198						
149							199						
150							200						
	1 - 15	hh : mm	X = on	coord plan 0 - 32 or circuit 1-196		X = on		1 - 15	hh : mm	X = on	coord plan 0 - 32 or circuit 1-196		X = on

Week Program (next/2/4/2)

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	1	1	1	1	1	2
2	1	1	1	1	1	1	1
3	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1
6	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1

0 = none, 1 - 15 = day plan

Exception Days (next/2/4/6)

	DOW	WOM	DOM	MOY	Day Prog.
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
	0-10	0 - 5	0-31	0-12	0 - 15

Year Program (next/2/4/3)

From Date	To Date	Week Program
01/01/2013	12/31/2013	1

New Years Day - Date - January 1st

Martin Luther King Day - DOW WOM - 3rd Monday of January

President's Day - DOW WOM - 3rd Monday February

Memorial Day - DOW WOM - Last Monday May

Fourth of July - Date - July 4th

Labor Day - DOW WOM - 1st Monday September

Columbus Day - DOW WOM - 2nd Monday October

Veteran's Day - Date - November 11th

Thanksgiving - DOW WOM - 4th Thursday November

Christmas - Date - December 25th

Time Clock References (next/2/4/5)

Synch reference Mode	0	0 = timed, 1 = by event
Synch Reference Time	00:00	00:00 - 23:59
Daylight Savings Enable	X	X = on
Reset Time	00:00	00:00 - 23:59

Exception day headings - DOW = Day of Week, WOM = Week of Month, DOM = Day of Month, MOY = Month of Year

Circuit Overrides (next/2/4/4)							
1 - Coord Line 1	**CL1**	*TOD*		**51 - Ped Omit 3**	**PO3**	*TOD*	
2 - Coord Line 2	**CL2**	*TOD*		**52 - Ped Omit 4**	**PO4**	*TOD*	
3 - Coord Line 4	**CL4**	*TOD*		**53 - Ped Omit 5**	**PO5**	*TOD*	
4 - Coord Line 8	**CL8**	*TOD*		**54 - Ped Omit 6**	**PO6**	*TOD*	
5 - Coord Line 16	**C16**	*TOD*		**55 - Ped Omit 7**	**PO7**	*TOD*	
6 - Coord Operation	**CRD**	*TOD*		**56 - Ped Omit 8**	**PO8**	*TOD*	
7 - Soft Flash	**SFL**	*TOD*		**57 - Conditional Service**	**CVS**	*TOD*	
8 - Enable System Relays	**ESR**	*TOD*		**58 - Inhibit Simultaneous Gap Out**	**ISG**	***On***	
9 - Call to Non Act 1	**CN1**	*TOD*		**59 - Inhibit Hardwire**	**HWI**	*TOD*	
10 - Call to Non Act 2	**CN2**	*TOD*		**60 - Ped Override Mode**	**POM**	***On***	
11 - Walk Rest Modifier	**WRM**	*TOD*		**61 - Dual Entry**	**DLE**	***On***	
12 - Min Recall	**MIN**	*TOD*		**62 - Exclusive Ped**	**EPD**	*TOD*	
13 - Max 2 Both Rings	**MX2**	*TOD*		**63 - Call to Time Clock Mode**	**CTC**	*TOD*	
14 - Coord Inhibit Max Ring 1, 2	**IMT**	*TOD*		**64 - Dual Enhanced Ped**	**DEP**	*TOD*	
15 - Not Used	**N/U**	*TOD*		**65 - Service Plan 1**	**SP1**	*TOD*	
16 - Call to Free	**CTF**	*TOD*		**66 - Service Plan 2**	**SP2**	*TOD*	
17 - TOD Output 1	**TO1**	*TOD*		**67 - Service Plan 3**	**SP3**	*TOD*	
18 - TOD Output 2	**TO2**	*TOD*		**68 - Service Plan 4**	**SP4**	*TOD*	
19 - TOD Output 3	**TO3**	*TOD*		**69 - Service Plan 5**	**SP5**	*TOD*	
20 - TOD Output 4	**TO4**	*TOD*		**70 - Service Plan 6**	**SP6**	*TOD*	
21 - TOD Output 5	**TO5**	*TOD*		**71 - Service Plan 7**	**SP7**	*TOD*	
22 - TOD Output 6	**TO6**	*TOD*		**72 - Service Plan 8**	**SP8**	*TOD*	
23 - TOD Output 7	**TO7**	*TOD*		**73 - Max Plan 1**	**MP1**	*TOD*	
24 - TOD Output 8	**TO8**	*TOD*		**74 - Max Plan 2**	**MP2**	*TOD*	
25 - Vehicle Call Phase 1	**VC1**	*TOD*	On / Off / TOD	**75 - Max Plan 3**	**MP3**	*TOD*	On / Off / TOD
26 - Vehicle Call Phase 2	**VC2**	*TOD*		**76 - Max Plan 4**	**MP4**	*TOD*	
27 - Vehicle Call Phase 3	**VC3**	*TOD*		**77 - Max Plan 5**	**MP5**	*TOD*	
28 - Vehicle Call Phase 4	**VC4**	*TOD*		**78 - Max Plan 6**	**MP6**	*TOD*	
29 - Vehicle Call Phase 5	**VC5**	*TOD*		**79 - Max Plan 7**	**MP7**	*TOD*	
30 - Vehicle Call Phase 6	**VC6**	*TOD*		**80 - Max Plan 8**	**MP8**	*TOD*	
31 - Vehicle Call Phase 7	**VC7**	*TOD*		**81 - Transit Priority Max Group 1**	**TG1**	*TOD*	
32 - Vehicle Call Phase 8	**VC8**	*TOD*		**82 - Transit Priority Max Group 2**	**TG2**	*TOD*	
33 - Ped Call Phase 1	**PC1**	*TOD*		**83 - Transit Priority Max Group 3**	**TG3**	*TOD*	
34 - Ped Call Phase 2	**PC2**	*TOD*		**84 - Transit Priority Max Group 4**	**TG4**	*TOD*	
35 - Ped Call Phase 3	**PC3**	*TOD*		**85 - Transit Priority Max Group 5**	**TG5**	*TOD*	
36 - Ped Call Phase 4	**PC4**	*TOD*		**86 - Transit Priority Max Group 6**	**TG6**	*TOD*	
37 - Ped Call Phase 5	**PC5**	*TOD*		**87 - Transit Priority Max Group 7**	**TG7**	*TOD*	
38 - Ped Call Phase 6	**PC6**	*TOD*		**88 - Transit Priority Max Group 8**	**TG8**	*TOD*	
39 - Ped Call Phase 7	**PC7**	*TOD*		**89 - Inhibit Volume Density 1**	**IV1**	*TOD*	
40 - Ped Call Phase 8	**PC8**	*TOD*		**90 - Inhibit Volume Density 2**	**IV2**	*TOD*	
41 - Vehicle Omit 1	**VO1**	*TOD*		**91 - Inhibit Volume Density 3**	**Iv3**	*TOD*	
42 - Vehicle Omit 2	**VO2**	*TOD*		**92 - Inhibit Volume Density 4**	**IV4**	*TOD*	
43 - Vehicle Omit 3	**VO3**	*TOD*		**93 - Inhibit Volume Density 5**	**IV5**	*TOD*	
44 - Vehicle Omit 4	**VO4**	*TOD*		**94 - Inhibit Volume Density 6**	**IV6**	*TOD*	
45 - Vehicle Omit 5	**VO5**	*TOD*		**95 - Inhibit Volume Density 7**	**IV7**	*TOD*	
46 - Vehicle Omit 6	**VO6**	*TOD*		**96 - Inhibit Volume Density 8**	**IV8**	*TOD*	
47 - Vehicle Omit 7	**VO7**	*TOD*		**97 - Lag 1**	**LG1**	*TOD*	
48 - Vehicle Omit 8	**VO8**	*TOD*		**98 - Lag 3**	**LG3**	*TOD*	
49 - Ped Omit 1	**PO1**	*TOD*		**99 - Lag 5**	**LG5**	*TOD*	
50 - Ped Omit 2	**PO2**	*TOD*		**100 - Lag 7**	**LG7**	*TOD*	

Circuit Overrides cont.							
101 - Inhibit Overlap A	**OLA**	*TOD*		**151 - Coord Hold 7**	**HD7**	*TOD*	
102 - Inhibit Overlap B	**OLB**	*TOD*		**152 - Coord Hold 8**	**HD8**	*TOD*	
103 - Inhibit Overlap C	**OLC**	*TOD*		**153 - PE Priority Return B**	**PRB**	*TOD*	
104 - Inhibit Overlap D	**OLD**	*TOD*		**154 - PE Priority Return C**	**PRC**	*TOD*	
105 - Enable Schedule A Phone 1	**AT1**	*TOD*		**155 - PE Priority Return D**	**PRD**	*TOD*	
106 - Enable Schedule A Phone 2	**AT2**	*TOD*		**156 - PE Priority Return E**	**PRE**	*TOD*	
107 - Enable Schedule B Phone 1	**BT1**	*TOD*		**157 - Platoon Inbound**	**PPI**	*TOD*	
108 - Enable Schedule B Phone 2	**BT2**	*TOD*		**158 - Platoon Outbound**	**PPO**	*TOD*	
109 - Enable Schedule C Phone 1	**CT1**	*TOD*		**159 - Platoon Spl 2**	**PS2**	*TOD*	
110 - Enable Schedule C Phone 2	**CT2**	*TOD*		**160 - Coord Walk Rest**	**CWR**	*TOD*	
111 - Enable Volume to Call Phone 1	**VT1**	*TOD*		**161 - Dynamic Phase Length Short Inhibit 1**	**SI1**	*TOD*	
112 - Enable Volume to Call Phone 2	**VT2**	*TOD*		**162 - Dynamic Phase Length Short Inhibit 2**	**SI2**	*TOD*	
113 - Enable Volume Logging	**EVL**	***On***		**163 - Dynamic Phase Length Short Inhibit 3**	**SI3**	*TOD*	
114 - Enable MOE Logging	**EML**	***On***		**164 - Dynamic Phase Length Short Inhibit 4**	**SI4**	*TOD*	
115 - Detector Low Threshold Inhibit	**DLI**	*TOD*		**165 - Dynamic Phase Length Short Inhibit 5**	**SI5**	*TOD*	
116 - Detector Continue Presence Inhibit	**DPI**	*TOD*		**166 - Dynamic Phase Length Short Inhibit 6**	**SI6**	*TOD*	
117 - Inhibit Detector Based on Programming	**IND**	*TOD*		**167 - Dynamic Phase Length Short Inhibit 7**	**SI7**	*TOD*	
118 - Inhibit Detector Delay	**IDD**	*TOD*		**168 - Dynamic Phase Length Short Inhibit 8**	**SI8**	*TOD*	
119 - Inhibit Conditional Ped	**ICP**	*TOD*		**169 - Coord Late Left Turn 1**	**CT1**	*TOD*	
120 - Inhibit Transit Priority	**ITP**	*TOD*		**170 - Coord Late Left Turn 3**	**CT3**	*TOD*	
121 - Red Rest Ring 1,2	**RRM**	*TOD*		**171 - Coord Late Left Turn 5**	**CT5**	*TOD*	
122 - Not Used	**N/U**	*TOD*		**172 - Coord Late Left Turn 7**	**CT7**	*TOD*	
123 - Omit Red Clear Ring 1,2	**ORC**	*TOD*		**173 - Dynamic Phase Length Enable A**	**DPA**	*TOD*	
124 - Not Used	**N/U**	*TOD*		**174 - Dynamic Phase Length Enable B**	**DPB**	*TOD*	
125 - Ped Recycle Ring 1,2	**PCY**	*TOD*	On / Off / TOD	**175 - Dynamic Phase Length Enable C**	**DPC**	*TOD*	On / Off / TOD
126 - Not Used	**N/U**	*TOD*		**176 - Dynamic Phase Length Enable D**	**DPD**	*TOD*	
127 - Enable MOE Log to Call Phone 1	**MT1**	*TOD*		**177 - Proactive Plan Select Average**	**PSA**	*TOD*	
128 - Enable MOE Log to Call Phone 2	**MT2**	*TOD*		**178 - Proactive Plan Select Inbound**	**PSI**	*TOD*	
129 - Transit Inhibit Short Time 1	**IS1**	*TOD*		**179 - Proactive Plan Select Outbound**	**PSO**	*TOD*	
130 - Transit Inhibit Short Time 2	**IS2**	*TOD*		**180 - Split Variant Inbound**	**SVI**	*TOD*	
131 - Transit Inhibit Short Time 3	**IS3**	*TOD*		**181 - Split Variant Outbound**	**SVO**	*TOD*	
132 - Transit Inhibit Short Time 4	**IS4**	*TOD*		**182 - Disable Coord Walk Rest Ring 1**	**DW1**	*TOD*	
133 - Transit Inhibit Short Time 5	**IS5**	*TOD*		**183 - Disable Coord Walk Rest Ring 2**	**DW2**	*TOD*	
134 - Transit Inhibit Short Time 6	**IS6**	*TOD*		**184 - Proactive Plan Select New Look**	**NLK**	*TOD*	
135 - Transit Inhibit Short Time 7	**IS7**	*TOD*		**185 - Disable Red Clearance Extension**	**DRX**	*TOD*	
136 - Transit Inhibit Short Time 8	**IS8**	*TOD*		**186 - Detector Plan Line 1**	**DL1**	*TOD*	
137 - Enable Transit Priority Logging	**ETL**	*TOD*		**187 - Detector Plan Line 2**	**DL2**	*TOD*	
138 - Disable Flashing Yellow Arrow 1	**DF1**	*TOD*		**188 - Disable LRT 1 Vertical Flashing Bar**	**DV1**	*TOD*	
139 - Disable Flashing Yellow Arrow 3	**DF3**	*TOD*		**189 - Disable LRT 2 Vertical Flashing Bar**	**DV2**	*TOD*	
140 - Disable Flashing Yellow Arrow 5	**DF5**	*TOD*		**190 - Disable LRT 3 Vertical Flashing Bar**	**DV3**	*TOD*	
141 - Disable Flashing Yellow Arrow 7	**DF7**	*TOD*		**191 - Disable LRT 4 Vertical Flashing Bar**	**DV4**	*TOD*	
142 - Disable Auto Max	**DAM**	*TOD*		**192 - Datakey Enable**	**DKE**	***On***	
143 - Disable Repeat Phase Service	**DRS**	*TOD*		**193 - Dynamic Phase Reversal Enable 1**	**DR1**	*TOD*	
144 - Coord End of Main Street	**EMS**	*TOD*		**194 - Dynamic Phase Reversal Enable 3**	**DR3**	*TOD*	
145 - Coord Hold 1	**HD1**	*TOD*		**195 - Dynamic Phase Reversal Enable 5**	**DR5**	*TOD*	
146 - Coord Hold 2	**HD2**	*TOD*		**196 - Dynamic Phase Reversal Enable 7**	**DR7**	*TOD*	
147 - Coord Hold 3	**HD3**	*TOD*		**197 - Enable Coord Logging**	**ECL**	***On***	
148 - Coord Hold 4	**HD4**	*TOD*		**198 - Disable Gap FYLTA 1,3,5,7**	**DGF**	*TOD*	
149 - Coord Hold 5	**HD5**	*TOD*		**199 - Coordination Auto Walk**	**CAW**	*TOD*	
150 - Coord Hold 6	**HD6**	*TOD*		**200 - Enable Coordinated Auto Max**	**ECM**	*TOD*	

Preemption Data (next/2/5)

Sequence (next/2/5/1 - 8)

Sequences / Intervals		Instruction	Phases Serviced	Interval Time	Hold On Input	Outputs On	Output Mode
1	1	0	25	0	X		0
	2	98		0			0
	3	0		0			0
	4	0		0			0
	5	0		0			0
	6	0		0			0
	7	0		0			0
	8	0		0			0
	9	0		0			0
	10	0		0			0
2	1	0	47	0	X		0
	2	98		0			0
	3	0		0			0
	4	0		0			0
	5	0		0			0
	6	0		0			0
	7	0		0			0
	8	0		0			0
	9	0		0			0
	10	0		0			0
3	1	0	16	0	X		0
	2	98		0			0
	3	0		0			0
	4	0		0			0
	5	0		0			0
	6	0		0			0
	7	0		0			0
	8	0		0			0
	9	0		0			0
	10	0		0			0
4	1	0	38	0	X		0
	2	98		0			0
	3	0		0			0
	4	0		0			0
	5	0		0			0
	6	0		0			0
	7	0		0			0
	8	0		0			0
	9	0		0			0
	10	0		0			0
5	1	0	38	8			0
	2	0	256	0	X		0
	3	98		0			0
	4	0		0			0
	5	0		0			0
	6	0		0			0
	7	0		0			0
	8	0		0			0
	9	0		0			0
	10	0		0			0

Instructions
0 - Service Phases
1-9 = Special Interval 1-9
10 - Preempt Sequence Allows FYLTA
11 - Preempt Interval Disables FYLTA
15 - Alternate Trap Protection
90 - Go to all Red
91 - Soft Flash On
92 - Soft Flash Off
93 - Enable Ped
94 - Disable Peds
95 - Priority Return
96 - Enable Coordination with peds
97 - Enable Coordination without peds
98 - Return with NO Calls
99 - Return with Vehicle Calls
100 - jump to step in Interval Time
101 - Use Interval Time as Resetable Gap Timer
196 - Coord Re-synch with Peds
197 - Coord Re-synch without Peds
200 - Light Rail Train phase without Peds
201 - Light Rail Train phase with Peds
202 - Return to highest queue/delay phase (this uses the Dynamic Phase Length Back Detectors)
216 - Light Rail Train Coord Re-synch with Peds
217 - Light Rail Train Coord Re-synch without Peds

Phases Serviced - phases 1 - 8
Interval Time - 0 - 255 sec or interval 1 - 10
Hold on Input - X = on
Outputs On - output 1 - 8

Output Modes -
0 = all steady on
1 = all flash together
2 = odd flashes WIG, even flashes WAG
3 = 1 - 4 steady on, 5 - 8 all flash together

Sequence cont.

Sequences / Intervals		Instruction	Phases Serviced	Interval Time	Hold On Input	Outputs On	Output Mode
6	1	0		0			0
	2	0		0			0
	3	0		0			0
	4	0		0			0
	5	0		0			0
	6	0		0			0
	7	0		0			0
	8	0		0			0
	9	0		0			0
	10	0		0			0
7	1	0		0			0
	2	0		0			0
	3	0		0			0
	4	0		0			0
	5	0		0			0
	6	0		0			0
	7	0		0			0
	8	0		0			0
	9	0		0			0
	10	0		0			0
8	1	0		0			0
	2	0		0			0
	3	0		0			0
	4	0		0			0
	5	0		0			0
	6	0		0			0
	7	0		0			0
	8	0		0			0
	9	0		0			0
	10	0		0			0

Sequence Timing (next/2/5/0)

	Sequence -- >	1	2	3	4	5	6	7	8	
	Input Memory									X = on
	Input Priority	6	6	6	6	8	0	0	0	0 = lowest, - 8 = highest
Entry (Transition) Parameters	Min Green	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec
	Walk	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0 would time the normal function time
	Ped Clear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Overlap Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec
	Overlap Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Delay to Preempt	0	0	0	0	0	0	0	0	0 - 255 sec
	Delay Ped Omit	0	0	0	0	0	0	0	0	
	Delay Phase Omit	0	0	0	0	0	0	0	0	
	Min Reservice	0	0	0	0	0	0	0	0	0 - 255 min
Overlap Inhibits	A									X = inhibit
	B									
	C									
	D									
Exit Parameters	Exit to Coord Plan Offset by X	0	0	0	0	0	0	0	0	0 - 20
	Exit Coord Plan Time	0	0	0	0	0	0	0	0	0 - 60 min
	Exit to Max Plan	0	0	0	0	0	0	0	0	0 - 8
	Exit Free Time	0	0	0	0	0	0	0	0	0 - 60 min
	Override Time	0	0	0	0	0	0	0	0	
	Fail Time	0	0	0	0	0	0	0	0	
	Exit Mode Time	0	0	0	0	0	0	0	0	

Priority Return and Special Intervals (next/2/5/0/6, next/2/5/9)													
Phase / Overlap -->		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**A**	**B**	**C**	**D**
Priority Return	**Enable**	*0*	0 = disabled, 1 = enabled, 2 = enabled, skip preemption phases on exit										
	A (max)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 100% of currently used max			
	B (max)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*				
	C (max)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*				
	D (max)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*				
	E (max)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*				
	Ped Clear	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 100% of currently used ped clearance			
Queue Delay Recovery		*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.			
Special Intervals	**1**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	2	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	3	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	4	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	5	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	6	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	7	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	8	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	9	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

0 = Dark
1 = green don't walk
2 = green walk
3 = green flashing don't walk
4 = yellow
5 = red
6 = flashing yellow WIG
7 = flashing yellow WAG
8 = flashing red WIG
9 = flashing red WAG
10 = walk only
11=flashing don't walk only

Light Rail Train (next/2/5/0/7)						
Light Rail Train -->	**1**	**2**	**3**	**4**	
Associated Preempt	*0*	*0*	*0*	*0*	0 = none, preempt 1 - 8
Time to Green	*0*	*0*	*0*	*0*	0 - 255 sec
Horizontal Bar Flash Time	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec
Vertical Bar Flash Time	*0.0*	*0.0*	*0.0*	*0.0*	
Min Duration	*0*	*0*	*0*	*0*	0 - 255 sec

Communications Data (next/2/6)

1st Central Phone Number		**2nd Central Phone Number**	
Modem Setup String		**Intersection Name**	*Herman and Teton*
Subnet Mask	*0.0.0.0*		
IP (ethernet) Port	*0*		
Central Port	*0*		
System Mode	*0*		
System Port	*1*	**Alternate System Port**	*0*

System ID	*0*	**AB3418e Physical Address**	*0*		**IP Address**	*0.0.0.0*	
Local ID	*0*	**AB3418e Group Address**	*0*		**Gateway Address**	*0.0.0.0*	

Baud Rates		**Flow Control**	**Port Use**
Port 1 (Slot A2 Upper)	*0*	*1*	*Suggested Use - FSK*
Port 2 (Slot A2 Lower)	*0*	*1*	*Suggested Use - Not Used*
Port 3 (Slot A1 Upper)	*0*	*0*	*Suggested Use - Modem to Central*
Port 4 (Slot A1 Lower or C50S)	*2*	*N\U*	*Suggested Use - RS232 to Laptop*
0 = 1200, 1 = 2400, 2 = 9600, 3 = 19200 baud		0 = off, 1 = on	

Reports

Volume Log Period	*15*	0-255 min. or below	**MOE Log Period**	*15*	below

0 = disabled, 1,2,3,4,5,6,10,12,15,20,30,60 minutes

Function Schedule Mapping (next/2/6/7)

Alarm 1	*0*		**Soft Flash**	*1*	
Alarm 2	*0*		**Manual Control Enable (MCE)**	*4*	
Alarm 3	*0*		**Emergency or Railroad Preempt**	*1*	
Alarm 4	*0*		**Not Used**	*0*	
Alarm 5	*0*	0 = none	**Cycle Failure**	*2*	0 = none
Not Used	*0*	1 = schedule A	**Coordination Failure**	*2*	1 = schedule A
Not Used	*0*	2 = schedule B	**Keyboard use / Data Changed**	*3*	2 = schedule B
Not Used	*0*	3 = schedule C	**Coord Running / Free**	*2*	3 = schedule C
Power On / Off	*1*	4 = schedule R	**Cabinet Door**	*3*	4 = schedule R
Checksum Failure	*4*		**Extended Ped Pushbutton**	*0*	
Video / Detector Failure	*4*		**Monitor Status**	*4*	
Master to Local Comm Lost	*0*				

Miscellaneous Data

Transit Priority (next/2/7)

	1	2	3	4	5	6	7	8	
Phases									Phases 1 - 8 (max of 2 compatible phases)
PE Enable (6.25Hz TP call on PE)									X = 6.25 Hz signal will activate TP
Priority	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 8, 8 = highest
Memory									X = on
Delay Time	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec
Minimum Reservice Time (per input)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 min
Override Time	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec
Bus Extend	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec
Minimum Reservice Time (all inputs)	*0*	0 - 255 min							
Free Operation Mode	*0*	0 = use shortest of max 1 or 2, 1 - 8 = use max time of group 1 - 8, 9 = use time of day							

Transit Priority Alternate Force Off Plans

Current Coord Plan	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Alternate TP Force Off Plan	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Current Coord Plan	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Alternate TP Force Off Plan	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

0 = none
17 - 32 = coord plan 17 - 32

Group Timing

	Phase -->	1	2	3	4	5	6	7	8
Group 1	**Max Times**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Walk Times	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Group 2	**Max Times**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Walk Times	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Group 3	**Max Times**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Walk Times	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Group 4	**Max Times**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Walk Times	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Group 5	**Max Times**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Walk Times	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Group 6	**Max Times**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Walk Times	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Group 7	**Max Times**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Walk Times	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Group 8	**Max Times**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Walk Times	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

0 - 255 sec
0 would time the normal function time

Truck Priority (next/2/7/9)

Truck Priority-->	**1**	**2**	**3**	**4**	
Associated Transit Priority	*0*	*0*	*0*	*0*	0 = none 1 - 8 = transit priority 1 - 8
Leading Detector	*0*	*0*	*0*	*0*	0 = none, 1 - 32 = detector 1 - 32
Trailing Detector	*0*	*0*	*0*	*0*	
Stop Bar Distance	*0*	*0*	*0*	*0*	0 - 999 feet
Trap Distance	*0*	*0*	*0*	*0*	0.0 - 99.9 feet
Minimum Speed	*0*	*0*	*0*	*0*	0 - 100 mph
Minimum Length	*0*	*0*	*0*	*0*	0 - 255 feet
Downhill Grade	*0*	*0*	*0*	*0*	0 - 20 %
Uphill Grade	*0*	*0*	*0*	*0*	
Undersized Vehicle					X = Enabled

Change I/O		X = On (After a download with a power on - off cycle)

Inputs (Non Default I/O is offset to the right) (next/2/8/1)

C1-39	*101*	*VD9*	**C1-55**	*15*	*VD5*	**C1-67**	*22*	*PED2*	**C11-15**	*254*	*N/U*
C1-40	*113*	*VD19*	**C1-56**	*11*	*VD1*	**C1-68**	*26*	*PED6*	**C11-16**	*254*	*N/U*
C1-41	*106*	*VD14*	**C1-57**	*17*	*VD7*	**C1-69**	*24*	*PED4*	**C11-17**	*254*	*N/U*
C1-42	*118*	*VD24*	**C1-58**	*13*	*VD3*	**C1-70**	*28*	*PED8*	**C11-18**	*254*	*N/U*
C1-43	*102*	*VD10*	**C1-59**	*16*	*VD6*	**C1-71**	*151*	*PE1*	**C11-19**	*254*	*N/U*
C1-44	*114*	*VD20*	**C1-60**	*12*	*VD2*	**C1-72**	*152*	*PE2*	**C11-20**	*254*	*N/U*
C1-45	*107*	*VD15*	**C1-61**	*18*	*VD8*	**C1-73**	*153*	*PE3*	**C11-21**	*254*	*N/U*
C1-46	*161*	*VD25*	**C1-62**	*14*	*VD4*	**C1-74**	*154*	*PE4*	**C11-22**	*254*	*N/U*
C1-47	*105*	*VD13*	**C11-10**	*254*	*N/U*	**C1-75**	*254*	*N/U*	**C11-23**	*254*	*N/U*
C1-48	*117*	*VD23*	**C11-11**	*254*	*N/U*	**C1-76**	*104*	*VD12*	**C11-24**	*254*	*N/U*
C1-49	*112*	*VD18*	**C11-12**	*254*	*N/U*	**C1-77**	*116*	*VD22*	**C11-25**	*254*	*N/U*
C1-50	*164*	*VD28*	**C11-13**	*254*	*N/U*	**C1-78**	*111*	*VD17*	**C11-26**	*254*	*N/U*
C1-51	*199*	*PEDI*	**C1-63**	*103*	*VD11*	**C1-79**	*163*	*VD27*	**C11-27**	*254*	*N/U*
C1-52	*155*	*PE5*	**C1-64**	*115*	*VD21*	**C1-80**	*82*	*IADV*	**C11-28**	*254*	*N/U*
C1-53	*85*	*MCE*	**C1-65**	*108*	*VD16*	**C1-81**	*137*	*MONS*	**C11-29**	*254*	*N/U*
C1-54	*254*	*N/U*	**C1-66**	*162*	*VD26*	**C1-82**	*62*	*ST1*	**C11-30**	*254*	*N/U*

Outputs (Non Default I/O is offset to the right) (next/2/8/2)

C1-2	*44*	*4DWK*	**C1-19**	*48*	*8DWK*	**C1-35**	*215*	*FYA1*	**C1-91**	*41*	*1DWK*
C1-3	*64*	*4WLK*	**C1-20**	*68*	*8WLK*	**C1-36**	*217*	*FYA5*	**C1-93**	*61*	*1WLK*
C1-4	*14*	*4RED*	**C1-21**	*18*	*8RED*	**C1-37**	*216*	*FYA3*	**C1-94**	*106*	*OLBR*
C1-5	*24*	*4YEL*	**C1-22**	*28*	*8YEL*	**C1-38**	*218*	*FYA7*	**C1-95**	*105*	*OLBY*
C1-6	*34*	*4GRN*	**C1-23**	*38*	*8GRN*	**C1-100**	*53*	*3PCL*	**C1-96**	*104*	*OLBG*
C1-7	*13*	*3RED*	**C1-24**	*17*	*7RED*	**C1-101**	*51*	*1PCL*	**C1-97**	*103*	*OLAR*
C1-8	*222*	*FYC3*	**C1-25**	*224*	*FYC7*	**C1-102**	*187*	*SFL*	**C1-98**	*102*	*OLAY*
C1-9	*33*	*3GRN*	**C1-26**	*37*	*7GRN*	**C1-103**	*147*	*WDOG*	**C1-99**	*101*	*OLAG*
C1-10	*42*	*2DWK*	**C1-27**	*46*	*6DWK*	**C1-83**	*43*	*3DWK*	**C11-1**	*254*	*N/U*
C1-11	*62*	*2WLK*	**C1-28**	*66*	*6WLK*	**C1-84**	*63*	*3WLK*	**C11-2**	*254*	*N/U*
C1-12	*12*	*2RED*	**C1-29**	*16*	*6RED*	**C1-85**	*116*	*OLDR*	**C11-3**	*254*	*N/U*
C1-13	*22*	*2YEL*	**C1-30**	*26*	*6YEL*	**C1-86**	*115*	*OLDY*	**C11-4**	*254*	*N/U*
C1-15	*32*	*2GRN*	**C1-31**	*36*	*6GRN*	**C1-87**	*114*	*OLDG*	**C11-5**	*254*	*N/U*
C1-16	*11*	*1RED*	**C1-32**	*15*	*5RED*	**C1-88**	*113*	*OLCR*	**C11-6**	*254*	*N/U*
C1-17	*221*	*FYC1*	**C1-33**	*223*	*FYC5*	**C1-89**	*112*	*OLCY*	**C11-7**	*254*	*N/U*
C1-18	*31*	*1GRN*	**C1-34**	*35*	*5GRN*	**C1-90**	*111*	*OLCG*	**C11-8**	*254*	*N/U*

Internal Logic (next/2/9)			
Step	**Inst.**	**Description**	**Comment**
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Internal Logic cont.			
Step	**Inst.**	**Description**	**Comment**
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Internal Logic cont.			
Step	**Inst.**	**Description**	**Comment**
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Internal Logic cont.			
Step	**Inst.**	**Description**	**Comment**
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Internal Logic cont.			
Step	**Inst.**	**Description**	**Comment**
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256			

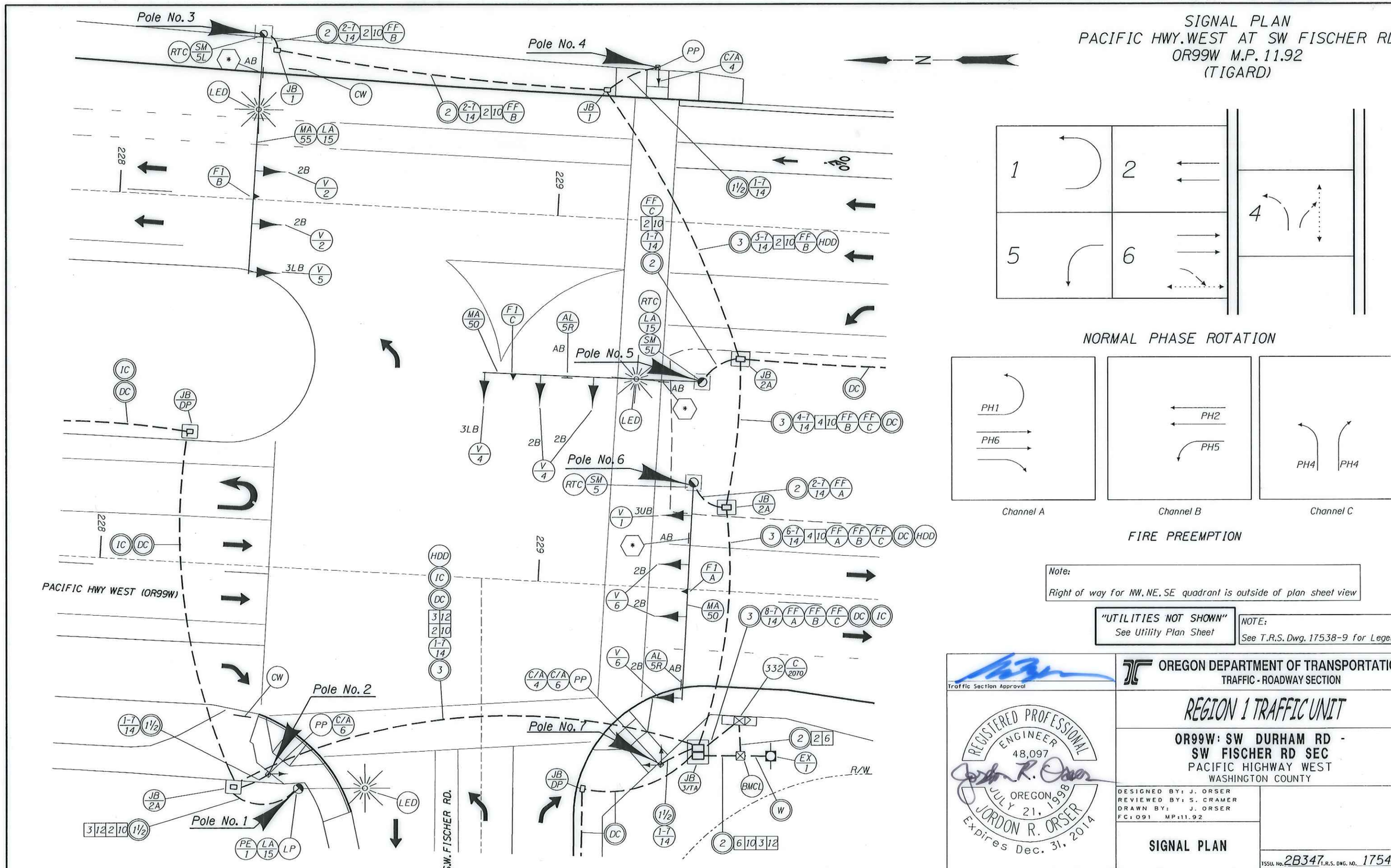
FYLTA - Continued (next/2/2/8/6)						
	Phase Pairs -->	**1 - 2**	**3 - 4**	**5 - 6**	**7 - 8**	
Gap-Dependent FYLTA (next/2/2/8/6-A)	**Detector Input**	*0*	*0*	*0*	*0*	0 = disable, 1 - 64 detectors
	Min Delay	*0.0*	*0.0*	*0.0*	*0.0*	0 - 255 sec
	Detector Gap	*255*	*255*	*255*	*255*	0 - 25.5 sec
	Max Delay	*3*	*3*	*3*	*3*	0 - 255 sec
	Not Ped	*4*	*4*	*4*	*4*	0 - 255 sec

FYLTA Gap-Dependent Plans (next/2/2/8/6)						
	Phase Pairs -->	**1 - 2**	**3 - 4**	**5 - 6**	**7 - 8**	
FYLTA Gap-Dependent Plan A	**Detector Input**	*0*	*0*	*0*	*0*	0 = disable, 1 - 64 detectors
	Min Delay	*0*	*0*	*0*	*0*	0 - 255 sec
	Detector Gap	*0.0*	*0.0*	*0.0*	*0.0*	0 - 25.5 sec
	Max Delay	*0*	*0*	*0*	*0*	0 - 255 sec
	Not Ped	*0*	*0*	*0*	*0*	0 - 255 sec
FYLTA Gap-Dependent Plan B	**Detector Input**	*0*	*0*	*0*	*0*	0 = disable, 1 - 64 detectors
	Min Delay	*0*	*0*	*0*	*0*	0 - 255 sec
	Detector Gap	*0.0*	*0.0*	*0.0*	*0.0*	0 - 25.5 sec
	Max Delay	*0*	*0*	*0*	*0*	0 - 255 sec
	Not Ped	*0*	*0*	*0*	*0*	0 - 255 sec
FYLTA Gap-Dependent Plan C	**Detector Input**	*0*	*0*	*0*	*0*	0 = disable, 1 - 64 detectors
	Min Delay	*0*	*0*	*0*	*0*	0 - 255 sec
	Detector Gap	*0.0*	*0.0*	*0.0*	*0.0*	0 - 25.5 sec
	Max Delay	*0*	*0*	*0*	*0*	0 - 255 sec

	Not Ped	*0*	*0*	*0*	*0*	0 - 255 sec
FYLTA Gap-Dependent Plan D	**Detector Input**	*0*	*0*	*0*	*0*	0 = disable, 1 - 64 detectors
	Min Delay	*0*	*0*	*0*	*0*	0 - 255 sec
	Detector Gap	*0.0*	*0.0*	*0.0*	*0.0*	0 - 25.5 sec
	Max Delay	*0*	*0*	*0*	*0*	0 - 255 sec
	Not Ped	*0*	*0*	*0*	*0*	0 - 255 sec

17540

SIGNAL PLAN
PACIFIC HWY. WEST AT SW FISCHER RD
OR99W M.P. 11.92
(TIGARD)



NORMAL PHASE ROTATION

Channel A | Channel B | Channel C

FIRE PREEMPTION

Note:
Right of way for NW, NE, SE quadrant is outside of plan sheet view

"UTILITIES NOT SHOWN"
See Utility Plan Sheet

NOTE:
See T.R.S. Dwg. 17538-9 for Legend

Traffic Section Approval

REGISTERED PROFESSIONAL ENGINEER 48,097 OREGON JULY 21, 1998 JORDON R. ORSER Expires Dec. 31, 2014

OREGON DEPARTMENT OF TRANSPORTATION
TRAFFIC - ROADWAY SECTION

REGION 1 TRAFFIC UNIT

OR99W: SW DURHAM RD - SW FISCHER RD SEC
PACIFIC HIGHWAY WEST
WASHINGTON COUNTY

DESIGNED BY: J. ORSER
REVIEWED BY: S. CRAMER
DRAWN BY: J. ORSER
FC: 091 MP: 11.92

SIGNAL PLAN

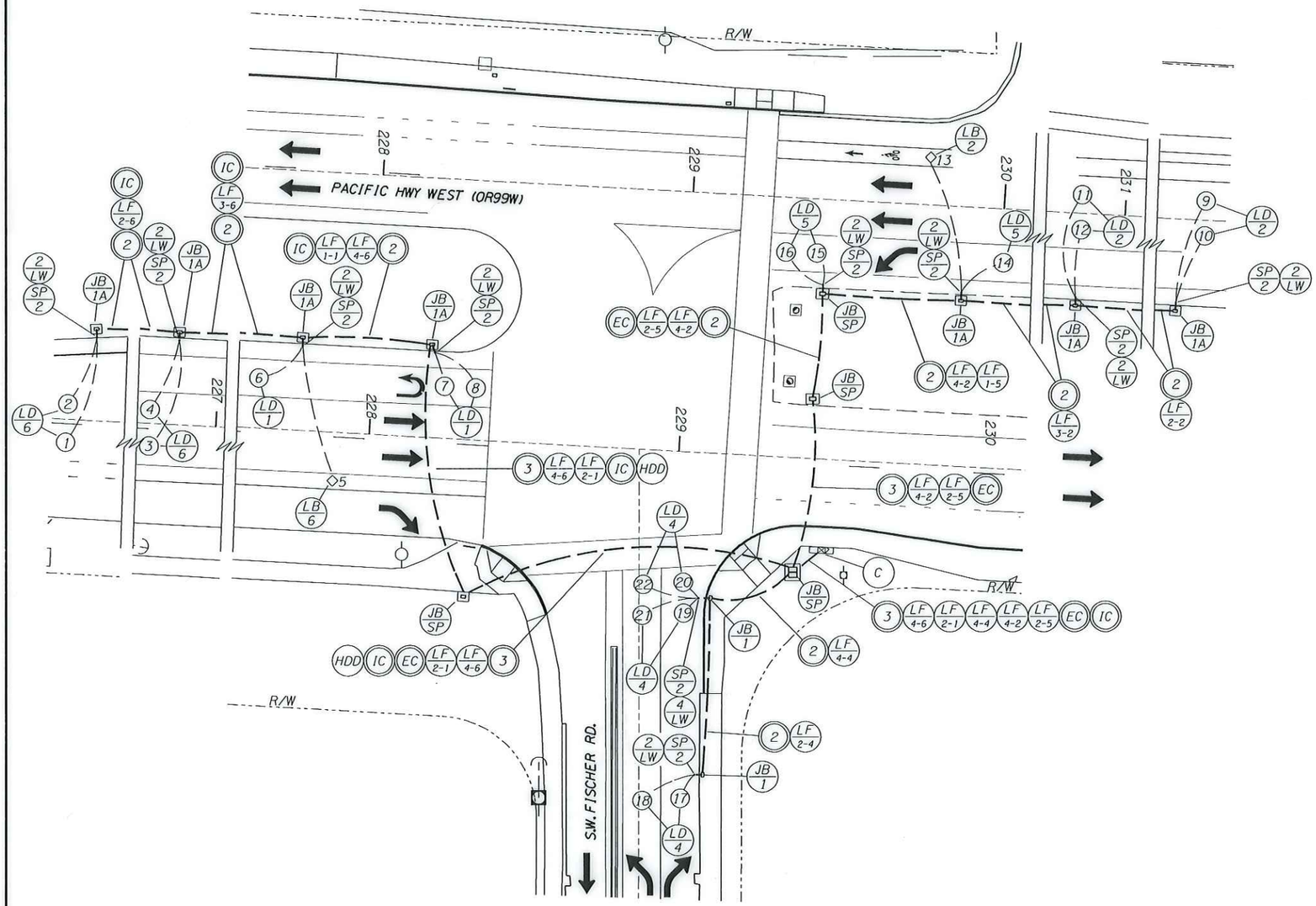
ISSU. No. 2B347 T.R.S. DWG. NO. 17540

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Rotation: 0° Scale: 1"=100'

17542

DETECTOR PLAN
PACIFIC HWY. WEST AT SW FISCHER RD
OR99W M.P. 11.92
(TIGARD)



Loop Number	Distance Feet	Phase	Slot	Voyage
1	320	6	J2U	19
2	320	6	J2L	20
3	160	6	J3U	21
4	160			
5 BIKE	50	6	J3L	22
6	75	1	I1	1
7	15	1	I9U	2
8	5			
9	320	2	I2U	9
10	320	2	I2L	10
11	160	2	I3U	11
12	160			
13 BIKE	50	2	I3L	12
14	75	5	J1	5
15	15	5	J9U	6
16	5			
17	75	4	I6U	14
18	75	4	I6L	15
19	15	4	I7U	16
20	5			
21	15	4	I7L	17
22	5			

Controller Cabinet

LOOP DETECTOR WIRING DIAGRAM
"Distance" is from Stop Line to center of loop in feet

"UTILITIES NOT SHOWN"
See Utility Plan Sheet

NOTE:
See T.R.S. Dwg. 17538-9 for Legend

Traffic Section Approval

REGISTERED PROFESSIONAL ENGINEER
48,097
OREGON
JULY 21, 1998
JORDON R. ORSER
Expires Dec. 31, 2014

OREGON DEPARTMENT OF TRANSPORTATION
TRAFFIC - ROADWAY SECTION

REGION 1 TRAFFIC UNIT

OR99W: SW DURHAM RD - SW FISCHER RD SEC
PACIFIC HIGHWAY WEST
WASHINGTON COUNTY

DESIGNED BY: J. ORSER
REVIEWED BY: S. CRAMER
DRAWN BY: J. ORSER
FC: 091 MP: 11.92

DETECTOR PLAN

ISSU. No. 2B347 T.R.S. DWG. NO. 17542

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Rotation: 0° Scale: 1"=100'

Table: Phase Timing Plans [Timing Plan: 1]

Phase	1	2	4	5	6
Walk	0	0	7	0	7
Ped Clear	0	0	43	0	16
Min Green	4	10	6	4	10
Passage	2.3	4.5	2.5	2.3	4.5
Max 1	25	90	35	25	90
Max 2	23	82	30	23	82
Max 3	25	92	33	40	86
Yellow Chang	3.5	5	3.5	4	5
Red Clear	1	1	1.5	1.5	1
Added Initial	0	1.2	0	0	1.2
Maximum Ini	4	17	6	4	17
Time Before I	8	10	8	8	10
Time To Redu	3	20	3	3	20
Minimum Ga	0.5	2.5	0.5	0.5	2.5

Table: Sequence Parameters [Sequence: 1]

Ring	Sequence Data
1	1,2,a,4,b
2	5,6,a,b

Table: Sequence Parameters [Sequence: 5]

Ring	Sequence Data
1	1,2,a,4,b
2	6,5,a,b

Table: Global Phase Recalls

Phase	2	6
Min	TRUE	TRUE
Max	FALSE	FALSE
Ped	FALSE	FALSE
Act. Walk Re:	FALSE	FALSE

Table: Pattern Parameters

Pattern	Cycle Time	Offset 1	Offset 2	Offset 3	Split Number	Seq Number	Ref Point	Coord Mode	Force Off
1	140	88	0	0	1	5	Green	Full Permissiv	Phase
2	120	1	0	0	2	1	Green	Full Permissiv	Phase
3	140	81	0	0	3	1	Green	Full Permissiv	Phase
4	120	85	0	0	4	1	Green	Full Permissiv	Phase

Max Mode	Trans Ped Mo	Min Permissi	Correction M	Single Perm	Phase Plan	Overlap Plan	Veh Detector	Veh Detector	Ped Detector
Max 1	Phase	Phase Only	Shortway (Au	0	1	1	1	1	1
Max 2	Phase	Phase Only	Shortway (Au	0	1	1	1	1	1
Max 3	Phase	Phase Only	Shortway (Au	0	1	1	1	1	1
Max 1	Phase	Phase Only	Shortway (Au	0	2	1	1	1	1

Ped Detector	Pri/Pre Detec	Description
1	1	Coord Plan #1
1	1	Coord Plan #2
1	1	Coord Plan #3
1	1	Coord Plan #4

Table: Split Parameters [Split: 1]

Phase	Time	Min	Max	Coord Phase	Ref Point	Trans Cover P	Force Off Mo	Mode	Pri Min
1	20	0	0	0	0	0	Fixed	None	0
2	90	0	0	TRUE	TRUE	0	Fixed	None	0
4	30	0	0	0	0	0	Fixed	None	0
5	20	0	0	0	0	0	Fixed	None	0
6	90	0	0	TRUE	0	0	Fixed	None	0

Pri Max	Pri Force Off Mode
0	Float
0	Float
0	Float
0	Float
0	Float

Table: Split Parameters [Split: 3]

Phase	Time	Min	Max	Coord Phase	Ref Point	Trans Cover F	Force Off Mo	Mode	Pri Min
1	20	0	0	0	0	0	Fixed	None	0
2	100	0	0	TRUE	TRUE	0	Fixed	None	0
4	20	0	0	0	0	0	Fixed	None	0
5	35	0	0	0	0	0	Fixed	None	0
6	85	0	0	TRUE	0	0	Fixed	None	0

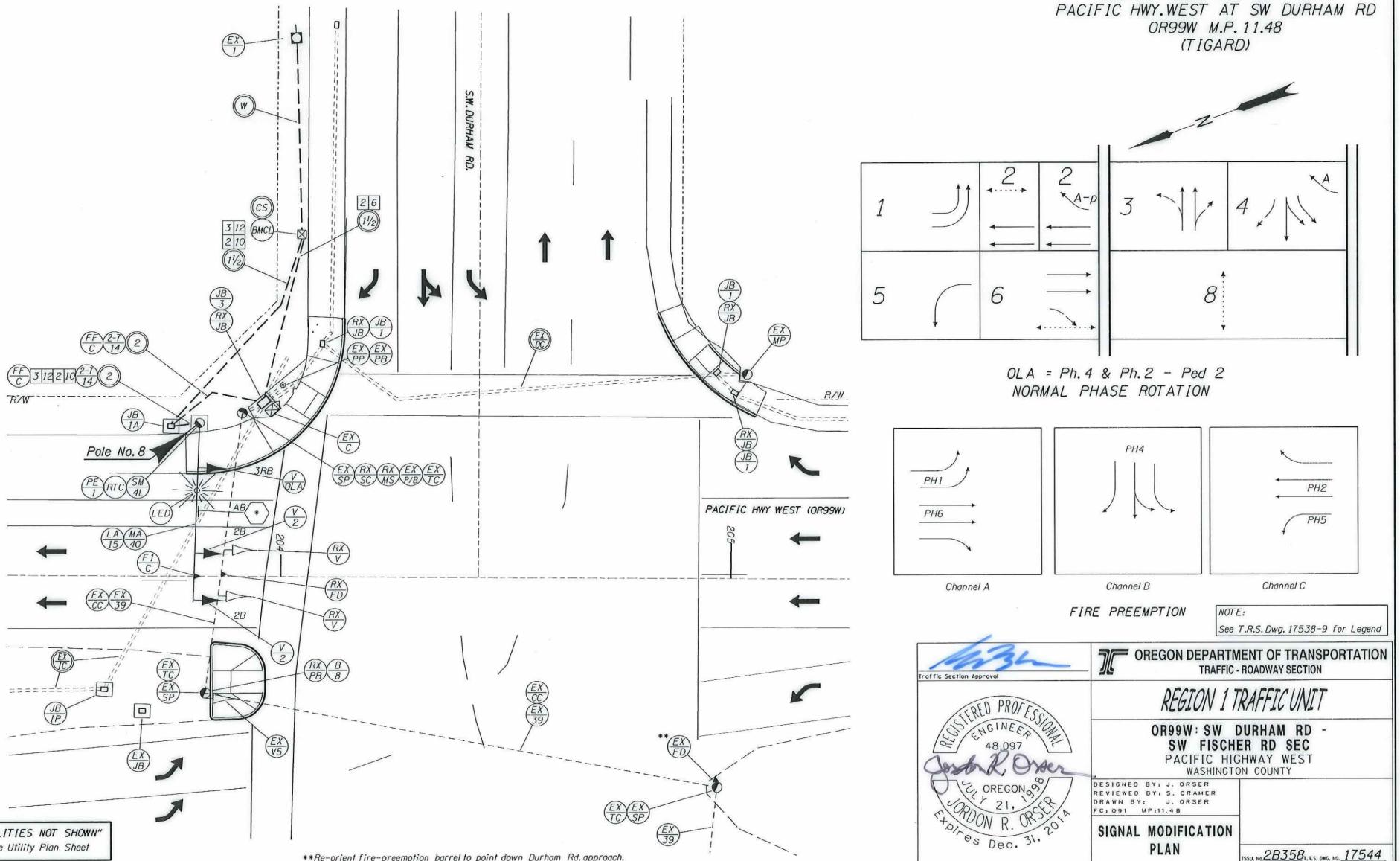
Pri Max	Pri Force Off Mode
0	Float
0	Float
0	Float
0	Float
0	Float

Table: Day Plan Events [Day Plan: 1]

Event	Hour	Minute	Action	Description
1	0	0	21	Coord Free
2	5	30	1	Coord Plan #1
3	10	0	2	Coord Plan #2
4	14	30	3	Coord Plan #3
5	18	30	2	Coord Plan #2
6	22	0	21	Coord Free

17544

SIGNAL MODIFICATION PLAN
PACIFIC HWY. WEST AT SW DURHAM RD
OR99W M.P. 11.48
(TIGARD)



OLA = Ph. 4 & Ph. 2 - Ped 2
NORMAL PHASE ROTATION

Channel A | Channel B | Channel C

FIRE PREEMPTION

NOTE:
See T.R.S. Dwg. 17538-9 for Legend

Traffic Section Approval

REGISTERED PROFESSIONAL ENGINEER
48,097
OREGON
JULY 21, 1998
JORDON R. ORSER
Expires Dec. 31, 2014

OREGON DEPARTMENT OF TRANSPORTATION
TRAFFIC - ROADWAY SECTION

REGION 1 TRAFFIC UNIT

OR99W: SW DURHAM RD - SW FISCHER RD SEC
PACIFIC HIGHWAY WEST
WASHINGTON COUNTY

DESIGNED BY: J. ORSER
REVIEWED BY: S. CRAMER
DRAWN BY: J. ORSER
FC: 091 MP: 11.48

SIGNAL MODIFICATION PLAN

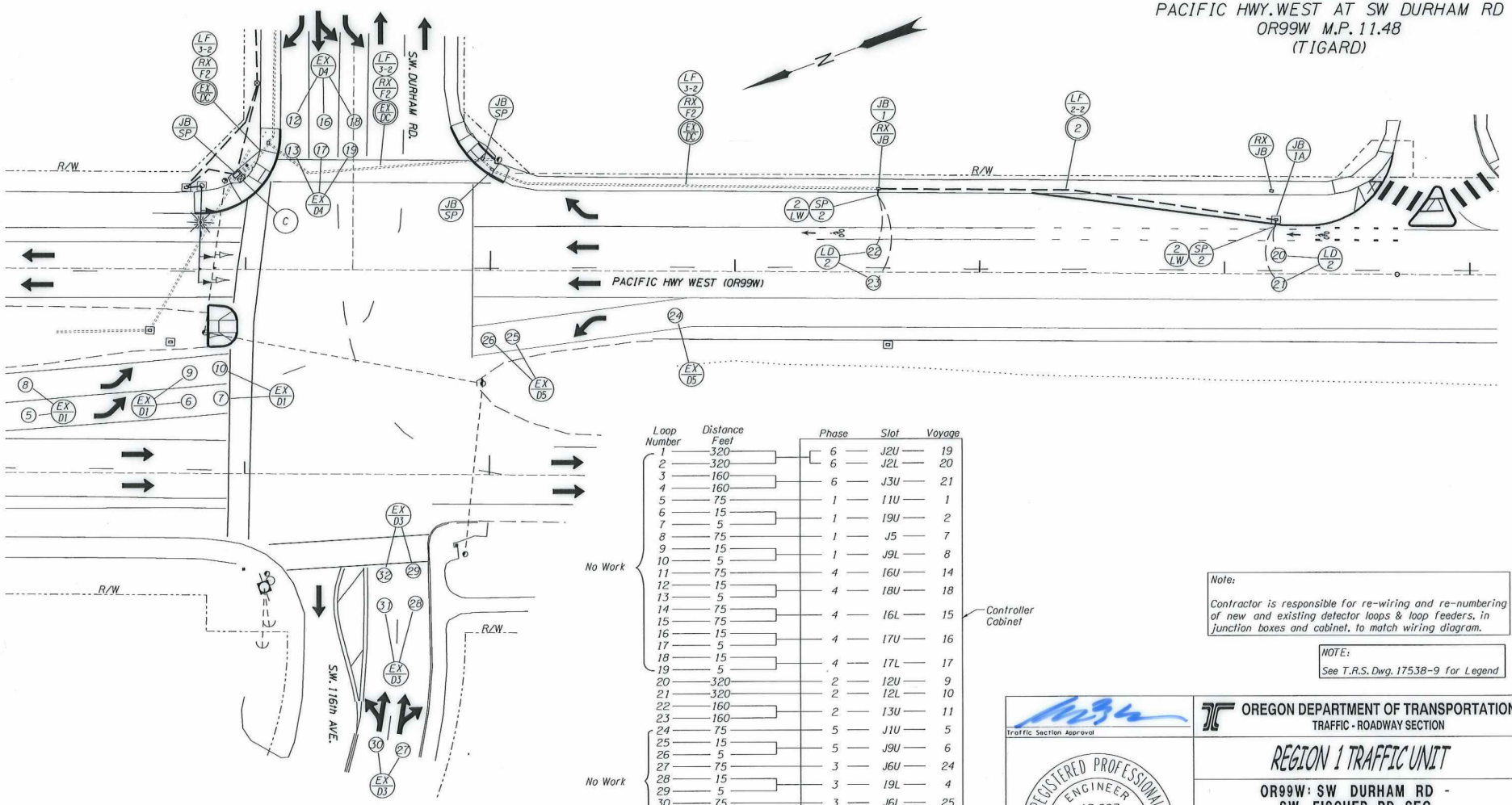
ISSU. No. 2B358 T.R.S. DWG. NO. 17544

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Rotation: 0° Scale: 1"=100'

17545

DETECTOR PLAN
PACIFIC HWY. WEST AT SW DURHAM RD
OR99W M.P. 11.48
(TIGARD)



Loop Number	Distance Feet	Phase	Slot	Voyage	
1	320	6	J2U	19	No Work
2	320	6	J2L	20	
3	160	6	J3U	21	
4	160				
5	75	1	I1U	1	
6	15	1	I9U	2	
7	5				
8	75	1	J5	7	
9	15	1	J9L	8	
10	5				
11	75	4	I6U	14	
12	15	4	I8U	18	
13	5				
14	75	4	I6L	15	Controller Cabinet
15	75				
16	15	4	I7U	16	
17	5				
18	15	4	I7L	17	
19	5				
20	320	2	I2U	9	
21	320	2	I2L	10	
22	160	2	I3U	11	
23	160				
24	75	5	J1U	5	No Work
25	15	5	J9U	6	
26	5				
27	75	3	J6U	24	
28	15	3	I9L	4	
29	5				
30	75	3	J6L	25	
31	15	3	I5U	3	
32	5				

LOOP DETECTOR WIRING DIAGRAM
"Distance" is from Stop Line to center of loop in feet

Note:
Contractor is responsible for re-wiring and re-numbering of new and existing detector loops & loop feeders, in junction boxes and cabinet, to match wiring diagram.

NOTE:
See T.R.S. Dwg. 17538-9 for Legend

"UTILITIES NOT SHOWN"
See Utility Plan Sheet

Traffic Section Approval

REGISTERED PROFESSIONAL ENGINEER
48,097
OREGON
JULY 21, 1998
JORDON R. ORSER
Expires Dec. 31, 2014

OREGON DEPARTMENT OF TRANSPORTATION
TRAFFIC - ROADWAY SECTION

REGION 1 TRAFFIC UNIT

OR99W: SW DURHAM RD - SW FISCHER RD SEC
PACIFIC HIGHWAY WEST
WASHINGTON COUNTY

DESIGNED BY: J. ORSER
REVIEWED BY: S. CRAMER
DRAWN BY: J. ORSER
FC: 091 MP: 11.92

DETECTOR PLAN

TSSU No. 28358 T.R.S. DWG. NO. 17545

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Rotation: 0° Scale: 1"=100'

Table: Phase Timing Plans [Timing Plan: 1]

Phase	1	2	3	4	5	6	7	8
Walk	0	7	0	0	0	7	0	5
Ped Clear	0	22	0	0	0	16	0	35
Min Green	4	10	12	12	4	10	0	4
Passage	2.3	4.5	2.3	2.3	2.3	4.8	0	0.2
Max 1	29	72	17	26	17	84	0	42
Max 2	20	52	25	27	22	50	0	51
Max 3	29	60	16	45	18	71	0	54
Yellow Change	4	4.7	4	4	4.4	4.3	0	0
Red Clear	1.3	0.7	2	2	1	0.7	0	0
Added Initial	0	1.2	0	0	0	1.2	0	0
Maximum Initial	4	17	6	6	4	17	0	4
Time Before Reduction	8	10	8	8	8	10	0	1
Time To Reduce	3	20	3	3	3	20	0	1
Minimum Gap	0.5	2.5	1	0.5	1	2.8	0	0.2
Advance Walk	0	0	0	0	0	0	0	5
Walk 2	0	0	0	0	0	0	0	16

Table: Sequence Parameters [Sequence: 1]

Ring	Sequence Data
1	1,2,a,3,4,b
2	5,6,a,8,b

Table: Sequence Parameters [Sequence: 2]

Ring	Sequence Data
1	2,1,a,3,4,b
2	5,6,a,8,b

Table: Pattern Parameters

Pattern	Cycle Time	Offset 1	Offset 2	Offset 3	Split Number	Seq Number	Ref Point	Coord Mode	Force Off
1	140	24	0	0	1	2	Green	Full Permissive	Phase
2	120	83	0	0	2	2	Green	Full Permissive	Phase
3	140	49	0	0	3	1	Green	Full Permissive	Phase
4	120	117	0	0	4	2	Green	Full Permissive	Phase

Max Mode	Trans Ped Mo	Min Permissi	Correction M	Single Perm	Phase Plan	Overlap Plan	Veh Detector	Veh Detector	Ped Detector
Max 1	Phase	Phase Only	Shortway (Au	0	1	1	1	1	1
Max 2	Phase	Phase Only	Shortway (Au	0	1	1	1	1	1
Max 3	Phase	Phase Only	Shortway (Au	0	1	1	1	1	1
Max 1	Phase	Phase Only	Shortway (Au	0	2	1	1	1	1

Ped Detector	Pri/Pre Detec	Description
1	1	Coord Plan #1
1	1	Coord Plan #2
1	1	Coord Plan #3
1	1	Coord Plan #4

Table: Split Parameters [Split: 1]

Phase	Time	Min	Max	Coord Phase	Ref Point	Trans Cover F	Force Off Mo	Mode	Pri Min
1	28	0	0	0	0	0	Fixed	None	0
2	68	0	0	TRUE	0	0	Fixed	None	0
3	19	0	0	0	0	0	Fixed	None	0
4	25	0	0	0	0	0	Fixed	None	0
5	16	0	0	0	0	0	Fixed	None	0
6	80	0	0	TRUE	TRUE	0	Fixed	None	0
8	44	0	0	0	0	0	Fixed	None	0

Pri Max	Pri Force Off Mode
0	Float
0	Float
0	Float
0	Float
0	Float
0	Float
0	Float

Table: Split Parameters [Split: 2]

Phase	Time	Min	Max	Coord Phase	Ref Point	Trans Cover F	Force Off Mo	Mode	Pri Min
1	19	0	0	0	0	0	Fixed	None	0
2	51	0	0	TRUE	0	0	Fixed	None	0
3	24	0	0	0	0	0	Fixed	None	0
4	26	0	0	0	0	0	Fixed	None	0
5	21	0	0	0	0	0	Fixed	None	0
6	49	0	0	TRUE	TRUE	0	Fixed	None	0
8	50	0	0	0	0	0	Fixed	None	0

Pri Max	Pri Force Off Mode
0	Float
0	Float
0	Float
0	Float
0	Float
0	Float
0	Float

Table: Day Plan Events [Day Plan: 1]

Event	Hour	Minute	Action	Description
1	0	0	21	Coord Free
2	5	30	1	Coord Plan #1
3	10	0	2	Coord Plan #2
4	14	30	3	Coord Plan #3
5	18	30	2	Coord Plan #2
6	22	0	21	Coord Free

APPENDIX I.

OPERATIONS CALCULATIONS



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1162	594	903	808	139	284
Future Volume (vph)	1162	594	903	808	139	284
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	5.6
Lane Util. Factor	0.95	1.00	0.97	0.95	0.97	0.88
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3374	1553	3400	3343	3127	2515
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3374	1553	3400	3343	3127	2515
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1236	632	961	860	148	302
RTOR Reduction (vph)	0	265	0	0	0	0
Lane Group Flow (vph)	1236	367	961	860	148	302
Confl. Peds. (#/hr)						4
Heavy Vehicles (%)	7%	4%	3%	8%	12%	13%
Turn Type	NA	Perm	Prot	NA	Prot	pt+ov
Protected Phases	2		1	6	8	1 4
Permitted Phases		2				
Actuated Green, G (s)	39.4	39.4	28.7	73.7	17.6	46.1
Effective Green, g (s)	41.4	41.4	30.3	75.7	19.6	41.1
Actuated g/C Ratio	0.40	0.40	0.29	0.73	0.19	0.40
Clearance Time (s)	6.0	6.0	5.6	6.0	6.0	
Vehicle Extension (s)	5.4	5.4	2.3	5.4	2.3	
Lane Grp Cap (vph)	1352	622	997	2449	593	1000
v/s Ratio Prot	c0.37		c0.28	0.26	c0.05	0.12
v/s Ratio Perm		0.24				
v/c Ratio	0.91	0.59	0.96	0.35	0.25	0.30
Uniform Delay, d1	29.3	24.3	36.0	5.0	35.6	21.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.3	2.5	20.1	0.4	0.1	0.1
Delay (s)	39.6	26.8	56.1	5.4	35.7	21.4
Level of Service	D	C	E	A	D	C
Approach Delay (s/veh)	35.3			32.1	26.1	
Approach LOS	D			C	C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	32.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	103.3	Sum of lost time (s)	18.6
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Edition methodology does not support exclusive ped or hold phases.



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	40	210	232	39	791	723
Future Volume (vph)	40	210	232	39	791	723
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	0.0	4.5	4.5	4.0	4.5
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1597	1524	3195	1459	1750	3505
Flt Permitted	0.95	1.00	1.00	1.00	0.48	1.00
Satd. Flow (perm)	1597	1524	3195	1459	883	3505
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	46	241	267	45	909	831
RTOR Reduction (vph)	0	47	0	38	0	0
Lane Group Flow (vph)	46	194	267	7	909	831
Confl. Peds. (#/hr)				2	2	
Heavy Vehicles (%)	13%	6%	13%	8%	3%	3%
Turn Type	Perm	pt+ov	NA	Perm	D.P+P	NA
Protected Phases		4 5	6		5	2
Permitted Phases	4			6	6	
Actuated Green, G (s)	12.3	77.0	14.4	14.4	74.1	79.1
Effective Green, g (s)	13.3	82.0	15.4	15.4	76.1	80.1
Actuated g/C Ratio	0.13	0.80	0.15	0.15	0.75	0.79
Clearance Time (s)	5.0		5.5	5.5	5.0	5.5
Vehicle Extension (s)	4.0		4.5	4.5	4.0	4.5
Lane Grp Cap (vph)	208	1226	482	220	1175	2755
v/s Ratio Prot		0.13	0.08		c0.46	0.24
v/s Ratio Perm	c0.03			0.00	c0.12	
v/c Ratio	0.22	0.16	0.55	0.03	0.77	0.30
Uniform Delay, d1	39.7	2.2	40.1	36.9	9.5	3.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.1	2.0	0.1	3.4	0.3
Delay (s)	40.4	2.3	42.1	37.0	12.9	3.3
Level of Service	D	A	D	D	B	A
Approach Delay (s/veh)	8.4		41.4			8.3
Approach LOS	A		D			A

Intersection Summary			
HCM 2000 Control Delay (s/veh)	12.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	101.9	Sum of lost time (s)	12.5
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Edition methodology does not support exclusive ped or hold phases.

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	61	740	2	8	228	129	1	0	5	46	1	28
Future Vol, veh/h	61	740	2	8	228	129	1	0	5	46	1	28
Conflicting Peds, #/hr	0	0	7	7	0	0	2	0	0	0	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	25	-	-	25	-	-	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	7	3	2	38	6	6	100	2	20	7	2	11
Mvmt Flow	66	804	2	9	248	140	1	0	5	50	1	30

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	388	0	0	814	0	0	1213	1350	812	1272	1281	320
Stage 1	-	-	-	-	-	-	945	945	-	335	335	-
Stage 2	-	-	-	-	-	-	268	405	-	937	946	-
Critical Hdwy	4.17	-	-	4.48	-	-	8.1	6.52	6.4	7.17	6.52	6.31
Critical Hdwy Stg 1	-	-	-	-	-	-	7.1	5.52	-	6.17	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.1	5.52	-	6.17	5.52	-
Follow-up Hdwy	2.263	-	-	2.542	-	-	4.4	4.018	3.48	3.563	4.018	3.399
Pot Cap-1 Maneuver	1144	-	-	676	-	-	102	150	352	141	165	700
Stage 1	-	-	-	-	-	-	214	340	-	668	642	-
Stage 2	-	-	-	-	-	-	566	598	-	311	340	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1144	-	-	672	-	-	90	139	350	129	153	699
Mov Cap-2 Maneuver	-	-	-	-	-	-	90	139	-	129	153	-
Stage 1	-	-	-	-	-	-	200	319	-	660	634	-
Stage 2	-	-	-	-	-	-	532	590	-	289	318	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.63	0.23	20.48	38.63
HCM LOS			C	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	90	350	1144	-	-	672	-	-	186
HCM Lane V/C Ratio	0.012	0.016	0.058	-	-	0.013	-	-	0.438
HCM Control Delay (s/veh)	45.6	15.4	8.3	-	-	10.4	-	-	38.6
HCM Lane LOS	E	C	A	-	-	B	-	-	E
HCM 95th %tile Q(veh)	0	0	0.2	-	-	0	-	-	2

3: JAE Access/SW 115th Avenue & SW Tualatin Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.0
Total Delay (hr)	0.1	0.5	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.0	1.0
Total Del/Veh (s)	5.3	3.0	1.1	6.3	1.5	1.0	14.9	6.8	14.1	19.1	6.9	3.2
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.2
Stop Del/Veh (s)	1.5	0.0	0.0	3.7	0.0	0.0	13.9	5.3	12.0	15.4	4.9	0.7

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	791	361	6	22	4
Future Vol, veh/h	1	791	361	6	22	4
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	25	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	3	7	2	5	2
Mvmt Flow	1	879	401	7	24	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	409	0	-	0	1287	405
Stage 1	-	-	-	-	405	-
Stage 2	-	-	-	-	881	-
Critical Hdwy	4.12	-	-	-	6.45	6.22
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.218	-	-	-	3.545	3.318
Pot Cap-1 Maneuver	1150	-	-	-	179	645
Stage 1	-	-	-	-	667	-
Stage 2	-	-	-	-	400	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1149	-	-	-	178	645
Mov Cap-2 Maneuver	-	-	-	-	302	-
Stage 1	-	-	-	-	665	-
Stage 2	-	-	-	-	400	-

Approach	EB	WB	SB
HCM Control Delay, s/v	0.01	0	17.01
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1149	-	-	-	329
HCM Lane V/C Ratio	0.001	-	-	-	0.088
HCM Control Delay (s/veh)	8.1	-	-	-	17
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	810	33	39	363	13	6
Future Vol, veh/h	810	33	39	363	13	6
Conflicting Peds, #/hr	0	2	2	0	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	2	2	7	15	17
Mvmt Flow	880	36	42	395	14	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	918	0	1381	900
Stage 1	-	-	-	-	900	-
Stage 2	-	-	-	-	480	-
Critical Hdwy	-	-	4.12	-	6.55	6.37
Critical Hdwy Stg 1	-	-	-	-	5.55	-
Critical Hdwy Stg 2	-	-	-	-	5.55	-
Follow-up Hdwy	-	-	2.218	-	3.635	3.453
Pot Cap-1 Maneuver	-	-	743	-	149	316
Stage 1	-	-	-	-	376	-
Stage 2	-	-	-	-	596	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	742	-	140	316
Mov Cap-2 Maneuver	-	-	-	-	266	-
Stage 1	-	-	-	-	376	-
Stage 2	-	-	-	-	561	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0.98	18.89
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	280	-	-	742	-
HCM Lane V/C Ratio	0.074	-	-	0.057	-
HCM Control Delay (s/veh)	18.9	-	-	10.1	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	0.2	-	-	0.2	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	1	2	24	87	4
Future Vol, veh/h	1	1	2	24	87	4
Conflicting Peds, #/hr	0	0	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	100	50	17	2	25
Mvmt Flow	1	1	2	28	102	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	142	109	111	0	-	0
Stage 1	109	-	-	-	-	-
Stage 2	33	-	-	-	-	-
Critical Hdwy	6.42	7.2	4.6	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	4.2	2.65	-	-	-
Pot Cap-1 Maneuver	851	734	1228	-	-	-
Stage 1	916	-	-	-	-	-
Stage 2	990	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	843	732	1223	-	-	-
Mov Cap-2 Maneuver	843	-	-	-	-	-
Stage 1	911	-	-	-	-	-
Stage 2	986	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	9.61	0.61	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	138	-	783	-	-
HCM Lane V/C Ratio	0.002	-	0.003	-	-
HCM Control Delay (s/veh)	7.9	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	2	20	23	59	29
Future Vol, veh/h	1	2	20	23	59	29
Conflicting Peds, #/hr	0	0	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	2	2	2	17	5	2
Mvmt Flow	1	3	27	31	80	39

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	189	104	124	0	-	0
Stage 1	104	-	-	-	-	-
Stage 2	85	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	800	950	1463	-	-	-
Stage 1	920	-	-	-	-	-
Stage 2	938	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	777	946	1456	-	-	-
Mov Cap-2 Maneuver	777	-	-	-	-	-
Stage 1	898	-	-	-	-	-
Stage 2	934	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	9.1	3.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	837	-	882	-	-
HCM Lane V/C Ratio	0.019	-	0.005	-	-
HCM Control Delay (s/veh)	7.5	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0	-	-

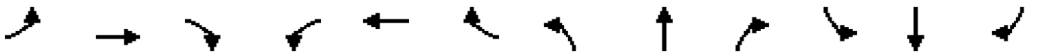
Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	8	58	40	50	6
Future Vol, veh/h	0	8	58	40	50	6
Conflicting Peds, #/hr	1	0	6	0	0	6
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	78	78	78	78
Heavy Vehicles, %	2	13	2	10	4	17
Mvmt Flow	0	10	74	51	64	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	275	74	78	0	-	0
Stage 1	74	-	-	-	-	-
Stage 2	201	-	-	-	-	-
Critical Hdwy	6.42	6.33	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.417	2.218	-	-	-
Pot Cap-1 Maneuver	715	958	1521	-	-	-
Stage 1	949	-	-	-	-	-
Stage 2	833	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	671	952	1512	-	-	-
Mov Cap-2 Maneuver	671	-	-	-	-	-
Stage 1	896	-	-	-	-	-
Stage 2	828	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	8.82	4.44	0
HCM LOS	A		

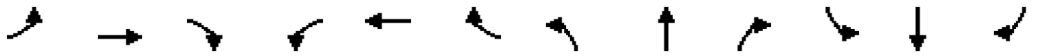
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1065	-	952	-	-
HCM Lane V/C Ratio	0.049	-	0.011	-	-
HCM Control Delay (s/veh)	7.5	0	8.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	0	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	101	21	15	12	27	17	237	49	211	517	31
Future Volume (vph)	7	101	21	15	12	27	17	237	49	211	517	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.90		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1801		1289	1577		1702	3073		1768	3421	
Flt Permitted	0.95	1.00		0.95	1.00		0.39	1.00		0.55	1.00	
Satd. Flow (perm)	1583	1801		1289	1577		703	3073		1020	3421	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	8	115	24	17	14	31	19	269	56	240	588	35
RTOR Reduction (vph)	0	7	0	0	26	0	0	13	0	0	3	0
Lane Group Flow (vph)	8	132	0	17	19	0	19	312	0	240	621	0
Confl. Peds. (#/hr)			1	1			1		2	2		1
Heavy Vehicles (%)	14%	2%	5%	40%	17%	4%	6%	14%	14%	2%	4%	13%
Turn Type	Prot	NA		Prot	NA		D.P+P	NA		D.P+P	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases							6			2		
Actuated Green, G (s)	0.7	8.8		0.9	9.0		31.1	19.3		31.1	30.4	
Effective Green, g (s)	1.7	9.8		1.9	10.0		33.1	20.3		31.1	30.4	
Actuated g/C Ratio	0.03	0.16		0.03	0.16		0.54	0.33		0.51	0.50	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	44	290		40	259		410	1026		666	1710	
v/s Ratio Prot	0.01	c0.07		c0.01	0.01		0.00	0.10		c0.07	c0.18	
v/s Ratio Perm							0.02			0.11		
v/c Ratio	0.18	0.46		0.43	0.07		0.05	0.30		0.36	0.36	
Uniform Delay, d1	28.9	23.1		28.9	21.5		6.4	15.0		8.4	9.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.0	1.1		7.1	0.1		0.0	0.2		0.3	0.1	
Delay (s)	30.9	24.2		36.0	21.6		6.5	15.2		8.7	9.4	
Level of Service	C	C		D	C		A	B		A	A	
Approach Delay (s/veh)		24.6			25.6			14.7			9.2	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	12.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	60.8	Sum of lost time (s)	17.0
Intersection Capacity Utilization	43.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	101	21	15	12	27	17	237	49	211	517	31
Future Volume (veh/h)	7	101	21	15	12	27	17	237	49	211	517	31
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1693	1870	1826	1307	1648	1841	1811	1693	1693	1870	1841	1707
Adj Flow Rate, veh/h	8	115	24	17	14	31	19	269	56	240	588	35
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	14	2	5	40	17	4	6	14	14	2	4	13
Cap, veh/h	59	240	50	65	80	176	435	653	134	602	1234	73
Arrive On Green	0.04	0.16	0.14	0.05	0.17	0.15	0.05	0.25	0.22	0.17	0.37	0.37
Sat Flow, veh/h	1612	1500	313	1245	456	1009	1725	2656	544	1781	3354	199
Grp Volume(v), veh/h	8	0	139	17	0	45	19	161	164	240	306	317
Grp Sat Flow(s),veh/h/ln	1612	0	1813	1245	0	1464	1725	1608	1592	1781	1749	1804
Q Serve(g_s), s	0.2	0.0	3.2	0.6	0.0	1.2	0.3	3.8	3.9	4.3	6.1	6.1
Cycle Q Clear(g_c), s	0.2	0.0	3.2	0.6	0.0	1.2	0.3	3.8	3.9	4.3	6.1	6.1
Prop In Lane	1.00		0.17	1.00		0.69	1.00		0.34	1.00		0.11
Lane Grp Cap(c), veh/h	59	0	289	65	0	256	435	395	391	602	644	664
V/C Ratio(X)	0.13	0.00	0.48	0.26	0.00	0.18	0.04	0.41	0.42	0.40	0.48	0.48
Avail Cap(c_a), veh/h	569	0	1240	302	0	1001	1156	1099	1088	1285	1543	1592
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.1	0.0	17.4	20.7	0.0	16.2	7.7	14.3	14.5	9.9	11.0	11.0
Incr Delay (d2), s/veh	1.0	0.0	1.2	2.1	0.0	0.3	0.0	0.7	0.7	0.4	0.5	0.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	1.2	0.2	0.0	0.4	0.1	1.1	1.2	1.2	1.7	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	22.2	0.0	18.7	22.8	0.0	16.6	7.8	15.0	15.2	10.4	11.5	11.5
LnGrp LOS	C		B	C		B	A	B	B	B	B	B
Approach Vol, veh/h		147			62			344			863	
Approach Delay, s/veh		18.8			18.3			14.7			11.2	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.6	15.1	6.3	11.2	6.1	21.7	5.7	11.9
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	25.0	30.0	10.0	30.0	20.0	40.0	15.0	30.0
Max Q Clear Time (g_c+I1), s	6.3	5.9	2.6	5.2	2.3	8.1	2.2	3.2
Green Ext Time (p_c), s	1.0	1.5	0.0	1.3	0.0	3.1	0.0	0.3

Intersection Summary	
HCM 7th Control Delay, s/veh	13.2
HCM 7th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Intersection Delay, s/veh	9.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	301	22	8	43	0	15	1	12	0	1	1
Future Vol, veh/h	17	301	22	8	43	0	15	1	12	0	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	2	2	23	13	14	2	13	2	2	2	2	2
Mvmt Flow	19	338	25	9	48	0	17	1	13	0	1	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	10	8	8.2	7.6
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	54%	5%	16%	0%
Vol Thru, %	4%	89%	84%	50%
Vol Right, %	43%	6%	0%	50%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	28	340	51	2
LT Vol	15	17	8	0
Through Vol	1	301	43	1
RT Vol	12	22	0	1
Lane Flow Rate	31	382	57	2
Geometry Grp	1	1	1	1
Degree of Util (X)	0.043	0.425	0.073	0.003
Departure Headway (Hd)	4.928	4.007	4.602	4.629
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	731	894	782	777
Service Time	2.929	2.057	2.606	2.633
HCM Lane V/C Ratio	0.042	0.427	0.073	0.003
HCM Control Delay, s/veh	8.2	10	8	7.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	2.1	0.2	0

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	149	145	32	74	7	18
Future Vol, veh/h	149	145	32	74	7	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	3	3	9	2	2	17
Mvmt Flow	180	175	39	89	8	22

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	128	0	-	0	617	83
Stage 1	-	-	-	-	83	-
Stage 2	-	-	-	-	534	-
Critical Hdwy	4.13	-	-	-	6.42	6.37
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.227	-	-	-	3.518	3.453
Pot Cap-1 Maneuver	1452	-	-	-	454	936
Stage 1	-	-	-	-	940	-
Stage 2	-	-	-	-	588	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1452	-	-	-	391	936
Mov Cap-2 Maneuver	-	-	-	-	391	-
Stage 1	-	-	-	-	811	-
Stage 2	-	-	-	-	588	-

Approach	EB	WB	SB
HCM Control Delay, s/v	3.97	0	10.47
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	912	-	-	-	391	936
HCM Lane V/C Ratio	0.124	-	-	-	0.022	0.023
HCM Control Delay (s/veh)	7.8	0	-	-	14.4	8.9
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.4	-	-	-	0.1	0.1

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	152	106	0	0	0
Future Vol, veh/h	0	152	106	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	2	5	5	2	2	2
Mvmt Flow	0	185	129	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	129	0	-	0	315	129
Stage 1	-	-	-	-	129	-
Stage 2	-	-	-	-	185	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1456	-	-	-	678	921
Stage 1	-	-	-	-	897	-
Stage 2	-	-	-	-	846	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1456	-	-	-	678	921
Mov Cap-2 Maneuver	-	-	-	-	678	-
Stage 1	-	-	-	-	897	-
Stage 2	-	-	-	-	846	-

Approach	EB	WB	SB
HCM Control Delay, s/v	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1456	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s/veh)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	20	131	96	29	12	8
Future Vol, veh/h	20	131	96	29	12	8
Conflicting Peds, #/hr	12	0	0	12	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	2	5	5	4	2	2
Mvmt Flow	24	158	116	35	14	10

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	163	0	-	0	351	146
Stage 1	-	-	-	-	145	-
Stage 2	-	-	-	-	206	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1416	-	-	-	646	901
Stage 1	-	-	-	-	882	-
Stage 2	-	-	-	-	828	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1400	-	-	-	620	890
Mov Cap-2 Maneuver	-	-	-	-	620	-
Stage 1	-	-	-	-	856	-
Stage 2	-	-	-	-	819	-

Approach	EB	WB	SB
HCM Control Delay, s/v	1.01	0	10.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	238	-	-	-	620	890
HCM Lane V/C Ratio	0.017	-	-	-	0.023	0.011
HCM Control Delay (s/veh)	7.6	0	-	-	10.9	9.1
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1	0

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	131	3	0	137	0	0	0	0	0	0	0
Future Vol, veh/h	0	131	3	0	137	0	0	0	0	0	0	0
Conflicting Peds, #/hr	8	0	3	3	0	8	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77
Heavy Vehicles, %	2	5	2	2	4	2	2	2	2	2	2	2
Mvmt Flow	0	170	4	0	178	0	0	0	0	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	186	0	0	177	0	0	354	361	175	356	363	187
Stage 1	-	-	-	-	-	-	175	175	-	186	186	-
Stage 2	-	-	-	-	-	-	179	186	-	170	177	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1389	-	-	1399	-	-	601	566	868	599	565	855
Stage 1	-	-	-	-	-	-	827	754	-	816	746	-
Stage 2	-	-	-	-	-	-	823	746	-	832	753	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1378	-	-	1395	-	-	599	560	866	595	559	848
Mov Cap-2 Maneuver	-	-	-	-	-	-	599	560	-	595	559	-
Stage 1	-	-	-	-	-	-	824	752	-	810	740	-
Stage 2	-	-	-	-	-	-	822	740	-	832	751	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0	0	0	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1378	-	-	1395	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-	-	-
HCM Control Delay (s/veh)	0	0	-	-	0	-	-	0
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	-

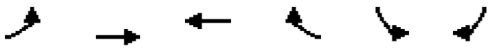
Intersection	
Int Delay, s/veh	6.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	69	64	123	67	23	35
Future Vol, veh/h	69	64	123	67	23	35
Conflicting Peds, #/hr	0	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	3	2	4	2	9	3
Mvmt Flow	80	74	143	78	27	41

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	413	49	69	0	-	0
Stage 1	49	-	-	-	-	-
Stage 2	364	-	-	-	-	-
Critical Hdwy	6.43	6.22	4.14	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.318	2.236	-	-	-
Pot Cap-1 Maneuver	593	1019	1519	-	-	-
Stage 1	971	-	-	-	-	-
Stage 2	701	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	533	1018	1516	-	-	-
Mov Cap-2 Maneuver	533	-	-	-	-	-
Stage 1	873	-	-	-	-	-
Stage 2	700	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	11.7	4.93	0
HCM LOS	B		

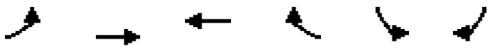
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1165	-	691	-	-
HCM Lane V/C Ratio	0.094	-	0.224	-	-
HCM Control Delay (s/veh)	7.6	0	11.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.9	-	-



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	18	370	268	190	47	6
Future Volume (vph)	18	370	268	190	47	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.94		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1702	1624	1629		1626	1583
Flt Permitted	0.41	1.00	1.00		0.95	1.00
Satd. Flow (perm)	738	1624	1629		1626	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	402	291	207	51	7
RTOR Reduction (vph)	0	0	20	0	0	6
Lane Group Flow (vph)	20	402	478	0	51	1
Confl. Peds. (#/hr)	2			2		
Heavy Vehicles (%)	6%	17%	12%	5%	11%	2%
Turn Type	D.P+P	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	6					4
Actuated Green, G (s)	26.6	32.0	25.9		4.1	4.1
Effective Green, g (s)	29.4	33.4	27.3		6.6	6.6
Actuated g/C Ratio	0.61	0.70	0.57		0.14	0.14
Clearance Time (s)	5.4	5.4	5.4		6.5	6.5
Vehicle Extension (s)	2.0	3.1	3.1		2.6	2.6
Lane Grp Cap (vph)	494	1130	926		223	217
v/s Ratio Prot	0.00	c0.25	c0.29		c0.03	
v/s Ratio Perm	0.02					0.00
v/c Ratio	0.04	0.36	0.52		0.23	0.00
Uniform Delay, d1	5.4	3.0	6.3		18.4	17.9
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	0.2	0.5		0.4	0.0
Delay (s)	5.4	3.2	6.8		18.8	17.9
Level of Service	A	A	A		B	B
Approach Delay (s/veh)		3.3	6.8		18.7	
Approach LOS		A	A		B	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	6.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	48.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	36.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	18	370	268	190	47	6
Future Volume (veh/h)	18	370	268	190	47	6
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1811	1648	1722	1826	1737	1870
Adj Flow Rate, veh/h	20	402	291	207	51	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	17	12	5	11	2
Cap, veh/h	578	1177	535	380	184	177
Arrive On Green	0.06	0.71	0.57	0.54	0.11	0.11
Sat Flow, veh/h	1725	1648	935	665	1654	1585
Grp Volume(v), veh/h	20	402	0	498	51	7
Grp Sat Flow(s),veh/h/ln	1725	1648	0	1601	1654	1585
Q Serve(g_s), s	0.0	4.2	0.0	9.0	1.3	0.2
Cycle Q Clear(g_c), s	0.0	4.2	0.0	9.0	1.3	0.2
Prop In Lane	1.00			0.42	1.00	1.00
Lane Grp Cap(c), veh/h	578	1177	0	915	184	177
V/C Ratio(X)	0.03	0.34	0.00	0.54	0.28	0.04
Avail Cap(c_a), veh/h	912	1669	0	2285	1173	1124
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.6	2.5	0.0	6.3	18.7	18.2
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.5	0.6	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.3	0.0	1.9	0.5	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	7.6	2.7	0.0	6.9	19.3	18.2
LnGrp LOS	A	A		A	B	B
Approach Vol, veh/h		422	498		58	
Approach Delay, s/veh		2.9	6.9		19.2	
Approach LOS		A	A		B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		36.7		9.1	6.5	30.2
Change Period (Y+Rc), s		5.4		6.5	5.4	5.4
Max Green Setting (Gmax), s		45.0		30.0	10.0	64.0
Max Q Clear Time (g_c+I1), s		6.2		3.3	2.0	11.0
Green Ext Time (p_c), s		9.2		0.1	0.0	13.8

Intersection Summary	
HCM 7th Control Delay, s/veh	5.9
HCM 7th LOS	A

Intersection	
Int Delay, s/veh	3.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	640	185	65	322	74	58
Future Vol, veh/h	640	185	65	322	74	58
Conflicting Peds, #/hr	0	1	1	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	100	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	3	3	4	3	14	12
Mvmt Flow	667	193	68	335	77	60

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	860	0	1235	764
Stage 1	-	-	-	-	764	-
Stage 2	-	-	-	-	471	-
Critical Hdwy	-	-	4.14	-	6.54	6.32
Critical Hdwy Stg 1	-	-	-	-	5.54	-
Critical Hdwy Stg 2	-	-	-	-	5.54	-
Follow-up Hdwy	-	-	2.236	-	3.626	3.408
Pot Cap-1 Maneuver	-	-	773	-	184	388
Stage 1	-	-	-	-	439	-
Stage 2	-	-	-	-	604	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	772	-	168	388
Mov Cap-2 Maneuver	-	-	-	-	168	-
Stage 1	-	-	-	-	439	-
Stage 2	-	-	-	-	551	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	1.7	31.41
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	168	388	-	-	772	-
HCM Lane V/C Ratio	0.459	0.156	-	-	0.088	-
HCM Control Delay (s/veh)	43.5	16	-	-	10.1	-
HCM Lane LOS	E	C	-	-	B	-
HCM 95th %tile Q(veh)	2.1	0.5	-	-	0.3	-



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	640	185	65	322	74	58
Future Volume (Veh/h)	640	185	65	322	74	58
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	667	193	68	335	77	60
Pedestrians					1	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			TWLTL		
Median storage veh)				2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			861		1236	765
vC1, stage 1 conf vol					765	
vC2, stage 2 conf vol					471	
vCu, unblocked vol			861		1236	765
tC, single (s)			4.1		6.5	6.3
tC, 2 stage (s)					5.5	
tF (s)			2.2		3.6	3.4
p0 queue free %			91		79	85
cM capacity (veh/h)			772		368	387

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	860	68	335	77	60
Volume Left	0	68	0	77	0
Volume Right	193	0	0	0	60
cSH	1700	772	1700	368	387
Volume to Capacity	0.51	0.09	0.20	0.21	0.15
Queue Length 95th (ft)	0	7	0	19	14
Control Delay (s/veh)	0.0	10.1	0.0	17.3	16.0
Lane LOS		B		C	C
Approach Delay (s/veh)	0.0	1.7		16.7	
Approach LOS				C	

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	62.7%	ICU Level of Service	B
Analysis Period (min)	15		

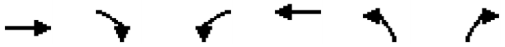
Intersection	
Int Delay, s/veh	8.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	36	12	36	82	101	85
Future Vol, veh/h	36	12	36	82	101	85
Conflicting Peds, #/hr	0	44	44	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	62	62	62	62	62	62
Heavy Vehicles, %	3	2	17	5	5	7
Mvmt Flow	58	19	58	132	163	137

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	121	0	360	112
Stage 1	-	-	-	-	112	-
Stage 2	-	-	-	-	248	-
Critical Hdwy	-	-	4.27	-	6.45	6.27
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.353	-	3.545	3.363
Pot Cap-1 Maneuver	-	-	1378	-	633	928
Stage 1	-	-	-	-	906	-
Stage 2	-	-	-	-	786	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1320	-	577	889
Mov Cap-2 Maneuver	-	-	-	-	577	-
Stage 1	-	-	-	-	868	-
Stage 2	-	-	-	-	749	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	2.4	14.23
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	688	-	-	549	-
HCM Lane V/C Ratio	0.436	-	-	0.044	-
HCM Control Delay (s/veh)	14.2	-	-	7.9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	2.2	-	-	0.1	-



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	36	12	36	82	101	85
Future Volume (Veh/h)	36	12	36	82	101	85
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.62	0.62	0.62	0.62	0.62	0.62
Hourly flow rate (vph)	58	19	58	132	163	137
Pedestrians					44	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					4	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			121		360	112
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			121		360	112
tC, single (s)			4.3		6.4	6.3
tC, 2 stage (s)						
tF (s)			2.4		3.5	3.4
p0 queue free %			96		72	85
cM capacity (veh/h)			1321		580	889

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	77	190	300
Volume Left	0	58	163
Volume Right	19	0	137
cSH	1700	1321	690
Volume to Capacity	0.05	0.04	0.44
Queue Length 95th (ft)	0	3	55
Control Delay (s/veh)	0.0	2.7	14.2
Lane LOS		A	B
Approach Delay (s/veh)	0.0	2.7	14.2
Approach LOS			B

Intersection Summary			
Average Delay	8.4		
Intersection Capacity Utilization	30.4%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	198	1393	40	0	1706
Future Vol, veh/h	0	198	1393	40	0	1706
Conflicting Peds, #/hr	0	1	0	1	1	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	Free	-	None
Storage Length	-	0	-	335	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	6	8	3	2	6
Mvmt Flow	0	206	1451	42	0	1777

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	727	0	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.02	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.36	-	-	-	-
Pot Cap-1 Maneuver	0	358	-	0	0	-
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	357	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	27.94	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	357	-
HCM Lane V/C Ratio	-	0.577	-
HCM Control Delay (s/veh)	-	27.9	-
HCM Lane LOS	-	D	-
HCM 95th %tile Q(veh)	-	3.5	-

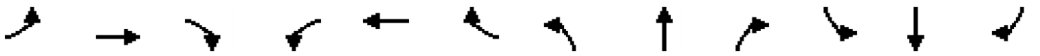


Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	198	1393	40	0	1706
Future Volume (Veh/h)	0	198	1393	40	0	1706
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	206	1451	42	0	1777
Pedestrians	1					1
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	3.5					3.5
Percent Blockage	0					0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2341	728			1452	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2341	728			1452	
tC, single (s)	6.8	*6.0			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	100	53			100	
cM capacity (veh/h)	30	438			462	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	206	726	726	42	889	889
Volume Left	0	0	0	0	0	0
Volume Right	206	0	0	42	0	0
cSH	438	1700	1700	1700	1700	1700
Volume to Capacity	0.47	0.43	0.43	0.02	0.52	0.52
Queue Length 95th (ft)	61	0	0	0	0	0
Control Delay (s/veh)	20.3	0.0	0.0	0.0	0.0	0.0
Lane LOS	C					
Approach Delay (s/veh)	20.3	0.0			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		

* User Entered Value



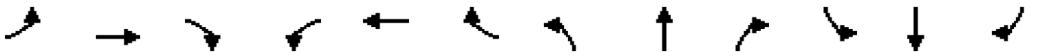
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	201	198	23	220	9	252	144	36	15	206	6
Future Volume (vph)	10	201	198	23	220	9	252	144	36	15	206	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.99		1.00	0.97		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1500	1484		1543	1766		1612	1577		1687	1799	
Flt Permitted	0.57	1.00		0.28	1.00		0.41	1.00		0.64	1.00	
Satd. Flow (perm)	904	1484		459	1766		700	1577		1129	1799	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	11	216	213	25	237	10	271	155	39	16	222	6
RTOR Reduction (vph)	0	20	0	0	1	0	0	0	0	0	1	0
Lane Group Flow (vph)	11	409	0	25	246	0	271	194	0	16	227	0
Confl. Peds. (#/hr)	2					2						
Heavy Vehicles (%)	20%	14%	23%	17%	7%	2%	12%	14%	28%	7%	4%	50%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	32.5	31.7		36.7	33.8		40.3	34.5		24.2	22.4	
Effective Green, g (s)	32.5	32.2		36.7	34.3		40.3	35.0		24.2	22.9	
Actuated g/C Ratio	0.36	0.36		0.41	0.38		0.45	0.39		0.27	0.25	
Clearance Time (s)	4.0	5.5		4.0	5.5		4.0	5.5		4.0	5.5	
Vehicle Extension (s)	2.0	3.2		2.0	3.2		2.0	3.2		2.0	3.2	
Lane Grp Cap (vph)	332	531		222	673		454	613		315	458	
v/s Ratio Prot	0.00	c0.28		c0.00	0.14		c0.09	0.12		0.00	0.13	
v/s Ratio Perm	0.01			0.04			c0.17			0.01		
v/c Ratio	0.03	0.77		0.11	0.37		0.60	0.32		0.05	0.50	
Uniform Delay, d1	18.5	25.6		17.3	20.0		17.0	19.1		24.2	28.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	6.9		0.1	0.4		1.4	0.3		0.0	0.9	
Delay (s)	18.5	32.5		17.4	20.3		18.4	19.4		24.3	29.5	
Level of Service	B	C		B	C		B	B		C	C	
Approach Delay (s/veh)		32.1			20.1			18.9			29.1	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	25.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	89.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Signalized Intersection Summary
20: SW Teton Avenue & SW Herman Road

07/15/2025



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	201	198	23	220	9	252	144	36	15	206	6
Future Volume (veh/h)	10	201	198	23	220	9	252	144	36	15	206	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1604	1693	1559	1648	1796	1870	1722	1693	1485	1796	1841	1159
Adj Flow Rate, veh/h	11	216	213	25	237	10	271	155	39	16	222	6
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	20	14	23	17	7	2	12	14	28	7	4	50
Cap, veh/h	418	308	303	275	697	29	407	401	101	314	295	8
Arrive On Green	0.01	0.39	0.39	0.03	0.41	0.40	0.16	0.31	0.30	0.02	0.17	0.16
Sat Flow, veh/h	1527	781	770	1570	1711	72	1640	1305	328	1711	1784	48
Grp Volume(v), veh/h	11	0	429	25	0	247	271	0	194	16	0	228
Grp Sat Flow(s),veh/h/ln	1527	0	1552	1570	0	1783	1640	0	1633	1711	0	1832
Q Serve(g_s), s	0.3	0.0	16.5	0.7	0.0	6.8	9.2	0.0	6.7	0.6	0.0	8.5
Cycle Q Clear(g_c), s	0.3	0.0	16.5	0.7	0.0	6.8	9.2	0.0	6.7	0.6	0.0	8.5
Prop In Lane	1.00		0.50	1.00		0.04	1.00		0.20	1.00		0.03
Lane Grp Cap(c), veh/h	418	0	611	275	0	726	407	0	502	314	0	302
V/C Ratio(X)	0.03	0.00	0.70	0.09	0.00	0.34	0.67	0.00	0.39	0.05	0.00	0.75
Avail Cap(c_a), veh/h	826	0	1188	672	0	1340	604	0	1319	762	0	1428
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.1	0.0	18.2	14.4	0.0	14.5	19.2	0.0	19.4	24.3	0.0	28.3
Incr Delay (d2), s/veh	0.0	0.0	1.6	0.1	0.0	0.3	0.7	0.0	0.5	0.0	0.0	4.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	5.3	0.2	0.0	2.5	3.2	0.0	2.4	0.2	0.0	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	13.1	0.0	19.8	14.5	0.0	14.8	19.9	0.0	20.0	24.4	0.0	32.5
LnGrp LOS	B		B	B		B	B		B	C		C
Approach Vol, veh/h		440			272			465			244	
Approach Delay, s/veh		19.6			14.8			19.9			31.9	
Approach LOS		B			B			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.0	33.0	15.5	16.8	5.0	34.0	5.4	26.9
Change Period (Y+Rc), s	4.0	5.5	4.0	5.5	4.0	5.5	4.0	5.5
Max Green Setting (Gmax), s	20.0	54.0	20.0	55.0	20.0	53.0	20.0	57.0
Max Q Clear Time (g_c+I1), s	2.7	18.5	11.2	10.5	2.3	8.8	2.6	8.7
Green Ext Time (p_c), s	0.0	9.0	0.3	0.8	0.0	5.4	0.0	2.8

Intersection Summary	
HCM 7th Control Delay, s/veh	20.9
HCM 7th LOS	C



Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	220	339	129	1488	18	1365	98
Future Volume (vph)	220	339	129	1488	18	1365	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1736	1528	1656	3312	1770	3406	1452
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1736	1528	1656	3312	1770	3406	1452
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	229	353	134	1550	19	1422	102
RTOR Reduction (vph)	0	171	0	0	0	0	31
Lane Group Flow (vph)	229	182	134	1550	19	1422	71
Confl. Peds. (#/hr)		5	3				3
Heavy Vehicles (%)	4%	4%	9%	9%	2%	6%	8%
Turn Type	Prot	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	4		5	2	1	6	
Permitted Phases		4					6
Actuated Green, G (s)	21.7	21.7	16.3	98.4	4.4	85.5	85.5
Effective Green, g (s)	22.7	22.7	17.8	100.4	4.9	87.5	87.5
Actuated g/C Ratio	0.16	0.16	0.13	0.72	0.04	0.63	0.63
Clearance Time (s)	5.0	5.0	5.5	6.0	4.5	6.0	6.0
Vehicle Extension (s)	2.5	2.5	2.3	4.5	2.3	4.5	4.5
Lane Grp Cap (vph)	281	247	210	2375	61	2128	907
v/s Ratio Prot	c0.13		0.08	c0.47	0.01	c0.42	
v/s Ratio Perm		0.12					0.05
v/c Ratio	0.81	0.74	0.64	0.65	0.31	0.67	0.08
Uniform Delay, d1	56.6	55.8	58.0	10.5	65.9	16.9	10.4
Progression Factor	1.00	1.00	1.00	1.00	1.13	1.25	0.90
Incremental Delay, d2	16.0	10.3	5.1	1.4	1.4	1.4	0.1
Delay (s)	72.7	66.1	63.2	11.9	76.1	22.6	9.4
Level of Service	E	E	E	B	E	C	A
Approach Delay (s/veh)	68.7			16.0		22.4	
Approach LOS	E			B		C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	26.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Signalized Intersection Summary
21: OR 99W (Pacific Highway) & SW Fischer Road

07/15/2025



Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (veh/h)	220	339	129	1488	18	1365	98
Future Volume (veh/h)	220	339	129	1488	18	1365	98
Initial Q (Qb), veh	0	0	0	0		0	0
Lane Width Adj.	1.00	1.00	1.00	1.00		1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00				1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00		1.00	1.00
Work Zone On Approach	No			No		No	
Adj Sat Flow, veh/h/ln	1841	1841	1767	1767		1811	1781
Adj Flow Rate, veh/h	229	176	134	1550		1422	102
Peak Hour Factor	0.96	0.96	0.96	0.96		0.96	0.96
Percent Heavy Veh, %	4	4	9	9		6	8
Cap, veh/h	271	241	238	2645		2114	925
Arrive On Green	0.15	0.15	0.14	0.79		1.00	1.00
Sat Flow, veh/h	1753	1560	1682	3445		3532	1506
Grp Volume(v), veh/h	229	176	134	1550		1422	102
Grp Sat Flow(s),veh/h/ln	1753	1560	1682	1678		1721	1506
Q Serve(g_s), s	17.8	15.0	10.4	25.5		0.0	0.0
Cycle Q Clear(g_c), s	17.8	15.0	10.4	25.5		0.0	0.0
Prop In Lane	1.00	1.00	1.00				1.00
Lane Grp Cap(c), veh/h	271	241	238	2645		2114	925
V/C Ratio(X)	0.84	0.73	0.56	0.59		0.67	0.11
Avail Cap(c_a), veh/h	326	290	238	2645		2114	925
HCM Platoon Ratio	1.00	1.00	1.00	1.00		2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00		0.77	0.77
Uniform Delay (d), s/veh	57.5	56.4	56.0	5.8		0.0	0.0
Incr Delay (d2), s/veh	14.9	6.5	2.3	1.0		1.3	0.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0		0.0	0.0
%ile BackOfQ(50%),veh/ln	9.1	13.1	4.5	7.1		0.4	0.0
Unsig. Movement Delay, s/veh							
LnGrp Delay(d), s/veh	72.4	62.9	58.3	6.8		1.3	0.2
LnGrp LOS	E	E	E	A		A	A
Approach Vol, veh/h	405			1684		1524	
Approach Delay, s/veh	68.2			10.9		1.3	
Approach LOS	E			B		A	

Timer - Assigned Phs		2		4	5	6	
Phs Duration (G+Y+Rc), s		114.3		25.7	24.3	90.0	
Change Period (Y+Rc), s		6.0		5.0	6.0	* 6	
Max Green Setting (Gmax), s		84.0		25.0	14.5	* 84	
Max Q Clear Time (g_c+I1), s		27.5		19.8	12.4	2.0	
Green Ext Time (p_c), s		50.8		0.9	0.1	64.8	

Intersection Summary	
HCM 7th Control Delay, s/veh	13.3
HCM 7th LOS	B

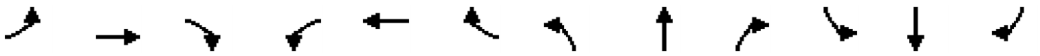
Notes

User approved pedestrian interval to be less than phase max green.
User approved ignoring U-Turning movement.

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis
22: OR 99W (Pacific Highway) & SW 116th Avenue/SW Durham Road

07/15/2025



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	49	27	278	23	156	71	1159	490	380	1115	14
Future Volume (vph)	6	49	27	278	23	156	71	1159	490	380	1115	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0	6.0	5.4	5.4	6.0	5.3	5.0	5.0
Lane Util. Factor		0.95		0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00		0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3350		1633	1651	1515	1770	3312	1513	3367	3374	1542
Flt Permitted		1.00		0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3350		1633	1651	1515	1770	3312	1513	3367	3374	1542
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	6	50	28	284	23	159	72	1183	500	388	1138	14
RTOR Reduction (vph)	0	26	0	0	0	140	0	0	94	0	0	6
Lane Group Flow (vph)	0	58	0	153	154	19	72	1183	406	388	1138	8
Confl. Peds. (#/hr)	9					9	2		6	6		2
Heavy Vehicles (%)	2%	2%	2%	5%	4%	3%	2%	9%	5%	4%	7%	2%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	3	3		4	4		5	2	4	1	6	
Permitted Phases						4			2			6
Actuated Green, G (s)		12.0		17.1	17.1	17.1	8.0	64.5	81.6	23.7	80.5	80.5
Effective Green, g (s)		12.0		17.1	17.1	17.1	8.0	64.5	81.6	23.7	80.5	80.5
Actuated g/C Ratio		0.09		0.12	0.12	0.12	0.06	0.46	0.58	0.17	0.57	0.57
Clearance Time (s)		6.0		6.0	6.0	6.0	5.4	5.4	6.0	5.3	5.0	5.0
Vehicle Extension (s)		2.3		2.3	2.3	2.3	2.3	4.5	2.3	2.3	4.8	4.8
Lane Grp Cap (vph)		287		199	201	185	101	1525	946	569	1940	886
v/s Ratio Prot		c0.02		c0.09	0.09		0.04	c0.36	0.05	c0.12	0.34	
v/s Ratio Perm						0.01			0.22			0.01
v/c Ratio		0.20		0.77	0.77	0.10	0.71	0.78	0.43	0.68	0.59	0.01
Uniform Delay, d1		59.6		59.5	59.5	54.6	64.9	31.7	16.2	54.6	19.1	12.7
Progression Factor		1.00		1.00	1.00	1.00	0.90	0.92	0.54	1.00	1.00	1.00
Incremental Delay, d2		0.2		15.3	14.9	0.1	14.9	3.0	0.1	2.9	1.3	0.0
Delay (s)		59.8		74.8	74.5	54.8	73.2	32.1	8.9	57.5	20.4	12.7
Level of Service		E		E	E	D	E	C	A	E	C	B
Approach Delay (s/veh)		59.8			67.9			27.2			29.7	
Approach LOS		E			E			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	33.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.7
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Edition methodology does not support exclusive ped or hold phases.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	843	185	586	1108	689	678
Future Volume (vph)	843	185	586	1108	689	678
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	5.6
Lane Util. Factor	0.95	1.00	0.97	0.95	0.97	0.88
Frpb, ped/bikes	1.00	0.99	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1518	3367	3471	3400	2787
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1518	3367	3471	3400	2787
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	860	189	598	1131	703	692
RTOR Reduction (vph)	0	114	0	0	0	0
Lane Group Flow (vph)	860	75	598	1131	703	692
Confl. Peds. (#/hr)		1	1			6
Heavy Vehicles (%)	2%	5%	4%	4%	3%	2%
Turn Type	NA	Perm	Prot	NA	Prot	pt+ov
Protected Phases	2		1	6	8	1 4
Permitted Phases		2				
Actuated Green, G (s)	44.0	44.0	23.6	73.2	31.3	54.5
Effective Green, g (s)	46.0	46.0	25.2	75.2	33.3	49.5
Actuated g/C Ratio	0.39	0.39	0.22	0.65	0.29	0.42
Clearance Time (s)	6.0	6.0	5.6	6.0	6.0	
Vehicle Extension (s)	5.4	5.4	2.3	5.4	2.3	
Lane Grp Cap (vph)	1397	599	728	2240	971	1184
v/s Ratio Prot	c0.24		c0.18	0.33	c0.21	0.25
v/s Ratio Perm		0.05				
v/c Ratio	0.62	0.12	0.82	0.50	0.72	0.58
Uniform Delay, d1	28.2	22.4	43.5	10.9	37.5	25.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.3	0.2	7.2	0.8	2.4	0.6
Delay (s)	29.5	22.7	50.7	11.7	39.9	26.2
Level of Service	C	C	D	B	D	C
Approach Delay (s/veh)	28.2			25.2	33.1	
Approach LOS	C			C	C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	116.5	Sum of lost time (s)	18.6
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Edition methodology does not support exclusive ped or hold phases.



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	37	602	782	47	398	374
Future Volume (vph)	37	602	782	47	398	374
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	0.0	4.5	4.5	4.0	4.5
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	3539	1529	1769	3471
Flt Permitted	0.95	1.00	1.00	1.00	0.15	1.00
Satd. Flow (perm)	1770	1583	3539	1529	277	3471
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	39	640	832	50	423	398
RTOR Reduction (vph)	0	12	0	25	0	0
Lane Group Flow (vph)	39	628	832	25	423	398
Confl. Peds. (#/hr)				7	7	
Heavy Vehicles (%)	2%	2%	2%	2%	2%	4%
Turn Type	Perm	pt+ov	NA	Perm	D.P+P	NA
Protected Phases		4 5	6		5	2
Permitted Phases	4			6	6	
Actuated Green, G (s)	13.4	61.0	31.4	31.4	74.0	79.0
Effective Green, g (s)	14.4	66.0	32.4	32.4	76.0	80.0
Actuated g/C Ratio	0.14	0.64	0.31	0.31	0.74	0.78
Clearance Time (s)	5.0		5.5	5.5	5.0	5.5
Vehicle Extension (s)	4.0		4.5	4.5	4.0	4.5
Lane Grp Cap (vph)	247	1015	1114	481	836	2698
v/s Ratio Prot		c0.40	c0.24		0.21	0.11
v/s Ratio Perm	0.02			0.02	0.16	
v/c Ratio	0.16	0.62	0.75	0.05	0.51	0.15
Uniform Delay, d1	38.9	11.0	31.6	24.6	15.3	2.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	1.3	3.1	0.1	0.7	0.1
Delay (s)	39.3	12.3	34.7	24.6	15.9	3.0
Level of Service	D	B	C	C	B	A
Approach Delay (s/veh)	13.8		34.1			9.7
Approach LOS	B		C			A

Intersection Summary			
HCM 2000 Control Delay (s/veh)	19.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	102.9	Sum of lost time (s)	12.5
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Edition methodology does not support exclusive ped or hold phases.

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	36	437	2	0	564	253	0	3	7	15	0	19
Future Vol, veh/h	36	437	2	0	564	253	0	3	7	15	0	19
Conflicting Peds, #/hr	4	0	6	6	0	4	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	25	-	-	25	-	-	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	3	50	2	2	2	2	33	14	7	2	11
Mvmt Flow	40	480	2	0	620	278	0	3	8	16	0	21

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	902	0	0	488	0	0	1187	1468	487	1324	1330	764
Stage 1	-	-	-	-	-	-	566	566	-	763	763	-
Stage 2	-	-	-	-	-	-	621	902	-	561	568	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.83	6.34	7.17	6.52	6.31
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.83	-	6.17	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.83	-	6.17	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.297	3.426	3.563	4.018	3.399
Pot Cap-1 Maneuver	754	-	-	1075	-	-	165	110	557	130	155	390
Stage 1	-	-	-	-	-	-	509	461	-	389	413	-
Stage 2	-	-	-	-	-	-	475	318	-	503	507	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	751	-	-	1069	-	-	147	103	554	117	145	388
Mov Cap-2 Maneuver	-	-	-	-	-	-	147	103	-	117	145	-
Stage 1	-	-	-	-	-	-	479	434	-	388	412	-
Stage 2	-	-	-	-	-	-	449	316	-	467	477	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.76	0	20.78	28.22
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	239	751	-	-	1069	-	-	192
HCM Lane V/C Ratio	-	0.046	0.053	-	-	-	-	-	0.195
HCM Control Delay (s/veh)	0	20.8	10.1	-	-	0	-	-	28.2
HCM Lane LOS	A	C	B	-	-	A	-	-	D
HCM 95th %tile Q(veh)	-	0.1	0.2	-	-	0	-	-	0.7

3: JAE Access/SW 115th Avenue & SW Tualatin Road Performance by movement

Movement	EBL	EBT	EBR	WBT	WBR	NBT	NBR	SBL	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Denied Del/Veh (s)	3.3	0.4	0.6	0.0	0.0	0.1	0.1	0.1	0.0	0.2
Total Delay (hr)	0.1	0.1	0.0	0.5	0.2	0.0	0.0	0.1	0.1	1.0
Total Del/Veh (s)	8.6	0.8	0.6	3.1	2.4	11.9	6.6	19.6	9.2	2.6
Stop Delay (hr)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2
Stop Del/Veh (s)	6.7	0.0	0.0	0.0	0.0	8.4	4.7	17.8	7.5	0.5

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	9	451	813	15	9	4
Future Vol, veh/h	9	451	813	15	9	4
Conflicting Peds, #/hr	3	0	0	3	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	25	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	3	7	2	11	2
Mvmt Flow	10	485	874	16	10	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	893	0	-	0	1390	885
Stage 1	-	-	-	-	885	-
Stage 2	-	-	-	-	504	-
Critical Hdwy	4.12	-	-	-	6.51	6.22
Critical Hdwy Stg 1	-	-	-	-	5.51	-
Critical Hdwy Stg 2	-	-	-	-	5.51	-
Follow-up Hdwy	2.218	-	-	-	3.599	3.318
Pot Cap-1 Maneuver	759	-	-	-	150	344
Stage 1	-	-	-	-	389	-
Stage 2	-	-	-	-	589	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	757	-	-	-	147	343
Mov Cap-2 Maneuver	-	-	-	-	274	-
Stage 1	-	-	-	-	383	-
Stage 2	-	-	-	-	587	-

Approach	EB	WB	SB
HCM Control Delay, s/v	0.19	0	17.93
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	757	-	-	-	292
HCM Lane V/C Ratio	0.013	-	-	-	0.048
HCM Control Delay (s/veh)	9.8	-	-	-	17.9
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	452	5	3	809	30	28
Future Vol, veh/h	452	5	3	809	30	28
Conflicting Peds, #/hr	0	1	1	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	4	20	2	2	3	7
Mvmt Flow	481	5	3	861	32	30

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	487	0	1352	485
Stage 1	-	-	-	-	485	-
Stage 2	-	-	-	-	867	-
Critical Hdwy	-	-	4.12	-	6.43	6.27
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.218	-	3.527	3.363
Pot Cap-1 Maneuver	-	-	1076	-	165	572
Stage 1	-	-	-	-	617	-
Stage 2	-	-	-	-	410	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1075	-	164	572
Mov Cap-2 Maneuver	-	-	-	-	295	-
Stage 1	-	-	-	-	617	-
Stage 2	-	-	-	-	408	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0.03	16.14
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	385	-	-	1075	-
HCM Lane V/C Ratio	0.16	-	-	0.003	-
HCM Control Delay (s/veh)	16.1	-	-	8.4	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.6	-	-	0	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	0	1	46	11	0
Future Vol, veh/h	3	0	1	46	11	0
Conflicting Peds, #/hr	0	0	3	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	9	2
Mvmt Flow	3	0	1	51	12	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	69	15	15	0	-	0
Stage 1	15	-	-	-	-	-
Stage 2	53	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	936	1064	1603	-	-	-
Stage 1	1008	-	-	-	-	-
Stage 2	969	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	930	1061	1598	-	-	-
Mov Cap-2 Maneuver	930	-	-	-	-	-
Stage 1	1004	-	-	-	-	-
Stage 2	966	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	8.88	0.15	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	38	-	930	-	-
HCM Lane V/C Ratio	0.001	-	0.004	-	-
HCM Control Delay (s/veh)	7.3	0	8.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	18	21	0	29	11	0
Future Vol, veh/h	18	21	0	29	11	0
Conflicting Peds, #/hr	0	0	7	0	0	7
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	99	99	99	99	99
Heavy Vehicles, %	2	2	2	3	9	2
Mvmt Flow	18	21	0	29	11	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	47	18	18	0	-	0
Stage 1	18	-	-	-	-	-
Stage 2	29	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	962	1060	1599	-	-	-
Stage 1	1005	-	-	-	-	-
Stage 2	993	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	950	1053	1588	-	-	-
Mov Cap-2 Maneuver	950	-	-	-	-	-
Stage 1	998	-	-	-	-	-
Stage 2	987	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	8.74	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1588	-	1003	-	-
HCM Lane V/C Ratio	-	-	0.039	-	-
HCM Control Delay (s/veh)	0	-	8.7	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	48	3	26	32	0
Future Vol, veh/h	1	48	3	26	32	0
Conflicting Peds, #/hr	0	0	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	8	3	2
Mvmt Flow	1	59	4	32	39	0

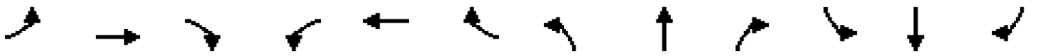
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	82	43	43	0	-	0
Stage 1	43	-	-	-	-	-
Stage 2	39	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	920	1027	1566	-	-	-
Stage 1	979	-	-	-	-	-
Stage 2	983	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	911	1023	1560	-	-	-
Mov Cap-2 Maneuver	911	-	-	-	-	-
Stage 1	973	-	-	-	-	-
Stage 2	980	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	8.75	0.76	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	186	-	1021	-	-
HCM Lane V/C Ratio	0.002	-	0.059	-	-
HCM Control Delay (s/veh)	7.3	0	8.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

HCM Signalized Intersection Capacity Analysis
9: SW 124th Avenue & SW Leveton Drive

07/16/2025



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	28	26	39	2	212	7	615	20	31	374	17
Future Volume (vph)	27	28	26	39	2	212	7	615	20	31	374	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.85		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1581		1719	1563		1262	3519		1770	3345	
Flt Permitted	0.95	1.00		0.95	1.00		0.50	1.00		0.29	1.00	
Satd. Flow (perm)	1736	1581		1719	1563		666	3519		535	3345	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	29	30	28	42	2	230	8	668	22	34	407	18
RTOR Reduction (vph)	0	22	0	0	173	0	0	2	0	0	3	0
Lane Group Flow (vph)	29	36	0	42	59	0	8	688	0	34	422	0
Confl. Peds. (#/hr)	4					4						
Heavy Vehicles (%)	4%	11%	12%	5%	2%	2%	43%	2%	5%	2%	6%	35%
Turn Type	Prot	NA		Prot	NA		D.P+P	NA		D.P+P	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases							6			2		
Actuated Green, G (s)	2.2	11.4		4.0	13.2		22.2	20.0		22.2	21.5	
Effective Green, g (s)	3.2	12.4		5.0	14.2		24.2	21.0		22.2	21.5	
Actuated g/C Ratio	0.06	0.22		0.09	0.25		0.42	0.36		0.39	0.37	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	96	340		149	385		297	1282		253	1248	
v/s Ratio Prot	0.02	0.02		c0.02	c0.04		0.00	c0.20		c0.01	0.13	
v/s Ratio Perm							0.01			0.05		
v/c Ratio	0.30	0.11		0.28	0.15		0.03	0.54		0.13	0.34	
Uniform Delay, d1	26.1	18.1		24.6	17.0		9.7	14.5		11.3	12.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.8	0.1		1.0	0.2		0.0	0.4		0.2	0.2	
Delay (s)	27.9	18.3		25.7	17.2		9.8	14.9		11.6	13.1	
Level of Service	C	B		C	B		A	B		B	B	
Approach Delay (s/veh)		21.5			18.5			14.8			13.0	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	57.6	Sum of lost time (s)	17.0
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	28	26	39	2	212	7	615	20	31	374	17
Future Volume (veh/h)	27	28	26	39	2	212	7	615	20	31	374	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1737	1722	1826	1870	1870	1263	1870	1826	1870	1811	1381
Adj Flow Rate, veh/h	29	30	28	42	2	230	8	668	22	34	407	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	11	12	5	2	2	43	2	5	2	6	35
Cap, veh/h	115	198	185	141	3	401	334	1012	33	323	1068	47
Arrive On Green	0.07	0.24	0.22	0.08	0.26	0.24	0.03	0.29	0.27	0.06	0.32	0.32
Sat Flow, veh/h	1753	824	769	1739	14	1566	1203	3511	116	1781	3357	148
Grp Volume(v), veh/h	29	0	58	42	0	232	8	338	352	34	208	217
Grp Sat Flow(s),veh/h/ln	1753	0	1594	1739	0	1579	1203	1777	1850	1781	1721	1784
Q Serve(g_s), s	0.8	0.0	1.5	1.2	0.0	6.7	0.2	8.6	8.6	0.7	4.8	4.9
Cycle Q Clear(g_c), s	0.8	0.0	1.5	1.2	0.0	6.7	0.2	8.6	8.6	0.7	4.8	4.9
Prop In Lane	1.00		0.48	1.00		0.99	1.00		0.06	1.00		0.08
Lane Grp Cap(c), veh/h	115	0	383	141	0	404	334	512	533	323	547	568
V/C Ratio(X)	0.25	0.00	0.15	0.30	0.00	0.57	0.02	0.66	0.66	0.11	0.38	0.38
Avail Cap(c_a), veh/h	545	0	960	372	0	952	789	1071	1115	1082	1338	1388
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.8	0.0	15.6	22.3	0.0	17.2	10.6	16.1	16.1	12.6	13.6	13.6
Incr Delay (d2), s/veh	1.1	0.0	0.2	1.2	0.0	1.3	0.0	1.5	1.4	0.1	0.4	0.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.5	0.5	0.0	2.2	0.0	3.0	3.1	0.2	1.5	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	24.0	0.0	15.8	23.4	0.0	18.4	10.6	17.6	17.5	12.7	14.0	14.0
LnGrp LOS	C		B	C		B	B	B	B	B	B	B
Approach Vol, veh/h		87			274			698			459	
Approach Delay, s/veh		18.5			19.2			17.5			13.9	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.1	18.8	8.2	16.4	5.5	21.4	7.4	17.2
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	25.0	30.0	10.0	30.0	20.0	40.0	15.0	30.0
Max Q Clear Time (g_c+I1), s	2.7	10.6	3.2	3.5	2.2	6.9	2.8	8.7
Green Ext Time (p_c), s	0.1	3.2	0.0	0.5	0.0	2.0	0.0	2.5

Intersection Summary	
HCM 7th Control Delay, s/veh	16.8
HCM 7th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Intersection Delay, s/veh	9.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	55	11	27	259	2	28	2	5	1	0	12
Future Vol, veh/h	6	55	11	27	259	2	28	2	5	1	0	12
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles, %	2	4	2	15	2	2	2	2	40	2	2	2
Mvmt Flow	7	68	14	33	320	2	35	2	6	1	0	15
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	7.9	10.7	8.4	7.6
HCM LOS	A	B	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	80%	8%	9%	8%
Vol Thru, %	6%	76%	90%	0%
Vol Right, %	14%	15%	1%	92%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	35	72	288	13
LT Vol	28	6	27	1
Through Vol	2	55	259	0
RT Vol	5	11	2	12
Lane Flow Rate	43	89	356	16
Geometry Grp	1	1	1	1
Degree of Util (X)	0.061	0.108	0.429	0.02
Departure Headway (Hd)	5.044	4.379	4.339	4.468
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	713	821	818	804
Service Time	3.052	2.389	2.422	2.479
HCM Lane V/C Ratio	0.06	0.108	0.435	0.02
HCM Control Delay, s/veh	8.4	7.9	10.7	7.6
HCM Lane LOS	A	A	B	A
HCM 95th-tile Q	0.2	0.4	2.2	0.1

Intersection	
Int Delay, s/veh	5.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	25	24	141	12	62	145
Future Vol, veh/h	25	24	141	12	62	145
Conflicting Peds, #/hr	3	0	0	3	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	82	82	82	82	82	76
Heavy Vehicles, %	2	8	2	2	2	2
Mvmt Flow	30	29	172	15	76	191

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	190	0	-	0	273	182
Stage 1	-	-	-	-	182	-
Stage 2	-	-	-	-	90	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1384	-	-	-	717	860
Stage 1	-	-	-	-	849	-
Stage 2	-	-	-	-	933	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1380	-	-	-	697	858
Mov Cap-2 Maneuver	-	-	-	-	697	-
Stage 1	-	-	-	-	828	-
Stage 2	-	-	-	-	931	-

Approach	EB	WB	SB
HCM Control Delay, s/v	3.91	0	10.51
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	918	-	-	-	697	858
HCM Lane V/C Ratio	0.022	-	-	-	0.109	0.222
HCM Control Delay (s/veh)	7.7	0	-	-	10.8	10.4
HCM Lane LOS	A	A	-	-	B	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4	0.8

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	89	153	0	0	0
Future Vol, veh/h	0	89	153	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	2	5	5	2	2	2
Mvmt Flow	0	109	187	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	187	0	-	0	295	187
Stage 1	-	-	-	-	187	-
Stage 2	-	-	-	-	109	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1388	-	-	-	696	856
Stage 1	-	-	-	-	845	-
Stage 2	-	-	-	-	916	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1388	-	-	-	696	856
Mov Cap-2 Maneuver	-	-	-	-	696	-
Stage 1	-	-	-	-	845	-
Stage 2	-	-	-	-	916	-

Approach	EB	WB	SB
HCM Control Delay, s/v	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1388	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s/veh)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	7	82	119	19	35	29
Future Vol, veh/h	7	82	119	19	35	29
Conflicting Peds, #/hr	7	0	0	7	0	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	100	145	23	43	35

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	175	0	-	0	281	166
Stage 1	-	-	-	-	164	-
Stage 2	-	-	-	-	117	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1401	-	-	-	709	879
Stage 1	-	-	-	-	865	-
Stage 2	-	-	-	-	908	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1392	-	-	-	695	871
Mov Cap-2 Maneuver	-	-	-	-	695	-
Stage 1	-	-	-	-	854	-
Stage 2	-	-	-	-	902	-

Approach	EB	WB	SB
HCM Control Delay, s/v	0.6	0	9.97
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	142	-	-	-	695	871
HCM Lane V/C Ratio	0.006	-	-	-	0.061	0.041
HCM Control Delay (s/veh)	7.6	0	-	-	10.5	9.3
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2	0.1

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	121	0	0	123	0	2	0	0	0	0	0
Future Vol, veh/h	0	121	0	0	123	0	2	0	0	0	0	0
Conflicting Peds, #/hr	7	0	5	5	0	7	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2	50	2	2	2	2	2
Mvmt Flow	0	148	0	0	150	0	2	0	0	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	157	0	0	153	0	0	303	310	153	305	310	157
Stage 1	-	-	-	-	-	-	153	153	-	157	157	-
Stage 2	-	-	-	-	-	-	150	157	-	148	153	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.6	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.6	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.6	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.95	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1423	-	-	1428	-	-	565	605	894	648	605	889
Stage 1	-	-	-	-	-	-	748	771	-	845	768	-
Stage 2	-	-	-	-	-	-	751	768	-	855	771	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1413	-	-	1421	-	-	563	598	889	643	598	883
Mov Cap-2 Maneuver	-	-	-	-	-	-	563	598	-	643	598	-
Stage 1	-	-	-	-	-	-	745	767	-	840	763	-
Stage 2	-	-	-	-	-	-	751	763	-	855	767	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0	0	11.42	0
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	563	1413	-	-	1421	-	-	-
HCM Lane V/C Ratio	0.004	-	-	-	-	-	-	-
HCM Control Delay (s/veh)	11.4	0	-	-	0	-	-	0
HCM Lane LOS	B	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	-

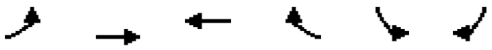
Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	112	58	67	67	46
Future Vol, veh/h	10	112	58	67	67	46
Conflicting Peds, #/hr	1	1	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	17	2	2	2	2	2
Mvmt Flow	12	132	68	79	79	54

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	323	108	134	0	-	0
Stage 1	107	-	-	-	-	-
Stage 2	216	-	-	-	-	-
Critical Hdwy	6.57	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.57	-	-	-	-	-
Critical Hdwy Stg 2	5.57	-	-	-	-	-
Follow-up Hdwy	3.653	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	641	946	1451	-	-	-
Stage 1	881	-	-	-	-	-
Stage 2	785	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	608	944	1449	-	-	-
Mov Cap-2 Maneuver	608	-	-	-	-	-
Stage 1	837	-	-	-	-	-
Stage 2	785	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	9.74	3.53	0
HCM LOS	A		

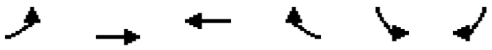
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	835	-	903	-	-
HCM Lane V/C Ratio	0.047	-	0.159	-	-
HCM Control Delay (s/veh)	7.6	0	9.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.6	-	-



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	2	316	504	57	163	35
Future Volume (vph)	2	316	504	57	163	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1769	1827	1741		1752	1568
Flt Permitted	0.25	1.00	1.00		0.95	1.00
Satd. Flow (perm)	465	1827	1741		1752	1568
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2	351	560	63	181	39
RTOR Reduction (vph)	0	0	4	0	0	29
Lane Group Flow (vph)	2	351	619	0	181	10
Confl. Peds. (#/hr)	1			1		
Heavy Vehicles (%)	2%	4%	8%	2%	3%	3%
Turn Type	D.P+P	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	6					4
Actuated Green, G (s)	25.9	31.3	25.3		12.1	12.1
Effective Green, g (s)	28.7	32.7	26.7		14.6	14.6
Actuated g/C Ratio	0.52	0.59	0.48		0.26	0.26
Clearance Time (s)	5.4	5.4	5.4		6.5	6.5
Vehicle Extension (s)	2.0	3.1	3.1		2.6	2.6
Lane Grp Cap (vph)	288	1080	840		462	413
v/s Ratio Prot	0.00	c0.19	c0.36		c0.10	
v/s Ratio Perm	0.00					0.01
v/c Ratio	0.01	0.33	0.74		0.39	0.02
Uniform Delay, d1	12.9	5.7	11.5		16.7	15.1
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	0.2	3.4		0.4	0.0
Delay (s)	12.9	5.9	14.9		17.1	15.1
Level of Service	B	A	B		B	B
Approach Delay (s/veh)		5.9	14.9		16.8	
Approach LOS		A	B		B	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	55.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	45.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	316	504	57	163	35
Future Volume (veh/h)	2	316	504	57	163	35
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1841	1781	1870	1856	1856
Adj Flow Rate, veh/h	2	351	560	63	181	39
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	4	8	2	3	3
Cap, veh/h	463	1264	930	105	311	277
Arrive On Green	0.03	0.69	0.59	0.57	0.18	0.18
Sat Flow, veh/h	1781	1841	1573	177	1767	1572
Grp Volume(v), veh/h	2	351	0	623	181	39
Grp Sat Flow(s),veh/h/ln	1781	1841	0	1749	1767	1572
Q Serve(g_s), s	0.0	4.3	0.0	13.2	5.5	1.2
Cycle Q Clear(g_c), s	0.0	4.3	0.0	13.2	5.5	1.2
Prop In Lane	1.00			0.10	1.00	1.00
Lane Grp Cap(c), veh/h	463	1264	0	1034	311	277
V/C Ratio(X)	0.00	0.28	0.00	0.60	0.58	0.14
Avail Cap(c_a), veh/h	764	1465	0	1962	985	876
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.8	3.5	0.0	7.6	22.0	20.3
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.6	1.4	0.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.9	0.0	3.6	2.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	10.8	3.7	0.0	8.2	23.4	20.5
LnGrp LOS	B	A		A	C	C
Approach Vol, veh/h		353	623		220	
Approach Delay, s/veh		3.7	8.2		22.9	
Approach LOS		A	A		C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		44.0		14.3	5.6	38.5
Change Period (Y+Rc), s		5.4		6.5	5.4	5.4
Max Green Setting (Gmax), s		45.0		30.0	10.0	64.0
Max Q Clear Time (g_c+I1), s		6.3		7.5	2.0	15.2
Green Ext Time (p_c), s		7.7		0.5	0.0	17.8

Intersection Summary	
HCM 7th Control Delay, s/veh	9.6
HCM 7th LOS	A

Intersection	
Int Delay, s/veh	7.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	362	65	36	730	124	34
Future Vol, veh/h	362	65	36	730	124	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	100	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	5	6	2	2	2
Mvmt Flow	389	70	39	785	133	37

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	459	0	1287	424
Stage 1	-	-	-	-	424	-
Stage 2	-	-	-	-	862	-
Critical Hdwy	-	-	4.16	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.254	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1081	-	181	630
Stage 1	-	-	-	-	660	-
Stage 2	-	-	-	-	413	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1081	-	175	630
Mov Cap-2 Maneuver	-	-	-	-	175	-
Stage 1	-	-	-	-	660	-
Stage 2	-	-	-	-	399	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0.4	58.75
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	175	630	-	-	1081	-
HCM Lane V/C Ratio	0.763	0.058	-	-	0.036	-
HCM Control Delay (s/veh)	71.8	11.1	-	-	8.5	-
HCM Lane LOS	F	B	-	-	A	-
HCM 95th %tile Q(veh)	4.9	0.2	-	-	0.1	-



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	362	65	36	730	124	34
Future Volume (Veh/h)	362	65	36	730	124	34
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	389	70	39	785	133	37
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			TWLTL		
Median storage veh)				2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			459		1287	424
vC1, stage 1 conf vol					424	
vC2, stage 2 conf vol					863	
vCu, unblocked vol			459		1287	424
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.3		3.5	3.3
p0 queue free %			96		63	94
cM capacity (veh/h)			1081		361	630

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	459	39	785	133	37
Volume Left	0	39	0	133	0
Volume Right	70	0	0	0	37
cSH	1700	1081	1700	361	630
Volume to Capacity	0.27	0.04	0.46	0.37	0.06
Queue Length 95th (ft)	0	3	0	41	5
Control Delay (s/veh)	0.0	8.5	0.0	20.7	11.1
Lane LOS		A		C	B
Approach Delay (s/veh)	0.0	0.4		18.6	
Approach LOS				C	

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		

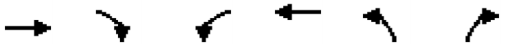
Intersection	
Int Delay, s/veh	8.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	15	7	16	72	254	20
Future Vol, veh/h	15	7	16	72	254	20
Conflicting Peds, #/hr	0	8	8	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	13	2	2	20
Mvmt Flow	16	8	17	78	276	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	32	0	141	28
Stage 1	-	-	-	-	28	-
Stage 2	-	-	-	-	113	-
Critical Hdwy	-	-	4.23	-	6.42	6.4
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.317	-	3.518	3.48
Pot Cap-1 Maneuver	-	-	1512	-	852	997
Stage 1	-	-	-	-	994	-
Stage 2	-	-	-	-	912	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1500	-	835	990
Mov Cap-2 Maneuver	-	-	-	-	835	-
Stage 1	-	-	-	-	987	-
Stage 2	-	-	-	-	901	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	1.35	11.57
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	845	-	-	327	-
HCM Lane V/C Ratio	0.353	-	-	0.012	-
HCM Control Delay (s/veh)	11.6	-	-	7.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	1.6	-	-	0	-



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	17	7	13	73	259	19
Future Volume (Veh/h)	17	7	13	73	259	19
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	8	14	79	282	21
Pedestrians					8	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			34		137	30
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			34		137	30
tC, single (s)			4.2		6.4	6.4
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.5
p0 queue free %			99		67	98
cM capacity (veh/h)			1498		842	987

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	26	93	303
Volume Left	0	14	282
Volume Right	8	0	21
cSH	1700	1498	851
Volume to Capacity	0.02	0.01	0.36
Queue Length 95th (ft)	0	1	41
Control Delay (s/veh)	0.0	1.2	11.6
Lane LOS		A	B
Approach Delay (s/veh)	0.0	1.2	11.6
Approach LOS			B

Intersection Summary			
Average Delay	8.6		
Intersection Capacity Utilization	33.4%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	6.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	322	1469	28	0	1648
Future Vol, veh/h	0	322	1469	28	0	1648
Conflicting Peds, #/hr	0	0	0	4	4	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	Free	-	None
Storage Length	-	0	-	335	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	2	3	3	4	2	2
Mvmt Flow	0	329	1499	29	0	1682

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	749	0	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.96	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.33	-	-	-	-
Pot Cap-1 Maneuver	0	352	-	0	0	-
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	352	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	67.54	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	352	-
HCM Lane V/C Ratio	-	0.934	-
HCM Control Delay (s/veh)	-	67.5	-
HCM Lane LOS	-	F	-
HCM 95th %tile Q(veh)	-	9.7	-

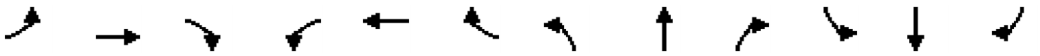


Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	332	1468	28	0	1649
Future Volume (Veh/h)	0	332	1468	28	0	1649
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	0	339	1498	29	0	1683
Pedestrians	4					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2344	753			1502	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2344	753			1502	
tC, single (s)	6.8	*6.0			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	20			100	
cM capacity (veh/h)	30	426			440	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	339	749	749	29	842	842
Volume Left	0	0	0	0	0	0
Volume Right	339	0	0	29	0	0
cSH	426	1700	1700	1700	1700	1700
Volume to Capacity	0.80	0.44	0.44	0.02	0.50	0.50
Queue Length 95th (ft)	177	0	0	0	0	0
Control Delay (s/veh)	39.1	0.0	0.0	0.0	0.0	0.0
Lane LOS	E					
Approach Delay (s/veh)	39.1	0.0			0.0	
Approach LOS	E					

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		

* User Entered Value



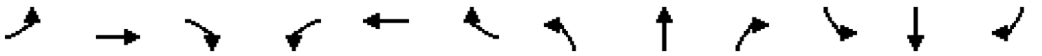
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	236	242	46	318	8	226	150	22	11	113	20
Future Volume (vph)	1	236	242	46	318	8	226	150	22	11	113	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	1.00		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1543	1671		1626	1821		1596	1749		1703	1620	
Flt Permitted	0.46	1.00		0.23	1.00		0.40	1.00		0.62	1.00	
Satd. Flow (perm)	741	1671		388	1821		673	1749		1117	1620	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	1	295	302	58	398	10	282	188	28	14	141	25
RTOR Reduction (vph)	0	16	0	0	0	0	0	0	0	0	5	0
Lane Group Flow (vph)	1	582	0	58	408	0	283	216	0	14	161	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	17%	2%	8%	11%	4%	2%	13%	6%	10%	6%	16%	4%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	57.8	56.9		66.2	61.3		41.3	35.1		21.6	19.4	
Effective Green, g (s)	57.8	57.4		66.2	61.8		41.3	35.6		21.6	19.9	
Actuated g/C Ratio	0.49	0.48		0.56	0.52		0.35	0.30		0.18	0.17	
Clearance Time (s)	4.0	5.5		4.0	5.5		4.0	5.5		4.0	5.5	
Vehicle Extension (s)	2.0	3.2		2.0	3.2		2.0	3.2		2.0	3.2	
Lane Grp Cap (vph)	367	809		272	949		373	525		214	272	
v/s Ratio Prot	0.00	c0.35		c0.01	c0.22		c0.11	0.12		0.00	0.10	
v/s Ratio Perm	0.00			0.11			c0.15			0.01		
v/c Ratio	0.00	0.72		0.21	0.43		0.76	0.41		0.07	0.59	
Uniform Delay, d1	15.8	24.2		15.9	17.5		31.0	33.1		39.9	45.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	3.1		0.1	0.3		7.7	0.6		0.0	3.5	
Delay (s)	15.8	27.3		16.1	17.8		38.7	33.7		40.0	49.1	
Level of Service	B	C		B	B		D	C		D	D	
Approach Delay (s/veh)		27.3			17.6			36.5			48.4	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	29.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	118.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Signalized Intersection Summary
20: SW Teton Avenue & SW Herman Road

07/16/2025



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	236	242	46	318	8	226	150	22	11	113	20
Future Volume (veh/h)	1	236	242	46	318	8	226	150	22	11	113	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1648	1870	1781	1737	1841	1870	1707	1811	1752	1811	1663	1841
Adj Flow Rate, veh/h	1	295	302	58	398	10	282	188	28	14	141	25
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	17	2	8	11	4	2	13	6	10	6	16	4
Cap, veh/h	378	383	392	268	882	22	388	441	66	255	185	33
Arrive On Green	0.00	0.45	0.45	0.04	0.49	0.49	0.17	0.29	0.28	0.02	0.13	0.13
Sat Flow, veh/h	1570	847	867	1654	1788	45	1626	1540	229	1725	1374	244
Grp Volume(v), veh/h	1	0	597	58	0	408	282	0	216	14	0	166
Grp Sat Flow(s),veh/h/ln	1570	0	1714	1654	0	1833	1626	0	1769	1725	0	1618
Q Serve(g_s), s	0.0	0.0	26.0	1.6	0.0	12.9	12.7	0.0	8.8	0.6	0.0	8.8
Cycle Q Clear(g_c), s	0.0	0.0	26.0	1.6	0.0	12.9	12.7	0.0	8.8	0.6	0.0	8.8
Prop In Lane	1.00		0.51	1.00		0.02	1.00		0.13	1.00		0.15
Lane Grp Cap(c), veh/h	378	0	774	268	0	904	388	0	506	255	0	218
V/C Ratio(X)	0.00	0.00	0.77	0.22	0.00	0.45	0.73	0.00	0.43	0.05	0.00	0.76
Avail Cap(c_a), veh/h	730	0	1053	570	0	1105	481	0	1147	615	0	1012
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.0	0.0	20.6	15.8	0.0	14.7	25.7	0.0	25.8	32.6	0.0	37.0
Incr Delay (d2), s/veh	0.0	0.0	2.6	0.1	0.0	0.4	2.9	0.0	0.6	0.0	0.0	5.9
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	9.7	0.5	0.0	5.0	4.9	0.0	3.7	0.3	0.0	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	14.0	0.0	23.2	16.0	0.0	15.0	28.6	0.0	26.4	32.7	0.0	42.9
LnGrp LOS	B		C	B		B	C		C	C		D
Approach Vol, veh/h		598			466			498			180	
Approach Delay, s/veh		23.1			15.2			27.6			42.1	
Approach LOS		C			B			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.8	45.1	18.9	16.9	4.1	48.7	5.5	30.4
Change Period (Y+Rc), s	4.0	5.5	4.0	5.5	4.0	5.5	4.0	5.5
Max Green Setting (Gmax), s	20.0	54.0	20.0	55.0	20.0	53.0	20.0	57.0
Max Q Clear Time (g_c+I1), s	3.6	28.0	14.7	10.8	2.0	14.9	2.6	10.8
Green Ext Time (p_c), s	0.1	11.5	0.2	0.6	0.0	9.5	0.0	3.1

Intersection Summary	
HCM 7th Control Delay, s/veh	24.3
HCM 7th LOS	C



Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	145	286	300	1568	27	1373	276
Future Volume (vph)	145	286	300	1568	27	1373	276
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.97	1.00	1.00	1.00	1.00	0.95
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1493	1770	3539	1770	3438	1509
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1493	1770	3539	1770	3438	1509
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	158	311	326	1704	29	1492	300
RTOR Reduction (vph)	0	256	0	0	0	0	85
Lane Group Flow (vph)	158	55	326	1704	29	1492	215
Confl. Peds. (#/hr)		21	9				9
Heavy Vehicles (%)	2%	5%	2%	2%	2%	5%	2%
Turn Type	Prot	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	4		5	2	1	6	
Permitted Phases		4					6
Actuated Green, G (s)	14.3	14.3	27.6	105.2	5.0	81.6	81.6
Effective Green, g (s)	15.3	15.3	29.1	107.2	5.5	83.6	83.6
Actuated g/C Ratio	0.11	0.11	0.21	0.77	0.04	0.60	0.60
Clearance Time (s)	5.0	5.0	5.5	6.0	4.5	6.0	6.0
Vehicle Extension (s)	2.5	2.5	2.3	4.5	2.3	4.5	4.5
Lane Grp Cap (vph)	193	163	367	2709	69	2052	901
v/s Ratio Prot	c0.09		c0.18	0.48	0.02	c0.43	
v/s Ratio Perm		0.04					0.14
v/c Ratio	0.82	0.34	0.89	0.63	0.42	0.73	0.24
Uniform Delay, d1	61.0	57.7	53.9	7.4	65.7	20.1	13.3
Progression Factor	1.00	1.00	1.00	1.00	0.97	1.32	1.43
Incremental Delay, d2	22.4	0.9	21.7	1.1	1.7	1.6	0.4
Delay (s)	83.4	58.6	75.6	8.5	65.7	28.2	19.4
Level of Service	F	E	E	A	E	C	B
Approach Delay (s/veh)	66.9			19.3		27.3	
Approach LOS	E			B		C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	27.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	89.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Signalized Intersection Summary
21: OR 99W (Pacific Highway) & SW Fischer Road

07/16/2025



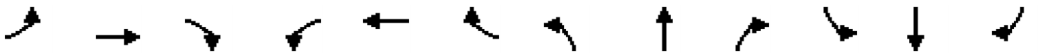
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (veh/h)	145	286	300	1568	27	1373	276
Future Volume (veh/h)	145	286	300	1568	27	1373	276
Initial Q (Qb), veh	0	0	0	0		0	0
Lane Width Adj.	1.00	1.00	1.00	1.00		1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00				0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00		1.00	1.00
Work Zone On Approach	No			No		No	
Adj Sat Flow, veh/h/ln	1870	1826	1870	1870		1826	1870
Adj Flow Rate, veh/h	158	153	326	1704		1492	300
Peak Hour Factor	0.92	0.92	0.92	0.92		0.92	0.92
Percent Heavy Veh, %	2	5	2	2		5	2
Cap, veh/h	204	177	365	2944		2064	936
Arrive On Green	0.11	0.11	0.21	0.83		1.00	1.00
Sat Flow, veh/h	1781	1547	1781	3647		3561	1573
Grp Volume(v), veh/h	158	153	326	1704		1492	300
Grp Sat Flow(s),veh/h/ln	1781	1547	1781	1777		1735	1573
Q Serve(g_s), s	12.1	13.6	24.9	22.1		0.0	0.0
Cycle Q Clear(g_c), s	12.1	13.6	24.9	22.1		0.0	0.0
Prop In Lane	1.00	1.00	1.00				1.00
Lane Grp Cap(c), veh/h	204	177	365	2944		2064	936
V/C Ratio(X)	0.78	0.87	0.89	0.58		0.72	0.32
Avail Cap(c_a), veh/h	204	177	394	2944		2064	936
HCM Platoon Ratio	1.00	1.00	1.00	1.00		2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00		0.60	0.60
Uniform Delay (d), s/veh	60.3	60.9	54.1	4.0		0.0	0.0
Incr Delay (d2), s/veh	16.4	32.8	20.1	0.8		1.4	0.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0		0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	12.8	12.9	5.4		0.4	0.1
Unsig. Movement Delay, s/veh							
LnGrp Delay(d), s/veh	76.7	93.7	74.2	4.8		1.4	0.5
LnGrp LOS	E	F	E	A		A	A
Approach Vol, veh/h	311			2030		1792	
Approach Delay, s/veh	85.1			15.9		1.2	
Approach LOS	F			B		A	

Timer - Assigned Phs		2		4	5	6	
Phs Duration (G+Y+Rc), s		120.0		20.0	32.7	87.3	
Change Period (Y+Rc), s		6.0		5.0	5.5	6.0	
Max Green Setting (Gmax), s		94.0		15.0	29.5	79.0	
Max Q Clear Time (g_c+I1), s		24.1		15.6	26.9	2.0	
Green Ext Time (p_c), s		64.4		0.0	0.3	62.4	

Intersection Summary	
HCM 7th Control Delay, s/veh	14.8
HCM 7th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.
User approved ignoring U-Turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	95	70	493	73	347	138	1259	225	440	1028	20
Future Volume (vph)	23	95	70	493	73	347	138	1259	225	440	1028	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0	6.0	5.4	5.4	6.0	5.3	5.0	5.0
Lane Util. Factor		0.95		0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	0.98
Flpb, ped/bikes		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.94		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99		0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3310		1681	1702	1533	1770	3505	1560	3433	3438	1547
Flt Permitted		0.99		0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3310		1681	1702	1533	1770	3505	1560	3433	3438	1547
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	24	101	74	524	78	369	147	1339	239	468	1094	21
RTOR Reduction (vph)	0	62	0	0	0	289	0	0	54	0	0	11
Lane Group Flow (vph)	0	137	0	299	303	80	147	1339	185	468	1094	10
Confl. Peds. (#/hr)	7					7	1		7	7		1
Heavy Vehicles (%)	2%	2%	3%	2%	3%	3%	2%	3%	2%	2%	5%	2%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	3	3		4	4		5	2	4	1	6	
Permitted Phases						4			2			6
Actuated Green, G (s)		12.4		27.5	27.5	27.5	13.2	55.8	83.3	21.6	64.5	64.5
Effective Green, g (s)		12.4		27.5	27.5	27.5	13.2	55.8	83.3	21.6	64.5	64.5
Actuated g/C Ratio		0.09		0.20	0.20	0.20	0.09	0.40	0.60	0.15	0.46	0.46
Clearance Time (s)		6.0		6.0	6.0	6.0	5.4	5.4	6.0	5.3	5.0	5.0
Vehicle Extension (s)		2.3		2.3	2.3	2.3	2.3	4.5	2.3	2.3	4.8	4.8
Lane Grp Cap (vph)		293		330	334	301	166	1396	928	529	1583	712
v/s Ratio Prot		c0.04		0.18	c0.18		0.08	c0.38	0.04	c0.14	0.32	
v/s Ratio Perm						0.05			0.08			0.01
v/c Ratio		0.47		0.91	0.91	0.26	0.89	0.96	0.20	0.88	0.69	0.01
Uniform Delay, d1		60.7		55.0	55.0	47.7	62.7	41.0	13.0	58.0	29.9	20.5
Progression Factor		1.00		1.00	1.00	1.00	0.93	1.18	1.41	1.00	1.00	1.00
Incremental Delay, d2		0.7		26.8	26.7	0.3	32.1	13.6	0.0	15.9	2.5	0.0
Delay (s)		61.4		81.8	81.7	48.0	90.6	61.9	18.4	73.9	32.4	20.5
Level of Service		E		F	F	D	F	E	B	E	C	C
Approach Delay (s/veh)		61.4			68.9			58.3			44.5	
Approach LOS		E			E			E			D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	55.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.7
Intersection Capacity Utilization	91.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Edition methodology does not support exclusive ped or hold phases.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1220	656	1003	848	152	308
Future Volume (vph)	1220	656	1003	848	152	308
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	5.6
Lane Util. Factor	0.95	1.00	0.97	0.95	0.97	0.88
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3374	1553	3400	3343	3127	2515
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3374	1553	3400	3343	3127	2515
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1298	698	1067	902	162	328
RTOR Reduction (vph)	0	280	0	0	0	0
Lane Group Flow (vph)	1298	418	1067	902	162	328
Confl. Peds. (#/hr)						4
Heavy Vehicles (%)	7%	4%	3%	8%	12%	13%
Turn Type	NA	Perm	Prot	NA	Prot	pt+ov
Protected Phases	2		1	6	8	1 4
Permitted Phases		2				
Actuated Green, G (s)	39.4	39.4	28.7	73.7	18.2	46.7
Effective Green, g (s)	41.4	41.4	30.3	75.7	20.2	41.7
Actuated g/C Ratio	0.40	0.40	0.29	0.73	0.19	0.40
Clearance Time (s)	6.0	6.0	5.6	6.0	6.0	
Vehicle Extension (s)	5.4	5.4	2.3	5.4	2.3	
Lane Grp Cap (vph)	1344	618	991	2435	607	1009
v/s Ratio Prot	c0.38		c0.31	0.27	c0.05	0.13
v/s Ratio Perm		0.27				
v/c Ratio	0.97	0.68	1.08	0.37	0.27	0.33
Uniform Delay, d1	30.6	25.7	36.8	5.2	35.6	21.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	17.2	4.1	51.6	0.4	0.1	0.1
Delay (s)	47.8	29.8	88.4	5.7	35.7	21.5
Level of Service	D	C	F	A	D	C
Approach Delay (s/veh)	41.5			50.5	26.2	
Approach LOS	D			D	C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	43.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	103.9	Sum of lost time (s)	18.6
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Edition methodology does not support exclusive ped or hold phases.



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	42	222	260	41	839	838
Future Volume (vph)	42	222	260	41	839	838
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	0.0	4.5	4.5	4.0	4.5
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1597	1524	3195	1458	1751	3505
Flt Permitted	0.95	1.00	1.00	1.00	0.40	1.00
Satd. Flow (perm)	1597	1524	3195	1458	740	3505
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	48	255	299	47	964	963
RTOR Reduction (vph)	0	48	0	40	0	0
Lane Group Flow (vph)	48	207	299	7	964	963
Confl. Peds. (#/hr)				2	2	
Heavy Vehicles (%)	13%	6%	13%	8%	3%	3%
Turn Type	Perm	pt+ov	NA	Perm	D.P+P	NA
Protected Phases		4 5	6		5	2
Permitted Phases	4			6	6	
Actuated Green, G (s)	13.4	92.6	16.9	16.9	91.1	96.1
Effective Green, g (s)	14.4	97.6	17.9	17.9	93.1	97.1
Actuated g/C Ratio	0.12	0.81	0.15	0.15	0.78	0.81
Clearance Time (s)	5.0		5.5	5.5	5.0	5.5
Vehicle Extension (s)	4.0		4.5	4.5	4.0	4.5
Lane Grp Cap (vph)	191	1239	476	217	1207	2836
v/s Ratio Prot		0.14	0.09		c0.50	0.27
v/s Ratio Perm	c0.03			0.00	c0.12	
v/c Ratio	0.25	0.17	0.63	0.03	0.80	0.34
Uniform Delay, d1	47.9	2.4	47.9	43.6	11.0	3.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	0.1	3.3	0.1	4.2	0.3
Delay (s)	48.9	2.5	51.2	43.8	15.2	3.3
Level of Service	D	A	D	D	B	A
Approach Delay (s/veh)	9.8		50.2			9.3
Approach LOS	A		D			A

Intersection Summary			
HCM 2000 Control Delay (s/veh)	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Edition methodology does not support exclusive ped or hold phases.

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	64	785	2	8	240	135	1	0	5	48	1	29
Future Vol, veh/h	64	785	2	8	240	135	1	0	5	48	1	29
Conflicting Peds, #/hr	0	0	7	7	0	0	2	0	0	0	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	25	-	-	25	-	-	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	7	3	2	38	6	6	100	2	20	7	2	11
Mvmt Flow	70	853	2	9	261	147	1	0	5	52	1	32

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	408	0	0	862	0	0	1281	1425	861	1344	1353	336
Stage 1	-	-	-	-	-	-	1000	1000	-	352	352	-
Stage 2	-	-	-	-	-	-	281	425	-	992	1002	-
Critical Hdwy	4.17	-	-	4.48	-	-	8.1	6.52	6.4	7.17	6.52	6.31
Critical Hdwy Stg 1	-	-	-	-	-	-	7.1	5.52	-	6.17	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.1	5.52	-	6.17	5.52	-
Follow-up Hdwy	2.263	-	-	2.542	-	-	4.4	4.018	3.48	3.563	4.018	3.399
Pot Cap-1 Maneuver	1125	-	-	646	-	-	91	135	330	126	150	686
Stage 1	-	-	-	-	-	-	197	321	-	655	632	-
Stage 2	-	-	-	-	-	-	556	586	-	290	320	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1125	-	-	642	-	-	79	124	327	114	138	684
Mov Cap-2 Maneuver	-	-	-	-	-	-	79	124	-	114	138	-
Stage 1	-	-	-	-	-	-	184	299	-	646	623	-
Stage 2	-	-	-	-	-	-	521	578	-	267	299	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.63	0.22	22.04	47.29
HCM LOS			C	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	79	327	1125	-	-	642	-	-	166
HCM Lane V/C Ratio	0.014	0.017	0.062	-	-	0.014	-	-	0.51
HCM Control Delay (s/veh)	51.3	16.2	8.4	-	-	10.7	-	-	47.3
HCM Lane LOS	F	C	A	-	-	B	-	-	E
HCM 95th %tile Q(veh)	0	0.1	0.2	-	-	0	-	-	2.5

3: JAE Access/SW 115th Avenue & SW Tualatin Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.1	0.0	0.0	0.1	0.0
Total Delay (hr)	0.1	0.5	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.1	1.1
Total Del/Veh (s)	6.1	2.9	3.0	5.6	1.8	1.1		9.5	18.8	6.8	7.4	3.4
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.3
Stop Del/Veh (s)	1.9	0.0	0.0	3.0	0.0	0.0		7.6	16.8	4.0	5.4	1.0

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	839	380	6	23	4
Future Vol, veh/h	1	839	380	6	23	4
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	25	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	3	7	2	5	2
Mvmt Flow	1	932	422	7	26	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	430	0	-	0	1361	427
Stage 1	-	-	-	-	427	-
Stage 2	-	-	-	-	934	-
Critical Hdwy	4.12	-	-	-	6.45	6.22
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.218	-	-	-	3.545	3.318
Pot Cap-1 Maneuver	1130	-	-	-	161	628
Stage 1	-	-	-	-	652	-
Stage 2	-	-	-	-	377	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1129	-	-	-	160	627
Mov Cap-2 Maneuver	-	-	-	-	284	-
Stage 1	-	-	-	-	651	-
Stage 2	-	-	-	-	377	-

Approach	EB	WB	SB
HCM Control Delay, s/v	0.01	0	17.91
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1129	-	-	-	309
HCM Lane V/C Ratio	0.001	-	-	-	0.097
HCM Control Delay (s/veh)	8.2	-	-	-	17.9
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	852	42	50	381	15	8
Future Vol, veh/h	852	42	50	381	15	8
Conflicting Peds, #/hr	0	2	2	0	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	2	2	7	15	17
Mvmt Flow	926	46	54	414	16	9

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	974	0	1475	951
Stage 1	-	-	-	-	951	-
Stage 2	-	-	-	-	524	-
Critical Hdwy	-	-	4.12	-	6.55	6.37
Critical Hdwy Stg 1	-	-	-	-	5.55	-
Critical Hdwy Stg 2	-	-	-	-	5.55	-
Follow-up Hdwy	-	-	2.218	-	3.635	3.453
Pot Cap-1 Maneuver	-	-	708	-	130	295
Stage 1	-	-	-	-	356	-
Stage 2	-	-	-	-	569	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	707	-	120	295
Mov Cap-2 Maneuver	-	-	-	-	245	-
Stage 1	-	-	-	-	355	-
Stage 2	-	-	-	-	524	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	1.22	20.29
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	260	-	-	707	-
HCM Lane V/C Ratio	0.096	-	-	0.077	-
HCM Control Delay (s/veh)	20.3	-	-	10.5	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	0.3	-	-	0.2	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	1	2	28	108	4
Future Vol, veh/h	1	1	2	28	108	4
Conflicting Peds, #/hr	0	0	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	100	50	17	2	25
Mvmt Flow	1	1	2	33	127	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	171	133	136	0	-	0
Stage 1	133	-	-	-	-	-
Stage 2	38	-	-	-	-	-
Critical Hdwy	6.42	7.2	4.6	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	4.2	2.65	-	-	-
Pot Cap-1 Maneuver	819	709	1200	-	-	-
Stage 1	893	-	-	-	-	-
Stage 2	985	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	811	706	1196	-	-	-
Mov Cap-2 Maneuver	811	-	-	-	-	-
Stage 1	888	-	-	-	-	-
Stage 2	981	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	9.78	0.53	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	120	-	755	-	-
HCM Lane V/C Ratio	0.002	-	0.003	-	-
HCM Control Delay (s/veh)	8	0	9.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	15	113	26	71	36
Future Vol, veh/h	2	15	113	26	71	36
Conflicting Peds, #/hr	0	0	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	2	2	2	17	5	2
Mvmt Flow	3	20	153	35	96	49

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	466	125	150	0	-	0
Stage 1	125	-	-	-	-	-
Stage 2	341	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	555	925	1432	-	-	-
Stage 1	900	-	-	-	-	-
Stage 2	720	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	490	921	1425	-	-	-
Mov Cap-2 Maneuver	490	-	-	-	-	-
Stage 1	798	-	-	-	-	-
Stage 2	717	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	9.44	6.37	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1397	-	834	-	-
HCM Lane V/C Ratio	0.107	-	0.028	-	-
HCM Control Delay (s/veh)	7.8	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.4	-	0.1	-	-

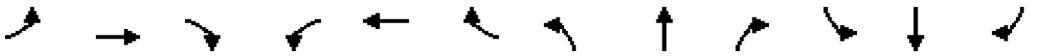
Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	12	86	136	68	13
Future Vol, veh/h	1	12	86	136	68	13
Conflicting Peds, #/hr	1	0	6	0	0	6
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	78	78	78	78
Heavy Vehicles, %	2	13	2	10	4	17
Mvmt Flow	1	15	110	174	87	17

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	497	102	110	0	-	0
Stage 1	102	-	-	-	-	-
Stage 2	396	-	-	-	-	-
Critical Hdwy	6.42	6.33	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.417	2.218	-	-	-
Pot Cap-1 Maneuver	532	924	1480	-	-	-
Stage 1	923	-	-	-	-	-
Stage 2	680	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	482	919	1472	-	-	-
Mov Cap-2 Maneuver	482	-	-	-	-	-
Stage 1	841	-	-	-	-	-
Stage 2	676	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	9.27	2.96	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	697	-	859	-	-
HCM Lane V/C Ratio	0.075	-	0.019	-	-
HCM Control Delay (s/veh)	7.6	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	0.1	-	-



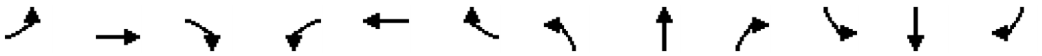
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	106	22	21	13	40	18	253	78	288	556	33
Future Volume (vph)	7	106	22	21	13	40	18	253	78	288	556	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.89		1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1801		1289	1572		1703	3038		1768	3421	
Flt Permitted	0.95	1.00		0.95	1.00		0.35	1.00		0.47	1.00	
Satd. Flow (perm)	1583	1801		1289	1572		624	3038		882	3421	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	8	120	25	24	15	45	20	288	89	327	632	38
RTOR Reduction (vph)	0	6	0	0	35	0	0	23	0	0	3	0
Lane Group Flow (vph)	8	139	0	24	25	0	20	354	0	327	667	0
Confl. Peds. (#/hr)			1	1			1		2	2		1
Heavy Vehicles (%)	14%	2%	5%	40%	17%	4%	6%	14%	14%	2%	4%	13%
Turn Type	Prot	NA		Prot	NA		D.P+P	NA		D.P+P	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases							6			2		
Actuated Green, G (s)	0.8	12.5		2.5	14.2		33.2	19.1		33.2	31.3	
Effective Green, g (s)	1.8	13.5		3.5	15.2		35.2	20.1		33.2	31.3	
Actuated g/C Ratio	0.03	0.20		0.05	0.22		0.52	0.29		0.49	0.46	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	41	356		66	350		367	895		612	1570	
v/s Ratio Prot	0.01	c0.08		c0.02	0.02		0.00	0.12		c0.11	0.20	
v/s Ratio Perm							0.03			c0.15		
v/c Ratio	0.20	0.39		0.36	0.07		0.05	0.40		0.53	0.43	
Uniform Delay, d1	32.5	23.8		31.3	20.9		8.2	19.2		11.1	12.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.3	0.7		3.4	0.1		0.1	0.3		0.9	0.2	
Delay (s)	34.8	24.5		34.7	21.0		8.3	19.5		12.0	12.6	
Level of Service	C	C		C	C		A	B		B	B	
Approach Delay (s/veh)		25.0			24.9			18.9			12.4	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	68.2	Sum of lost time (s)	17.0
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Signalized Intersection Summary
9: SW 124th Avenue & SW Leveton Drive

07/15/2025



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	106	22	21	13	40	18	253	78	288	556	33
Future Volume (veh/h)	7	106	22	21	13	40	18	253	78	288	556	33
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1693	1870	1826	1307	1648	1841	1811	1693	1693	1870	1841	1707
Adj Flow Rate, veh/h	8	120	25	24	15	45	20	288	89	327	632	38
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	14	2	5	40	17	4	6	14	14	2	4	13
Cap, veh/h	57	243	51	75	68	203	419	556	168	606	1287	77
Arrive On Green	0.04	0.16	0.14	0.06	0.19	0.17	0.04	0.23	0.21	0.20	0.38	0.38
Sat Flow, veh/h	1612	1501	313	1245	362	1087	1725	2428	735	1781	3351	201
Grp Volume(v), veh/h	8	0	145	24	0	60	20	189	188	327	329	341
Grp Sat Flow(s),veh/h/ln	1612	0	1813	1245	0	1450	1725	1608	1556	1781	1749	1804
Q Serve(g_s), s	0.2	0.0	3.6	0.9	0.0	1.7	0.3	5.0	5.2	6.5	7.0	7.0
Cycle Q Clear(g_c), s	0.2	0.0	3.6	0.9	0.0	1.7	0.3	5.0	5.2	6.5	7.0	7.0
Prop In Lane	1.00		0.17	1.00		0.75	1.00		0.47	1.00		0.11
Lane Grp Cap(c), veh/h	57	0	294	75	0	271	419	368	356	606	672	693
V/C Ratio(X)	0.14	0.00	0.49	0.32	0.00	0.22	0.05	0.51	0.53	0.54	0.49	0.49
Avail Cap(c_a), veh/h	529	0	1153	281	0	922	1085	1023	990	1163	1435	1480
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.8	0.0	18.7	21.9	0.0	17.1	8.0	16.4	16.7	10.9	11.4	11.4
Incr Delay (d2), s/veh	1.1	0.0	1.3	2.4	0.0	0.4	0.0	1.1	1.2	0.7	0.6	0.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	1.4	0.3	0.0	0.5	0.1	1.6	1.6	1.9	2.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	23.9	0.0	20.0	24.3	0.0	17.5	8.0	17.5	17.9	11.6	11.9	11.9
LnGrp LOS	C		B	C		B	A	B	B	B	B	B
Approach Vol, veh/h		153			84			397			997	
Approach Delay, s/veh		20.2			19.5			17.2			11.8	
Approach LOS		C			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.8	15.2	6.9	11.9	6.2	23.7	5.7	13.1
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	25.0	30.0	10.0	30.0	20.0	40.0	15.0	30.0
Max Q Clear Time (g_c+I1), s	8.5	7.2	2.9	5.6	2.3	9.0	2.2	3.7
Green Ext Time (p_c), s	1.4	1.7	0.0	1.4	0.0	3.4	0.0	0.5

Intersection Summary	
HCM 7th Control Delay, s/veh	14.3
HCM 7th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Intersection Delay, s/veh	11.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	409	23	11	62	0	16	1	22	0	1	1
Future Vol, veh/h	18	409	23	11	62	0	16	1	22	0	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	2	2	23	13	14	2	13	2	2	2	2	2
Mvmt Flow	20	460	26	12	70	0	18	1	25	0	1	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	12.4	8.4	8.5	8
HCM LOS	B	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	41%	4%	15%	0%
Vol Thru, %	3%	91%	85%	50%
Vol Right, %	56%	5%	0%	50%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	39	450	73	2
LT Vol	16	18	11	0
Through Vol	1	409	62	1
RT Vol	22	23	0	1
Lane Flow Rate	44	506	82	2
Geometry Grp	1	1	1	1
Degree of Util (X)	0.063	0.569	0.109	0.003
Departure Headway (Hd)	5.147	4.054	4.763	4.98
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	699	880	755	721
Service Time	3.154	2.134	2.772	2.992
HCM Lane V/C Ratio	0.063	0.575	0.109	0.003
HCM Control Delay, s/veh	8.5	12.4	8.4	8
HCM Lane LOS	A	B	A	A
HCM 95th-tile Q	0.2	3.7	0.4	0

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	149	254	54	74	7	18
Future Vol, veh/h	149	254	54	74	7	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	3	3	9	2	2	17
Mvmt Flow	180	306	65	89	8	22

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	154	0	-	0	775	110
Stage 1	-	-	-	-	110	-
Stage 2	-	-	-	-	665	-
Critical Hdwy	4.13	-	-	-	6.42	6.37
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.227	-	-	-	3.518	3.453
Pot Cap-1 Maneuver	1420	-	-	-	367	905
Stage 1	-	-	-	-	915	-
Stage 2	-	-	-	-	511	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1420	-	-	-	311	905
Mov Cap-2 Maneuver	-	-	-	-	311	-
Stage 1	-	-	-	-	776	-
Stage 2	-	-	-	-	511	-

Approach	EB	WB	SB
HCM Control Delay, s/v	2.92	0	11.27
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	666	-	-	-	311	905
HCM Lane V/C Ratio	0.126	-	-	-	0.027	0.024
HCM Control Delay (s/veh)	7.9	0	-	-	16.9	9.1
HCM Lane LOS	A	A	-	-	C	A
HCM 95th %tile Q(veh)	0.4	-	-	-	0.1	0.1

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	262	131	0	0	0
Future Vol, veh/h	0	262	131	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	2	5	5	2	2	2
Mvmt Flow	0	320	160	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	160	0	-	0	479	160
Stage 1	-	-	-	-	160	-
Stage 2	-	-	-	-	320	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1420	-	-	-	545	885
Stage 1	-	-	-	-	869	-
Stage 2	-	-	-	-	736	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1420	-	-	-	545	885
Mov Cap-2 Maneuver	-	-	-	-	545	-
Stage 1	-	-	-	-	869	-
Stage 2	-	-	-	-	736	-

Approach	EB	WB	SB
HCM Control Delay, s/v	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1420	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s/veh)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	27	233	120	29	12	9
Future Vol, veh/h	27	233	120	29	12	9
Conflicting Peds, #/hr	12	0	0	12	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	2	5	5	4	2	2
Mvmt Flow	33	281	145	35	14	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	192	0	-	0	520	175
Stage 1	-	-	-	-	174	-
Stage 2	-	-	-	-	346	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1382	-	-	-	516	868
Stage 1	-	-	-	-	856	-
Stage 2	-	-	-	-	717	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1366	-	-	-	491	857
Mov Cap-2 Maneuver	-	-	-	-	491	-
Stage 1	-	-	-	-	823	-
Stage 2	-	-	-	-	708	-

Approach	EB	WB	SB
HCM Control Delay, s/v	0.8	0	11.14
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	187	-	-	-	491	857
HCM Lane V/C Ratio	0.024	-	-	-	0.029	0.013
HCM Control Delay (s/veh)	7.7	0	-	-	12.6	9.3
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1	0

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	209	27	16	154	0	9	0	5	0	0	0
Future Vol, veh/h	0	209	27	16	154	0	9	0	5	0	0	0
Conflicting Peds, #/hr	8	0	3	3	0	8	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77
Heavy Vehicles, %	2	5	2	2	4	2	2	2	2	2	2	2
Mvmt Flow	0	271	35	21	200	0	12	0	6	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	208	0	0	309	0	0	535	542	292	521	559	209
Stage 1	-	-	-	-	-	-	292	292	-	250	250	-
Stage 2	-	-	-	-	-	-	243	250	-	271	309	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1363	-	-	1251	-	-	456	448	747	466	438	831
Stage 1	-	-	-	-	-	-	716	671	-	754	700	-
Stage 2	-	-	-	-	-	-	761	700	-	734	659	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1353	-	-	1247	-	-	446	435	745	450	425	824
Mov Cap-2 Maneuver	-	-	-	-	-	-	446	435	-	450	425	-
Stage 1	-	-	-	-	-	-	714	669	-	735	682	-
Stage 2	-	-	-	-	-	-	746	682	-	728	657	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0	0.75	12.16	0
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	521	1353	-	-	169	-	-	-
HCM Lane V/C Ratio	0.035	-	-	-	0.017	-	-	-
HCM Control Delay (s/veh)	12.2	0	-	-	7.9	0	-	0
HCM Lane LOS	B	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0.1	-	-	-

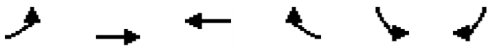
Intersection	
Int Delay, s/veh	8.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	144	71	143	120	31	49
Future Vol, veh/h	144	71	143	120	31	49
Conflicting Peds, #/hr	0	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	3	2	4	2	9	3
Mvmt Flow	167	83	166	140	36	57

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	539	67	95	0	-	0
Stage 1	67	-	-	-	-	-
Stage 2	472	-	-	-	-	-
Critical Hdwy	6.43	6.22	4.14	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.318	2.236	-	-	-
Pot Cap-1 Maneuver	502	997	1486	-	-	-
Stage 1	954	-	-	-	-	-
Stage 2	625	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	439	995	1484	-	-	-
Mov Cap-2 Maneuver	439	-	-	-	-	-
Stage 1	836	-	-	-	-	-
Stage 2	624	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	17.34	4.2	0
HCM LOS	C		

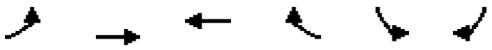
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	979	-	539	-	-
HCM Lane V/C Ratio	0.112	-	0.464	-	-
HCM Control Delay (s/veh)	7.7	0	17.3	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.4	-	2.4	-	-



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	19	390	281	264	60	6
Future Volume (vph)	19	390	281	264	60	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.93		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1702	1624	1617		1626	1583
Flt Permitted	0.35	1.00	1.00		0.95	1.00
Satd. Flow (perm)	622	1624	1617		1626	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	424	305	287	65	7
RTOR Reduction (vph)	0	0	25	0	0	6
Lane Group Flow (vph)	21	424	567	0	65	1
Confl. Peds. (#/hr)	2			2		
Heavy Vehicles (%)	6%	17%	12%	5%	11%	2%
Turn Type	D.P+P	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	6					4
Actuated Green, G (s)	29.5	34.9	28.8		4.7	4.7
Effective Green, g (s)	32.3	36.3	30.2		7.2	7.2
Actuated g/C Ratio	0.63	0.70	0.59		0.14	0.14
Clearance Time (s)	5.4	5.4	5.4		6.5	6.5
Vehicle Extension (s)	2.0	3.1	3.1		2.6	2.6
Lane Grp Cap (vph)	434	1144	948		227	221
v/s Ratio Prot	0.00	c0.26	c0.35		c0.04	
v/s Ratio Perm	0.03					0.00
v/c Ratio	0.05	0.37	0.60		0.29	0.00
Uniform Delay, d1	6.6	3.0	6.8		19.8	19.1
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	0.2	1.0		0.5	0.0
Delay (s)	6.6	3.2	7.8		20.4	19.1
Level of Service	A	A	A		C	B
Approach Delay (s/veh)		3.4	7.8		20.3	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	6.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	51.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	41.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	19	390	281	264	60	6
Future Volume (veh/h)	19	390	281	264	60	6
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1811	1648	1722	1826	1737	1870
Adj Flow Rate, veh/h	21	424	305	287	65	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	17	12	5	11	2
Cap, veh/h	529	1224	503	474	179	171
Arrive On Green	0.05	0.74	0.62	0.59	0.11	0.11
Sat Flow, veh/h	1725	1648	815	767	1654	1585
Grp Volume(v), veh/h	21	424	0	592	65	7
Grp Sat Flow(s),veh/h/ln	1725	1648	0	1583	1654	1585
Q Serve(g_s), s	0.0	4.8	0.0	12.5	2.0	0.2
Cycle Q Clear(g_c), s	0.0	4.8	0.0	12.5	2.0	0.2
Prop In Lane	1.00			0.48	1.00	1.00
Lane Grp Cap(c), veh/h	529	1224	0	977	179	171
V/C Ratio(X)	0.04	0.35	0.00	0.61	0.36	0.04
Avail Cap(c_a), veh/h	807	1426	0	1929	1002	960
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.8	2.4	0.0	6.5	22.2	21.4
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.6	1.0	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.5	0.0	2.8	0.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	8.8	2.6	0.0	7.2	23.2	21.5
LnGrp LOS	A	A		A	C	C
Approach Vol, veh/h		445	592		72	
Approach Delay, s/veh		2.9	7.2		23.0	
Approach LOS		A	A		C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		43.9		9.8	6.7	37.1
Change Period (Y+Rc), s		5.4		6.5	5.4	5.4
Max Green Setting (Gmax), s		45.0		30.0	10.0	64.0
Max Q Clear Time (g_c+I1), s		6.8		4.0	2.0	14.5
Green Ext Time (p_c), s		9.8		0.1	0.0	17.2

Intersection Summary	
HCM 7th Control Delay, s/veh	6.5
HCM 7th LOS	A

Intersection	
Int Delay, s/veh	4.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	674	195	68	347	78	61
Future Vol, veh/h	674	195	68	347	78	61
Conflicting Peds, #/hr	0	1	1	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	100	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	3	3	4	3	14	12
Mvmt Flow	702	203	71	361	81	64

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	906	0	1308	805
Stage 1	-	-	-	-	805	-
Stage 2	-	-	-	-	503	-
Critical Hdwy	-	-	4.14	-	6.54	6.32
Critical Hdwy Stg 1	-	-	-	-	5.54	-
Critical Hdwy Stg 2	-	-	-	-	5.54	-
Follow-up Hdwy	-	-	2.236	-	3.626	3.408
Pot Cap-1 Maneuver	-	-	743	-	166	368
Stage 1	-	-	-	-	420	-
Stage 2	-	-	-	-	583	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	742	-	150	367
Mov Cap-2 Maneuver	-	-	-	-	150	-
Stage 1	-	-	-	-	420	-
Stage 2	-	-	-	-	528	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	1.7	37.84
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	150	367	-	-	742	-
HCM Lane V/C Ratio	0.542	0.173	-	-	0.095	-
HCM Control Delay (s/veh)	54.3	16.8	-	-	10.4	-
HCM Lane LOS	F	C	-	-	B	-
HCM 95th %tile Q(veh)	2.7	0.6	-	-	0.3	-



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	674	195	68	347	78	61
Future Volume (Veh/h)	674	195	68	347	78	61
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	702	203	71	361	81	64
Pedestrians					1	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			TWLTL		
Median storage veh)				2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			906		1308	805
vC1, stage 1 conf vol					805	
vC2, stage 2 conf vol					503	
vCu, unblocked vol			906		1308	805
tC, single (s)			4.1		6.5	6.3
tC, 2 stage (s)					5.5	
tF (s)			2.2		3.6	3.4
p0 queue free %			90		77	83
cM capacity (veh/h)			742		349	367

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	905	71	361	81	64
Volume Left	0	71	0	81	0
Volume Right	203	0	0	0	64
cSH	1700	742	1700	349	367
Volume to Capacity	0.53	0.10	0.21	0.23	0.17
Queue Length 95th (ft)	0	8	0	22	16
Control Delay (s/veh)	0.0	10.4	0.0	18.4	16.9
Lane LOS		B		C	C
Approach Delay (s/veh)	0.0	1.7		17.7	
Approach LOS				C	

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		

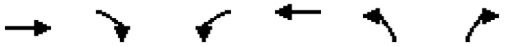
Intersection	
Int Delay, s/veh	8.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	38	13	38	86	106	89
Future Vol, veh/h	38	13	38	86	106	89
Conflicting Peds, #/hr	0	44	44	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	62	62	62	62	62	62
Heavy Vehicles, %	3	2	17	5	5	7
Mvmt Flow	61	21	61	139	171	144

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	126	0	377	116
Stage 1	-	-	-	-	116	-
Stage 2	-	-	-	-	261	-
Critical Hdwy	-	-	4.27	-	6.45	6.27
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.353	-	3.545	3.363
Pot Cap-1 Maneuver	-	-	1372	-	619	923
Stage 1	-	-	-	-	902	-
Stage 2	-	-	-	-	775	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1315	-	563	884
Mov Cap-2 Maneuver	-	-	-	-	563	-
Stage 1	-	-	-	-	864	-
Stage 2	-	-	-	-	736	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	2.41	14.91
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	675	-	-	552	-
HCM Lane V/C Ratio	0.466	-	-	0.047	-
HCM Control Delay (s/veh)	14.9	-	-	7.9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	2.5	-	-	0.1	-



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	38	13	38	86	106	89
Future Volume (Veh/h)	38	13	38	86	106	89
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.62	0.62	0.62	0.62	0.62	0.62
Hourly flow rate (vph)	61	21	61	139	171	144
Pedestrians					44	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					4	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			126		377	116
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			126		377	116
tC, single (s)			4.3		6.4	6.3
tC, 2 stage (s)						
tF (s)			2.4		3.5	3.4
p0 queue free %			95		70	84
cM capacity (veh/h)			1315		566	885

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	82	200	315
Volume Left	0	61	171
Volume Right	21	0	144
cSH	1700	1315	677
Volume to Capacity	0.05	0.05	0.47
Queue Length 95th (ft)	0	4	62
Control Delay (s/veh)	0.0	2.7	14.9
Lane LOS		A	B
Approach Delay (s/veh)	0.0	2.7	14.9
Approach LOS			B

Intersection Summary			
Average Delay	8.7		
Intersection Capacity Utilization	31.3%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	208	1473	42	0	1828
Future Vol, veh/h	0	208	1473	42	0	1828
Conflicting Peds, #/hr	0	1	0	1	1	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	Free	-	None
Storage Length	-	0	-	335	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	6	8	3	2	6
Mvmt Flow	0	217	1534	44	0	1904

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	768	0	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.02	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.36	-	-	-	-
Pot Cap-1 Maneuver	0	336	-	0	0	-
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	335	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	33.39	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	335	-
HCM Lane V/C Ratio	-	0.646	-
HCM Control Delay (s/veh)	-	33.4	-
HCM Lane LOS	-	D	-
HCM 95th %tile Q(veh)	-	4.3	-

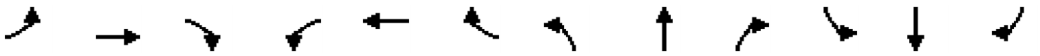


Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	208	1473	42	0	1828
Future Volume (Veh/h)	0	208	1473	42	0	1828
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	217	1534	44	0	1904
Pedestrians	1					1
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	3.5					3.5
Percent Blockage	0					0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2487	769			1535	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2487	769			1535	
tC, single (s)	6.8	*6.0			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	100	48			100	
cM capacity (veh/h)	24	416			429	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	217	767	767	44	952	952
Volume Left	0	0	0	0	0	0
Volume Right	217	0	0	44	0	0
cSH	416	1700	1700	1700	1700	1700
Volume to Capacity	0.52	0.45	0.45	0.03	0.56	0.56
Queue Length 95th (ft)	73	0	0	0	0	0
Control Delay (s/veh)	22.7	0.0	0.0	0.0	0.0	0.0
Lane LOS	C					
Approach Delay (s/veh)	22.7	0.0			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		

* User Entered Value



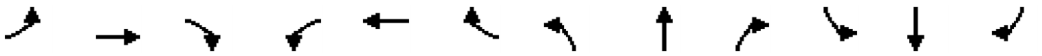
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	216	215	24	269	9	291	151	38	16	216	6
Future Volume (vph)	11	216	215	24	269	9	291	151	38	16	216	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.99		1.00	0.97		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1501	1484		1543	1768		1612	1577		1687	1800	
Flt Permitted	0.51	1.00		0.28	1.00		0.37	1.00		0.63	1.00	
Satd. Flow (perm)	805	1484		451	1768		633	1577		1120	1800	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	12	232	231	26	289	10	313	162	41	17	232	6
RTOR Reduction (vph)	0	19	0	0	1	0	0	0	0	0	1	0
Lane Group Flow (vph)	12	444	0	26	298	0	313	203	0	17	237	0
Confl. Peds. (#/hr)	2					2						
Heavy Vehicles (%)	20%	14%	23%	17%	7%	2%	12%	14%	28%	7%	4%	50%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	40.1	39.2		44.3	41.3		43.5	37.6		25.4	23.5	
Effective Green, g (s)	40.1	39.7		44.3	41.8		43.5	38.1		25.4	24.0	
Actuated g/C Ratio	0.40	0.39		0.44	0.42		0.43	0.38		0.25	0.24	
Clearance Time (s)	4.0	5.5		4.0	5.5		4.0	5.5		4.0	5.5	
Vehicle Extension (s)	2.0	3.2		2.0	3.2		2.0	3.2		2.0	3.2	
Lane Grp Cap (vph)	326	585		230	733		428	596		293	428	
v/s Ratio Prot	0.00	c0.30		c0.00	0.17		c0.12	0.13		0.00	0.13	
v/s Ratio Perm	0.01			0.05			c0.20			0.01		
v/c Ratio	0.04	0.76		0.11	0.41		0.73	0.34		0.06	0.55	
Uniform Delay, d1	18.5	26.4		17.8	20.7		21.0	22.3		28.4	33.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	5.7		0.1	0.4		5.5	0.4		0.0	1.6	
Delay (s)	18.5	32.1		17.8	21.1		26.4	22.7		28.5	35.3	
Level of Service	B	C		B	C		C	C		C	D	
Approach Delay (s/veh)		31.7			20.9			25.0			34.8	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	27.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	100.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	64.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Signalized Intersection Summary
20: SW Teton Avenue & SW Herman Road

07/15/2025



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	216	215	24	269	9	291	151	38	16	216	6
Future Volume (veh/h)	11	216	215	24	269	9	291	151	38	16	216	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1604	1693	1559	1648	1796	1870	1722	1693	1485	1796	1841	1159
Adj Flow Rate, veh/h	12	232	231	26	289	10	313	162	41	17	232	6
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	20	14	23	17	7	2	12	14	28	7	4	50
Cap, veh/h	383	313	312	250	718	25	420	424	107	305	297	8
Arrive On Green	0.01	0.40	0.40	0.03	0.42	0.41	0.18	0.33	0.32	0.02	0.17	0.16
Sat Flow, veh/h	1527	777	774	1570	1726	60	1640	1303	330	1711	1786	46
Grp Volume(v), veh/h	12	0	463	26	0	299	313	0	203	17	0	238
Grp Sat Flow(s),veh/h/ln	1527	0	1551	1570	0	1785	1640	0	1633	1711	0	1832
Q Serve(g_s), s	0.4	0.0	20.4	0.8	0.0	9.4	12.0	0.0	7.7	0.7	0.0	10.0
Cycle Q Clear(g_c), s	0.4	0.0	20.4	0.8	0.0	9.4	12.0	0.0	7.7	0.7	0.0	10.0
Prop In Lane	1.00		0.50	1.00		0.03	1.00		0.20	1.00		0.03
Lane Grp Cap(c), veh/h	383	0	625	250	0	743	420	0	531	305	0	305
V/C Ratio(X)	0.03	0.00	0.74	0.10	0.00	0.40	0.74	0.00	0.38	0.06	0.00	0.78
Avail Cap(c_a), veh/h	741	0	1054	598	0	1191	536	0	1171	698	0	1268
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.4	0.0	20.5	16.2	0.0	16.4	21.3	0.0	20.9	27.3	0.0	32.0
Incr Delay (d2), s/veh	0.0	0.0	1.9	0.1	0.0	0.4	2.9	0.0	0.5	0.0	0.0	4.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	6.8	0.3	0.0	3.6	4.6	0.0	2.8	0.3	0.0	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	14.4	0.0	22.4	16.3	0.0	16.8	24.1	0.0	21.4	27.3	0.0	36.8
LnGrp LOS	B		C	B		B	C		C	C		D
Approach Vol, veh/h		475			325			516			255	
Approach Delay, s/veh		22.2			16.8			23.0			36.1	
Approach LOS		C			B			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.2	37.3	18.3	18.3	5.2	38.4	5.6	31.1
Change Period (Y+Rc), s	4.0	5.5	4.0	5.5	4.0	5.5	4.0	5.5
Max Green Setting (Gmax), s	20.0	54.0	20.0	55.0	20.0	53.0	20.0	57.0
Max Q Clear Time (g_c+I1), s	2.8	22.4	14.0	12.0	2.4	11.4	2.7	9.7
Green Ext Time (p_c), s	0.0	9.4	0.3	0.8	0.0	6.7	0.0	2.9

Intersection Summary	
HCM 7th Control Delay, s/veh	23.6
HCM 7th LOS	C



Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	231	358	135	1572	19	1468	103
Future Volume (vph)	231	358	135	1572	19	1468	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1736	1528	1656	3312	1770	3406	1452
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1736	1528	1656	3312	1770	3406	1452
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	241	373	141	1638	20	1529	107
RTOR Reduction (vph)	0	162	0	0	0	0	30
Lane Group Flow (vph)	241	211	141	1638	20	1529	77
Confl. Peds. (#/hr)		5	3				3
Heavy Vehicles (%)	4%	4%	9%	9%	2%	6%	8%
Turn Type	Prot	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	4		5	2	1	6	
Permitted Phases		4					6
Actuated Green, G (s)	22.5	22.5	16.3	97.6	4.4	84.7	84.7
Effective Green, g (s)	23.5	23.5	17.8	99.6	4.9	86.7	86.7
Actuated g/C Ratio	0.17	0.17	0.13	0.71	0.04	0.62	0.62
Clearance Time (s)	5.0	5.0	5.5	6.0	4.5	6.0	6.0
Vehicle Extension (s)	2.5	2.5	2.3	4.5	2.3	4.5	4.5
Lane Grp Cap (vph)	291	256	210	2356	61	2109	899
v/s Ratio Prot	c0.14		0.09	c0.49	0.01	c0.45	
v/s Ratio Perm		0.14					0.05
v/c Ratio	0.83	0.82	0.67	0.70	0.33	0.72	0.09
Uniform Delay, d1	56.3	56.2	58.3	11.5	65.9	18.4	10.7
Progression Factor	1.00	1.00	1.00	1.00	1.16	1.19	0.85
Incremental Delay, d2	17.0	18.5	7.1	1.7	1.4	1.8	0.1
Delay (s)	73.3	74.7	65.4	13.3	78.2	23.7	9.2
Level of Service	E	E	E	B	E	C	A
Approach Delay (s/veh)	74.2			17.4		23.4	
Approach LOS	E			B		C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	28.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Signalized Intersection Summary
21: OR 99W (Pacific Highway) & SW Fischer Road

07/15/2025



Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (veh/h)	231	358	135	1572	19	1468	103
Future Volume (veh/h)	231	358	135	1572	19	1468	103
Initial Q (Qb), veh	0	0	0	0		0	0
Lane Width Adj.	1.00	1.00	1.00	1.00		1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00				1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00		1.00	1.00
Work Zone On Approach	No			No		No	
Adj Sat Flow, veh/h/ln	1841	1841	1767	1767		1811	1781
Adj Flow Rate, veh/h	241	187	141	1638		1529	107
Peak Hour Factor	0.96	0.96	0.96	0.96		0.96	0.96
Percent Heavy Veh, %	4	4	9	9		6	8
Cap, veh/h	282	251	228	2624		2114	925
Arrive On Green	0.16	0.16	0.14	0.78		1.00	1.00
Sat Flow, veh/h	1753	1560	1682	3445		3532	1506
Grp Volume(v), veh/h	241	187	141	1638		1529	107
Grp Sat Flow(s),veh/h/ln	1753	1560	1682	1678		1721	1506
Q Serve(g_s), s	18.7	16.0	11.1	29.1		0.0	0.0
Cycle Q Clear(g_c), s	18.7	16.0	11.1	29.1		0.0	0.0
Prop In Lane	1.00	1.00	1.00				1.00
Lane Grp Cap(c), veh/h	282	251	228	2624		2114	925
V/C Ratio(X)	0.85	0.74	0.62	0.62		0.72	0.12
Avail Cap(c_a), veh/h	326	290	228	2624		2114	925
HCM Platoon Ratio	1.00	1.00	1.00	1.00		2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00		0.69	0.69
Uniform Delay (d), s/veh	57.1	56.0	57.1	6.5		0.0	0.0
Incr Delay (d2), s/veh	16.7	7.9	4.2	1.1		1.5	0.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0		0.0	0.0
%ile BackOfQ(50%),veh/ln	9.7	13.9	4.9	8.3		0.4	0.0
Unsig. Movement Delay, s/veh							
LnGrp Delay(d), s/veh	73.9	63.9	61.3	7.6		1.5	0.2
LnGrp LOS	E	E	E	A		A	A
Approach Vol, veh/h	428			1779		1636	
Approach Delay, s/veh	69.5			11.9		1.4	
Approach LOS	E			B		A	

Timer - Assigned Phs		2		4	5	6	
Phs Duration (G+Y+Rc), s		113.5		26.5	23.5	90.0	
Change Period (Y+Rc), s		6.0		5.0	6.0	* 6	
Max Green Setting (Gmax), s		84.0		25.0	14.5	* 84	
Max Q Clear Time (g_c+I1), s		31.1		20.7	13.1	2.0	
Green Ext Time (p_c), s		48.9		0.8	0.1	68.9	

Intersection Summary	
HCM 7th Control Delay, s/veh	13.9
HCM 7th LOS	B

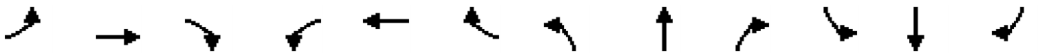
Notes

User approved pedestrian interval to be less than phase max green.
User approved ignoring U-Turning movement.

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis
22: OR 99W (Pacific Highway) & SW 116th Avenue/SW Durham Road

07/15/2025



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	51	28	299	24	164	75	1226	516	399	1199	15
Future Volume (vph)	6	51	28	299	24	164	75	1226	516	399	1199	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0	6.0	5.4	5.4	6.0	5.3	5.0	5.0
Lane Util. Factor		0.95		0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00		0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3351		1633	1651	1517	1770	3312	1513	3367	3374	1542
Flt Permitted		1.00		0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3351		1633	1651	1517	1770	3312	1513	3367	3374	1542
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	6	52	29	305	24	167	77	1251	527	407	1223	15
RTOR Reduction (vph)	0	27	0	0	0	146	0	0	89	0	0	7
Lane Group Flow (vph)	0	60	0	165	164	21	77	1251	438	407	1223	8
Confl. Peds. (#/hr)	9					9	2		6	6		2
Heavy Vehicles (%)	2%	2%	2%	5%	4%	3%	2%	9%	5%	4%	7%	2%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	3	3		4	4		5	2	4	1	6	
Permitted Phases						4			2			6
Actuated Green, G (s)		12.0		17.8	17.8	17.8	9.4	64.8	82.6	22.7	78.4	78.4
Effective Green, g (s)		12.0		17.8	17.8	17.8	9.4	64.8	82.6	22.7	78.4	78.4
Actuated g/C Ratio		0.09		0.13	0.13	0.13	0.07	0.46	0.59	0.16	0.56	0.56
Clearance Time (s)		6.0		6.0	6.0	6.0	5.4	5.4	6.0	5.3	5.0	5.0
Vehicle Extension (s)		2.3		2.3	2.3	2.3	2.3	4.5	2.3	2.3	4.8	4.8
Lane Grp Cap (vph)		287		207	209	192	118	1532	957	545	1889	863
v/s Ratio Prot		c0.02		c0.10	0.10		0.04	c0.38	0.06	c0.12	0.36	
v/s Ratio Perm						0.01			0.23			0.01
v/c Ratio		0.21		0.80	0.78	0.11	0.65	0.82	0.46	0.75	0.65	0.01
Uniform Delay, d1		59.6		59.3	59.2	54.1	63.7	32.5	16.1	55.9	21.3	13.6
Progression Factor		1.00		1.00	1.00	1.00	0.92	0.90	0.50	1.00	1.00	1.00
Incremental Delay, d2		0.2		18.1	16.5	0.1	7.6	3.6	0.1	5.1	1.7	0.0
Delay (s)		59.8		77.4	75.8	54.2	66.4	32.7	8.3	61.0	23.0	13.6
Level of Service		E		E	E	D	E	C	A	E	C	B
Approach Delay (s/veh)		59.8			69.1			27.2			32.3	
Approach LOS		E			E			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	35.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.7
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Edition methodology does not support exclusive ped or hold phases.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	885	201	625	1163	762	767
Future Volume (vph)	885	201	625	1163	762	767
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	5.6
Lane Util. Factor	0.95	1.00	0.97	0.95	0.97	0.88
Frpb, ped/bikes	1.00	0.99	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1518	3367	3471	3400	2787
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1518	3367	3471	3400	2787
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	903	205	638	1187	778	783
RTOR Reduction (vph)	0	123	0	0	0	0
Lane Group Flow (vph)	903	82	638	1187	778	783
Confl. Peds. (#/hr)		1	1			6
Heavy Vehicles (%)	2%	5%	4%	4%	3%	2%
Turn Type	NA	Perm	Prot	NA	Prot	pt+ov
Protected Phases	2		1	6	8	1 4
Permitted Phases		2				
Actuated Green, G (s)	42.7	42.7	24.9	73.2	33.7	58.2
Effective Green, g (s)	44.7	44.7	26.5	75.2	35.7	53.2
Actuated g/C Ratio	0.38	0.38	0.22	0.63	0.30	0.45
Clearance Time (s)	6.0	6.0	5.6	6.0	6.0	
Vehicle Extension (s)	5.4	5.4	2.3	5.4	2.3	
Lane Grp Cap (vph)	1330	570	750	2195	1020	1247
v/s Ratio Prot	c0.26		c0.19	0.34	c0.23	0.28
v/s Ratio Perm		0.05				
v/c Ratio	0.68	0.14	0.85	0.54	0.76	0.63
Uniform Delay, d1	31.1	24.5	44.3	12.2	37.8	25.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.0	0.3	9.0	1.0	3.2	0.8
Delay (s)	33.0	24.8	53.3	13.2	41.0	26.0
Level of Service	C	C	D	B	D	C
Approach Delay (s/veh)	31.5			27.2	33.5	
Approach LOS	C			C	C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	30.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	118.9	Sum of lost time (s)	18.6
Intersection Capacity Utilization	75.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Edition methodology does not support exclusive ped or hold phases.



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	39	639	902	49	420	408
Future Volume (vph)	39	639	902	49	420	408
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	0.0	4.5	4.5	4.0	4.5
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	3539	1529	1769	3471
Flt Permitted	0.95	1.00	1.00	1.00	0.11	1.00
Satd. Flow (perm)	1770	1583	3539	1529	214	3471
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	41	680	960	52	447	434
RTOR Reduction (vph)	0	7	0	21	0	0
Lane Group Flow (vph)	41	673	960	31	447	434
Confl. Peds. (#/hr)				7	7	
Heavy Vehicles (%)	2%	2%	2%	2%	2%	4%
Turn Type	Perm	pt+ov	NA	Perm	D.P+P	NA
Protected Phases		4 5	6		5	2
Permitted Phases	4			6	6	
Actuated Green, G (s)	14.2	58.4	34.8	34.8	74.0	79.0
Effective Green, g (s)	15.2	63.4	35.8	35.8	76.0	80.0
Actuated g/C Ratio	0.15	0.61	0.35	0.35	0.73	0.77
Clearance Time (s)	5.0		5.5	5.5	5.0	5.5
Vehicle Extension (s)	4.0		4.5	4.5	4.0	4.5
Lane Grp Cap (vph)	259	967	1221	527	759	2677
v/s Ratio Prot		c0.42	c0.27		0.23	0.13
v/s Ratio Perm	0.02			0.02	0.20	
v/c Ratio	0.16	0.70	0.79	0.06	0.59	0.16
Uniform Delay, d1	38.7	13.6	30.5	22.7	18.8	3.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	2.4	3.8	0.1	1.4	0.1
Delay (s)	39.1	16.0	34.3	22.8	20.2	3.2
Level of Service	D	B	C	C	C	A
Approach Delay (s/veh)	17.3		33.7			11.8
Approach LOS	B		C			B

Intersection Summary			
HCM 2000 Control Delay (s/veh)	21.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	103.7	Sum of lost time (s)	12.5
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Edition methodology does not support exclusive ped or hold phases.

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	38	461	2	0	599	266	0	3	7	16	0	20
Future Vol, veh/h	38	461	2	0	599	266	0	3	7	16	0	20
Conflicting Peds, #/hr	4	0	6	6	0	4	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	25	-	-	25	-	-	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	3	50	2	2	2	2	33	14	7	2	11
Mvmt Flow	42	507	2	0	658	292	0	3	8	18	0	22

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	955	0	0	515	0	0	1256	1552	514	1400	1407	809
Stage 1	-	-	-	-	-	-	597	597	-	808	808	-
Stage 2	-	-	-	-	-	-	659	955	-	592	598	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.83	6.34	7.17	6.52	6.31
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.83	-	6.17	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.83	-	6.17	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.297	3.426	3.563	4.018	3.399
Pot Cap-1 Maneuver	720	-	-	1051	-	-	148	97	538	115	139	367
Stage 1	-	-	-	-	-	-	489	445	-	367	394	-
Stage 2	-	-	-	-	-	-	453	299	-	484	491	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	717	-	-	1045	-	-	130	90	535	103	130	365
Mov Cap-2 Maneuver	-	-	-	-	-	-	130	90	-	103	130	-
Stage 1	-	-	-	-	-	-	458	417	-	366	392	-
Stage 2	-	-	-	-	-	-	425	298	-	446	460	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.78	0	22.55	32.33
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	216	717	-	-	1045	-	-	171
HCM Lane V/C Ratio	-	0.051	0.058	-	-	-	-	-	0.232
HCM Control Delay (s/veh)	0	22.6	10.3	-	-	0	-	-	32.3
HCM Lane LOS	A	C	B	-	-	A	-	-	D
HCM 95th %tile Q(veh)	-	0.2	0.2	-	-	0	-	-	0.9

3: JAE Access/SW 115th Avenue & SW Tualatin Road Performance by movement

Movement	EBL	EBT	EBR	WBT	WBR	NBT	NBR	SBL	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.3	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1
Total Delay (hr)	0.1	0.4	0.0	0.6	0.2	0.0	0.0	0.1	0.0	1.5
Total Del/Veh (s)	12.4	3.2	1.9	3.4	2.4	22.2	8.0	21.5	6.9	3.7
Stop Delay (hr)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2
Stop Del/Veh (s)	8.2	0.0	0.0	0.0	0.0	19.4	6.2	19.8	5.4	0.5

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	9	476	861	16	9	4
Future Vol, veh/h	9	476	861	16	9	4
Conflicting Peds, #/hr	3	0	0	3	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	25	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	3	7	2	11	2
Mvmt Flow	10	512	926	17	10	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	946	0	-	0	1469	937
Stage 1	-	-	-	-	937	-
Stage 2	-	-	-	-	531	-
Critical Hdwy	4.12	-	-	-	6.51	6.22
Critical Hdwy Stg 1	-	-	-	-	5.51	-
Critical Hdwy Stg 2	-	-	-	-	5.51	-
Follow-up Hdwy	2.218	-	-	-	3.599	3.318
Pot Cap-1 Maneuver	725	-	-	-	134	321
Stage 1	-	-	-	-	367	-
Stage 2	-	-	-	-	572	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	723	-	-	-	131	320
Mov Cap-2 Maneuver	-	-	-	-	258	-
Stage 1	-	-	-	-	361	-
Stage 2	-	-	-	-	570	-

Approach	EB	WB	SB
HCM Control Delay, s/v	0.19	0	18.84
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	723	-	-	-	274
HCM Lane V/C Ratio	0.013	-	-	-	0.051
HCM Control Delay (s/veh)	10	-	-	-	18.8
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	475	7	6	850	38	38
Future Vol, veh/h	475	7	6	850	38	38
Conflicting Peds, #/hr	0	1	1	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	4	20	2	2	3	7
Mvmt Flow	505	7	6	904	40	40

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	514	0	1427	510
Stage 1	-	-	-	-	510	-
Stage 2	-	-	-	-	917	-
Critical Hdwy	-	-	4.12	-	6.43	6.27
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.218	-	3.527	3.363
Pot Cap-1 Maneuver	-	-	1052	-	148	554
Stage 1	-	-	-	-	601	-
Stage 2	-	-	-	-	388	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1051	-	147	553
Mov Cap-2 Maneuver	-	-	-	-	277	-
Stage 1	-	-	-	-	600	-
Stage 2	-	-	-	-	386	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0.06	17.47
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	369	-	-	1051	-
HCM Lane V/C Ratio	0.219	-	-	0.006	-
HCM Control Delay (s/veh)	17.5	-	-	8.4	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.8	-	-	0	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	0	1	63	16	0
Future Vol, veh/h	3	0	1	63	16	0
Conflicting Peds, #/hr	0	0	3	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	9	2
Mvmt Flow	3	0	1	70	18	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	93	21	21	0	-	0
Stage 1	21	-	-	-	-	-
Stage 2	72	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	907	1057	1595	-	-	-
Stage 1	1002	-	-	-	-	-
Stage 2	951	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	901	1054	1591	-	-	-
Mov Cap-2 Maneuver	901	-	-	-	-	-
Stage 1	998	-	-	-	-	-
Stage 2	948	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	9.01	0.11	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	28	-	901	-	-
HCM Lane V/C Ratio	0.001	-	0.004	-	-
HCM Control Delay (s/veh)	7.3	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	6.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	25	107	16	38	15	2
Future Vol, veh/h	25	107	16	38	15	2
Conflicting Peds, #/hr	0	0	7	0	0	7
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	99	99	99	99	99
Heavy Vehicles, %	2	2	2	3	9	2
Mvmt Flow	25	108	16	38	15	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	94	23	24	0	-	0
Stage 1	23	-	-	-	-	-
Stage 2	71	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	906	1054	1591	-	-	-
Stage 1	999	-	-	-	-	-
Stage 2	952	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	885	1047	1580	-	-	-
Mov Cap-2 Maneuver	885	-	-	-	-	-
Stage 1	982	-	-	-	-	-
Stage 2	946	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	9.1	2.16	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	533	-	1011	-	-
HCM Lane V/C Ratio	0.01	-	0.132	-	-
HCM Control Delay (s/veh)	7.3	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

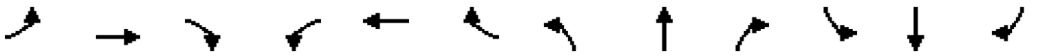
Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	74	8	45	121	2
Future Vol, veh/h	7	74	8	45	121	2
Conflicting Peds, #/hr	0	0	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	8	3	2
Mvmt Flow	9	90	10	55	148	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	227	153	154	0	-	0
Stage 1	153	-	-	-	-	-
Stage 2	74	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	761	893	1426	-	-	-
Stage 1	875	-	-	-	-	-
Stage 2	949	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	750	890	1421	-	-	-
Mov Cap-2 Maneuver	750	-	-	-	-	-
Stage 1	866	-	-	-	-	-
Stage 2	945	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	9.63	1.14	0
HCM LOS	A		

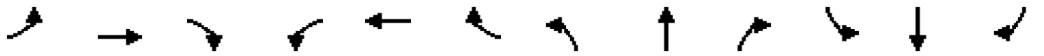
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	272	-	876	-	-
HCM Lane V/C Ratio	0.007	-	0.113	-	-
HCM Control Delay (s/veh)	7.6	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	29	27	66	2	282	7	668	27	46	395	18
Future Volume (vph)	28	29	27	66	2	282	7	668	27	46	395	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.85		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1583		1719	1562		1262	3515		1770	3342	
Flt Permitted	0.95	1.00		0.95	1.00		0.47	1.00		0.24	1.00	
Satd. Flow (perm)	1736	1583		1719	1562		629	3515		438	3342	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	32	29	72	2	307	8	726	29	50	429	20
RTOR Reduction (vph)	0	23	0	0	224	0	0	2	0	0	2	0
Lane Group Flow (vph)	30	38	0	72	85	0	8	753	0	50	447	0
Confl. Peds. (#/hr)	4					4						
Heavy Vehicles (%)	4%	11%	12%	5%	2%	2%	43%	2%	5%	2%	6%	35%
Turn Type	Prot	NA		Prot	NA		D.P+P	NA		D.P+P	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases							6			2		
Actuated Green, G (s)	2.4	12.5		6.5	16.6		26.4	22.3		26.4	25.6	
Effective Green, g (s)	3.4	13.5		7.5	17.6		28.4	23.3		26.4	25.6	
Actuated g/C Ratio	0.05	0.21		0.11	0.27		0.43	0.36		0.40	0.39	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	90	326		197	420		290	1252		260	1308	
v/s Ratio Prot	0.02	0.02		c0.04	c0.05		0.00	c0.21		c0.01	c0.13	
v/s Ratio Perm							0.01			0.07		
v/c Ratio	0.33	0.12		0.37	0.20		0.03	0.60		0.19	0.34	
Uniform Delay, d1	29.9	21.1		26.8	18.5		10.5	17.2		12.5	14.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.2	0.2		1.2	0.2		0.0	0.8		0.4	0.2	
Delay (s)	32.1	21.3		27.9	18.7		10.6	18.1		12.8	14.1	
Level of Service	C	C		C	B		B	B		B	B	
Approach Delay (s/veh)		24.8			20.4			18.0			14.0	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	65.4	Sum of lost time (s)	17.0
Intersection Capacity Utilization	60.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	29	27	66	2	282	7	668	27	46	395	18
Future Volume (veh/h)	28	29	27	66	2	282	7	668	27	46	395	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1737	1722	1826	1870	1870	1263	1870	1826	1870	1811	1381
Adj Flow Rate, veh/h	30	32	29	72	2	307	8	726	29	50	429	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	11	12	5	2	2	43	2	5	2	6	35
Cap, veh/h	109	214	194	169	3	457	315	1017	41	315	1139	53
Arrive On Green	0.06	0.26	0.24	0.10	0.29	0.27	0.03	0.29	0.28	0.08	0.34	0.34
Sat Flow, veh/h	1753	837	759	1739	10	1570	1203	3483	139	1781	3348	156
Grp Volume(v), veh/h	30	0	61	72	0	309	8	370	385	50	220	229
Grp Sat Flow(s),veh/h/ln	1753	0	1596	1739	0	1580	1203	1777	1845	1781	1721	1783
Q Serve(g_s), s	1.0	0.0	1.8	2.4	0.0	10.6	0.3	11.3	11.4	1.1	5.9	5.9
Cycle Q Clear(g_c), s	1.0	0.0	1.8	2.4	0.0	10.6	0.3	11.3	11.4	1.1	5.9	5.9
Prop In Lane	1.00		0.48	1.00		0.99	1.00		0.08	1.00		0.09
Lane Grp Cap(c), veh/h	109	0	409	169	0	460	315	519	539	315	585	607
V/C Ratio(X)	0.28	0.00	0.15	0.43	0.00	0.67	0.03	0.71	0.71	0.16	0.38	0.38
Avail Cap(c_a), veh/h	461	0	813	314	0	805	698	905	940	913	1131	1172
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.2	0.0	17.7	25.9	0.0	19.5	11.9	19.3	19.3	14.3	15.2	15.2
Incr Delay (d2), s/veh	1.3	0.0	0.2	1.7	0.0	1.7	0.0	1.8	1.8	0.2	0.4	0.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.6	1.0	0.0	3.6	0.1	4.2	4.4	0.4	2.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	28.6	0.0	17.9	27.5	0.0	21.2	12.0	21.1	21.1	14.6	15.6	15.6
LnGrp LOS	C		B	C		C	B	C	C	B	B	B
Approach Vol, veh/h		91			381			763			499	
Approach Delay, s/veh		21.4			22.4			21.0			15.5	
Approach LOS		C			C			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.6	21.8	9.9	19.6	5.6	25.7	7.8	21.7
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	25.0	30.0	10.0	30.0	20.0	40.0	15.0	30.0
Max Q Clear Time (g_c+I1), s	3.1	13.4	4.4	3.8	2.3	7.9	3.0	12.6
Green Ext Time (p_c), s	0.1	3.4	0.1	0.5	0.0	2.1	0.0	3.2

Intersection Summary	
HCM 7th Control Delay, s/veh	19.7
HCM 7th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Intersection Delay, s/veh	12.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	77	12	40	356	2	29	2	8	1	0	13
Future Vol, veh/h	6	77	12	40	356	2	29	2	8	1	0	13
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles, %	2	4	2	15	2	2	2	2	40	2	2	2
Mvmt Flow	7	95	15	49	440	2	36	2	10	1	0	16
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	8.4	14.3	8.8	8
HCM LOS	A	B	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	74%	6%	10%	7%
Vol Thru, %	5%	81%	89%	0%
Vol Right, %	21%	13%	1%	93%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	39	95	398	14
LT Vol	29	6	40	1
Through Vol	2	77	356	0
RT Vol	8	12	2	13
Lane Flow Rate	48	117	491	17
Geometry Grp	1	1	1	1
Degree of Util (X)	0.072	0.149	0.613	0.023
Departure Headway (Hd)	5.376	4.563	4.488	4.857
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	665	786	811	734
Service Time	3.42	2.592	2.488	2.905
HCM Lane V/C Ratio	0.072	0.149	0.605	0.023
HCM Control Delay, s/veh	8.8	8.4	14.3	8
HCM Lane LOS	A	A	B	A
HCM 95th-tile Q	0.2	0.5	4.3	0.1

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	25	47	244	12	62	145
Future Vol, veh/h	25	47	244	12	62	145
Conflicting Peds, #/hr	3	0	0	3	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	82	82	82	82	82	76
Heavy Vehicles, %	2	8	2	2	2	2
Mvmt Flow	30	57	298	15	76	191

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	315	0	-	0	426	308
Stage 1	-	-	-	-	308	-
Stage 2	-	-	-	-	118	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1245	-	-	-	585	732
Stage 1	-	-	-	-	745	-
Stage 2	-	-	-	-	907	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1241	-	-	-	567	730
Mov Cap-2 Maneuver	-	-	-	-	567	-
Stage 1	-	-	-	-	724	-
Stage 2	-	-	-	-	904	-

Approach	EB	WB	SB
HCM Control Delay, s/v	2.77	0	11.85
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	625	-	-	-	567	730
HCM Lane V/C Ratio	0.025	-	-	-	0.133	0.261
HCM Control Delay (s/veh)	8	0	-	-	12.3	11.7
HCM Lane LOS	A	A	-	-	B	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5	1

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	107	234	0	0	0
Future Vol, veh/h	0	107	234	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	2	5	5	2	2	2
Mvmt Flow	0	130	285	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	285	0	-	0	416	285
Stage 1	-	-	-	-	285	-
Stage 2	-	-	-	-	130	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1277	-	-	-	593	754
Stage 1	-	-	-	-	763	-
Stage 2	-	-	-	-	896	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1277	-	-	-	593	754
Mov Cap-2 Maneuver	-	-	-	-	593	-
Stage 1	-	-	-	-	763	-
Stage 2	-	-	-	-	896	-

Approach	EB	WB	SB
HCM Control Delay, s/v	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1277	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s/veh)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	9	106	214	19	35	36
Future Vol, veh/h	9	106	214	19	35	36
Conflicting Peds, #/hr	7	0	0	7	0	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	129	261	23	43	44

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	291	0	-	0	431	282
Stage 1	-	-	-	-	280	-
Stage 2	-	-	-	-	151	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1271	-	-	-	582	757
Stage 1	-	-	-	-	768	-
Stage 2	-	-	-	-	877	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1262	-	-	-	568	751
Mov Cap-2 Maneuver	-	-	-	-	568	-
Stage 1	-	-	-	-	755	-
Stage 2	-	-	-	-	871	-

Approach	EB	WB	SB
HCM Control Delay, s/v	0.62	0	10.96
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	141	-	-	-	568	751
HCM Lane V/C Ratio	0.009	-	-	-	0.075	0.058
HCM Control Delay (s/veh)	7.9	0	-	-	11.8	10.1
HCM Lane LOS	A	A	-	-	B	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2	0.2

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	139	8	6	195	0	25	0	13	0	0	0
Future Vol, veh/h	0	139	8	6	195	0	25	0	13	0	0	0
Conflicting Peds, #/hr	7	0	5	5	0	7	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2	50	2	2	2	2	2
Mvmt Flow	0	170	10	7	238	0	30	0	16	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	245	0	0	184	0	0	432	439	179	429	444	245
Stage 1	-	-	-	-	-	-	179	179	-	259	259	-
Stage 2	-	-	-	-	-	-	252	259	-	170	184	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.6	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.6	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.6	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.95	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1321	-	-	1391	-	-	460	512	863	536	509	794
Stage 1	-	-	-	-	-	-	723	751	-	745	693	-
Stage 2	-	-	-	-	-	-	657	693	-	832	747	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1313	-	-	1384	-	-	455	503	859	520	500	789
Mov Cap-2 Maneuver	-	-	-	-	-	-	455	503	-	520	500	-
Stage 1	-	-	-	-	-	-	719	747	-	736	684	-
Stage 2	-	-	-	-	-	-	653	684	-	817	744	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0	0.23	12.26	0
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	542	1313	-	-	54	-	-	-
HCM Lane V/C Ratio	0.085	-	-	-	0.005	-	-	-
HCM Control Delay (s/veh)	12.3	0	-	-	7.6	0	-	0
HCM Lane LOS	B	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	-

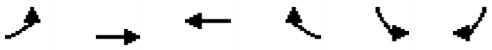
Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	25	129	66	79	116	115
Future Vol, veh/h	25	129	66	79	116	115
Conflicting Peds, #/hr	1	1	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	17	2	2	2	2	2
Mvmt Flow	29	152	78	93	136	135

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	454	206	273	0	-	0
Stage 1	205	-	-	-	-	-
Stage 2	249	-	-	-	-	-
Critical Hdwy	6.57	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.57	-	-	-	-	-
Critical Hdwy Stg 2	5.57	-	-	-	-	-
Follow-up Hdwy	3.653	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	537	834	1290	-	-	-
Stage 1	795	-	-	-	-	-
Stage 2	758	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	502	833	1289	-	-	-
Mov Cap-2 Maneuver	502	-	-	-	-	-
Stage 1	744	-	-	-	-	-
Stage 2	758	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	11.3	3.63	0
HCM LOS	B		

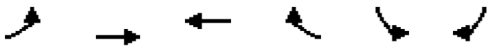
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	819	-	752	-	-
HCM Lane V/C Ratio	0.06	-	0.241	-	-
HCM Control Delay (s/veh)	8	0	11.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.9	-	-



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	2	338	529	74	228	37
Future Volume (vph)	2	338	529	74	228	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1769	1827	1737		1752	1568
Flt Permitted	0.20	1.00	1.00		0.95	1.00
Satd. Flow (perm)	373	1827	1737		1752	1568
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2	376	588	82	253	41
RTOR Reduction (vph)	0	0	5	0	0	29
Lane Group Flow (vph)	2	376	665	0	253	12
Confl. Peds. (#/hr)	1			1		
Heavy Vehicles (%)	2%	4%	8%	2%	3%	3%
Turn Type	D.P+P	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	6					4
Actuated Green, G (s)	29.0	34.4	28.4		16.0	16.0
Effective Green, g (s)	31.8	35.8	29.8		18.5	18.5
Actuated g/C Ratio	0.51	0.57	0.48		0.30	0.30
Clearance Time (s)	5.4	5.4	5.4		6.5	6.5
Vehicle Extension (s)	2.0	3.1	3.1		2.6	2.6
Lane Grp Cap (vph)	235	1049	830		520	465
v/s Ratio Prot	0.00	c0.21	c0.38		c0.14	
v/s Ratio Perm	0.00					0.01
v/c Ratio	0.01	0.36	0.80		0.49	0.03
Uniform Delay, d1	16.9	7.1	13.7		18.0	15.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	0.2	5.6		0.6	0.0
Delay (s)	16.9	7.3	19.4		18.6	15.5
Level of Service	B	A	B		B	B
Approach Delay (s/veh)		7.4	19.4		18.1	
Approach LOS		A	B		B	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	62.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	338	529	74	228	37
Future Volume (veh/h)	2	338	529	74	228	37
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1841	1781	1870	1856	1856
Adj Flow Rate, veh/h	2	376	588	82	253	41
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	4	8	2	3	3
Cap, veh/h	404	1238	902	126	369	328
Arrive On Green	0.02	0.67	0.59	0.57	0.21	0.21
Sat Flow, veh/h	1781	1841	1530	213	1767	1572
Grp Volume(v), veh/h	2	376	0	670	253	41
Grp Sat Flow(s),veh/h/ln	1781	1841	0	1743	1767	1572
Q Serve(g_s), s	0.0	5.7	0.0	17.3	8.9	1.4
Cycle Q Clear(g_c), s	0.0	5.7	0.0	17.3	8.9	1.4
Prop In Lane	1.00			0.12	1.00	1.00
Lane Grp Cap(c), veh/h	404	1238	0	1028	369	328
V/C Ratio(X)	0.00	0.30	0.00	0.65	0.69	0.12
Avail Cap(c_a), veh/h	663	1266	0	1690	852	758
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.0	4.5	0.0	9.3	24.6	21.7
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.7	1.8	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.5	0.0	5.2	3.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	14.0	4.7	0.0	10.0	26.5	21.8
LnGrp LOS	B	A		B	C	C
Approach Vol, veh/h		378	670		294	
Approach Delay, s/veh		4.7	10.0		25.8	
Approach LOS		A	B		C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		49.4		18.1	5.6	43.8
Change Period (Y+Rc), s		5.4		6.5	5.4	5.4
Max Green Setting (Gmax), s		45.0		30.0	10.0	64.0
Max Q Clear Time (g_c+I1), s		7.7		10.9	2.0	19.3
Green Ext Time (p_c), s		8.3		0.7	0.0	19.1

Intersection Summary	
HCM 7th Control Delay, s/veh	12.0
HCM 7th LOS	B

Intersection	
Int Delay, s/veh	10.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	389	68	38	770	131	36
Future Vol, veh/h	389	68	38	770	131	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	100	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	5	6	2	2	2
Mvmt Flow	418	73	41	828	141	39

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	491	0	1365	455
Stage 1	-	-	-	-	455	-
Stage 2	-	-	-	-	910	-
Critical Hdwy	-	-	4.16	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.254	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1052	-	163	605
Stage 1	-	-	-	-	639	-
Stage 2	-	-	-	-	393	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1052	-	156	605
Mov Cap-2 Maneuver	-	-	-	-	156	-
Stage 1	-	-	-	-	639	-
Stage 2	-	-	-	-	377	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0.4	84.86
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	156	605	-	-	1052	-
HCM Lane V/C Ratio	0.901	0.064	-	-	0.039	-
HCM Control Delay (s/veh)	105.1	11.4	-	-	8.6	-
HCM Lane LOS	F	B	-	-	A	-
HCM 95th %tile Q(veh)	6.4	0.2	-	-	0.1	-



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	389	68	38	770	131	36
Future Volume (Veh/h)	389	68	38	770	131	36
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	418	73	41	828	141	39
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			TWLTL		
Median storage veh)				2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			491		1365	455
vC1, stage 1 conf vol					455	
vC2, stage 2 conf vol					910	
vCu, unblocked vol			491		1365	455
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.3		3.5	3.3
p0 queue free %			96		59	94
cM capacity (veh/h)			1052		341	606

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	491	41	828	141	39
Volume Left	0	41	0	141	0
Volume Right	73	0	0	0	39
cSH	1700	1052	1700	341	606
Volume to Capacity	0.29	0.04	0.49	0.41	0.06
Queue Length 95th (ft)	0	3	0	49	5
Control Delay (s/veh)	0.0	8.6	0.0	22.8	11.4
Lane LOS		A		C	B
Approach Delay (s/veh)	0.0	0.4		20.3	
Approach LOS				C	

Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	54.5%	ICU Level of Service		A
Analysis Period (min)	15			

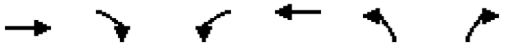
Intersection	
Int Delay, s/veh	8.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	16	7	17	76	267	21
Future Vol, veh/h	16	7	17	76	267	21
Conflicting Peds, #/hr	0	8	8	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	13	2	2	20
Mvmt Flow	17	8	18	83	290	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	33	0	149	29
Stage 1	-	-	-	-	29	-
Stage 2	-	-	-	-	120	-
Critical Hdwy	-	-	4.23	-	6.42	6.4
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.317	-	3.518	3.48
Pot Cap-1 Maneuver	-	-	1511	-	843	996
Stage 1	-	-	-	-	993	-
Stage 2	-	-	-	-	906	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1499	-	826	988
Mov Cap-2 Maneuver	-	-	-	-	826	-
Stage 1	-	-	-	-	986	-
Stage 2	-	-	-	-	894	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	1.36	11.86
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	836	-	-	329	-
HCM Lane V/C Ratio	0.374	-	-	0.012	-
HCM Control Delay (s/veh)	11.9	-	-	7.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	1.7	-	-	0	-



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	16	7	17	76	267	21
Future Volume (Veh/h)	16	7	17	76	267	21
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	8	18	83	290	23
Pedestrians					8	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			33		148	29
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			33		148	29
tC, single (s)			4.2		6.4	6.4
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.5
p0 queue free %			99		65	98
cM capacity (veh/h)			1499		828	989

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	25	101	313
Volume Left	0	18	290
Volume Right	8	0	23
cSH	1700	1499	838
Volume to Capacity	0.01	0.01	0.37
Queue Length 95th (ft)	0	1	44
Control Delay (s/veh)	0.0	1.4	11.8
Lane LOS		A	B
Approach Delay (s/veh)	0.0	1.4	11.8
Approach LOS			B

Intersection Summary			
Average Delay	8.8		
Intersection Capacity Utilization	34.3%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	9.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	332	1594	30	0	1739
Future Vol, veh/h	0	332	1594	30	0	1739
Conflicting Peds, #/hr	0	0	0	4	4	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	Free	-	None
Storage Length	-	0	-	335	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	2	3	3	4	2	2
Mvmt Flow	0	339	1627	31	0	1774

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	813	0	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.96	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.33	-	-	-	-
Pot Cap-1 Maneuver	0	~ 319	-	0	0	-
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	~ 319	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/veh	104.66	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	319	-
HCM Lane V/C Ratio	-	1.061	-
HCM Control Delay (s/veh)	-	104.7	-
HCM Lane LOS	-	F	-
HCM 95th %tile Q(veh)	-	12.6	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	332	1594	30	0	1739
Future Volume (Veh/h)	0	332	1594	30	0	1739
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	0	339	1627	31	0	1774
Pedestrians	4					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2518	818			1631	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2518	818			1631	
tC, single (s)	6.8	*6.0			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	14			100	
cM capacity (veh/h)	23	393			393	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	339	814	814	31	887	887
Volume Left	0	0	0	0	0	0
Volume Right	339	0	0	31	0	0
cSH	393	1700	1700	1700	1700	1700
Volume to Capacity	0.86	0.48	0.48	0.02	0.52	0.52
Queue Length 95th (ft)	210	0	0	0	0	0
Control Delay (s/veh)	50.4	0.0	0.0	0.0	0.0	0.0
Lane LOS	F					
Approach Delay (s/veh)	50.4	0.0			0.0	
Approach LOS	F					

Intersection Summary			
Average Delay	4.5		
Intersection Capacity Utilization	71.3%	ICU Level of Service	C
Analysis Period (min)	15		

* User Entered Value

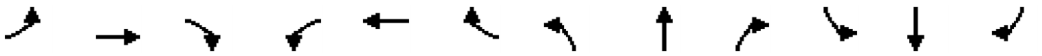
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	270	291	47	337	8	245	157	24	13	123	20
Future Volume (vph)	2	270	291	47	337	8	245	157	24	13	123	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	1.00		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1543	1667		1626	1821		1596	1748		1703	1622	
Flt Permitted	0.43	1.00		0.14	1.00		0.38	1.00		0.62	1.00	
Satd. Flow (perm)	702	1667		244	1821		639	1748		1107	1622	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	2	338	364	59	421	10	306	196	30	16	154	25
RTOR Reduction (vph)	0	18	0	0	0	0	0	0	0	0	4	0
Lane Group Flow (vph)	3	684	0	59	431	0	306	226	0	16	175	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	17%	2%	8%	11%	4%	2%	13%	6%	10%	6%	16%	4%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	57.8	56.9		66.3	61.4		42.8	36.6		22.5	20.3	
Effective Green, g (s)	57.8	57.4		66.3	61.9		42.8	37.1		22.5	20.8	
Actuated g/C Ratio	0.48	0.48		0.55	0.52		0.36	0.31		0.19	0.17	
Clearance Time (s)	4.0	5.5		4.0	5.5		4.0	5.5		4.0	5.5	
Vehicle Extension (s)	2.0	3.2		2.0	3.2		2.0	3.2		2.0	3.2	
Lane Grp Cap (vph)	344	796		196	938		375	539		218	280	
v/s Ratio Prot	0.00	c0.41		c0.01	0.24		c0.13	0.13		0.00	0.11	
v/s Ratio Perm	0.00			0.15			c0.17			0.01		
v/c Ratio	0.01	0.86		0.30	0.46		0.82	0.42		0.07	0.62	
Uniform Delay, d1	16.5	27.8		19.5	18.5		31.4	32.9		40.0	46.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	9.3		0.3	0.4		12.2	0.6		0.1	4.4	
Delay (s)	16.5	37.1		19.8	18.9		43.6	33.5		40.1	50.4	
Level of Service	B	D		B	B		D	C		D	D	
Approach Delay (s/veh)		37.0			19.0			39.3			49.6	
Approach LOS		D			B			D			D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	34.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	120.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Signalized Intersection Summary
20: SW Teton Avenue & SW Herman Road

07/15/2025



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	270	291	47	337	8	245	157	24	13	123	20
Future Volume (veh/h)	2	270	291	47	337	8	245	157	24	13	123	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1648	1870	1781	1737	1841	1870	1707	1811	1752	1811	1663	1841
Adj Flow Rate, veh/h	2	338	364	59	421	10	306	196	30	16	154	25
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	17	2	8	11	4	2	13	6	10	6	16	4
Cap, veh/h	374	391	421	206	915	22	383	453	69	248	192	31
Arrive On Green	0.00	0.47	0.47	0.04	0.51	0.51	0.18	0.30	0.29	0.02	0.14	0.13
Sat Flow, veh/h	1570	824	887	1654	1791	43	1626	1534	235	1725	1395	226
Grp Volume(v), veh/h	2	0	702	59	0	431	306	0	226	16	0	179
Grp Sat Flow(s),veh/h/ln	1570	0	1711	1654	0	1833	1626	0	1768	1725	0	1621
Q Serve(g_s), s	0.1	0.0	38.1	1.8	0.0	15.7	16.2	0.0	10.8	0.8	0.0	11.2
Cycle Q Clear(g_c), s	0.1	0.0	38.1	1.8	0.0	15.7	16.2	0.0	10.8	0.8	0.0	11.2
Prop In Lane	1.00		0.52	1.00		0.02	1.00		0.13	1.00		0.14
Lane Grp Cap(c), veh/h	374	0	812	206	0	937	383	0	523	248	0	223
V/C Ratio(X)	0.01	0.00	0.86	0.29	0.00	0.46	0.80	0.00	0.43	0.06	0.00	0.80
Avail Cap(c_a), veh/h	671	0	895	458	0	941	409	0	976	548	0	863
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.2	0.0	24.5	20.5	0.0	16.3	30.1	0.0	29.7	38.0	0.0	43.6
Incr Delay (d2), s/veh	0.0	0.0	8.4	0.3	0.0	0.4	9.1	0.0	0.6	0.0	0.0	7.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	15.8	0.7	0.0	6.3	7.1	0.0	4.6	0.3	0.0	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	15.2	0.0	32.9	20.8	0.0	16.7	39.1	0.0	30.3	38.0	0.0	50.8
LnGrp LOS	B		C	C		B	D		C	D		D
Approach Vol, veh/h		704			490			532			195	
Approach Delay, s/veh		32.8			17.2			35.4			49.8	
Approach LOS		C			B			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.1	54.5	22.4	19.3	4.3	58.3	5.9	35.8
Change Period (Y+Rc), s	4.0	5.5	4.0	5.5	4.0	5.5	4.0	5.5
Max Green Setting (Gmax), s	20.0	54.0	20.0	55.0	20.0	53.0	20.0	57.0
Max Q Clear Time (g_c+I1), s	3.8	40.1	18.2	13.2	2.1	17.7	2.8	12.8
Green Ext Time (p_c), s	0.1	8.8	0.1	0.6	0.0	9.8	0.0	3.2

Intersection Summary	
HCM 7th Control Delay, s/veh	31.3
HCM 7th LOS	C



Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	156	303	308	1695	28	1447	281
Future Volume (vph)	156	303	308	1695	28	1447	281
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.97	1.00	1.00	1.00	1.00	0.95
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1493	1770	3539	1770	3438	1509
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1493	1770	3539	1770	3438	1509
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	170	329	335	1842	30	1573	305
RTOR Reduction (vph)	0	251	0	0	0	0	82
Lane Group Flow (vph)	170	78	335	1842	30	1573	223
Confl. Peds. (#/hr)		21	9				9
Heavy Vehicles (%)	2%	5%	2%	2%	2%	5%	2%
Turn Type	Prot	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	4		5	2	1	6	
Permitted Phases		4					6
Actuated Green, G (s)	14.6	14.6	28.0	104.8	5.1	80.9	80.9
Effective Green, g (s)	15.6	15.6	29.5	106.8	5.6	82.9	82.9
Actuated g/C Ratio	0.11	0.11	0.21	0.76	0.04	0.59	0.59
Clearance Time (s)	5.0	5.0	5.5	6.0	4.5	6.0	6.0
Vehicle Extension (s)	2.5	2.5	2.3	4.5	2.3	4.5	4.5
Lane Grp Cap (vph)	197	166	372	2699	70	2035	893
v/s Ratio Prot	c0.10		c0.19	0.52	0.02	c0.46	
v/s Ratio Perm		0.05					0.15
v/c Ratio	0.86	0.47	0.90	0.68	0.43	0.77	0.25
Uniform Delay, d1	61.1	58.3	53.8	8.2	65.6	21.5	13.7
Progression Factor	1.00	1.00	1.00	1.00	0.97	1.29	1.32
Incremental Delay, d2	29.8	1.5	23.8	1.4	1.6	2.0	0.4
Delay (s)	90.9	59.9	77.6	9.6	65.3	29.6	18.5
Level of Service	F	E	E	A	E	C	B
Approach Delay (s/veh)	70.5			20.1		28.4	
Approach LOS	E			C		C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	29.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	92.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Signalized Intersection Summary
21: OR 99W (Pacific Highway) & SW Fischer Road

07/15/2025



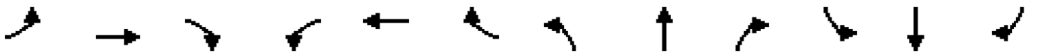
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (veh/h)	156	303	308	1695	28	1447	281
Future Volume (veh/h)	156	303	308	1695	28	1447	281
Initial Q (Qb), veh	0	0	0	0		0	0
Lane Width Adj.	1.00	1.00	1.00	1.00		1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00				0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00		1.00	1.00
Work Zone On Approach	No			No		No	
Adj Sat Flow, veh/h/ln	1870	1826	1870	1870		1826	1870
Adj Flow Rate, veh/h	170	164	335	1842		1573	305
Peak Hour Factor	0.92	0.92	0.92	0.92		0.92	0.92
Percent Heavy Veh, %	2	5	2	2		5	2
Cap, veh/h	204	177	374	2944		2048	928
Arrive On Green	0.11	0.11	0.21	0.83		1.00	1.00
Sat Flow, veh/h	1781	1547	1781	3647		3561	1573
Grp Volume(v), veh/h	170	164	335	1842		1573	305
Grp Sat Flow(s),veh/h/ln	1781	1547	1781	1777		1735	1573
Q Serve(g_s), s	13.1	14.7	25.6	25.8		0.0	0.0
Cycle Q Clear(g_c), s	13.1	14.7	25.6	25.8		0.0	0.0
Prop In Lane	1.00	1.00	1.00				1.00
Lane Grp Cap(c), veh/h	204	177	374	2944		2048	928
V/C Ratio(X)	0.84	0.93	0.90	0.63		0.77	0.33
Avail Cap(c_a), veh/h	204	177	394	2944		2048	928
HCM Platoon Ratio	1.00	1.00	1.00	1.00		2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00		0.54	0.54
Uniform Delay (d), s/veh	60.7	61.4	53.8	4.3		0.0	0.0
Incr Delay (d2), s/veh	24.4	46.9	21.2	1.0		1.5	0.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0		0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	14.3	13.4	6.4		0.4	0.1
Unsig. Movement Delay, s/veh							
LnGrp Delay(d), s/veh	85.1	108.3	75.1	5.3		1.5	0.5
LnGrp LOS	F	F	E	A		A	A
Approach Vol, veh/h	334			2177		1878	
Approach Delay, s/veh	96.5			16.0		1.4	
Approach LOS	F			B		A	

Timer - Assigned Phs		2		4	5	6	
Phs Duration (G+Y+Rc), s		120.0		20.0	33.4	86.6	
Change Period (Y+Rc), s		6.0		5.0	5.5	6.0	
Max Green Setting (Gmax), s		94.0		15.0	29.5	79.0	
Max Q Clear Time (g_c+I1), s		27.8		16.7	27.6	2.0	
Green Ext Time (p_c), s		63.0		0.0	0.2	65.3	

Intersection Summary	
HCM 7th Control Delay, s/veh	15.9
HCM 7th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.
User approved ignoring U-Turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	97	71	508	74	355	142	1366	256	459	1089	21
Future Volume (vph)	23	97	71	508	74	355	142	1366	256	459	1089	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0	6.0	5.4	5.4	6.0	5.3	5.0	5.0
Lane Util. Factor		0.95		0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	0.98
Flpb, ped/bikes		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.94		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99		0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3309		1681	1702	1533	1770	3505	1560	3433	3438	1547
Flt Permitted		0.99		0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3309		1681	1702	1533	1770	3505	1560	3433	3438	1547
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	24	103	76	540	79	378	151	1453	272	488	1159	22
RTOR Reduction (vph)	0	64	0	0	0	287	0	0	56	0	0	12
Lane Group Flow (vph)	0	139	0	308	311	91	151	1453	216	488	1159	10
Confl. Peds. (#/hr)	7					7	1		7	7		1
Heavy Vehicles (%)	2%	2%	3%	2%	3%	3%	2%	3%	2%	2%	5%	2%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	3	3		4	4		5	2	4	1	6	
Permitted Phases						4			2			6
Actuated Green, G (s)		12.4		27.9	27.9	27.9	13.4	55.0	82.9	22.0	63.9	63.9
Effective Green, g (s)		12.4		27.9	27.9	27.9	13.4	55.0	82.9	22.0	63.9	63.9
Actuated g/C Ratio		0.09		0.20	0.20	0.20	0.10	0.39	0.59	0.16	0.46	0.46
Clearance Time (s)		6.0		6.0	6.0	6.0	5.4	5.4	6.0	5.3	5.0	5.0
Vehicle Extension (s)		2.3		2.3	2.3	2.3	2.3	4.5	2.3	2.3	4.8	4.8
Lane Grp Cap (vph)		293		334	339	305	169	1376	923	539	1569	706
v/s Ratio Prot		c0.04		c0.18	0.18		0.09	c0.41	0.05	c0.14	0.34	
v/s Ratio Perm						0.06			0.09			0.01
v/c Ratio		0.48		0.92	0.92	0.30	0.89	1.06	0.23	0.91	0.74	0.01
Uniform Delay, d1		60.7		55.0	54.9	47.7	62.6	42.5	13.5	58.0	31.2	20.8
Progression Factor		1.00		1.00	1.00	1.00	0.92	1.18	1.30	1.00	1.00	1.00
Incremental Delay, d2		0.7		29.8	28.4	0.3	31.8	37.3	0.1	18.5	3.2	0.0
Delay (s)		61.4		84.8	83.3	48.1	89.5	87.3	17.6	76.5	34.4	20.9
Level of Service		E		F	F	D	F	F	B	E	C	C
Approach Delay (s/veh)		61.4			70.4			77.3			46.5	
Approach LOS		E			E			E			D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	64.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.7
Intersection Capacity Utilization	95.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Edition methodology does not support exclusive ped or hold phases.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1220	711	1053	848	161	315
Future Volume (vph)	1220	711	1053	848	161	315
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	5.6
Lane Util. Factor	0.95	1.00	0.97	0.95	0.97	0.88
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3374	1553	3400	3343	3127	2515
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3374	1553	3400	3343	3127	2515
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1298	756	1120	902	171	335
RTOR Reduction (vph)	0	304	0	0	0	0
Lane Group Flow (vph)	1298	452	1120	902	171	335
Confl. Peds. (#/hr)						4
Heavy Vehicles (%)	7%	4%	3%	8%	12%	13%
Turn Type	NA	Perm	Prot	NA	Prot	pt+ov
Protected Phases	2		1	6	8	1 4
Permitted Phases		2				
Actuated Green, G (s)	39.4	39.4	28.7	73.7	18.4	46.9
Effective Green, g (s)	41.4	41.4	30.3	75.7	20.4	41.9
Actuated g/C Ratio	0.40	0.40	0.29	0.73	0.20	0.40
Clearance Time (s)	6.0	6.0	5.6	6.0	6.0	
Vehicle Extension (s)	5.4	5.4	2.3	5.4	2.3	
Lane Grp Cap (vph)	1341	617	989	2430	612	1012
v/s Ratio Prot	c0.38		c0.33	0.27	c0.05	0.13
v/s Ratio Perm		0.29				
v/c Ratio	0.97	0.73	1.13	0.37	0.28	0.33
Uniform Delay, d1	30.7	26.7	36.9	5.3	35.6	21.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	17.6	5.7	72.4	0.4	0.1	0.1
Delay (s)	48.3	32.4	109.3	5.7	35.7	21.6
Level of Service	D	C	F	A	D	C
Approach Delay (s/veh)	42.5			63.1	26.3	
Approach LOS	D			E	C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	49.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	104.1	Sum of lost time (s)	18.6
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Edition methodology does not support exclusive ped or hold phases.



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	42	224	274	41	860	922
Future Volume (vph)	42	224	274	41	860	922
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	0.0	4.5	4.5	4.0	4.5
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1597	1524	3195	1459	1751	3505
Flt Permitted	0.95	1.00	1.00	1.00	0.42	1.00
Satd. Flow (perm)	1597	1524	3195	1459	772	3505
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	48	257	315	47	989	1060
RTOR Reduction (vph)	0	53	0	39	0	0
Lane Group Flow (vph)	48	204	315	8	989	1060
Confl. Peds. (#/hr)				2	2	
Heavy Vehicles (%)	13%	6%	13%	8%	3%	3%
Turn Type	Perm	pt+ov	NA	Perm	D.P+P	NA
Protected Phases		4 5	6		5	2
Permitted Phases	4			6	6	
Actuated Green, G (s)	12.4	76.0	15.5	15.5	74.1	79.1
Effective Green, g (s)	13.4	81.0	16.5	16.5	76.1	80.1
Actuated g/C Ratio	0.13	0.79	0.16	0.16	0.75	0.79
Clearance Time (s)	5.0		5.5	5.5	5.0	5.5
Vehicle Extension (s)	4.0		4.5	4.5	4.0	4.5
Lane Grp Cap (vph)	209	1210	516	236	1148	2752
v/s Ratio Prot		0.13	0.10		c0.50	0.30
v/s Ratio Perm	c0.03			0.01	c0.14	
v/c Ratio	0.23	0.17	0.61	0.03	0.86	0.39
Uniform Delay, d1	39.7	2.5	39.8	36.0	11.9	3.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	0.1	2.8	0.1	7.0	0.4
Delay (s)	40.4	2.6	42.5	36.1	18.9	3.8
Level of Service	D	A	D	D	B	A
Approach Delay (s/veh)	8.5		41.7			11.1
Approach LOS	A		D			B

Intersection Summary			
HCM 2000 Control Delay (s/veh)	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	102.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Edition methodology does not support exclusive ped or hold phases.

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	64	806	2	8	242	137	1	0	5	48	1	29
Future Vol, veh/h	64	806	2	8	242	137	1	0	5	48	1	29
Conflicting Peds, #/hr	0	0	7	7	0	0	2	0	0	0	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	25	-	-	25	-	-	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	7	3	2	38	6	6	100	2	20	7	2	11
Mvmt Flow	70	876	2	9	263	149	1	0	5	52	1	32

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	412	0	0	885	0	0	1306	1453	884	1370	1379	340
Stage 1	-	-	-	-	-	-	1023	1023	-	355	355	-
Stage 2	-	-	-	-	-	-	283	429	-	1015	1024	-
Critical Hdwy	4.17	-	-	4.48	-	-	8.1	6.52	6.4	7.17	6.52	6.31
Critical Hdwy Stg 1	-	-	-	-	-	-	7.1	5.52	-	6.17	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.1	5.52	-	6.17	5.52	-
Follow-up Hdwy	2.263	-	-	2.542	-	-	4.4	4.018	3.48	3.563	4.018	3.399
Pot Cap-1 Maneuver	1120	-	-	633	-	-	87	130	320	121	144	683
Stage 1	-	-	-	-	-	-	191	313	-	652	630	-
Stage 2	-	-	-	-	-	-	554	584	-	281	313	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1120	-	-	629	-	-	75	120	317	110	133	681
Mov Cap-2 Maneuver	-	-	-	-	-	-	75	120	-	110	133	-
Stage 1	-	-	-	-	-	-	178	292	-	643	621	-
Stage 2	-	-	-	-	-	-	519	576	-	259	291	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.62	0.22	22.71	50.51
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	75	317	1120	-	-	629	-	-	160
HCM Lane V/C Ratio	0.014	0.017	0.062	-	-	0.014	-	-	0.531
HCM Control Delay (s/veh)	53.6	16.5	8.4	-	-	10.8	-	-	50.5
HCM Lane LOS	F	C	A	-	-	B	-	-	F
HCM 95th %tile Q(veh)	0	0.1	0.2	-	-	0	-	-	2.6

3: JAE Access/SW 115th Avenue & SW Tualatin Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.0
Total Delay (hr)	0.1	0.5	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.1	1.1
Total Del/Veh (s)	6.1	2.9	2.6	4.5	1.7	1.1	19.9	8.1	14.9	9.0	7.4	3.3
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.3
Stop Del/Veh (s)	2.3	0.0	0.0	2.2	0.0	0.0	19.2	6.4	12.8	6.4	5.2	0.9

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	860	384	6	23	4
Future Vol, veh/h	1	860	384	6	23	4
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	25	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	3	7	2	5	2
Mvmt Flow	1	956	427	7	26	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	434	0	-	0	1389	431
Stage 1	-	-	-	-	431	-
Stage 2	-	-	-	-	958	-
Critical Hdwy	4.12	-	-	-	6.45	6.22
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.218	-	-	-	3.545	3.318
Pot Cap-1 Maneuver	1125	-	-	-	155	624
Stage 1	-	-	-	-	649	-
Stage 2	-	-	-	-	368	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1124	-	-	-	154	624
Mov Cap-2 Maneuver	-	-	-	-	277	-
Stage 1	-	-	-	-	648	-
Stage 2	-	-	-	-	368	-

Approach	EB	WB	SB
HCM Control Delay, s/v	0.01	0	18.25
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1124	-	-	-	302
HCM Lane V/C Ratio	0.001	-	-	-	0.099
HCM Control Delay (s/veh)	8.2	-	-	-	18.2
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	852	63	68	381	19	11
Future Vol, veh/h	852	63	68	381	19	11
Conflicting Peds, #/hr	0	2	2	0	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	2	2	7	15	17
Mvmt Flow	926	68	74	414	21	12

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	997	0	1525	962
Stage 1	-	-	-	-	962	-
Stage 2	-	-	-	-	563	-
Critical Hdwy	-	-	4.12	-	6.55	6.37
Critical Hdwy Stg 1	-	-	-	-	5.55	-
Critical Hdwy Stg 2	-	-	-	-	5.55	-
Follow-up Hdwy	-	-	2.218	-	3.635	3.453
Pot Cap-1 Maneuver	-	-	694	-	121	291
Stage 1	-	-	-	-	351	-
Stage 2	-	-	-	-	545	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	693	-	108	290
Mov Cap-2 Maneuver	-	-	-	-	233	-
Stage 1	-	-	-	-	351	-
Stage 2	-	-	-	-	486	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	1.64	21.44
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	251	-	-	693	-
HCM Lane V/C Ratio	0.13	-	-	0.107	-
HCM Control Delay (s/veh)	21.4	-	-	10.8	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	0.4	-	-	0.4	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	4	19	30	121	29
Future Vol, veh/h	5	4	19	30	121	29
Conflicting Peds, #/hr	0	0	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	100	50	17	2	25
Mvmt Flow	6	5	22	35	142	34

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	243	163	180	0	-	0
Stage 1	163	-	-	-	-	-
Stage 2	80	-	-	-	-	-
Critical Hdwy	6.42	7.2	4.6	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	4.2	2.65	-	-	-
Pot Cap-1 Maneuver	745	679	1152	-	-	-
Stage 1	866	-	-	-	-	-
Stage 2	943	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	725	676	1148	-	-	-
Mov Cap-2 Maneuver	725	-	-	-	-	-
Stage 1	845	-	-	-	-	-
Stage 2	940	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	10.2	3.18	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	698	-	702	-	-
HCM Lane V/C Ratio	0.019	-	0.015	-	-
HCM Control Delay (s/veh)	8.2	0	10.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0	-	-

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	19	137	44	75	48
Future Vol, veh/h	4	19	137	44	75	48
Conflicting Peds, #/hr	0	0	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	2	2	2	17	5	2
Mvmt Flow	5	26	185	59	101	65

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	569	139	171	0	-	0
Stage 1	139	-	-	-	-	-
Stage 2	430	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	484	909	1406	-	-	-
Stage 1	888	-	-	-	-	-
Stage 2	656	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	414	905	1399	-	-	-
Mov Cap-2 Maneuver	414	-	-	-	-	-
Stage 1	763	-	-	-	-	-
Stage 2	653	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	10.01	6.03	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1353	-	750	-	-
HCM Lane V/C Ratio	0.132	-	0.041	-	-
HCM Control Delay (s/veh)	8	0	10	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.5	-	0.1	-	-

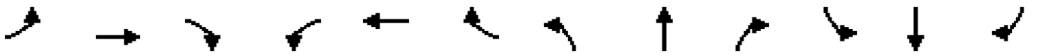
Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	20	120	176	72	17
Future Vol, veh/h	2	20	120	176	72	17
Conflicting Peds, #/hr	1	0	6	0	0	6
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	78	78	78	78
Heavy Vehicles, %	2	13	2	10	4	17
Mvmt Flow	3	26	154	226	92	22

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	644	109	120	0	-	0
Stage 1	109	-	-	-	-	-
Stage 2	534	-	-	-	-	-
Critical Hdwy	6.42	6.33	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.417	2.218	-	-	-
Pot Cap-1 Maneuver	438	915	1468	-	-	-
Stage 1	915	-	-	-	-	-
Stage 2	588	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	380	910	1459	-	-	-
Mov Cap-2 Maneuver	380	-	-	-	-	-
Stage 1	800	-	-	-	-	-
Stage 2	584	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	9.62	3.14	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	730	-	808	-	-
HCM Lane V/C Ratio	0.105	-	0.035	-	-
HCM Control Delay (s/veh)	7.8	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.4	-	0.1	-	-



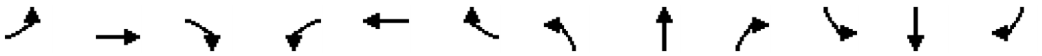
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	106	22	25	13	54	18	253	99	372	556	33
Future Volume (vph)	7	106	22	25	13	54	18	253	99	372	556	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.88		1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1801		1289	1568		1703	3013		1768	3421	
Flt Permitted	0.95	1.00		0.95	1.00		0.35	1.00		0.45	1.00	
Satd. Flow (perm)	1583	1801		1289	1568		628	3013		829	3421	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	8	120	25	28	15	61	20	288	112	423	632	38
RTOR Reduction (vph)	0	6	0	0	48	0	0	33	0	0	3	0
Lane Group Flow (vph)	8	139	0	28	28	0	20	368	0	423	667	0
Confl. Peds. (#/hr)			1	1			1		2	2		1
Heavy Vehicles (%)	14%	2%	5%	40%	17%	4%	6%	14%	14%	2%	4%	13%
Turn Type	Prot	NA		Prot	NA		D.P+P	NA		D.P+P	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases							6			2		
Actuated Green, G (s)	0.9	12.8		2.6	14.5		35.9	19.8		35.9	34.0	
Effective Green, g (s)	1.9	13.8		3.6	15.5		37.9	20.8		35.9	34.0	
Actuated g/C Ratio	0.03	0.19		0.05	0.22		0.53	0.29		0.50	0.48	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	42	348		65	340		377	878		629	1631	
v/s Ratio Prot	0.01	c0.08		c0.02	0.02		0.00	0.12		c0.15	0.20	
v/s Ratio Perm							0.03			c0.19		
v/c Ratio	0.19	0.40		0.43	0.08		0.05	0.42		0.67	0.41	
Uniform Delay, d1	33.9	25.1		32.9	22.2		8.0	20.4		11.6	12.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.2	0.8		4.5	0.1		0.1	0.3		2.8	0.2	
Delay (s)	36.2	25.9		37.4	22.3		8.1	20.7		14.5	12.3	
Level of Service	D	C		D	C		A	C		B	B	
Approach Delay (s/veh)		26.4			26.4			20.1			13.1	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	71.3	Sum of lost time (s)	17.0
Intersection Capacity Utilization	58.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Signalized Intersection Summary
9: SW 124th Avenue & SW Leveton Drive

07/15/2025



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	106	22	25	13	54	18	253	99	372	556	33
Future Volume (veh/h)	7	106	22	25	13	54	18	253	99	372	556	33
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1693	1870	1826	1307	1648	1841	1811	1693	1693	1870	1841	1707
Adj Flow Rate, veh/h	8	120	25	28	15	61	20	288	112	423	632	38
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	14	2	5	40	17	4	6	14	14	2	4	13
Cap, veh/h	54	237	49	79	53	217	431	484	184	647	1391	84
Arrive On Green	0.03	0.16	0.14	0.06	0.19	0.17	0.04	0.21	0.19	0.25	0.42	0.42
Sat Flow, veh/h	1612	1501	313	1245	284	1154	1725	2275	864	1781	3351	201
Grp Volume(v), veh/h	8	0	145	28	0	76	20	202	198	423	329	341
Grp Sat Flow(s),veh/h/ln	1612	0	1813	1245	0	1438	1725	1608	1532	1781	1749	1804
Q Serve(g_s), s	0.3	0.0	3.9	1.1	0.0	2.4	0.3	6.0	6.3	9.3	7.2	7.2
Cycle Q Clear(g_c), s	0.3	0.0	3.9	1.1	0.0	2.4	0.3	6.0	6.3	9.3	7.2	7.2
Prop In Lane	1.00		0.17	1.00		0.80	1.00		0.56	1.00		0.11
Lane Grp Cap(c), veh/h	54	0	286	79	0	270	431	342	326	647	726	749
V/C Ratio(X)	0.15	0.00	0.51	0.35	0.00	0.28	0.05	0.59	0.61	0.65	0.45	0.45
Avail Cap(c_a), veh/h	486	0	1060	258	0	841	1040	940	895	1050	1319	1361
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.9	0.0	20.5	23.8	0.0	18.8	7.8	18.8	19.2	11.6	11.2	11.2
Incr Delay (d2), s/veh	1.2	0.0	1.4	2.7	0.0	0.6	0.0	1.6	1.8	1.1	0.4	0.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	1.5	0.4	0.0	0.7	0.1	2.0	2.0	2.8	2.1	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	26.1	0.0	21.9	26.5	0.0	19.4	7.9	20.4	21.0	12.7	11.6	11.6
LnGrp LOS	C		C	C		B	A	C	C	B	B	B
Approach Vol, veh/h		153			104			420			1093	
Approach Delay, s/veh		22.1			21.3			20.1			12.0	
Approach LOS		C			C			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.0	15.3	7.4	12.4	6.3	27.0	5.8	14.0
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	25.0	30.0	10.0	30.0	20.0	40.0	15.0	30.0
Max Q Clear Time (g_c+I1), s	11.3	8.3	3.1	5.9	2.3	9.2	2.3	4.4
Green Ext Time (p_c), s	1.8	1.9	0.0	1.4	0.0	3.4	0.0	0.7

Intersection Summary	
HCM 7th Control Delay, s/veh	15.4
HCM 7th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Intersection Delay, s/veh	15.8
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	514	23	13	80	0	16	1	31	0	1	1
Future Vol, veh/h	18	514	23	13	80	0	16	1	31	0	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	2	2	23	13	14	2	13	2	2	2	2	2
Mvmt Flow	20	578	26	15	90	0	18	1	35	0	1	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	17.6	8.8	8.9	8.4
HCM LOS	C	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	33%	3%	14%	0%
Vol Thru, %	2%	93%	86%	50%
Vol Right, %	65%	4%	0%	50%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	48	555	93	2
LT Vol	16	18	13	0
Through Vol	1	514	80	1
RT Vol	31	23	0	1
Lane Flow Rate	54	624	104	2
Geometry Grp	1	1	1	1
Degree of Util (X)	0.081	0.728	0.143	0.003
Departure Headway (Hd)	5.394	4.204	4.918	5.318
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	663	867	729	670
Service Time	3.438	2.204	2.948	3.371
HCM Lane V/C Ratio	0.081	0.72	0.143	0.003
HCM Control Delay, s/veh	8.9	17.6	8.8	8.4
HCM Lane LOS	A	C	A	A
HCM 95th-tile Q	0.3	6.6	0.5	0

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	189	328	69	92	10	22
Future Vol, veh/h	189	328	69	92	10	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	3	3	9	2	2	17
Mvmt Flow	228	395	83	111	12	27

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	194	0	-	0	989	139
Stage 1	-	-	-	-	139	-
Stage 2	-	-	-	-	851	-
Critical Hdwy	4.13	-	-	-	6.42	6.37
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.227	-	-	-	3.518	3.453
Pot Cap-1 Maneuver	1373	-	-	-	274	871
Stage 1	-	-	-	-	888	-
Stage 2	-	-	-	-	419	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1373	-	-	-	215	871
Mov Cap-2 Maneuver	-	-	-	-	215	-
Stage 1	-	-	-	-	699	-
Stage 2	-	-	-	-	419	-

Approach	EB	WB	SB
HCM Control Delay, s/v	2.98	0	13.46
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	658	-	-	-	215	871
HCM Lane V/C Ratio	0.166	-	-	-	0.056	0.03
HCM Control Delay (s/veh)	8.1	0	-	-	22.7	9.3
HCM Lane LOS	A	A	-	-	C	A
HCM 95th %tile Q(veh)	0.6	-	-	-	0.2	0.1

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	32	307	157	13	3	8
Future Vol, veh/h	32	307	157	13	3	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	2	5	5	2	2	2
Mvmt Flow	39	374	191	16	4	10

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	207	0	-	0	652	199
Stage 1	-	-	-	-	199	-
Stage 2	-	-	-	-	452	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1364	-	-	-	433	842
Stage 1	-	-	-	-	834	-
Stage 2	-	-	-	-	641	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1364	-	-	-	417	842
Mov Cap-2 Maneuver	-	-	-	-	417	-
Stage 1	-	-	-	-	804	-
Stage 2	-	-	-	-	641	-

Approach	EB	WB	SB
HCM Control Delay, s/v	0.73	0	10.58
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	170	-	-	-	659
HCM Lane V/C Ratio	0.029	-	-	-	0.02
HCM Control Delay (s/veh)	7.7	0	-	-	10.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	49	288	150	25	12	14
Future Vol, veh/h	49	288	150	25	12	14
Conflicting Peds, #/hr	12	0	0	12	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	2	5	5	4	2	2
Mvmt Flow	59	347	181	30	14	17

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	223	0	-	0	673	209
Stage 1	-	-	-	-	208	-
Stage 2	-	-	-	-	465	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1346	-	-	-	421	832
Stage 1	-	-	-	-	827	-
Stage 2	-	-	-	-	632	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1331	-	-	-	388	821
Mov Cap-2 Maneuver	-	-	-	-	388	-
Stage 1	-	-	-	-	773	-
Stage 2	-	-	-	-	625	-

Approach	EB	WB	SB
HCM Control Delay, s/v	1.14	0	11.85
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	262	-	-	-	388	821
HCM Lane V/C Ratio	0.044	-	-	-	0.037	0.021
HCM Control Delay (s/veh)	7.8	0	-	-	14.6	9.5
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1	0.1

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	264	27	16	180	0	9	0	5	0	0	0
Future Vol, veh/h	0	264	27	16	180	0	9	0	5	0	0	0
Conflicting Peds, #/hr	8	0	3	3	0	8	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77
Heavy Vehicles, %	2	5	2	2	4	2	2	2	2	2	2	2
Mvmt Flow	0	343	35	21	234	0	12	0	6	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	242	0	0	381	0	0	640	647	363	626	664	243
Stage 1	-	-	-	-	-	-	363	363	-	283	283	-
Stage 2	-	-	-	-	-	-	276	283	-	343	381	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1325	-	-	1178	-	-	388	390	681	397	381	796
Stage 1	-	-	-	-	-	-	655	624	-	724	677	-
Stage 2	-	-	-	-	-	-	730	677	-	672	613	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1315	-	-	1174	-	-	379	378	680	382	369	789
Mov Cap-2 Maneuver	-	-	-	-	-	-	379	378	-	382	369	-
Stage 1	-	-	-	-	-	-	654	623	-	704	658	-
Stage 2	-	-	-	-	-	-	714	658	-	666	612	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0	0.66	13.33	0
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	450	1315	-	-	147	-	-	-
HCM Lane V/C Ratio	0.04	-	-	-	0.018	-	-	-
HCM Control Delay (s/veh)	13.3	0	-	-	8.1	0	-	0
HCM Lane LOS	B	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0.1	-	-	-

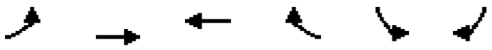
Intersection	
Int Delay, s/veh	13.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	195	75	163	154	37	55
Future Vol, veh/h	195	75	163	154	37	55
Conflicting Peds, #/hr	0	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	3	2	4	2	9	3
Mvmt Flow	227	87	190	179	43	64

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	635	77	109	0	-	0
Stage 1	77	-	-	-	-	-
Stage 2	558	-	-	-	-	-
Critical Hdwy	6.43	6.22	4.14	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.318	2.236	-	-	-
Pot Cap-1 Maneuver	441	984	1469	-	-	-
Stage 1	943	-	-	-	-	-
Stage 2	571	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	376	982	1466	-	-	-
Mov Cap-2 Maneuver	376	-	-	-	-	-
Stage 1	807	-	-	-	-	-
Stage 2	570	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	28.88	4.02	0
HCM LOS	D		

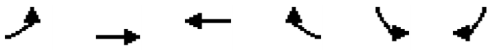
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	926	-	454	-	-
HCM Lane V/C Ratio	0.129	-	0.692	-	-
HCM Control Delay (s/veh)	7.8	0	28.9	-	-
HCM Lane LOS	A	A	D	-	-
HCM 95th %tile Q(veh)	0.4	-	5.2	-	-



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	19	390	281	318	70	6
Future Volume (vph)	19	390	281	318	70	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.93		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1702	1624	1609		1626	1583
Flt Permitted	0.29	1.00	1.00		0.95	1.00
Satd. Flow (perm)	525	1624	1609		1626	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	424	305	346	76	7
RTOR Reduction (vph)	0	0	31	0	0	6
Lane Group Flow (vph)	21	424	620	0	76	1
Confl. Peds. (#/hr)	2			2		
Heavy Vehicles (%)	6%	17%	12%	5%	11%	2%
Turn Type	D.P+P	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	6					4
Actuated Green, G (s)	32.8	38.2	31.3		6.9	6.9
Effective Green, g (s)	35.6	39.6	32.7		9.4	9.4
Actuated g/C Ratio	0.62	0.69	0.57		0.16	0.16
Clearance Time (s)	5.4	5.4	5.4		6.5	6.5
Vehicle Extension (s)	2.0	3.1	3.1		2.6	2.6
Lane Grp Cap (vph)	387	1128	923		268	261
v/s Ratio Prot	0.00	c0.26	c0.39		c0.05	
v/s Ratio Perm	0.03					0.00
v/c Ratio	0.05	0.38	0.67		0.28	0.00
Uniform Delay, d1	8.8	3.6	8.4		20.9	19.9
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	0.2	2.0		0.5	0.0
Delay (s)	8.8	3.8	10.4		21.3	19.9
Level of Service	A	A	B		C	B
Approach Delay (s/veh)		4.0	10.4		21.2	
Approach LOS		A	B		C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	57.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	45.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	19	390	281	318	70	6
Future Volume (veh/h)	19	390	281	318	70	6
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1811	1648	1722	1826	1737	1870
Adj Flow Rate, veh/h	21	424	305	346	76	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	17	12	5	11	2
Cap, veh/h	496	1251	473	536	174	167
Arrive On Green	0.05	0.76	0.64	0.62	0.11	0.11
Sat Flow, veh/h	1725	1648	736	835	1654	1585
Grp Volume(v), veh/h	21	424	0	651	76	7
Grp Sat Flow(s),veh/h/ln	1725	1648	0	1570	1654	1585
Q Serve(g_s), s	0.0	4.9	0.0	15.2	2.5	0.2
Cycle Q Clear(g_c), s	0.0	4.9	0.0	15.2	2.5	0.2
Prop In Lane	1.00			0.53	1.00	1.00
Lane Grp Cap(c), veh/h	496	1251	0	1009	174	167
V/C Ratio(X)	0.04	0.34	0.00	0.65	0.44	0.04
Avail Cap(c_a), veh/h	746	1297	0	1742	912	874
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.8	2.3	0.0	6.7	24.7	23.7
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.7	1.4	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.5	0.0	3.4	1.0	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	9.8	2.5	0.0	7.4	26.1	23.8
LnGrp LOS	A	A		A	C	C
Approach Vol, veh/h		445	651		83	
Approach Delay, s/veh		2.8	7.4		25.9	
Approach LOS		A	A		C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		48.7		10.2	6.9	41.9
Change Period (Y+Rc), s		5.4		6.5	5.4	5.4
Max Green Setting (Gmax), s		45.0		30.0	10.0	64.0
Max Q Clear Time (g_c+I1), s		6.9		4.5	2.0	17.2
Green Ext Time (p_c), s		9.8		0.2	0.0	19.2

Intersection Summary	
HCM 7th Control Delay, s/veh	7.0
HCM 7th LOS	A

Intersection	
Int Delay, s/veh	4.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	677	195	68	365	78	61
Future Vol, veh/h	677	195	68	365	78	61
Conflicting Peds, #/hr	0	1	1	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	100	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	3	3	4	3	14	12
Mvmt Flow	705	203	71	380	81	64

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	909	0	1330	808
Stage 1	-	-	-	-	808	-
Stage 2	-	-	-	-	522	-
Critical Hdwy	-	-	4.14	-	6.54	6.32
Critical Hdwy Stg 1	-	-	-	-	5.54	-
Critical Hdwy Stg 2	-	-	-	-	5.54	-
Follow-up Hdwy	-	-	2.236	-	3.626	3.408
Pot Cap-1 Maneuver	-	-	741	-	161	366
Stage 1	-	-	-	-	419	-
Stage 2	-	-	-	-	572	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	740	-	145	366
Mov Cap-2 Maneuver	-	-	-	-	145	-
Stage 1	-	-	-	-	418	-
Stage 2	-	-	-	-	517	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	1.63	39.58
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	145	366	-	-	740	-
HCM Lane V/C Ratio	0.559	0.174	-	-	0.096	-
HCM Control Delay (s/veh)	57.3	16.9	-	-	10.4	-
HCM Lane LOS	F	C	-	-	B	-
HCM 95th %tile Q(veh)	2.8	0.6	-	-	0.3	-



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	677	195	68	365	78	61
Future Volume (Veh/h)	677	195	68	365	78	61
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	705	203	71	380	81	64
Pedestrians					1	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			TWLTL		
Median storage veh)				2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			909		1330	808
vC1, stage 1 conf vol					808	
vC2, stage 2 conf vol					522	
vCu, unblocked vol			909		1330	808
tC, single (s)			4.1		6.5	6.3
tC, 2 stage (s)					5.5	
tF (s)			2.2		3.6	3.4
p0 queue free %			90		77	83
cM capacity (veh/h)			740		345	366

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	908	71	380	81	64
Volume Left	0	71	0	81	0
Volume Right	203	0	0	0	64
cSH	1700	740	1700	345	366
Volume to Capacity	0.53	0.10	0.22	0.23	0.17
Queue Length 95th (ft)	0	8	0	22	16
Control Delay (s/veh)	0.0	10.4	0.0	18.6	16.9
Lane LOS		B		C	C
Approach Delay (s/veh)	0.0	1.6		17.9	
Approach LOS				C	

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

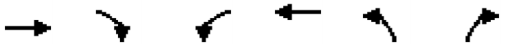
Intersection	
Int Delay, s/veh	8.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	38	13	38	86	108	89
Future Vol, veh/h	38	13	38	86	108	89
Conflicting Peds, #/hr	0	44	44	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	62	62	62	62	62	62
Heavy Vehicles, %	3	2	17	5	5	7
Mvmt Flow	61	21	61	139	174	144

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	126	0	377	116
Stage 1	-	-	-	-	116	-
Stage 2	-	-	-	-	261	-
Critical Hdwy	-	-	4.27	-	6.45	6.27
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.353	-	3.545	3.363
Pot Cap-1 Maneuver	-	-	1372	-	619	923
Stage 1	-	-	-	-	902	-
Stage 2	-	-	-	-	775	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1315	-	563	884
Mov Cap-2 Maneuver	-	-	-	-	563	-
Stage 1	-	-	-	-	864	-
Stage 2	-	-	-	-	736	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	2.41	15.03
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	673	-	-	552	-
HCM Lane V/C Ratio	0.472	-	-	0.047	-
HCM Control Delay (s/veh)	15	-	-	7.9	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	2.5	-	-	0.1	-



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	38	13	38	86	108	89
Future Volume (Veh/h)	38	13	38	86	108	89
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.62	0.62	0.62	0.62	0.62	0.62
Hourly flow rate (vph)	61	21	61	139	174	144
Pedestrians					44	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					4	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			126		377	116
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			126		377	116
tC, single (s)			4.3		6.4	6.3
tC, 2 stage (s)						
tF (s)			2.4		3.5	3.4
p0 queue free %			95		69	84
cM capacity (veh/h)			1315		566	885

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	82	200	318
Volume Left	0	61	174
Volume Right	21	0	144
cSH	1700	1315	676
Volume to Capacity	0.05	0.05	0.47
Queue Length 95th (ft)	0	4	63
Control Delay (s/veh)	0.0	2.7	15.0
Lane LOS		A	B
Approach Delay (s/veh)	0.0	2.7	15.0
Approach LOS			B

Intersection Summary			
Average Delay	8.8		
Intersection Capacity Utilization	31.4%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	210	1480	42	0	1878
Future Vol, veh/h	0	210	1480	42	0	1878
Conflicting Peds, #/hr	0	1	0	1	1	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	Free	-	None
Storage Length	-	0	-	335	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	6	8	3	2	6
Mvmt Flow	0	219	1542	44	0	1956

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	772	0	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.02	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.36	-	-	-	-
Pot Cap-1 Maneuver	0	334	-	0	0	-
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	333	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	34.21	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	333	-
HCM Lane V/C Ratio	-	0.656	-
HCM Control Delay (s/veh)	-	34.2	-
HCM Lane LOS	-	D	-
HCM 95th %tile Q(veh)	-	4.4	-

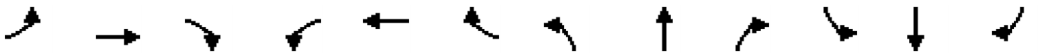


Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	210	1480	42	0	1878
Future Volume (Veh/h)	0	210	1480	42	0	1878
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	219	1542	44	0	1956
Pedestrians	1					1
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	3.5					3.5
Percent Blockage	0					0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2521	773			1543	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2521	773			1543	
tC, single (s)	6.8	*6.0			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	100	47			100	
cM capacity (veh/h)	23	414			426	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	219	771	771	44	978	978
Volume Left	0	0	0	0	0	0
Volume Right	219	0	0	44	0	0
cSH	414	1700	1700	1700	1700	1700
Volume to Capacity	0.53	0.45	0.45	0.03	0.58	0.58
Queue Length 95th (ft)	75	0	0	0	0	0
Control Delay (s/veh)	23.1	0.0	0.0	0.0	0.0	0.0
Lane LOS	C					
Approach Delay (s/veh)	23.1	0.0			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	62.2%	ICU Level of Service	B
Analysis Period (min)	15		

* User Entered Value



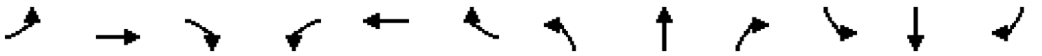
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	218	223	24	279	9	334	151	38	16	216	6
Future Volume (vph)	11	218	223	24	279	9	334	151	38	16	216	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	1.00		1.00	0.97		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1501	1481		1543	1768		1612	1577		1687	1800	
Flt Permitted	0.50	1.00		0.27	1.00		0.36	1.00		0.63	1.00	
Satd. Flow (perm)	789	1481		445	1768		612	1577		1120	1800	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	12	234	240	26	300	10	359	162	41	17	232	6
RTOR Reduction (vph)	0	19	0	0	1	0	0	0	0	0	1	0
Lane Group Flow (vph)	12	455	0	26	309	0	359	203	0	17	237	0
Confl. Peds. (#/hr)	2					2						
Heavy Vehicles (%)	20%	14%	23%	17%	7%	2%	12%	14%	28%	7%	4%	50%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	42.8	41.9		47.2	44.1		44.8	38.8		25.6	23.6	
Effective Green, g (s)	42.8	42.4		47.2	44.6		44.8	39.3		25.6	24.1	
Actuated g/C Ratio	0.41	0.40		0.45	0.43		0.43	0.38		0.24	0.23	
Clearance Time (s)	4.0	5.5		4.0	5.5		4.0	5.5		4.0	5.5	
Vehicle Extension (s)	2.0	3.2		2.0	3.2		2.0	3.2		2.0	3.2	
Lane Grp Cap (vph)	328	599		232	752		425	591		284	413	
v/s Ratio Prot	0.00	c0.31		c0.00	0.17		c0.14	0.13		0.00	0.13	
v/s Ratio Perm	0.01			0.05			c0.22			0.01		
v/c Ratio	0.04	0.76		0.11	0.41		0.84	0.34		0.06	0.57	
Uniform Delay, d1	18.6	26.8		18.0	21.0		23.0	23.5		30.2	35.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	5.6		0.1	0.4		13.7	0.4		0.0	2.0	
Delay (s)	18.6	32.4		18.1	21.4		36.7	23.9		30.3	37.8	
Level of Service	B	C		B	C		D	C		C	D	
Approach Delay (s/veh)		32.1			21.1			32.1			37.3	
Approach LOS		C			C			C			D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	30.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	104.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Signalized Intersection Summary
20: SW Teton Avenue & SW Herman Road

07/15/2025



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	218	223	24	279	9	334	151	38	16	216	6
Future Volume (veh/h)	11	218	223	24	279	9	334	151	38	16	216	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1604	1693	1559	1648	1796	1870	1722	1693	1485	1796	1841	1159
Adj Flow Rate, veh/h	12	234	240	26	300	10	359	162	41	17	232	6
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	20	14	23	17	7	2	12	14	28	7	4	50
Cap, veh/h	367	307	315	232	716	24	445	448	113	295	292	8
Arrive On Green	0.01	0.40	0.40	0.03	0.41	0.41	0.20	0.34	0.34	0.02	0.16	0.16
Sat Flow, veh/h	1527	765	784	1570	1728	58	1640	1303	330	1711	1786	46
Grp Volume(v), veh/h	12	0	474	26	0	310	359	0	203	17	0	238
Grp Sat Flow(s),veh/h/ln	1527	0	1549	1570	0	1786	1640	0	1633	1711	0	1832
Q Serve(g_s), s	0.4	0.0	22.8	0.8	0.0	10.6	15.0	0.0	8.1	0.7	0.0	10.8
Cycle Q Clear(g_c), s	0.4	0.0	22.8	0.8	0.0	10.6	15.0	0.0	8.1	0.7	0.0	10.8
Prop In Lane	1.00		0.51	1.00		0.03	1.00		0.20	1.00		0.03
Lane Grp Cap(c), veh/h	367	0	622	232	0	739	445	0	561	295	0	300
V/C Ratio(X)	0.03	0.00	0.76	0.11	0.00	0.42	0.81	0.00	0.36	0.06	0.00	0.79
Avail Cap(c_a), veh/h	699	0	978	554	0	1106	498	0	1088	658	0	1178
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.7	0.0	22.4	17.7	0.0	17.9	22.5	0.0	21.3	29.5	0.0	34.7
Incr Delay (d2), s/veh	0.0	0.0	2.1	0.1	0.0	0.4	7.6	0.0	0.4	0.0	0.0	5.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	7.8	0.3	0.0	4.2	6.3	0.0	3.0	0.3	0.0	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	15.7	0.0	24.5	17.8	0.0	18.4	30.1	0.0	21.7	29.6	0.0	39.9
LnGrp LOS	B		C	B		B	C		C	C		D
Approach Vol, veh/h		486			336			562			255	
Approach Delay, s/veh		24.3			18.3			27.0			39.2	
Approach LOS		C			B			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.3	39.7	21.2	19.1	5.3	40.8	5.7	34.7
Change Period (Y+Rc), s	4.0	5.5	4.0	5.5	4.0	5.5	4.0	5.5
Max Green Setting (Gmax), s	20.0	54.0	20.0	55.0	20.0	53.0	20.0	57.0
Max Q Clear Time (g_c+I1), s	2.8	24.8	17.0	12.8	2.4	12.6	2.7	10.1
Green Ext Time (p_c), s	0.0	9.4	0.2	0.8	0.0	6.9	0.0	2.9

Intersection Summary	
HCM 7th Control Delay, s/veh	26.3
HCM 7th LOS	C



Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	231	361	136	1580	19	1515	103
Future Volume (vph)	231	361	136	1580	19	1515	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1736	1528	1656	3312	1770	3406	1452
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1736	1528	1656	3312	1770	3406	1452
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	241	376	142	1646	20	1578	107
RTOR Reduction (vph)	0	160	0	0	0	0	29
Lane Group Flow (vph)	241	216	142	1646	20	1578	78
Confl. Peds. (#/hr)		5	3				3
Heavy Vehicles (%)	4%	4%	9%	9%	2%	6%	8%
Turn Type	Prot	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	4		5	2	1	6	
Permitted Phases		4					6
Actuated Green, G (s)	22.5	22.5	16.3	97.6	4.4	84.7	84.7
Effective Green, g (s)	23.5	23.5	17.8	99.6	4.9	86.7	86.7
Actuated g/C Ratio	0.17	0.17	0.13	0.71	0.04	0.62	0.62
Clearance Time (s)	5.0	5.0	5.5	6.0	4.5	6.0	6.0
Vehicle Extension (s)	2.5	2.5	2.3	4.5	2.3	4.5	4.5
Lane Grp Cap (vph)	291	256	210	2356	61	2109	899
v/s Ratio Prot	0.14		0.09	c0.50	0.01	c0.46	
v/s Ratio Perm		c0.14					0.05
v/c Ratio	0.83	0.84	0.68	0.70	0.33	0.75	0.09
Uniform Delay, d1	56.3	56.5	58.3	11.6	65.9	18.9	10.7
Progression Factor	1.00	1.00	1.00	1.00	1.17	1.18	0.82
Incremental Delay, d2	17.0	21.4	7.2	1.7	1.4	1.9	0.1
Delay (s)	73.3	77.9	65.5	13.3	78.7	24.3	9.0
Level of Service	E	E	E	B	E	C	A
Approach Delay (s/veh)	76.1			17.5		24.0	
Approach LOS	E			B		C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	29.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Signalized Intersection Summary
21: OR 99W (Pacific Highway) & SW Fischer Road

07/15/2025



Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (veh/h)	231	361	136	1580	19	1515	103
Future Volume (veh/h)	231	361	136	1580	19	1515	103
Initial Q (Qb), veh	0	0	0	0		0	0
Lane Width Adj.	1.00	1.00	1.00	1.00		1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00				1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00		1.00	1.00
Work Zone On Approach	No			No		No	
Adj Sat Flow, veh/h/ln	1841	1841	1767	1767		1811	1781
Adj Flow Rate, veh/h	241	189	142	1646		1578	107
Peak Hour Factor	0.96	0.96	0.96	0.96		0.96	0.96
Percent Heavy Veh, %	4	4	9	9		6	8
Cap, veh/h	282	251	228	2624		2114	925
Arrive On Green	0.16	0.16	0.14	0.78		1.00	1.00
Sat Flow, veh/h	1753	1560	1682	3445		3532	1506
Grp Volume(v), veh/h	241	189	142	1646		1578	107
Grp Sat Flow(s),veh/h/ln	1753	1560	1682	1678		1721	1506
Q Serve(g_s), s	18.7	16.2	11.2	29.4		0.0	0.0
Cycle Q Clear(g_c), s	18.7	16.2	11.2	29.4		0.0	0.0
Prop In Lane	1.00	1.00	1.00				1.00
Lane Grp Cap(c), veh/h	282	251	228	2624		2114	925
V/C Ratio(X)	0.85	0.75	0.62	0.63		0.75	0.12
Avail Cap(c_a), veh/h	326	290	228	2624		2114	925
HCM Platoon Ratio	1.00	1.00	1.00	1.00		2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00		0.67	0.67
Uniform Delay (d), s/veh	57.1	56.1	57.2	6.5		0.0	0.0
Incr Delay (d2), s/veh	16.7	8.4	4.4	1.1		1.7	0.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0		0.0	0.0
%ile BackOfQ(50%),veh/ln	9.7	14.1	4.9	8.4		0.5	0.0
Unsig. Movement Delay, s/veh							
LnGrp Delay(d), s/veh	73.8	64.5	61.6	7.7		1.7	0.2
LnGrp LOS	E	E	E	A		A	A
Approach Vol, veh/h	430			1788		1685	
Approach Delay, s/veh	69.7			12.0		1.6	
Approach LOS	E			B		A	

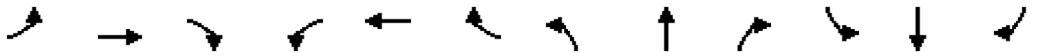
Timer - Assigned Phs		2		4	5	6	
Phs Duration (G+Y+Rc), s		113.5		26.5	23.5	90.0	
Change Period (Y+Rc), s		6.0		5.0	6.0	* 6	
Max Green Setting (Gmax), s		84.0		25.0	14.5	* 84	
Max Q Clear Time (g_c+I1), s		31.4		20.7	13.2	2.0	
Green Ext Time (p_c), s		48.8		0.8	0.0	70.6	

Intersection Summary	
HCM 7th Control Delay, s/veh	13.8
HCM 7th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.
User approved ignoring U-Turning movement.

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	51	28	308	24	164	75	1233	518	399	1237	15
Future Volume (vph)	6	51	28	308	24	164	75	1233	518	399	1237	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0	6.0	5.4	5.4	6.0	5.3	5.0	5.0
Lane Util. Factor		0.95		0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00		0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3351		1633	1651	1517	1770	3312	1513	3367	3374	1542
Flt Permitted		1.00		0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3351		1633	1651	1517	1770	3312	1513	3367	3374	1542
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	6	52	29	314	24	167	77	1258	529	407	1262	15
RTOR Reduction (vph)	0	27	0	0	0	146	0	0	89	0	0	7
Lane Group Flow (vph)	0	60	0	170	168	21	77	1258	440	407	1262	8
Confl. Peds. (#/hr)	9					9	2		6	6		2
Heavy Vehicles (%)	2%	2%	2%	5%	4%	3%	2%	9%	5%	4%	7%	2%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	3	3		4	4		5	2	4	1	6	
Permitted Phases						4			2			6
Actuated Green, G (s)		12.0		17.9	17.9	17.9	9.4	64.7	82.6	22.7	78.3	78.3
Effective Green, g (s)		12.0		17.9	17.9	17.9	9.4	64.7	82.6	22.7	78.3	78.3
Actuated g/C Ratio		0.09		0.13	0.13	0.13	0.07	0.46	0.59	0.16	0.56	0.56
Clearance Time (s)		6.0		6.0	6.0	6.0	5.4	5.4	6.0	5.3	5.0	5.0
Vehicle Extension (s)		2.3		2.3	2.3	2.3	2.3	4.5	2.3	2.3	4.8	4.8
Lane Grp Cap (vph)		287		208	211	193	118	1530	957	545	1887	862
v/s Ratio Prot		c0.02		c0.10	0.10		0.04	c0.38	0.06	0.12	c0.37	
v/s Ratio Perm						0.01			0.23			0.01
v/c Ratio		0.21		0.82	0.80	0.11	0.65	0.82	0.46	0.75	0.67	0.01
Uniform Delay, d1		59.6		59.5	59.3	54.0	63.7	32.7	16.1	55.9	21.7	13.7
Progression Factor		1.00		1.00	1.00	1.00	0.93	0.89	0.50	1.00	1.00	1.00
Incremental Delay, d2		0.2		20.7	17.7	0.1	7.5	3.7	0.1	5.1	1.9	0.0
Delay (s)		59.8		80.2	77.0	54.2	66.6	32.9	8.2	61.0	23.6	13.7
Level of Service		E		F	E	D	E	C	A	E	C	B
Approach Delay (s/veh)		59.8			70.5			27.3			32.6	
Approach LOS		E			E			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	35.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.7
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Edition methodology does not support exclusive ped or hold phases.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	885	208	632	1163	816	807
Future Volume (vph)	885	208	632	1163	816	807
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	5.6
Lane Util. Factor	0.95	1.00	0.97	0.95	0.97	0.88
Frpb, ped/bikes	1.00	0.99	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1518	3367	3471	3400	2787
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1518	3367	3471	3400	2787
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	903	212	645	1187	833	823
RTOR Reduction (vph)	0	129	0	0	0	0
Lane Group Flow (vph)	903	83	645	1187	833	823
Confl. Peds. (#/hr)		1	1			6
Heavy Vehicles (%)	2%	5%	4%	4%	3%	2%
Turn Type	NA	Perm	Prot	NA	Prot	pt+ov
Protected Phases	2		1	6	8	1 4
Permitted Phases		2				
Actuated Green, G (s)	42.0	42.0	25.5	73.1	35.2	60.2
Effective Green, g (s)	44.0	44.0	27.1	75.1	37.2	55.2
Actuated g/C Ratio	0.37	0.37	0.23	0.62	0.31	0.46
Clearance Time (s)	6.0	6.0	5.6	6.0	6.0	
Vehicle Extension (s)	5.4	5.4	2.3	5.4	2.3	
Lane Grp Cap (vph)	1294	555	758	2166	1051	1278
v/s Ratio Prot	c0.26		c0.19	0.34	c0.25	0.30
v/s Ratio Perm		0.05				
v/c Ratio	0.70	0.15	0.85	0.55	0.79	0.64
Uniform Delay, d1	32.5	25.6	44.7	12.9	38.0	25.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	0.3	8.9	1.0	4.0	0.9
Delay (s)	34.8	25.9	53.5	13.9	42.0	25.9
Level of Service	C	C	D	B	D	C
Approach Delay (s/veh)	33.1			27.9	34.0	
Approach LOS	C			C	C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	31.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	120.3	Sum of lost time (s)	18.6
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Edition methodology does not support exclusive ped or hold phases.



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	39	649	986	49	423	419
Future Volume (vph)	39	649	986	49	423	419
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	0.0	4.5	4.5	4.0	4.5
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	3539	1529	1769	3471
Flt Permitted	0.95	1.00	1.00	1.00	0.11	1.00
Satd. Flow (perm)	1770	1583	3539	1529	197	3471
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	41	690	1049	52	450	446
RTOR Reduction (vph)	0	5	0	18	0	0
Lane Group Flow (vph)	41	685	1049	34	450	446
Confl. Peds. (#/hr)				7	7	
Heavy Vehicles (%)	2%	2%	2%	2%	2%	4%
Turn Type	Perm	pt+ov	NA	Perm	D.P+P	NA
Protected Phases		4 5	6		5	2
Permitted Phases	4			6	6	
Actuated Green, G (s)	14.5	56.6	36.9	36.9	74.0	79.0
Effective Green, g (s)	15.5	61.6	37.9	37.9	76.0	80.0
Actuated g/C Ratio	0.15	0.59	0.36	0.36	0.73	0.77
Clearance Time (s)	5.0		5.5	5.5	5.0	5.5
Vehicle Extension (s)	4.0		4.5	4.5	4.0	4.5
Lane Grp Cap (vph)	263	937	1289	557	719	2670
v/s Ratio Prot		c0.43	c0.30		0.23	0.13
v/s Ratio Perm	0.02			0.02	0.23	
v/c Ratio	0.16	0.73	0.81	0.06	0.63	0.17
Uniform Delay, d1	38.6	15.2	29.9	21.5	20.8	3.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	3.2	4.5	0.1	1.9	0.1
Delay (s)	38.9	18.4	34.3	21.6	22.7	3.3
Level of Service	D	B	C	C	C	A
Approach Delay (s/veh)	19.6		33.7			13.1
Approach LOS	B		C			B

Intersection Summary			
HCM 2000 Control Delay (s/veh)	23.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	104.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Edition methodology does not support exclusive ped or hold phases.

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	38	464	2	0	609	276	0	3	7	16	0	20
Future Vol, veh/h	38	464	2	0	609	276	0	3	7	16	0	20
Conflicting Peds, #/hr	4	0	6	6	0	4	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	25	-	-	25	-	-	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	3	50	2	2	2	2	33	14	7	2	11
Mvmt Flow	42	510	2	0	669	303	0	3	8	18	0	22

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	977	0	0	518	0	0	1271	1577	517	1420	1426	826
Stage 1	-	-	-	-	-	-	601	601	-	825	825	-
Stage 2	-	-	-	-	-	-	670	977	-	595	602	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.83	6.34	7.17	6.52	6.31
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.83	-	6.17	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.83	-	6.17	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.297	3.426	3.563	4.018	3.399
Pot Cap-1 Maneuver	706	-	-	1048	-	-	145	93	535	111	135	359
Stage 1	-	-	-	-	-	-	487	444	-	360	387	-
Stage 2	-	-	-	-	-	-	446	292	-	482	489	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	704	-	-	1042	-	-	127	87	532	99	126	357
Mov Cap-2 Maneuver	-	-	-	-	-	-	127	87	-	99	126	-
Stage 1	-	-	-	-	-	-	456	415	-	358	385	-
Stage 2	-	-	-	-	-	-	418	291	-	443	457	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.79	0	23.1	33.46
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	210	704	-	-	1042	-	-	165
HCM Lane V/C Ratio	-	0.052	0.059	-	-	-	-	-	0.239
HCM Control Delay (s/veh)	0	23.1	10.4	-	-	0	-	-	33.5
HCM Lane LOS	A	C	B	-	-	A	-	-	D
HCM 95th %tile Q(veh)	-	0.2	0.2	-	-	0	-	-	0.9

3: JAE Access/SW 115th Avenue & SW Tualatin Road Performance by movement

Movement	EBL	EBT	EBR	WBT	WBR	NBT	NBR	SBL	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Denied Del/Veh (s)	0.4	0.1	0.0	0.2	0.2	0.1	0.1	0.0	0.1	0.2
Total Delay (hr)	0.2	0.4	0.0	1.0	0.4	0.0	0.0	0.1	0.1	2.3
Total Del/Veh (s)	21.6	3.1	0.9	5.7	5.3	29.1	9.0	27.6	11.0	5.6
Stop Delay (hr)	0.2	0.0	0.0	0.4	0.2	0.0	0.0	0.1	0.0	1.0
Stop Del/Veh (s)	17.6	0.0	0.0	2.1	2.8	26.4	7.5	25.9	9.0	2.4

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	9	479	881	16	9	4
Future Vol, veh/h	9	479	881	16	9	4
Conflicting Peds, #/hr	3	0	0	3	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	25	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	3	7	2	11	2
Mvmt Flow	10	515	947	17	10	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	968	0	-	0	1493	959
Stage 1	-	-	-	-	959	-
Stage 2	-	-	-	-	534	-
Critical Hdwy	4.12	-	-	-	6.51	6.22
Critical Hdwy Stg 1	-	-	-	-	5.51	-
Critical Hdwy Stg 2	-	-	-	-	5.51	-
Follow-up Hdwy	2.218	-	-	-	3.599	3.318
Pot Cap-1 Maneuver	712	-	-	-	129	312
Stage 1	-	-	-	-	358	-
Stage 2	-	-	-	-	570	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	710	-	-	-	127	311
Mov Cap-2 Maneuver	-	-	-	-	252	-
Stage 1	-	-	-	-	353	-
Stage 2	-	-	-	-	568	-

Approach	EB	WB	SB
HCM Control Delay, s/v	0.19	0	19.19
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	710	-	-	-	268
HCM Lane V/C Ratio	0.014	-	-	-	0.052
HCM Control Delay (s/veh)	10.1	-	-	-	19.2
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection	
Int Delay, s/veh	1.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	475	10	7	850	58	46
Future Vol, veh/h	475	10	7	850	58	46
Conflicting Peds, #/hr	0	1	1	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	4	20	2	2	3	7
Mvmt Flow	505	11	7	904	62	49

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	517	0	1431	512
Stage 1	-	-	-	-	512	-
Stage 2	-	-	-	-	919	-
Critical Hdwy	-	-	4.12	-	6.43	6.27
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.218	-	3.527	3.363
Pot Cap-1 Maneuver	-	-	1049	-	147	552
Stage 1	-	-	-	-	600	-
Stage 2	-	-	-	-	387	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1048	-	146	552
Mov Cap-2 Maneuver	-	-	-	-	276	-
Stage 1	-	-	-	-	599	-
Stage 2	-	-	-	-	384	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0.07	19.71
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	354	-	-	1048	-
HCM Lane V/C Ratio	0.312	-	-	0.007	-
HCM Control Delay (s/veh)	19.7	-	-	8.5	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	1.3	-	-	0	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	27	16	3	67	17	3
Future Vol, veh/h	27	16	3	67	17	3
Conflicting Peds, #/hr	0	0	3	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	9	2
Mvmt Flow	30	18	3	74	19	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	105	24	25	0	-	0
Stage 1	24	-	-	-	-	-
Stage 2	81	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	893	1053	1589	-	-	-
Stage 1	999	-	-	-	-	-
Stage 2	942	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	886	1050	1585	-	-	-
Mov Cap-2 Maneuver	886	-	-	-	-	-
Stage 1	994	-	-	-	-	-
Stage 2	939	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	9.03	0.31	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	77	-	941	-	-
HCM Lane V/C Ratio	0.002	-	0.051	-	-
HCM Control Delay (s/veh)	7.3	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	6.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	29	142	20	40	31	3
Future Vol, veh/h	29	142	20	40	31	3
Conflicting Peds, #/hr	0	0	7	0	0	7
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	99	99	99	99	99
Heavy Vehicles, %	2	2	2	3	9	2
Mvmt Flow	29	143	20	40	31	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	121	40	41	0	-	0
Stage 1	40	-	-	-	-	-
Stage 2	81	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	875	1032	1568	-	-	-
Stage 1	983	-	-	-	-	-
Stage 2	942	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	852	1025	1557	-	-	-
Mov Cap-2 Maneuver	852	-	-	-	-	-
Stage 1	963	-	-	-	-	-
Stage 2	936	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	9.4	2.45	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	600	-	991	-	-
HCM Lane V/C Ratio	0.013	-	0.174	-	-
HCM Control Delay (s/veh)	7.3	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.6	-	-

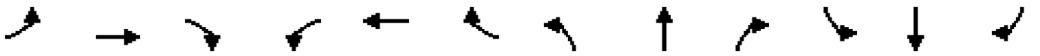
Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	119	15	51	171	3
Future Vol, veh/h	7	119	15	51	171	3
Conflicting Peds, #/hr	0	0	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	8	3	2
Mvmt Flow	9	145	18	62	209	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	313	214	216	0	-	0
Stage 1	214	-	-	-	-	-
Stage 2	99	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	680	826	1354	-	-	-
Stage 1	821	-	-	-	-	-
Stage 2	925	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	665	822	1348	-	-	-
Mov Cap-2 Maneuver	665	-	-	-	-	-
Stage 1	807	-	-	-	-	-
Stage 2	922	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	10.47	1.75	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	409	-	812	-	-
HCM Lane V/C Ratio	0.014	-	0.189	-	-
HCM Control Delay (s/veh)	7.7	0	10.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.7	-	-



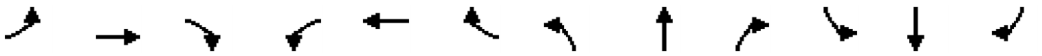
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	29	27	87	2	366	7	668	30	57	395	18
Future Volume (vph)	28	29	27	87	2	366	7	668	30	57	395	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.85		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1583		1719	1562		1262	3512		1770	3342	
Flt Permitted	0.95	1.00		0.95	1.00		0.47	1.00		0.23	1.00	
Satd. Flow (perm)	1736	1583		1719	1562		631	3512		428	3342	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	32	29	95	2	398	8	726	33	62	429	20
RTOR Reduction (vph)	0	23	0	0	295	0	0	3	0	0	2	0
Lane Group Flow (vph)	30	38	0	95	105	0	8	756	0	62	447	0
Confl. Peds. (#/hr)	4					4						
Heavy Vehicles (%)	4%	11%	12%	5%	2%	2%	43%	2%	5%	2%	6%	35%
Turn Type	Prot	NA		Prot	NA		D.P+P	NA		D.P+P	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases							6			2		
Actuated Green, G (s)	2.5	12.4		6.9	16.8		29.4	23.4		29.4	28.6	
Effective Green, g (s)	3.5	13.4		7.9	17.8		31.4	24.4		29.4	28.6	
Actuated g/C Ratio	0.05	0.20		0.11	0.26		0.46	0.36		0.43	0.42	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	88	308		197	404		304	1247		300	1391	
v/s Ratio Prot	0.02	0.02		c0.06	c0.07		0.00	c0.22		c0.02	c0.13	
v/s Ratio Perm							0.01			0.07		
v/c Ratio	0.34	0.12		0.48	0.26		0.03	0.61		0.21	0.32	
Uniform Delay, d1	31.5	22.8		28.5	20.2		10.2	18.2		12.2	13.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.3	0.2		1.9	0.3		0.0	0.8		0.3	0.1	
Delay (s)	33.8	23.0		30.3	20.6		10.2	19.0		12.6	13.6	
Level of Service	C	C		C	C		B	B		B	B	
Approach Delay (s/veh)		26.5			22.4			19.0			13.5	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	68.7	Sum of lost time (s)	17.0
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Signalized Intersection Summary
9: SW 124th Avenue & SW Leveton Drive

07/15/2025



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	29	27	87	2	366	7	668	30	57	395	18
Future Volume (veh/h)	28	29	27	87	2	366	7	668	30	57	395	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1737	1722	1826	1870	1870	1263	1870	1826	1870	1811	1381
Adj Flow Rate, veh/h	30	32	29	95	2	398	8	726	33	62	429	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	11	12	5	2	2	43	2	5	2	6	35
Cap, veh/h	103	244	221	173	3	522	296	976	44	302	1131	53
Arrive On Green	0.06	0.29	0.28	0.10	0.33	0.32	0.02	0.28	0.27	0.08	0.34	0.34
Sat Flow, veh/h	1753	837	759	1739	8	1572	1203	3462	157	1781	3348	156
Grp Volume(v), veh/h	30	0	61	95	0	400	8	373	386	62	220	229
Grp Sat Flow(s),veh/h/ln	1753	0	1596	1739	0	1580	1203	1777	1842	1781	1721	1783
Q Serve(g_s), s	1.1	0.0	2.0	3.6	0.0	15.7	0.3	13.1	13.2	1.6	6.7	6.7
Cycle Q Clear(g_c), s	1.1	0.0	2.0	3.6	0.0	15.7	0.3	13.1	13.2	1.6	6.7	6.7
Prop In Lane	1.00		0.48	1.00		1.00	1.00		0.09	1.00		0.09
Lane Grp Cap(c), veh/h	103	0	465	173	0	525	296	501	519	302	581	602
V/C Ratio(X)	0.29	0.00	0.13	0.55	0.00	0.76	0.03	0.74	0.74	0.21	0.38	0.38
Avail Cap(c_a), veh/h	407	0	718	277	0	710	632	799	828	804	998	1034
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.1	0.0	18.2	29.6	0.0	21.1	13.8	22.5	22.5	16.6	17.3	17.4
Incr Delay (d2), s/veh	1.5	0.0	0.1	2.7	0.0	3.4	0.0	2.2	2.1	0.3	0.4	0.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.7	1.5	0.0	5.7	0.1	5.1	5.3	0.6	2.4	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	32.6	0.0	18.3	32.3	0.0	24.4	13.8	24.7	24.7	16.9	17.7	17.7
LnGrp LOS	C		B	C		C	B	C	C	B	B	B
Approach Vol, veh/h		91			495			767			511	
Approach Delay, s/veh		23.0			25.9			24.6			17.6	
Approach LOS		C			C			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.6	23.5	10.9	24.1	5.7	28.3	8.1	26.9
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	25.0	30.0	10.0	30.0	20.0	40.0	15.0	30.0
Max Q Clear Time (g_c+I1), s	3.6	15.2	5.6	4.0	2.3	8.7	3.1	17.7
Green Ext Time (p_c), s	0.2	3.3	0.1	0.5	0.0	2.1	0.0	3.5

Intersection Summary	
HCM 7th Control Delay, s/veh	23.0
HCM 7th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Intersection Delay, s/veh	19.1
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	91	12	49	461	2	29	2	9	1	0	13
Future Vol, veh/h	6	91	12	49	461	2	29	2	9	1	0	13
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles, %	2	4	2	15	2	2	2	2	40	2	2	2
Mvmt Flow	7	112	15	60	569	2	36	2	11	1	0	16
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	8.8	22.3	9.3	8.4
HCM LOS	A	C	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	73%	6%	10%	7%
Vol Thru, %	5%	83%	90%	0%
Vol Right, %	23%	11%	0%	93%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	40	109	512	14
LT Vol	29	6	49	1
Through Vol	2	91	461	0
RT Vol	9	12	2	13
Lane Flow Rate	49	135	632	17
Geometry Grp	1	1	1	1
Degree of Util (X)	0.079	0.177	0.791	0.025
Departure Headway (Hd)	5.726	4.739	4.504	5.23
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	624	756	803	680
Service Time	3.78	2.777	2.531	3.293
HCM Lane V/C Ratio	0.079	0.179	0.787	0.025
HCM Control Delay, s/veh	9.3	8.8	22.3	8.4
HCM Lane LOS	A	A	C	A
HCM 95th-tile Q	0.3	0.6	8.2	0.1

Intersection	
Int Delay, s/veh	6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	30	58	317	15	81	186
Future Vol, veh/h	30	58	317	15	81	186
Conflicting Peds, #/hr	3	0	0	3	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	82	82	82	82	82	76
Heavy Vehicles, %	2	8	2	2	2	2
Mvmt Flow	37	71	387	18	99	245

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	408	0	-	0	543	399
Stage 1	-	-	-	-	399	-
Stage 2	-	-	-	-	144	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1151	-	-	-	501	651
Stage 1	-	-	-	-	678	-
Stage 2	-	-	-	-	883	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1148	-	-	-	482	649
Mov Cap-2 Maneuver	-	-	-	-	482	-
Stage 1	-	-	-	-	654	-
Stage 2	-	-	-	-	881	-

Approach	EB	WB	SB
HCM Control Delay, s/v	2.81	0	14.02
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	614	-	-	-	482	649
HCM Lane V/C Ratio	0.032	-	-	-	0.205	0.377
HCM Control Delay (s/veh)	8.2	0	-	-	14.4	13.9
HCM Lane LOS	A	A	-	-	B	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.8	1.8

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	126	307	0	2	0
Future Vol, veh/h	1	126	307	0	2	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	2	5	5	2	2	2
Mvmt Flow	1	154	374	0	2	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	374	0	-	0	530	374
Stage 1	-	-	-	-	374	-
Stage 2	-	-	-	-	156	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1184	-	-	-	509	672
Stage 1	-	-	-	-	695	-
Stage 2	-	-	-	-	872	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1184	-	-	-	509	672
Mov Cap-2 Maneuver	-	-	-	-	509	-
Stage 1	-	-	-	-	695	-
Stage 2	-	-	-	-	872	-

Approach	EB	WB	SB
HCM Control Delay, s/v	0.06	0	12.11
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	14	-	-	-	509
HCM Lane V/C Ratio	0.001	-	-	-	0.005
HCM Control Delay (s/veh)	8	0	-	-	12.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	12	134	269	17	33	57
Future Vol, veh/h	12	134	269	17	33	57
Conflicting Peds, #/hr	7	0	0	7	0	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	163	328	21	40	70

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	356	0	-	0	538	347
Stage 1	-	-	-	-	345	-
Stage 2	-	-	-	-	193	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1203	-	-	-	504	696
Stage 1	-	-	-	-	717	-
Stage 2	-	-	-	-	840	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1195	-	-	-	491	690
Mov Cap-2 Maneuver	-	-	-	-	491	-
Stage 1	-	-	-	-	702	-
Stage 2	-	-	-	-	834	-

Approach	EB	WB	SB
HCM Control Delay, s/v	0.66	0	11.61
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	148	-	-	-	491	690
HCM Lane V/C Ratio	0.012	-	-	-	0.082	0.101
HCM Control Delay (s/veh)	8.1	0	-	-	13	10.8
HCM Lane LOS	A	A	-	-	B	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3	0.3

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	165	8	6	248	0	25	0	13	0	0	0
Future Vol, veh/h	0	165	8	6	248	0	25	0	13	0	0	0
Conflicting Peds, #/hr	7	0	5	5	0	7	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2	50	2	2	2	2	2
Mvmt Flow	0	201	10	7	302	0	30	0	16	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	309	0	0	216	0	0	528	535	211	525	540	309
Stage 1	-	-	-	-	-	-	211	211	-	324	324	-
Stage 2	-	-	-	-	-	-	317	324	-	201	216	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.6	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.6	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.6	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.95	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1251	-	-	1354	-	-	394	451	829	463	449	731
Stage 1	-	-	-	-	-	-	693	728	-	688	650	-
Stage 2	-	-	-	-	-	-	603	650	-	801	724	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1243	-	-	1347	-	-	389	443	825	448	441	726
Mov Cap-2 Maneuver	-	-	-	-	-	-	389	443	-	448	441	-
Stage 1	-	-	-	-	-	-	690	724	-	679	641	-
Stage 2	-	-	-	-	-	-	599	641	-	785	721	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0	0.18	13.39	0
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	475	1243	-	-	43	-	-	-
HCM Lane V/C Ratio	0.098	-	-	-	0.005	-	-	-
HCM Control Delay (s/veh)	13.4	0	-	-	7.7	0	-	0
HCM Lane LOS	B	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	-

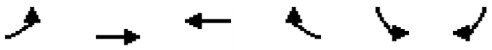
Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	32	148	68	85	160	166
Future Vol, veh/h	32	148	68	85	160	166
Conflicting Peds, #/hr	1	1	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	17	2	2	2	2	2
Mvmt Flow	38	174	80	100	188	195

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	548	288	385	0	-	0
Stage 1	287	-	-	-	-	-
Stage 2	261	-	-	-	-	-
Critical Hdwy	6.57	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.57	-	-	-	-	-
Critical Hdwy Stg 2	5.57	-	-	-	-	-
Follow-up Hdwy	3.653	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	473	751	1174	-	-	-
Stage 1	729	-	-	-	-	-
Stage 2	749	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	438	750	1173	-	-	-
Mov Cap-2 Maneuver	438	-	-	-	-	-
Stage 1	675	-	-	-	-	-
Stage 2	748	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	12.92	3.69	0
HCM LOS	B		

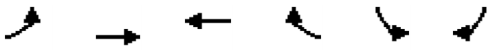
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	800	-	665	-	-
HCM Lane V/C Ratio	0.068	-	0.318	-	-
HCM Control Delay (s/veh)	8.3	0	12.9	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.2	-	1.4	-	-



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	2	338	529	83	291	37
Future Volume (vph)	2	338	529	83	291	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1827	1735		1752	1568
Flt Permitted	0.19	1.00	1.00		0.95	1.00
Satd. Flow (perm)	355	1827	1735		1752	1568
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2	376	588	92	323	41
RTOR Reduction (vph)	0	0	5	0	0	28
Lane Group Flow (vph)	2	376	675	0	323	13
Confl. Peds. (#/hr)	1			1		
Heavy Vehicles (%)	2%	4%	8%	2%	3%	3%
Turn Type	D.P+P	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	6					4
Actuated Green, G (s)	32.1	37.5	31.5		18.9	18.9
Effective Green, g (s)	34.9	38.9	32.9		21.4	21.4
Actuated g/C Ratio	0.51	0.57	0.48		0.31	0.31
Clearance Time (s)	5.4	5.4	5.4		6.5	6.5
Vehicle Extension (s)	2.0	3.1	3.1		2.6	2.6
Lane Grp Cap (vph)	222	1040	835		548	491
v/s Ratio Prot	0.00	c0.21	c0.39		c0.18	
v/s Ratio Perm	0.00					0.01
v/c Ratio	0.01	0.36	0.81		0.59	0.03
Uniform Delay, d1	19.0	8.0	15.0		19.7	16.2
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	0.2	5.8		1.4	0.0
Delay (s)	19.0	8.2	20.8		21.2	16.3
Level of Service	B	A	C		C	B
Approach Delay (s/veh)		8.2	20.8		20.6	
Approach LOS		A	C		C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	17.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	68.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	338	529	83	291	37
Future Volume (veh/h)	2	338	529	83	291	37
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1841	1781	1870	1856	1856
Adj Flow Rate, veh/h	2	376	588	92	323	41
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	4	8	2	3	3
Cap, veh/h	364	1197	864	135	427	380
Arrive On Green	0.02	0.65	0.57	0.56	0.24	0.24
Sat Flow, veh/h	1781	1841	1504	235	1767	1572
Grp Volume(v), veh/h	2	376	0	680	323	41
Grp Sat Flow(s),veh/h/ln	1781	1841	0	1739	1767	1572
Q Serve(g_s), s	0.0	6.6	0.0	20.3	12.6	1.5
Cycle Q Clear(g_c), s	0.0	6.6	0.0	20.3	12.6	1.5
Prop In Lane	1.00			0.14	1.00	1.00
Lane Grp Cap(c), veh/h	364	1197	0	999	427	380
V/C Ratio(X)	0.01	0.31	0.00	0.68	0.76	0.11
Avail Cap(c_a), veh/h	600	1197	0	1536	776	690
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.1	5.7	0.0	11.1	26.0	21.8
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.9	2.2	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.0	0.0	6.6	5.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	17.1	5.8	0.0	11.9	28.2	21.9
LnGrp LOS	B	A		B	C	C
Approach Vol, veh/h		378	680		364	
Approach Delay, s/veh		5.9	11.9		27.5	
Approach LOS		A	B		C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		52.1		21.9	5.6	46.5
Change Period (Y+Rc), s		5.4		6.5	5.4	5.4
Max Green Setting (Gmax), s		45.0		30.0	10.0	64.0
Max Q Clear Time (g_c+I1), s		8.6		14.6	2.0	22.3
Green Ext Time (p_c), s		8.2		0.9	0.0	18.8

Intersection Summary	
HCM 7th Control Delay, s/veh	14.3
HCM 7th LOS	B

Intersection	
Int Delay, s/veh	10.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	397	68	38	771	131	36
Future Vol, veh/h	397	68	38	771	131	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	100	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	5	6	2	2	2
Mvmt Flow	427	73	41	829	141	39

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	500	0	1374	463
Stage 1	-	-	-	-	463	-
Stage 2	-	-	-	-	911	-
Critical Hdwy	-	-	4.16	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.254	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1044	-	160	599
Stage 1	-	-	-	-	633	-
Stage 2	-	-	-	-	392	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1044	-	154	599
Mov Cap-2 Maneuver	-	-	-	-	154	-
Stage 1	-	-	-	-	633	-
Stage 2	-	-	-	-	377	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0.4	87.92
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	154	599	-	-	1044	-
HCM Lane V/C Ratio	0.914	0.065	-	-	0.039	-
HCM Control Delay (s/veh)	108.9	11.4	-	-	8.6	-
HCM Lane LOS	F	B	-	-	A	-
HCM 95th %tile Q(veh)	6.5	0.2	-	-	0.1	-



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	397	68	38	771	131	36
Future Volume (Veh/h)	397	68	38	771	131	36
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	427	73	41	829	141	39
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			TWLTL		
Median storage veh)				2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			500		1375	464
vC1, stage 1 conf vol					464	
vC2, stage 2 conf vol					911	
vCu, unblocked vol			500		1375	464
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.3		3.5	3.3
p0 queue free %			96		59	93
cM capacity (veh/h)			1044		340	599

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	500	41	829	141	39
Volume Left	0	41	0	141	0
Volume Right	73	0	0	0	39
cSH	1700	1044	1700	340	599
Volume to Capacity	0.29	0.04	0.49	0.41	0.07
Queue Length 95th (ft)	0	3	0	49	5
Control Delay (s/veh)	0.0	8.6	0.0	22.9	11.4
Lane LOS		A		C	B
Approach Delay (s/veh)	0.0	0.4		20.4	
Approach LOS				C	

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	54.5%	ICU Level of Service	A
Analysis Period (min)	15		

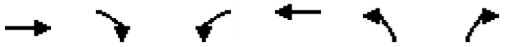
Intersection	
Int Delay, s/veh	8.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	16	7	17	76	277	21
Future Vol, veh/h	16	7	17	76	277	21
Conflicting Peds, #/hr	0	8	8	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	13	2	2	20
Mvmt Flow	17	8	18	83	301	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	33	0	149	29
Stage 1	-	-	-	-	29	-
Stage 2	-	-	-	-	120	-
Critical Hdwy	-	-	4.23	-	6.42	6.4
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.317	-	3.518	3.48
Pot Cap-1 Maneuver	-	-	1511	-	843	996
Stage 1	-	-	-	-	993	-
Stage 2	-	-	-	-	906	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1499	-	826	988
Mov Cap-2 Maneuver	-	-	-	-	826	-
Stage 1	-	-	-	-	986	-
Stage 2	-	-	-	-	894	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	1.36	12.01
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	836	-	-	329	-
HCM Lane V/C Ratio	0.388	-	-	0.012	-
HCM Control Delay (s/veh)	12	-	-	7.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	1.8	-	-	0	-



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	16	7	17	76	277	21
Future Volume (Veh/h)	16	7	17	76	277	21
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	8	18	83	301	23
Pedestrians					8	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			33		148	29
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			33		148	29
tC, single (s)			4.2		6.4	6.4
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.5
p0 queue free %			99		64	98
cM capacity (veh/h)			1499		828	989

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	25	101	324
Volume Left	0	18	301
Volume Right	8	0	23
cSH	1700	1499	837
Volume to Capacity	0.01	0.01	0.39
Queue Length 95th (ft)	0	1	46
Control Delay (s/veh)	0.0	1.4	12.0
Lane LOS		A	B
Approach Delay (s/veh)	0.0	1.4	12.0
Approach LOS			B

Intersection Summary			
Average Delay	8.9		
Intersection Capacity Utilization	34.9%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	11.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	342	1634	30	0	1746
Future Vol, veh/h	0	342	1634	30	0	1746
Conflicting Peds, #/hr	0	0	0	4	4	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	Free	-	None
Storage Length	-	0	-	335	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	2	3	3	4	2	2
Mvmt Flow	0	349	1667	31	0	1782

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	834	0	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.96	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.33	-	-	-	-
Pot Cap-1 Maneuver	0	~ 309	-	0	0	-
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	~ 309	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/veh	$27.38	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	309	-
HCM Lane V/C Ratio	-	1.128	-
HCM Control Delay (s/veh)	-	127.4	-
HCM Lane LOS	-	F	-
HCM 95th %tile Q(veh)	-	14.2	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	342	1634	30	0	1746
Future Volume (Veh/h)	0	342	1634	30	0	1746
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	0	349	1667	31	0	1782
Pedestrians	4					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2562	838			1671	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2562	838			1671	
tC, single (s)	6.8	*6.0			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	9			100	
cM capacity (veh/h)	21	383			379	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	349	834	834	31	891	891
Volume Left	0	0	0	0	0	0
Volume Right	349	0	0	31	0	0
cSH	383	1700	1700	1700	1700	1700
Volume to Capacity	0.91	0.49	0.49	0.02	0.52	0.52
Queue Length 95th (ft)	238	0	0	0	0	0
Control Delay (s/veh)	59.5	0.0	0.0	0.0	0.0	0.0
Lane LOS	F					
Approach Delay (s/veh)	59.5	0.0			0.0	
Approach LOS	F					

Intersection Summary			
Average Delay	5.4		
Intersection Capacity Utilization	73.0%	ICU Level of Service	D
Analysis Period (min)	15		

* User Entered Value

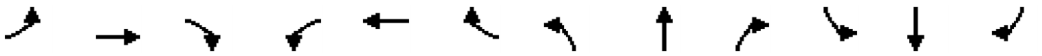
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	289	334	47	340	8	251	157	24	13	123	20
Future Volume (vph)	2	289	334	47	340	8	251	157	24	13	123	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	1.00		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1543	1660		1626	1821		1596	1748		1703	1622	
Flt Permitted	0.43	1.00		0.08	1.00		0.38	1.00		0.62	1.00	
Satd. Flow (perm)	695	1660		145	1821		640	1748		1107	1622	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	2	361	418	59	425	10	314	196	30	16	154	25
RTOR Reduction (vph)	0	19	0	0	0	0	0	0	0	0	4	0
Lane Group Flow (vph)	3	760	0	59	435	0	314	226	0	16	175	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	17%	2%	8%	11%	4%	2%	13%	6%	10%	6%	16%	4%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	57.8	56.9		66.3	61.4		43.0	36.8		22.6	20.4	
Effective Green, g (s)	57.8	57.4		66.3	61.9		43.0	37.3		22.6	20.9	
Actuated g/C Ratio	0.48	0.48		0.55	0.51		0.36	0.31		0.19	0.17	
Clearance Time (s)	4.0	5.5		4.0	5.5		4.0	5.5		4.0	5.5	
Vehicle Extension (s)	2.0	3.2		2.0	3.2		2.0	3.2		2.0	3.2	
Lane Grp Cap (vph)	340	792		146	936		376	541		218	281	
v/s Ratio Prot	0.00	c0.46		c0.02	0.24		c0.13	0.13		0.00	0.11	
v/s Ratio Perm	0.00			0.20			c0.17			0.01		
v/c Ratio	0.01	0.96		0.40	0.46		0.84	0.42		0.07	0.62	
Uniform Delay, d1	16.6	30.3		22.7	18.6		31.7	32.9		40.0	46.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	22.4		0.7	0.4		14.1	0.6		0.1	4.3	
Delay (s)	16.6	52.7		23.4	19.0		45.8	33.5		40.1	50.4	
Level of Service	B	D		C	B		D	C		D	D	
Approach Delay (s/veh)		52.6			19.5			40.6			49.5	
Approach LOS		D			B			D			D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	41.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	120.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Signalized Intersection Summary
20: SW Teton Avenue & SW Herman Road

07/15/2025



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	289	334	47	340	8	251	157	24	13	123	20
Future Volume (veh/h)	2	289	334	47	340	8	251	157	24	13	123	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1648	1870	1781	1737	1841	1870	1707	1811	1752	1811	1663	1841
Adj Flow Rate, veh/h	2	361	418	59	425	10	314	196	30	16	154	25
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	17	2	8	11	4	2	13	6	10	6	16	4
Cap, veh/h	377	383	444	158	931	22	382	456	70	242	189	31
Arrive On Green	0.00	0.48	0.48	0.04	0.52	0.52	0.18	0.30	0.29	0.02	0.14	0.13
Sat Flow, veh/h	1570	790	915	1654	1791	42	1626	1534	235	1725	1395	226
Grp Volume(v), veh/h	2	0	779	59	0	435	314	0	226	16	0	179
Grp Sat Flow(s),veh/h/ln	1570	0	1706	1654	0	1833	1626	0	1768	1725	0	1621
Q Serve(g_s), s	0.1	0.0	47.9	1.9	0.0	16.5	17.8	0.0	11.4	0.9	0.0	11.9
Cycle Q Clear(g_c), s	0.1	0.0	47.9	1.9	0.0	16.5	17.8	0.0	11.4	0.9	0.0	11.9
Prop In Lane	1.00		0.54	1.00		0.02	1.00		0.13	1.00		0.14
Lane Grp Cap(c), veh/h	377	0	827	158	0	953	382	0	525	242	0	220
V/C Ratio(X)	0.01	0.00	0.94	0.37	0.00	0.46	0.82	0.00	0.43	0.07	0.00	0.81
Avail Cap(c_a), veh/h	656	0	840	394	0	953	385	0	919	523	0	813
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.5	0.0	27.2	24.8	0.0	16.7	32.1	0.0	31.4	40.5	0.0	46.5
Incr Delay (d2), s/veh	0.0	0.0	18.4	0.5	0.0	0.4	12.4	0.0	0.6	0.0	0.0	7.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	21.9	0.7	0.0	6.7	8.1	0.0	4.9	0.4	0.0	5.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	15.5	0.0	45.6	25.3	0.0	17.1	44.4	0.0	32.0	40.5	0.0	54.2
LnGrp LOS	B		D	C		B	D		C	D		D
Approach Vol, veh/h		781			494			540			195	
Approach Delay, s/veh		45.5			18.1			39.2			53.0	
Approach LOS		D			B			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.2	58.6	23.8	20.0	4.3	62.5	5.9	37.9
Change Period (Y+Rc), s	4.0	5.5	4.0	5.5	4.0	5.5	4.0	5.5
Max Green Setting (Gmax), s	20.0	54.0	20.0	55.0	20.0	53.0	20.0	57.0
Max Q Clear Time (g_c+I1), s	3.9	49.9	19.8	13.9	2.1	18.5	2.9	13.4
Green Ext Time (p_c), s	0.1	3.2	0.0	0.6	0.0	9.8	0.0	3.2

Intersection Summary	
HCM 7th Control Delay, s/veh	37.8
HCM 7th LOS	D



Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	156	303	311	1742	28	1453	281
Future Volume (vph)	156	303	311	1742	28	1453	281
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.97	1.00	1.00	1.00	1.00	0.95
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1493	1770	3539	1770	3438	1509
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1493	1770	3539	1770	3438	1509
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	170	329	338	1893	30	1579	305
RTOR Reduction (vph)	0	251	0	0	0	0	83
Lane Group Flow (vph)	170	78	338	1893	30	1579	222
Confl. Peds. (#/hr)		21	9				9
Heavy Vehicles (%)	2%	5%	2%	2%	2%	5%	2%
Turn Type	Prot	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	4		5	2	1	6	
Permitted Phases		4					6
Actuated Green, G (s)	14.6	14.6	28.2	104.8	5.1	80.7	80.7
Effective Green, g (s)	15.6	15.6	29.7	106.8	5.6	82.7	82.7
Actuated g/C Ratio	0.11	0.11	0.21	0.76	0.04	0.59	0.59
Clearance Time (s)	5.0	5.0	5.5	6.0	4.5	6.0	6.0
Vehicle Extension (s)	2.5	2.5	2.3	4.5	2.3	4.5	4.5
Lane Grp Cap (vph)	197	166	375	2699	70	2030	891
v/s Ratio Prot	c0.10		c0.19	0.53	0.02	c0.46	
v/s Ratio Perm		0.05					0.15
v/c Ratio	0.86	0.47	0.90	0.70	0.43	0.78	0.25
Uniform Delay, d1	61.1	58.3	53.7	8.5	65.6	21.7	13.8
Progression Factor	1.00	1.00	1.00	1.00	0.97	1.28	1.32
Incremental Delay, d2	29.8	1.5	23.8	1.5	1.6	2.0	0.4
Delay (s)	90.9	59.9	77.5	10.0	65.4	29.9	18.6
Level of Service	F	E	E	B	E	C	B
Approach Delay (s/veh)	70.5			20.2		28.6	
Approach LOS	E			C		C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	29.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	92.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Signalized Intersection Summary
21: OR 99W (Pacific Highway) & SW Fischer Road

07/15/2025



Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (veh/h)	156	303	311	1742	28	1453	281
Future Volume (veh/h)	156	303	311	1742	28	1453	281
Initial Q (Qb), veh	0	0	0	0		0	0
Lane Width Adj.	1.00	1.00	1.00	1.00		1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00				0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00		1.00	1.00
Work Zone On Approach	No			No		No	
Adj Sat Flow, veh/h/ln	1870	1826	1870	1870		1826	1870
Adj Flow Rate, veh/h	170	150	338	1893		1579	305
Peak Hour Factor	0.92	0.92	0.92	0.92		0.92	0.92
Percent Heavy Veh, %	2	5	2	2		5	2
Cap, veh/h	204	177	376	2944		2043	926
Arrive On Green	0.11	0.11	0.21	0.83		1.00	1.00
Sat Flow, veh/h	1781	1547	1781	3647		3561	1573
Grp Volume(v), veh/h	170	150	338	1893		1579	305
Grp Sat Flow(s),veh/h/ln	1781	1547	1781	1777		1735	1573
Q Serve(g_s), s	13.1	13.3	25.9	27.4		0.0	0.0
Cycle Q Clear(g_c), s	13.1	13.3	25.9	27.4		0.0	0.0
Prop In Lane	1.00	1.00	1.00				1.00
Lane Grp Cap(c), veh/h	204	177	376	2944		2043	926
V/C Ratio(X)	0.84	0.85	0.90	0.64		0.77	0.33
Avail Cap(c_a), veh/h	204	177	394	2944		2043	926
HCM Platoon Ratio	1.00	1.00	1.00	1.00		2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00		0.53	0.53
Uniform Delay (d), s/veh	60.7	60.8	53.8	4.4		0.0	0.0
Incr Delay (d2), s/veh	24.4	29.6	21.6	1.1		1.6	0.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0		0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	12.4	13.6	6.7		0.4	0.1
Unsig. Movement Delay, s/veh							
LnGrp Delay(d), s/veh	85.1	90.4	75.3	5.5		1.6	0.5
LnGrp LOS	F	F	E	A		A	A
Approach Vol, veh/h	320			2231		1884	
Approach Delay, s/veh	87.6			16.1		1.4	
Approach LOS	F			B		A	

Timer - Assigned Phs		2		4	5	6	
Phs Duration (G+Y+Rc), s		120.0		20.0	33.6	86.4	
Change Period (Y+Rc), s		6.0		5.0	5.5	6.0	
Max Green Setting (Gmax), s		94.0		15.0	29.5	79.0	
Max Q Clear Time (g_c+I1), s		29.4		15.3	27.9	2.0	
Green Ext Time (p_c), s		62.1		0.0	0.2	65.5	

Intersection Summary	
HCM 7th Control Delay, s/veh	15.0
HCM 7th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.
User approved ignoring U-Turning movement.

HCM Signalized Intersection Capacity Analysis
22: OR 99W (Pacific Highway) & SW 116th Avenue/SW Durham Road

07/15/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	97	71	509	74	355	142	1404	265	459	1094	21
Future Volume (vph)	23	97	71	509	74	355	142	1404	265	459	1094	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0	6.0	5.4	5.4	6.0	5.3	5.0	5.0
Lane Util. Factor		0.95		0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	0.98
Flpb, ped/bikes		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.94		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99		0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3309		1681	1702	1533	1770	3505	1560	3433	3438	1547
Flt Permitted		0.99		0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3309		1681	1702	1533	1770	3505	1560	3433	3438	1547
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	24	103	76	541	79	378	151	1494	282	488	1164	22
RTOR Reduction (vph)	0	64	0	0	0	287	0	0	56	0	0	12
Lane Group Flow (vph)	0	139	0	308	312	91	151	1494	226	488	1164	10
Confl. Peds. (#/hr)	7					7	1		7	7		1
Heavy Vehicles (%)	2%	2%	3%	2%	3%	3%	2%	3%	2%	2%	5%	2%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	3	3		4	4		5	2	4	1	6	
Permitted Phases						4			2			6
Actuated Green, G (s)		12.4		27.9	27.9	27.9	13.4	55.0	82.9	22.0	63.9	63.9
Effective Green, g (s)		12.4		27.9	27.9	27.9	13.4	55.0	82.9	22.0	63.9	63.9
Actuated g/C Ratio		0.09		0.20	0.20	0.20	0.10	0.39	0.59	0.16	0.46	0.46
Clearance Time (s)		6.0		6.0	6.0	6.0	5.4	5.4	6.0	5.3	5.0	5.0
Vehicle Extension (s)		2.3		2.3	2.3	2.3	2.3	4.5	2.3	2.3	4.8	4.8
Lane Grp Cap (vph)		293		334	339	305	169	1376	923	539	1569	706
v/s Ratio Prot		c0.04		0.18	c0.18		0.09	c0.43	0.05	c0.14	0.34	
v/s Ratio Perm						0.06			0.10			0.01
v/c Ratio		0.48		0.92	0.92	0.30	0.89	1.09	0.24	0.91	0.74	0.01
Uniform Delay, d1		60.7		55.0	55.0	47.7	62.6	42.5	13.6	58.0	31.3	20.8
Progression Factor		1.00		1.00	1.00	1.00	0.91	1.18	1.32	1.00	1.00	1.00
Incremental Delay, d2		0.7		29.8	29.2	0.3	31.2	48.0	0.1	18.5	3.2	0.0
Delay (s)		61.4		84.8	84.2	48.1	88.5	98.2	18.0	76.5	34.5	20.9
Level of Service		E		F	F	D	F	F	B	E	C	C
Approach Delay (s/veh)		61.4			70.7			85.7			46.6	
Approach LOS		E			E			F			D	

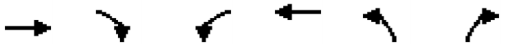
Intersection Summary			
HCM 2000 Control Delay (s/veh)	67.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.7
Intersection Capacity Utilization	96.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM 7th Edition methodology does not support exclusive ped or hold phases.

APPENDIX J.

QUEUING ANALYSIS



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1236	632	961	860	148	302
v/c Ratio	0.89	0.70	0.93	0.34	0.29	0.26
Control Delay (s/veh)	37.3	12.6	51.3	5.6	37.0	17.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	37.3	12.6	51.3	5.6	37.0	17.9
Queue Length 50th (ft)	347	78	286	62	42	60
Queue Length 95th (ft)	#696	298	#574	206	69	119
Internal Link Dist (ft)	1687			1822	503	
Turn Bay Length (ft)		225	550		300	275
Base Capacity (vph)	1396	901	1029	2530	1167	1148
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.70	0.93	0.34	0.13	0.26

Intersection Summary

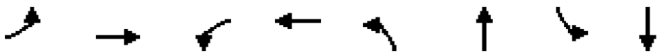
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	46	241	267	45	909	831
v/c Ratio	0.22	0.19	0.55	0.17	0.77	0.30
Control Delay (s/veh)	40.5	0.8	44.5	12.6	18.6	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	40.5	0.8	44.5	12.6	18.6	4.4
Queue Length 50th (ft)	27	0	83	0	217	50
Queue Length 95th (ft)	56	16	130	29	#757	164
Internal Link Dist (ft)	1180		1024			503
Turn Bay Length (ft)	25	300		150	200	
Base Capacity (vph)	504	1459	1246	596	1179	2753
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.17	0.21	0.08	0.77	0.30

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



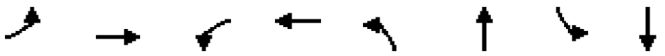
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	8	139	17	45	19	325	240	623
v/c Ratio	0.03	0.32	0.07	0.11	0.03	0.36	0.36	0.29
Control Delay (s/veh)	30.6	20.5	29.7	11.1	9.2	19.4	10.6	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	30.6	20.5	29.7	11.1	9.2	19.4	10.6	11.1
Queue Length 50th (ft)	2	27	3	3	1	30	22	31
Queue Length 95th (ft)	19	106	31	29	19	129	146	217
Internal Link Dist (ft)		981		1223		1392		1024
Turn Bay Length (ft)	100		150		150		150	
Base Capacity (vph)	582	1389	325	1108	927	2371	1081	2839
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.10	0.05	0.04	0.02	0.14	0.22	0.22

Intersection Summary



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	20	402	498	51	7
v/c Ratio	0.03	0.32	0.42	0.13	0.02
Control Delay (s/veh)	2.5	4.8	7.3	16.2	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	2.5	4.8	7.3	16.2	10.7
Queue Length 50th (ft)	1	42	49	11	0
Queue Length 95th (ft)	7	91	195	39	8
Internal Link Dist (ft)		877	1007	781	
Turn Bay Length (ft)	100			135	
Base Capacity (vph)	892	1624	1626	1336	1302
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.02	0.25	0.31	0.04	0.01

Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	11	429	25	247	271	194	16	228
v/c Ratio	0.03	0.77	0.09	0.35	0.58	0.30	0.04	0.55
Control Delay (s/veh)	15.1	34.3	15.5	20.2	23.5	23.9	19.3	38.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	15.1	34.3	15.5	20.2	23.5	23.9	19.3	38.9
Queue Length 50th (ft)	3	200	7	84	99	69	5	114
Queue Length 95th (ft)	15	385	25	199	214	180	21	243
Internal Link Dist (ft)		1007		989		572		1708
Turn Bay Length (ft)	100		100		60		50	
Base Capacity (vph)	564	1043	492	1229	564	1141	655	1301
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.41	0.05	0.20	0.48	0.17	0.02	0.18

Intersection Summary



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Group Flow (vph)	229	353	134	1550	19	1422	102
v/c Ratio	0.81	0.84	0.71	0.64	0.22	0.65	0.11
Control Delay (s/veh)	78.4	41.9	80.4	12.6	76.8	22.0	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	78.4	41.9	80.4	12.6	76.8	22.0	3.1
Queue Length 50th (ft)	201	137	120	393	15	596	6
Queue Length 95th (ft)	294	#281	#214	516	m27	700	m15
Internal Link Dist (ft)	1134			1909		2372	
Turn Bay Length (ft)	275		435		300		200
Base Capacity (vph)	322	449	189	2418	202	2172	955
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.79	0.71	0.64	0.09	0.65	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	84	153	154	159	72	1183	500	388	1138	14
v/c Ratio	0.27	0.77	0.77	0.49	0.62	0.76	0.51	0.71	0.58	0.01
Control Delay (s/veh)	42.7	83.7	83.2	13.1	74.3	32.0	5.3	63.6	21.2	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	42.7	83.7	83.2	13.1	74.3	32.0	5.3	63.6	21.2	0.0
Queue Length 50th (ft)	25	143	143	0	62	497	25	174	358	0
Queue Length 95th (ft)	53	223	225	66	m98	597	32	232	443	0
Internal Link Dist (ft)	481		939			2372			1326	
Turn Bay Length (ft)		300		315	550		140	265		400
Base Capacity (vph)	336	226	228	347	134	1549	999	545	1964	945
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.68	0.68	0.46	0.54	0.76	0.50	0.71	0.58	0.01

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Intersection: 1: SW 124th Avenue & OR 99W (Pacific Highway)

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	T	T	R	L	L	T	T	L	L	R	R
Maximum Queue (ft)	742	741	410	1822	1829	1889	1852	126	124	155	163
Average Queue (ft)	396	394	296	1425	1336	1038	836	52	57	62	66
95th Queue (ft)	673	686	479	2060	2214	2359	2070	103	105	129	133
Link Distance (ft)	1714	1714		1829	1829	1829	1829	496	496		
Upstream Blk Time (%)				1	7	20	7				
Queuing Penalty (veh)				5	28	85	31				
Storage Bay Dist (ft)			225							275	275
Storage Blk Time (%)		27	11								
Queuing Penalty (veh)		162	64								

Intersection: 2: SW 124th Avenue & SW Tualatin Road

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	R	L	T	T
Maximum Queue (ft)	107	167	134	234	78	399	488	174
Average Queue (ft)	38	49	49	105	24	220	92	53
95th Queue (ft)	86	117	107	196	59	416	320	132
Link Distance (ft)		1173	1027	1027			496	496
Upstream Blk Time (%)							0	
Queuing Penalty (veh)							2	
Storage Bay Dist (ft)	25				150	200		
Storage Blk Time (%)	30	13		5		11	1	
Queuing Penalty (veh)	64	5		2		42	5	

Intersection: 3: JAE Access/SW 115th Avenue & SW Tualatin Road

Movement	EB	EB	WB	NB	NB	SB
Directions Served	L	TR	L	L	TR	LTR
Maximum Queue (ft)	73	19	48	45	54	94
Average Queue (ft)	18	1	5	1	6	42
95th Queue (ft)	53	14	27	16	32	75
Link Distance (ft)		1193		552	552	1330
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	25		25			
Storage Blk Time (%)	2		1			
Queuing Penalty (veh)	15		3			

Intersection: 4: SW Tualatin Road & SW 112th Avenue

Movement	SB
Directions Served	LR
Maximum Queue (ft)	66
Average Queue (ft)	23
95th Queue (ft)	57
Link Distance (ft)	540
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: SW 108th Ave & SW Tualatin Road

Movement	EB	WB	NB
Directions Served	TR	L	LR
Maximum Queue (ft)	18	52	65
Average Queue (ft)	1	18	17
95th Queue (ft)	13	49	50
Link Distance (ft)	1064		285
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		25	
Storage Blk Time (%)		4	
Queuing Penalty (veh)		13	

Intersection: 6: SW 108th Ave & North Access

Movement	EB
Directions Served	LR
Maximum Queue (ft)	43
Average Queue (ft)	3
95th Queue (ft)	19
Link Distance (ft)	593
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 7: SW 108th Ave & Center Access

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	35	28
Average Queue (ft)	2	2
95th Queue (ft)	17	14
Link Distance (ft)	421	252
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 8: SW 108th Ave & South Access

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	57	39
Average Queue (ft)	8	4
95th Queue (ft)	36	23
Link Distance (ft)	415	207
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: SW 124th Avenue & SW Leveton Drive

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	81	177	68	76	57	126	208	167	153	166
Average Queue (ft)	9	87	14	22	10	34	80	60	36	56
95th Queue (ft)	44	162	45	57	37	88	168	119	106	125
Link Distance (ft)		1016		1226		1440	1440		1027	1027
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		150		150			150		
Storage Blk Time (%)		10		0		0		0	0	
Queuing Penalty (veh)		1		0		0		1	1	

Intersection: 10: SW 118th Drive/JAE Access & SW Leveton Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	99	74	49	26
Average Queue (ft)	62	31	15	2
95th Queue (ft)	90	58	38	13
Link Distance (ft)	1226	1030	498	610
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: SW Leveton Drive & West Access

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	65	16	40	65
Average Queue (ft)	17	1	9	17
95th Queue (ft)	51	7	34	52
Link Distance (ft)	1030	399	532	532
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 12: SW Leveton Drive & New Access

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 13: SW Leveton Drive & Center Access

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	34	14	40	35
Average Queue (ft)	3	0	11	11
95th Queue (ft)	17	7	37	37
Link Distance (ft)	413	362	352	352
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 14: Calmax Technology Access/East Access & SW Leveton Drive

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 15: SW 108th Ave & SW Leveton Drive

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	81	48
Average Queue (ft)	41	8
95th Queue (ft)	66	35
Link Distance (ft)	556	796
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 16: SW Herman Road & SW 108th Ave

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	44	174	172	65	17
Average Queue (ft)	9	40	57	20	2
95th Queue (ft)	36	114	137	49	10
Link Distance (ft)		933	994		796
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100			135	
Storage Blk Time (%)		1			
Queuing Penalty (veh)		0			

Intersection: 17: SW Teton Avenue & SW Tualatin Road

Movement	EB	WB	WB	NB	NB
Directions Served	TR	L	T	L	R
Maximum Queue (ft)	20	87	83	123	93
Average Queue (ft)	1	34	3	51	40
95th Queue (ft)	12	70	36	100	76
Link Distance (ft)	169		1000		1711
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		25		100	
Storage Blk Time (%)		11		1	0
Queuing Penalty (veh)		36		1	0

Intersection: 18: SW 115th Avenue & SW Hazelbrook Road

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	48	107
Average Queue (ft)	4	52
95th Queue (ft)	25	87
Link Distance (ft)	1163	1330
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 19: OR 99W (Pacific Highway) & SW Hazelbrook Road

Movement	WB	NB	NB	SB	SB
Directions Served	R	T	T	T	T
Maximum Queue (ft)	186	47	35	1804	1752
Average Queue (ft)	31	2	1	559	538
95th Queue (ft)	130	25	16	1872	1852
Link Distance (ft)	1290	1829	1829	1944	1944
Upstream Blk Time (%)				5	4
Queuing Penalty (veh)				40	32
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 20: SW Teton Avenue & SW Herman Road

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	112	370	135	271	159	276	84	218
Average Queue (ft)	11	155	19	100	93	73	10	91
95th Queue (ft)	56	292	69	198	158	187	43	173
Link Distance (ft)		994		1022		604		1711
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	100		100		60		50	
Storage Blk Time (%)		16		7	18	6	0	19
Queuing Penalty (veh)		2		2	33	14	0	3

Intersection: 21: OR 99W (Pacific Highway) & SW Fischer Road

Movement	EB	EB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	L	T	T	U	T	T	R
Maximum Queue (ft)	447	886	395	694	706	348	1570	1564	400
Average Queue (ft)	271	336	252	287	305	52	473	455	77
95th Queue (ft)	455	743	476	736	740	215	1498	1489	302
Link Distance (ft)		1160		1944	1944		2374	2374	
Upstream Blk Time (%)		0					1	2	
Queuing Penalty (veh)		0					8	11	
Storage Bay Dist (ft)	275		435			300			200
Storage Blk Time (%)	15	23	12	2			18	19	
Queuing Penalty (veh)	52	51	90	2			3	19	

Intersection: 22: OR 99W (Pacific Highway) & SW 116th Avenue/SW Durham Road

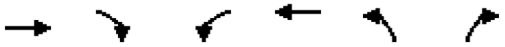
Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	LT	R	L	T	T	R	L	L	T
Maximum Queue (ft)	140	165	273	296	201	163	620	662	315	331	415	929
Average Queue (ft)	20	71	143	178	73	76	307	325	198	190	235	306
95th Queue (ft)	89	145	229	260	145	153	506	559	380	296	377	689
Link Distance (ft)		503		959	959		2374	2374				1364
Upstream Blk Time (%)												1
Queuing Penalty (veh)												0
Storage Bay Dist (ft)	275		300			550			140	265	265	
Storage Blk Time (%)			0	0			1	22	6	1	4	11
Queuing Penalty (veh)			0	0			0	109	37	8	23	42

Intersection: 22: OR 99W (Pacific Highway) & SW 116th Avenue/SW Durham Road

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	889	16
Average Queue (ft)	282	3
95th Queue (ft)	649	13
Link Distance (ft)	1364	
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		400
Storage Blk Time (%)	5	
Queuing Penalty (veh)	1	

Network Summary

Network wide Queuing Penalty: 1145



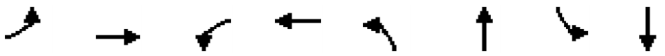
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	860	189	598	1131	703	692
v/c Ratio	0.60	0.26	0.80	0.49	0.78	0.52
Control Delay (s/veh)	30.4	4.9	50.5	11.1	45.0	22.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	30.4	4.9	50.5	11.1	45.0	22.0
Queue Length 50th (ft)	255	0	210	193	244	177
Queue Length 95th (ft)	392	51	292	314	309	289
Internal Link Dist (ft)	1687			1822	503	
Turn Bay Length (ft)		225	550		300	275
Base Capacity (vph)	1435	728	894	2304	1130	1435
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.26	0.67	0.49	0.62	0.48

Intersection Summary



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	39	640	832	50	423	398
v/c Ratio	0.16	0.62	0.75	0.10	0.50	0.15
Control Delay (s/veh)	38.6	14.5	36.4	11.9	20.7	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	38.6	14.5	36.4	11.9	20.7	3.9
Queue Length 50th (ft)	23	216	242	6	111	23
Queue Length 95th (ft)	52	387	370	36	318	77
Internal Link Dist (ft)	1180		1024			503
Turn Bay Length (ft)	25	300		150	200	
Base Capacity (vph)	553	1296	1367	611	838	2698
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.49	0.61	0.08	0.50	0.15

Intersection Summary



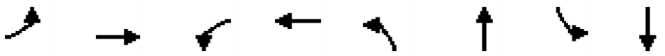
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	29	58	42	232	8	690	34	425
v/c Ratio	0.08	0.16	0.12	0.39	0.02	0.50	0.07	0.31
Control Delay (s/veh)	30.7	15.6	29.6	6.0	11.7	17.3	12.1	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	30.7	15.6	29.6	6.0	11.7	17.3	12.1	13.9
Queue Length 50th (ft)	6	7	9	0	1	65	5	38
Queue Length 95th (ft)	44	42	57	52	11	255	30	152
Internal Link Dist (ft)		981		1223		1392		1024
Turn Bay Length (ft)	100		150		150		150	
Base Capacity (vph)	674	1191	459	1165	701	2633	1107	2634
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.05	0.09	0.20	0.01	0.26	0.03	0.16

Intersection Summary



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	2	351	623	181	39
v/c Ratio	0.00	0.35	0.69	0.36	0.08
Control Delay (s/veh)	4.0	7.7	15.0	19.6	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	4.0	7.7	15.0	19.6	8.2
Queue Length 50th (ft)	0	46	103	33	0
Queue Length 95th (ft)	3	115	352	141	23
Internal Link Dist (ft)		877	1007	781	
Turn Bay Length (ft)	100			135	
Base Capacity (vph)	669	1804	1656	1206	1091
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.00	0.19	0.38	0.15	0.04

Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1	598	58	408	283	216	14	166
v/c Ratio	0.00	0.72	0.20	0.41	0.73	0.39	0.05	0.66
Control Delay (s/veh)	13.0	29.9	14.0	18.1	40.8	34.0	25.4	57.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	13.0	29.9	14.0	18.1	40.8	34.0	25.4	57.3
Queue Length 50th (ft)	0	340	19	166	162	118	7	115
Queue Length 95th (ft)	3	454	38	268	214	186	19	167
Internal Link Dist (ft)		1007		989		572		1708
Turn Bay Length (ft)	100		100		60		50	
Base Capacity (vph)	567	833	444	998	405	902	478	838
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.72	0.13	0.41	0.70	0.24	0.03	0.20

Intersection Summary



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Group Flow (vph)	158	311	326	1704	29	1492	300
v/c Ratio	0.82	0.74	0.89	0.62	0.31	0.73	0.30
Control Delay (s/veh)	91.3	20.5	79.2	8.7	67.2	29.4	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	91.3	20.5	79.2	8.7	67.2	29.4	6.9
Queue Length 50th (ft)	142	20	286	354	26	697	47
Queue Length 95th (ft)	#257	125	#440	453	m36	790	m74
Internal Link Dist (ft)	1134			1909		2372	
Turn Bay Length (ft)	275		435		300		200
Base Capacity (vph)	202	424	391	2756	202	2052	985
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.73	0.83	0.62	0.14	0.73	0.30

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	199	299	303	369	147	1339	239	468	1094	21
v/c Ratio	0.56	0.91	0.91	0.63	0.88	0.96	0.25	0.88	0.69	0.03
Control Delay (s/veh)	46.4	85.4	85.5	10.4	95.5	61.8	4.8	76.6	33.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	46.4	85.4	85.5	10.4	95.5	61.8	4.8	76.6	33.1	0.1
Queue Length 50th (ft)	61	278	283	7	135	613	49	215	416	0
Queue Length 95th (ft)	102	#471	#474	103	m#255	#794	m75	#296	498	0
Internal Link Dist (ft)	481		939			2372			1326	
Turn Bay Length (ft)		300		315	550		140	265		400
Base Capacity (vph)	392	338	342	595	171	1396	983	556	1583	772
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.88	0.89	0.62	0.86	0.96	0.24	0.84	0.69	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Intersection: 1: SW 124th Avenue & OR 99W (Pacific Highway)

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	T	T	R	L	L	T	T	L	L	R	R
Maximum Queue (ft)	374	375	202	611	532	441	418	383	396	315	267
Average Queue (ft)	242	225	69	346	230	181	183	252	258	150	149
95th Queue (ft)	353	338	156	547	405	363	366	355	362	266	245
Link Distance (ft)	1714	1714		1829	1829	1829	1829	496	496		
Upstream Blk Time (%)									0		
Queuing Penalty (veh)									0		
Storage Bay Dist (ft)			225							275	275
Storage Blk Time (%)		7							7	0	0
Queuing Penalty (veh)		13							51	1	0

Intersection: 2: SW 124th Avenue & SW Tualatin Road

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	R	L	T	T
Maximum Queue (ft)	111	448	316	404	120	379	245	196
Average Queue (ft)	33	236	180	239	29	230	33	45
95th Queue (ft)	91	395	287	366	111	414	142	137
Link Distance (ft)		1173	1027	1027			496	496
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	25				150	200		
Storage Blk Time (%)	23	36		26		18	0	
Queuing Penalty (veh)	138	13		12		35	0	

Intersection: 3: JAE Access/SW 115th Avenue & SW Tualatin Road

Movement	EB	WB	NB	SB
Directions Served	L	TR	TR	LTR
Maximum Queue (ft)	76	40	55	75
Average Queue (ft)	21	4	12	23
95th Queue (ft)	57	28	41	64
Link Distance (ft)		800	552	1330
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	25			
Storage Blk Time (%)	5	0		
Queuing Penalty (veh)	24	0		

Intersection: 4: SW Tualatin Road & SW 112th Avenue

Movement	EB	WB	SB
Directions Served	L	TR	LR
Maximum Queue (ft)	35	10	66
Average Queue (ft)	6	0	17
95th Queue (ft)	27	5	53
Link Distance (ft)		1064	540
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	25		
Storage Blk Time (%)	1		
Queuing Penalty (veh)	4		

Intersection: 5: SW 108th Ave & SW Tualatin Road

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	21	89
Average Queue (ft)	2	36
95th Queue (ft)	14	71
Link Distance (ft)		285
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	25	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	2	

Intersection: 6: SW 108th Ave & North Access

Movement	EB
Directions Served	LR
Maximum Queue (ft)	35
Average Queue (ft)	3
95th Queue (ft)	20
Link Distance (ft)	593
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 7: SW 108th Ave & Center Access

Movement	EB
Directions Served	LR
Maximum Queue (ft)	63
Average Queue (ft)	26
95th Queue (ft)	56
Link Distance (ft)	421
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: SW 108th Ave & South Access

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	60	12
Average Queue (ft)	30	0
95th Queue (ft)	57	6
Link Distance (ft)	415	207
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: SW 124th Avenue & SW Leveton Drive

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	77	124	86	107	43	210	206	77	161	198
Average Queue (ft)	24	34	32	52	5	74	93	18	45	66
95th Queue (ft)	58	83	69	92	25	150	174	51	118	147
Link Distance (ft)		1016		1226		1440	1440		1027	1027
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		150		150			150		
Storage Blk Time (%)		1				1			0	
Queuing Penalty (veh)		0				0			0	

Intersection: 10: SW 118th Drive/JAE Access & SW Leveton Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	84	107	65	40
Average Queue (ft)	34	50	20	10
95th Queue (ft)	61	80	45	35
Link Distance (ft)	1226	1030	498	610
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: SW Leveton Drive & West Access

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	40	72	105
Average Queue (ft)	4	32	51
95th Queue (ft)	22	62	85
Link Distance (ft)	1030	531	531
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 12: SW Leveton Drive & New Access

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 13: SW Leveton Drive & Center Access

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	20	59	64
Average Queue (ft)	1	24	25
95th Queue (ft)	11	52	55
Link Distance (ft)	403	352	352
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 14: Calmax Technology Access/East Access & SW Leveton Drive

Movement	NB
Directions Served	LTR
Maximum Queue (ft)	35
Average Queue (ft)	2
95th Queue (ft)	20
Link Distance (ft)	617
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 15: SW 108th Ave & SW Leveton Drive

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	71	40	13
Average Queue (ft)	38	7	0
95th Queue (ft)	57	29	7
Link Distance (ft)	556	796	207
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 16: SW Herman Road & SW 108th Ave

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	27	165	262	137	47
Average Queue (ft)	1	71	120	57	10
95th Queue (ft)	12	129	215	107	27
Link Distance (ft)		933	994		796
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100			135	
Storage Blk Time (%)		2		0	
Queuing Penalty (veh)		0		0	

Intersection: 17: SW Teton Avenue & SW Tualatin Road

Movement	EB	WB	WB	NB	NB
Directions Served	TR	L	T	L	R
Maximum Queue (ft)	10	44	6	190	172
Average Queue (ft)	0	14	0	84	36
95th Queue (ft)	5	42	4	159	105
Link Distance (ft)	169		1000		1711
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		25		100	
Storage Blk Time (%)		2		13	0
Queuing Penalty (veh)		16		4	0

Intersection: 18: SW 115th Avenue & SW Hazelbrook Road

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	19	116
Average Queue (ft)	1	61
95th Queue (ft)	12	98
Link Distance (ft)	1163	1330
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 19: OR 99W (Pacific Highway) & SW Hazelbrook Road

Movement	WB	SB
Directions Served	R	T
Maximum Queue (ft)	484	284
Average Queue (ft)	167	10
95th Queue (ft)	428	208
Link Distance (ft)	1290	1944
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 20: SW Teton Avenue & SW Herman Road

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	14	502	149	271	159	307	65	206
Average Queue (ft)	1	191	35	120	85	92	6	73
95th Queue (ft)	8	394	95	222	157	228	30	158
Link Distance (ft)		994		1022		604		1711
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	100		100		60		50	
Storage Blk Time (%)		20	1	9	17	7	1	15
Queuing Penalty (veh)		0	2	4	32	18	1	2

Intersection: 21: OR 99W (Pacific Highway) & SW Fischer Road

Movement	EB	EB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	L	T	T	U	T	T	R
Maximum Queue (ft)	395	590	460	1226	1204	354	1066	1076	400
Average Queue (ft)	202	256	417	607	556	54	494	499	155
95th Queue (ft)	365	492	521	1348	1308	190	1039	1062	428
Link Distance (ft)		1160		1944	1944		2374	2374	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	275		435			300			200
Storage Blk Time (%)	7	15	37	1			21	28	0
Queuing Penalty (veh)	19	23	290	2			6	77	1

Intersection: 22: OR 99W (Pacific Highway) & SW 116th Avenue/SW Durham Road

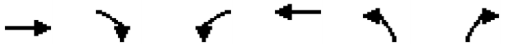
Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	LT	R	L	T	T	R	L	L	T
Maximum Queue (ft)	228	292	375	670	458	674	997	1039	315	322	445	492
Average Queue (ft)	69	135	296	376	210	260	635	654	224	212	250	301
95th Queue (ft)	172	240	419	580	387	630	985	1004	429	316	372	443
Link Distance (ft)		503		959	959		2374	2374				1364
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	275		300			550			140	265	265	
Storage Blk Time (%)	0	1	6	25		0	17	47	0	2	8	12
Queuing Penalty (veh)	0	1	19	61		0	24	106	1	9	41	52

Intersection: 22: OR 99W (Pacific Highway) & SW 116th Avenue/SW Durham Road

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	435	22
Average Queue (ft)	292	4
95th Queue (ft)	425	17
Link Distance (ft)	1364	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		400
Storage Blk Time (%)	1	
Queuing Penalty (veh)	0	

Network Summary

Network wide Queuing Penalty: 1105



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1298	698	1067	902	162	328
v/c Ratio	0.94	0.76	1.04	0.36	0.31	0.28
Control Delay (s/veh)	42.8	15.5	75.6	5.9	37.1	18.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	42.8	15.5	75.6	5.9	37.1	18.0
Queue Length 50th (ft)	380	109	~339	68	46	66
Queue Length 95th (ft)	#756	#391	#670	223	74	130
Internal Link Dist (ft)	1687			1822	503	
Turn Bay Length (ft)		225	550		300	275
Base Capacity (vph)	1387	913	1023	2515	1164	1153
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.76	1.04	0.36	0.14	0.28

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

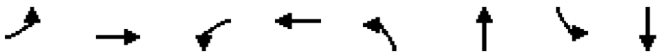
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	48	255	299	47	964	963
v/c Ratio	0.25	0.20	0.63	0.18	0.80	0.34
Control Delay (s/veh)	47.4	0.8	53.3	12.9	20.6	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.3
Total Delay (s/veh)	47.4	0.8	53.3	12.9	20.8	4.7
Queue Length 50th (ft)	35	0	117	0	313	65
Queue Length 95th (ft)	58	17	145	30	#900	197
Internal Link Dist (ft)	1180		1024			503
Turn Bay Length (ft)	25	300		150	200	
Base Capacity (vph)	425	1449	1051	511	1211	2836
Starvation Cap Reductn	0	0	0	0	15	1088
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.18	0.28	0.09	0.81	0.55

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



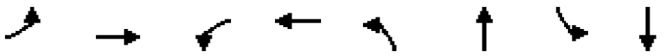
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	8	145	24	60	20	377	327	670
v/c Ratio	0.03	0.38	0.12	0.14	0.04	0.47	0.53	0.39
Control Delay (s/veh)	36.6	26.2	35.7	10.4	10.4	23.6	14.1	14.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	36.6	26.2	35.7	10.4	10.4	23.6	14.1	14.8
Queue Length 50th (ft)	2	36	6	4	2	43	37	40
Queue Length 95th (ft)	21	122	41	36	19	157	203	237
Internal Link Dist (ft)		981		1223		1392		1024
Turn Bay Length (ft)	100		150		150		150	
Base Capacity (vph)	472	1213	264	938	784	2052	913	2537
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.12	0.09	0.06	0.03	0.18	0.36	0.26

Intersection Summary



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	21	424	592	65	7
v/c Ratio	0.03	0.34	0.49	0.17	0.02
Control Delay (s/veh)	2.6	5.0	7.9	18.4	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	2.6	5.0	7.9	18.4	12.3
Queue Length 50th (ft)	1	48	65	13	0
Queue Length 95th (ft)	8	106	259	54	10
Internal Link Dist (ft)		877	1007	781	
Turn Bay Length (ft)	100			135	
Base Capacity (vph)	815	1624	1604	1275	1243
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.03	0.26	0.37	0.05	0.01

Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	12	463	26	299	313	203	17	238
v/c Ratio	0.03	0.76	0.09	0.39	0.70	0.32	0.05	0.60
Control Delay (s/veh)	15.1	33.8	15.5	20.9	31.4	26.7	21.5	44.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	15.1	33.8	15.5	20.9	31.4	26.7	21.5	44.7
Queue Length 50th (ft)	4	250	9	121	144	88	6	146
Queue Length 95th (ft)	15	431	26	243	#271	200	23	266
Internal Link Dist (ft)		1007		989		572		1708
Turn Bay Length (ft)	100		100		60		50	
Base Capacity (vph)	534	939	460	1114	505	1038	606	1185
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.49	0.06	0.27	0.62	0.20	0.03	0.20

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Group Flow (vph)	241	373	141	1638	20	1529	107
v/c Ratio	0.83	0.89	0.75	0.68	0.23	0.71	0.11
Control Delay (s/veh)	79.3	50.6	83.6	13.9	78.6	23.0	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	79.3	50.6	83.6	13.9	78.6	23.0	3.2
Queue Length 50th (ft)	210	167	126	455	16	676	7
Queue Length 95th (ft)	#325	#338	#229	576	m26	779	m15
Internal Link Dist (ft)	1134			1909		2372	
Turn Bay Length (ft)	275		435		300		200
Base Capacity (vph)	322	442	189	2399	202	2154	947
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.84	0.75	0.68	0.10	0.71	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	87	165	164	167	77	1251	527	407	1223	15
v/c Ratio	0.28	0.80	0.78	0.49	0.65	0.82	0.54	0.75	0.65	0.02
Control Delay (s/veh)	42.7	85.6	84.1	12.7	76.8	33.5	5.6	65.3	23.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	42.7	85.6	84.1	12.7	76.8	33.5	5.6	65.3	23.9	0.0
Queue Length 50th (ft)	26	152	151	0	64	548	28	184	413	0
Queue Length 95th (ft)	55	#255	#250	68	m98	645	37	243	494	0
Internal Link Dist (ft)	481		939			2372			1326	
Turn Bay Length (ft)		300		315	550		140	265		400
Base Capacity (vph)	337	228	231	356	134	1533	992	545	1889	913
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.72	0.71	0.47	0.57	0.82	0.53	0.75	0.65	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Intersection: 1: SW 124th Avenue & OR 99W (Pacific Highway)

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	T	T	R	L	L	T	T	L	L	R	R
Maximum Queue (ft)	1388	1417	410	1824	1829	1887	1868	158	161	228	192
Average Queue (ft)	683	710	354	1578	1541	1375	980	64	74	75	77
95th Queue (ft)	1364	1425	502	2167	2326	2582	2221	129	136	164	160
Link Distance (ft)	1714	1714		1829	1829	1829	1829	496	496		
Upstream Blk Time (%)	2	4		2	15	37	4				
Queuing Penalty (veh)	0	0		8	66	168	18				
Storage Bay Dist (ft)			225							275	275
Storage Blk Time (%)		39	23							0	0
Queuing Penalty (veh)		256	140							0	0

Intersection: 2: SW 124th Avenue & SW Tualatin Road

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	R	L	T	T
Maximum Queue (ft)	123	171	198	331	184	395	432	168
Average Queue (ft)	38	48	79	160	34	220	97	49
95th Queue (ft)	92	122	157	277	105	410	334	121
Link Distance (ft)		1173	1027	1027			496	496
Upstream Blk Time (%)							1	
Queuing Penalty (veh)							5	
Storage Bay Dist (ft)	25				150	200		
Storage Blk Time (%)	38	11		12		13	1	
Queuing Penalty (veh)	83	5		5		56	6	

Intersection: 3: JAE Access/SW 115th Avenue & SW Tualatin Road

Movement	EB	EB	WB	NB	NB	SB
Directions Served	L	TR	L	L	TR	LTR
Maximum Queue (ft)	84	30	49	14	56	116
Average Queue (ft)	20	1	5	1	8	44
95th Queue (ft)	58	13	26	12	36	89
Link Distance (ft)		1193		552	552	1330
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	25		25			
Storage Blk Time (%)	2	0	1			
Queuing Penalty (veh)	19	0	3			

Intersection: 4: SW Tualatin Road & SW 112th Avenue

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	7	66
Average Queue (ft)	0	23
95th Queue (ft)	5	55
Link Distance (ft)		540
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	25	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 5: SW 108th Ave & SW Tualatin Road

Movement	EB	WB	NB
Directions Served	TR	L	LR
Maximum Queue (ft)	23	53	75
Average Queue (ft)	1	21	23
95th Queue (ft)	14	51	57
Link Distance (ft)	1064		285
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		25	
Storage Blk Time (%)		6	
Queuing Penalty (veh)		22	

Intersection: 6: SW 108th Ave & North Access

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	34	25
Average Queue (ft)	2	1
95th Queue (ft)	16	14
Link Distance (ft)	593	406
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: SW 108th Ave & Center Access

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	41	53
Average Queue (ft)	12	10
95th Queue (ft)	40	38
Link Distance (ft)	421	252
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 8: SW 108th Ave & South Access

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	50	46
Average Queue (ft)	14	8
95th Queue (ft)	43	33
Link Distance (ft)	415	207
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: SW 124th Avenue & SW Leveton Drive

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	105	200	90	114	42	140	206	156	146	170
Average Queue (ft)	8	96	21	33	8	43	93	72	40	65
95th Queue (ft)	47	179	64	78	32	101	168	128	110	138
Link Distance (ft)		1016		1226		1440	1440		1027	1027
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		150		150			150		
Storage Blk Time (%)		13		0		0		0	0	
Queuing Penalty (veh)		1		0		0		1	0	

Intersection: 10: SW 118th Drive/JAE Access & SW Leveton Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	147	79	41	20
Average Queue (ft)	71	35	19	2
95th Queue (ft)	111	61	40	15
Link Distance (ft)	1226	1030	498	610
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: SW Leveton Drive & West Access

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	80	39	62
Average Queue (ft)	19	8	14
95th Queue (ft)	58	31	46
Link Distance (ft)	1030	532	532
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 12: SW Leveton Drive & New Access

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 13: SW Leveton Drive & Center Access

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	49	7	34	35
Average Queue (ft)	4	0	9	12
95th Queue (ft)	24	5	32	39
Link Distance (ft)	413	362	352	352
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 14: Calmax Technology Access/East Access & SW Leveton Drive

Movement	WB	NB
Directions Served	LTR	LTR
Maximum Queue (ft)	40	40
Average Queue (ft)	4	13
95th Queue (ft)	22	40
Link Distance (ft)	556	617
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 15: SW 108th Ave & SW Leveton Drive

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	144	58	5
Average Queue (ft)	60	12	0
95th Queue (ft)	100	42	4
Link Distance (ft)	556	796	207
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 16: SW Herman Road & SW 108th Ave

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	50	184	221	70	17
Average Queue (ft)	11	49	86	24	2
95th Queue (ft)	40	126	174	54	12
Link Distance (ft)		933	994		796
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100			135	
Storage Blk Time (%)		1			
Queuing Penalty (veh)		0			

Intersection: 17: SW Teton Avenue & SW Tualatin Road

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	45	81	114	106
Average Queue (ft)	3	27	50	42
95th Queue (ft)	22	64	99	83
Link Distance (ft)	169			1711
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		25	100	
Storage Blk Time (%)		9	1	0
Queuing Penalty (veh)		30	1	0

Intersection: 18: SW 115th Avenue & SW Hazelbrook Road

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	47	134
Average Queue (ft)	5	54
95th Queue (ft)	26	98
Link Distance (ft)	1163	1330
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 19: OR 99W (Pacific Highway) & SW Hazelbrook Road

Movement	WB	NB	NB	SB	SB
Directions Served	R	T	T	T	T
Maximum Queue (ft)	201	18	19	1982	1988
Average Queue (ft)	38	1	0	1064	1041
95th Queue (ft)	154	8	9	2571	2571
Link Distance (ft)	1290	1829	1829	1944	1944
Upstream Blk Time (%)				13	12
Queuing Penalty (veh)				118	110
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 20: SW Teton Avenue & SW Herman Road

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	35	380	72	258	159	381	70	209
Average Queue (ft)	5	183	16	119	108	111	11	93
95th Queue (ft)	22	327	48	215	173	275	48	176
Link Distance (ft)		994		1022		604		1711
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	100		100		60		50	
Storage Blk Time (%)		19		11	23	8	1	21
Queuing Penalty (veh)		2		3	44	25	1	3

Intersection: 21: OR 99W (Pacific Highway) & SW Fischer Road

Movement	EB	EB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	L	T	T	U	T	T	R
Maximum Queue (ft)	460	1214	422	603	568	352	2400	2398	400
Average Queue (ft)	338	605	238	247	269	54	1065	1055	124
95th Queue (ft)	534	1282	440	517	523	249	2671	2671	408
Link Distance (ft)		1160		1944	1944		2374	2374	
Upstream Blk Time (%)		21					11	10	
Queuing Penalty (veh)		0					81	79	
Storage Bay Dist (ft)	275		435			300			200
Storage Blk Time (%)	15	46	5	0			44	45	
Queuing Penalty (veh)	53	105	40	0			8	46	

Intersection: 22: OR 99W (Pacific Highway) & SW 116th Avenue/SW Durham Road

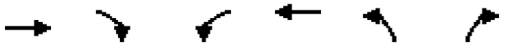
Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	LT	R	L	T	T	R	L	L	T
Maximum Queue (ft)	113	146	365	718	498	382	641	693	315	315	465	1404
Average Queue (ft)	14	71	184	255	97	88	348	367	210	152	285	568
95th Queue (ft)	59	134	328	552	324	225	558	611	400	294	495	1323
Link Distance (ft)		503		959	959		2374	2374				1364
Upstream Blk Time (%)				2	1							19
Queuing Penalty (veh)				0	0							0
Storage Bay Dist (ft)	275		300			550			140	265	265	
Storage Blk Time (%)			8	14			1	26	6	1	3	33
Queuing Penalty (veh)			14	21			1	132	37	3	20	131

Intersection: 22: OR 99W (Pacific Highway) & SW 116th Avenue/SW Durham Road

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	1398	465
Average Queue (ft)	549	18
95th Queue (ft)	1311	160
Link Distance (ft)	1364	
Upstream Blk Time (%)	15	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		400
Storage Blk Time (%)	24	
Queuing Penalty (veh)	4	

Network Summary

Network wide Queuing Penalty: 1976



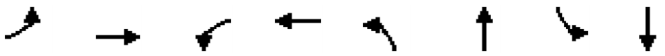
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	903	205	638	1187	778	783
v/c Ratio	0.66	0.29	0.83	0.53	0.82	0.56
Control Delay (s/veh)	33.8	5.6	52.6	12.5	46.3	22.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	33.8	5.6	52.6	12.5	46.3	22.0
Queue Length 50th (ft)	294	4	230	228	278	201
Queue Length 95th (ft)	416	58	314	337	349	338
Internal Link Dist (ft)	1687			1822	503	
Turn Bay Length (ft)		225	550		300	275
Base Capacity (vph)	1365	706	875	2256	1106	1487
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.29	0.73	0.53	0.70	0.53

Intersection Summary



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	41	680	960	52	447	434
v/c Ratio	0.16	0.70	0.79	0.10	0.59	0.16
Control Delay (s/veh)	38.3	18.5	36.4	13.0	25.9	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	38.3	18.5	36.4	13.0	25.9	4.1
Queue Length 50th (ft)	24	295	265	8	157	25
Queue Length 95th (ft)	53	442	443	40	371	84
Internal Link Dist (ft)	1180		1024			503
Turn Bay Length (ft)	25	300		150	200	
Base Capacity (vph)	549	1232	1355	604	761	2676
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.55	0.71	0.09	0.59	0.16

Intersection Summary



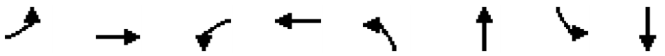
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	30	61	72	309	8	755	50	449
v/c Ratio	0.10	0.19	0.23	0.45	0.02	0.59	0.13	0.31
Control Delay (s/veh)	33.3	17.1	32.4	5.8	11.4	20.9	12.2	14.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	33.3	17.1	32.4	5.8	11.4	20.9	12.2	14.4
Queue Length 50th (ft)	10	11	24	1	1	123	8	44
Queue Length 95th (ft)	46	43	88	59	11	286	40	161
Internal Link Dist (ft)		981		1223		1392		1024
Turn Bay Length (ft)	100		150		150		150	
Base Capacity (vph)	566	1049	385	1054	624	2308	941	2364
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.06	0.19	0.29	0.01	0.33	0.05	0.19

Intersection Summary



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	2	376	670	253	41
v/c Ratio	0.00	0.39	0.76	0.45	0.08
Control Delay (s/veh)	5.0	9.3	18.8	23.1	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	5.0	9.3	18.8	23.1	8.6
Queue Length 50th (ft)	0	62	140	59	0
Queue Length 95th (ft)	3	156	460	224	26
Internal Link Dist (ft)		877	1007	781	
Turn Bay Length (ft)	100			135	
Base Capacity (vph)	582	1740	1603	1110	1008
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.00	0.22	0.42	0.23	0.04

Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	3	702	59	431	306	226	16	179
v/c Ratio	0.01	0.86	0.27	0.44	0.79	0.40	0.06	0.68
Control Delay (s/veh)	13.0	39.3	16.1	19.3	44.8	34.0	25.2	58.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	13.0	39.3	16.1	19.3	44.8	34.0	25.2	58.3
Queue Length 50th (ft)	1	455	19	182	179	124	8	126
Queue Length 95th (ft)	5	#612	39	292	232	194	21	179
Internal Link Dist (ft)		1007		989		572		1708
Turn Bay Length (ft)	100		100		60		50	
Base Capacity (vph)	544	819	381	985	402	887	482	825
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.86	0.15	0.44	0.76	0.25	0.03	0.22

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Group Flow (vph)	170	329	335	1842	30	1573	305
v/c Ratio	0.86	0.79	0.90	0.67	0.31	0.77	0.31
Control Delay (s/veh)	97.5	25.4	80.5	9.8	66.5	30.7	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	97.5	25.4	80.5	9.8	66.5	30.7	7.0
Queue Length 50th (ft)	154	40	296	416	26	753	49
Queue Length 95th (ft)	#283	#177	#459	532	m36	840	m75
Internal Link Dist (ft)	1134			1909		2372	
Turn Bay Length (ft)	275		435		300		200
Base Capacity (vph)	202	420	391	2746	202	2035	975
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.78	0.86	0.67	0.15	0.77	0.31

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	203	308	311	378	151	1453	272	488	1159	22
v/c Ratio	0.57	0.92	0.92	0.64	0.90	1.06	0.28	0.90	0.74	0.03
Control Delay (s/veh)	46.4	87.6	87.0	11.5	95.5	84.5	5.1	78.9	34.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	46.4	87.6	87.0	11.5	95.5	84.5	5.1	78.9	34.9	0.0
Queue Length 50th (ft)	61	289	292	15	139	~764	53	226	453	0
Queue Length 95th (ft)	104	#491	#492	118	m#257	#911	m79	#318	542	0
Internal Link Dist (ft)	481		939			2372			1326	
Turn Bay Length (ft)		300		315	550		140	265		400
Base Capacity (vph)	393	338	342	594	171	1376	977	556	1571	767
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.91	0.91	0.64	0.88	1.06	0.28	0.88	0.74	0.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Intersection: 1: SW 124th Avenue & OR 99W (Pacific Highway)

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	T	T	R	L	L	T	T	L	L	R	R
Maximum Queue (ft)	455	404	262	854	734	427	457	478	506	410	333
Average Queue (ft)	279	261	74	493	327	201	205	302	315	219	172
95th Queue (ft)	407	382	159	848	623	394	404	438	463	413	275
Link Distance (ft)	1714	1714		1829	1829	1829	1829	496	496		
Upstream Blk Time (%)								0	0		
Queuing Penalty (veh)								0	3		
Storage Bay Dist (ft)			225							275	275
Storage Blk Time (%)		14							15	1	1
Queuing Penalty (veh)		27							112	3	3

Intersection: 2: SW 124th Avenue & SW Tualatin Road

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	R	L	T	T
Maximum Queue (ft)	124	582	469	653	335	396	320	229
Average Queue (ft)	39	287	249	387	85	248	51	60
95th Queue (ft)	104	491	414	603	283	426	194	163
Link Distance (ft)		1173	1027	1027			496	496
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	25				150	200		
Storage Blk Time (%)	24	40		46		21	1	
Queuing Penalty (veh)	155	15		23		43	3	

Intersection: 3: JAE Access/SW 115th Avenue & SW Tualatin Road

Movement	EB	EB	WB	NB	SB
Directions Served	L	TR	TR	TR	LTR
Maximum Queue (ft)	64	50	82	60	77
Average Queue (ft)	26	3	5	11	26
95th Queue (ft)	59	29	37	41	61
Link Distance (ft)		1193	800	552	1330
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	25				
Storage Blk Time (%)	8	0	0		
Queuing Penalty (veh)	36	0	0		

Intersection: 4: SW Tualatin Road & SW 112th Avenue

Movement	EB	WB	SB
Directions Served	L	TR	LR
Maximum Queue (ft)	35	12	73
Average Queue (ft)	7	0	19
95th Queue (ft)	30	7	56
Link Distance (ft)		1064	540
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	25		
Storage Blk Time (%)	1		
Queuing Penalty (veh)	6		

Intersection: 5: SW 108th Ave & SW Tualatin Road

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	33	112
Average Queue (ft)	2	47
95th Queue (ft)	15	91
Link Distance (ft)		285
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	25	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	1	

Intersection: 6: SW 108th Ave & North Access

Movement	EB
Directions Served	LR
Maximum Queue (ft)	35
Average Queue (ft)	2
95th Queue (ft)	15
Link Distance (ft)	593
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 7: SW 108th Ave & Center Access

Movement	EB
Directions Served	LR
Maximum Queue (ft)	97
Average Queue (ft)	47
95th Queue (ft)	78
Link Distance (ft)	421
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: SW 108th Ave & South Access

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	68	12
Average Queue (ft)	35	1
95th Queue (ft)	56	8
Link Distance (ft)	415	207
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: SW 124th Avenue & SW Leveton Drive

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	76	149	105	164	58	224	285	82	160	187
Average Queue (ft)	24	48	45	79	7	79	124	29	47	66
95th Queue (ft)	57	111	87	131	33	159	228	63	115	143
Link Distance (ft)		1016		1226		1440	1440		1027	1027
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		150		150			150		
Storage Blk Time (%)		4		0		1			0	
Queuing Penalty (veh)		1		0		0			0	

Intersection: 10: SW 118th Drive/JAE Access & SW Leveton Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	76	121	64	43
Average Queue (ft)	39	64	24	12
95th Queue (ft)	65	99	47	39
Link Distance (ft)	1226	1030	498	610
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: SW Leveton Drive & West Access

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	40	6	77	95
Average Queue (ft)	6	0	35	50
95th Queue (ft)	28	5	65	81
Link Distance (ft)	1030	408	531	531
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 12: SW Leveton Drive & New Access

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 13: SW Leveton Drive & Center Access

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	26	57	56
Average Queue (ft)	2	27	25
95th Queue (ft)	17	54	54
Link Distance (ft)	403	352	352
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 14: Calmax Technology Access/East Access & SW Leveton Drive

Movement	WB	NB
Directions Served	LTR	LTR
Maximum Queue (ft)	25	98
Average Queue (ft)	1	35
95th Queue (ft)	11	79
Link Distance (ft)	556	617
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 15: SW 108th Ave & SW Leveton Drive

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	96	55	12
Average Queue (ft)	48	10	0
95th Queue (ft)	80	39	6
Link Distance (ft)	556	796	207
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 16: SW Herman Road & SW 108th Ave

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	27	158	330	156	39
Average Queue (ft)	1	78	145	78	10
95th Queue (ft)	12	135	265	132	27
Link Distance (ft)		933	994		796
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100			135	
Storage Blk Time (%)		2		1	
Queuing Penalty (veh)		0		0	

Intersection: 17: SW Teton Avenue & SW Tualatin Road

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	10	61	186	114
Average Queue (ft)	0	15	91	30
95th Queue (ft)	4	47	163	89
Link Distance (ft)	169			1711
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		25	100	
Storage Blk Time (%)		3	15	0
Queuing Penalty (veh)		21	5	0

Intersection: 18: SW 115th Avenue & SW Hazelbrook Road

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	14	242
Average Queue (ft)	1	66
95th Queue (ft)	7	170
Link Distance (ft)	1163	1330
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 19: OR 99W (Pacific Highway) & SW Hazelbrook Road

Movement	WB	NB	SB	SB
Directions Served	R	T	T	T
Maximum Queue (ft)	913	10	170	164
Average Queue (ft)	519	0	12	12
95th Queue (ft)	1066	7	178	172
Link Distance (ft)	1290	1829	1944	1944
Upstream Blk Time (%)	2			
Queuing Penalty (veh)	5			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 20: SW Teton Avenue & SW Herman Road

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	14	675	135	366	159	524	77	237
Average Queue (ft)	1	285	37	140	106	123	11	83
95th Queue (ft)	6	602	97	266	178	329	45	171
Link Distance (ft)		994		1022		604		1711
Upstream Blk Time (%)		0				0		
Queuing Penalty (veh)		0				0		
Storage Bay Dist (ft)	100		100		60		50	
Storage Blk Time (%)		29	1	12	25	11	1	21
Queuing Penalty (veh)		1	4	6	48	29	1	3

Intersection: 21: OR 99W (Pacific Highway) & SW Fischer Road

Movement	EB	EB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	L	T	T	U	T	T	R
Maximum Queue (ft)	460	742	460	1488	1495	363	1334	1338	400
Average Queue (ft)	249	317	436	868	827	73	619	621	177
95th Queue (ft)	442	620	523	1535	1538	225	1264	1280	462
Link Distance (ft)		1160		1944	1944		2374	2374	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	275		435			300			200
Storage Blk Time (%)	14	19	42	7			26	31	
Queuing Penalty (veh)	43	31	360	21			7	86	

Intersection: 22: OR 99W (Pacific Highway) & SW 116th Avenue/SW Durham Road

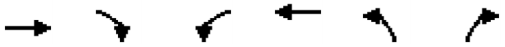
Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	LT	R	L	T	T	R	L	L	T
Maximum Queue (ft)	219	281	375	804	753	675	2382	2393	315	351	464	569
Average Queue (ft)	78	148	323	535	401	348	1483	1509	249	229	276	323
95th Queue (ft)	179	240	435	972	921	771	2681	2702	433	332	406	487
Link Distance (ft)		503		959	959		2374	2374				1364
Upstream Blk Time (%)				10	9		1	1				
Queuing Penalty (veh)				0	0		7	13				
Storage Bay Dist (ft)	275		300			550			140	265	265	
Storage Blk Time (%)	0	0	19	40			41	54	1	3	11	15
Queuing Penalty (veh)	0	0	63	101			58	139	4	14	60	67

Intersection: 22: OR 99W (Pacific Highway) & SW 116th Avenue/SW Durham Road

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	482	113
Average Queue (ft)	313	8
95th Queue (ft)	449	74
Link Distance (ft)	1364	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		400
Storage Blk Time (%)	2	
Queuing Penalty (veh)	0	

Network Summary

Network wide Queuing Penalty: 1630



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1298	756	1120	902	171	335
v/c Ratio	0.94	0.81	1.10	0.36	0.32	0.29
Control Delay (s/veh)	43.2	17.3	93.2	6.0	37.3	18.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	43.2	17.3	93.2	6.0	37.3	18.1
Queue Length 50th (ft)	382	128	~391	70	50	68
Queue Length 95th (ft)	#759	#491	#717	225	77	132
Internal Link Dist (ft)	1687			1822	503	
Turn Bay Length (ft)		225	550		300	275
Base Capacity (vph)	1385	934	1021	2510	1163	1155
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.81	1.10	0.36	0.15	0.29

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

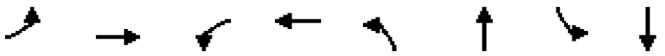
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	48	257	315	47	989	1060
v/c Ratio	0.23	0.20	0.61	0.17	0.86	0.39
Control Delay (s/veh)	40.7	0.8	45.0	12.3	24.6	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.2
Total Delay (s/veh)	40.7	0.8	45.0	12.3	24.6	5.1
Queue Length 50th (ft)	28	0	97	0	313	70
Queue Length 95th (ft)	58	17	152	30	#929	223
Internal Link Dist (ft)	1180		1024			503
Turn Bay Length (ft)	25	300		150	200	
Base Capacity (vph)	504	1455	1246	597	1150	2751
Starvation Cap Reductn	0	0	0	0	0	873
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.18	0.25	0.08	0.86	0.56

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



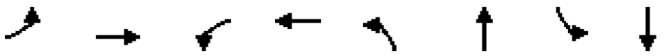
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	8	145	28	76	20	401	423	670
v/c Ratio	0.04	0.39	0.14	0.18	0.04	0.50	0.66	0.37
Control Delay (s/veh)	38.4	28.0	37.2	9.8	10.3	24.2	16.8	14.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	38.4	28.0	37.2	9.8	10.3	24.2	16.8	14.4
Queue Length 50th (ft)	2	40	8	4	2	50	52	41
Queue Length 95th (ft)	21	124	47	39	19	163	272	237
Internal Link Dist (ft)		981		1223		1392		1024
Turn Bay Length (ft)	100		150		150		150	
Base Capacity (vph)	448	1151	251	899	773	1937	892	2423
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.13	0.11	0.08	0.03	0.21	0.47	0.28

Intersection Summary



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	21	424	651	76	7
v/c Ratio	0.04	0.37	0.60	0.21	0.02
Control Delay (s/veh)	3.6	5.5	11.3	22.8	14.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	3.6	5.5	11.3	22.8	14.7
Queue Length 50th (ft)	1	50	79	15	0
Queue Length 95th (ft)	8	113	310	67	10
Internal Link Dist (ft)		877	1007	781	
Turn Bay Length (ft)	100			135	
Base Capacity (vph)	701	1624	1559	1096	1069
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.03	0.26	0.42	0.07	0.01

Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	12	474	26	310	359	203	17	238
v/c Ratio	0.03	0.75	0.09	0.39	0.81	0.33	0.05	0.62
Control Delay (s/veh)	15.0	33.7	15.5	21.1	39.7	27.4	21.9	46.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	15.0	33.7	15.5	21.1	39.7	27.4	21.9	46.8
Queue Length 50th (ft)	4	265	9	129	179	92	7	153
Queue Length 95th (ft)	15	446	26	254	#385	200	23	266
Internal Link Dist (ft)		1007		989		572		1708
Turn Bay Length (ft)	100		100		60		50	
Base Capacity (vph)	529	882	447	1052	483	976	590	1114
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.54	0.06	0.29	0.74	0.21	0.03	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Group Flow (vph)	241	376	142	1646	20	1578	107
v/c Ratio	0.83	0.90	0.75	0.69	0.23	0.73	0.11
Control Delay (s/veh)	78.9	52.9	84.1	14.0	79.1	23.7	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	78.9	52.9	84.1	14.0	79.1	23.7	3.3
Queue Length 50th (ft)	210	173	127	464	16	714	7
Queue Length 95th (ft)	#325	#348	#231	583	m25	817	m15
Internal Link Dist (ft)	1134			1909		2372	
Turn Bay Length (ft)	275		435		300		200
Base Capacity (vph)	322	440	189	2397	202	2152	945
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.85	0.75	0.69	0.10	0.73	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	87	170	168	167	77	1258	529	407	1262	15
v/c Ratio	0.28	0.82	0.80	0.49	0.65	0.82	0.54	0.75	0.67	0.02
Control Delay (s/veh)	42.7	87.8	85.4	12.7	77.0	33.8	5.6	65.3	24.6	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	42.7	87.8	85.4	12.7	77.0	33.8	5.6	65.3	24.6	0.0
Queue Length 50th (ft)	26	157	155	0	64	552	28	184	434	0
Queue Length 95th (ft)	55	#267	#258	68	m98	650	37	243	517	0
Internal Link Dist (ft)	481		939			2372			1326	
Turn Bay Length (ft)		300		315	550		140	265		400
Base Capacity (vph)	337	228	231	356	134	1530	992	545	1887	912
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.75	0.73	0.47	0.57	0.82	0.53	0.75	0.67	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Intersection: 1: SW 124th Avenue & OR 99W (Pacific Highway)

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	T	T	R	L	L	T	T	L	L	R	R
Maximum Queue (ft)	1750	1772	410	1823	1829	1889	1864	136	141	181	192
Average Queue (ft)	1133	1199	399	1650	1649	1497	1187	57	67	74	77
95th Queue (ft)	2004	2058	469	2103	2188	2563	2394	113	122	154	154
Link Distance (ft)	1714	1714		1829	1829	1829	1829	496	496		
Upstream Blk Time (%)	6	15		4	13	40	11				
Queuing Penalty (veh)	0	0		17	60	188	51				
Storage Bay Dist (ft)			225							275	275
Storage Blk Time (%)		45	34								
Queuing Penalty (veh)		316	209								

Intersection: 2: SW 124th Avenue & SW Tualatin Road

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	R	L	T	T
Maximum Queue (ft)	115	164	160	267	118	399	486	172
Average Queue (ft)	41	52	56	123	31	210	80	45
95th Queue (ft)	95	122	115	230	77	386	283	120
Link Distance (ft)		1173	1027	1027			496	496
Upstream Blk Time (%)							0	
Queuing Penalty (veh)							1	
Storage Bay Dist (ft)	25				150	200		
Storage Blk Time (%)	32	15		8	0	10	1	
Queuing Penalty (veh)	72	6		3	0	50	8	

Intersection: 3: JAE Access/SW 115th Avenue & SW Tualatin Road

Movement	EB	EB	WB	WB	NB	NB	SB
Directions Served	L	TR	L	TR	L	TR	LTR
Maximum Queue (ft)	82	37	34	10	22	59	95
Average Queue (ft)	19	2	2	1	2	8	45
95th Queue (ft)	56	29	19	7	16	37	83
Link Distance (ft)		1193		800	552	552	1330
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	25		25				
Storage Blk Time (%)	2	0	0	0			
Queuing Penalty (veh)	20	0	1	0			

Intersection: 4: SW Tualatin Road & SW 112th Avenue

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	7	72
Average Queue (ft)	0	25
95th Queue (ft)	5	59
Link Distance (ft)		540
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	25	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 5: SW 108th Ave & SW Tualatin Road

Movement	EB	WB	WB	NB
Directions Served	TR	L	T	LR
Maximum Queue (ft)	5	84	20	78
Average Queue (ft)	0	29	1	25
95th Queue (ft)	4	61	14	62
Link Distance (ft)	1064		727	285
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		25		
Storage Blk Time (%)		8		
Queuing Penalty (veh)		31		

Intersection: 6: SW 108th Ave & North Access

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	63	49
Average Queue (ft)	10	2
95th Queue (ft)	43	20
Link Distance (ft)	593	406
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: SW 108th Ave & Center Access

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	46	62
Average Queue (ft)	21	14
95th Queue (ft)	51	46
Link Distance (ft)	421	252
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 8: SW 108th Ave & South Access

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	65	63
Average Queue (ft)	22	10
95th Queue (ft)	53	42
Link Distance (ft)	415	207
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: SW 124th Avenue & SW Leveton Drive

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	102	225	111	145	65	126	226	183	179	159
Average Queue (ft)	9	106	29	37	11	45	109	88	40	57
95th Queue (ft)	49	199	82	95	39	100	199	155	117	121
Link Distance (ft)		1016		1226		1440	1440		1027	1027
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		150		150			150		
Storage Blk Time (%)		15	0	0		0		1	0	
Queuing Penalty (veh)		1	0	0		0		3	0	

Intersection: 10: SW 118th Drive/JAE Access & SW Leveton Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	194	100	59	27
Average Queue (ft)	87	43	24	3
95th Queue (ft)	151	79	48	19
Link Distance (ft)	1226	1030	498	610
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: SW Leveton Drive & West Access

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	94	34	83
Average Queue (ft)	27	8	22
95th Queue (ft)	69	30	61
Link Distance (ft)	1030	532	532
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 12: SW Leveton Drive & New Access

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	34	39
Average Queue (ft)	3	10
95th Queue (ft)	18	36
Link Distance (ft)	399	328
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: SW Leveton Drive & Center Access

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	40	45	39
Average Queue (ft)	8	10	15
95th Queue (ft)	34	37	43
Link Distance (ft)	413	352	352
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 14: Calmax Technology Access/East Access & SW Leveton Drive

Movement	EB	WB	NB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	7	42	45
Average Queue (ft)	0	5	13
95th Queue (ft)	5	27	41
Link Distance (ft)	362	556	617
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 15: SW 108th Ave & SW Leveton Drive

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	154	94	5
Average Queue (ft)	73	18	0
95th Queue (ft)	128	60	4
Link Distance (ft)	556	796	207
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 16: SW Herman Road & SW 108th Ave

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	59	226	216	102	17
Average Queue (ft)	11	61	97	30	3
95th Queue (ft)	40	150	189	70	12
Link Distance (ft)		933	994		796
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100			135	
Storage Blk Time (%)	0	2		0	
Queuing Penalty (veh)	0	0		0	

Intersection: 17: SW Teton Avenue & SW Tualatin Road

Movement	EB	WB	WB	NB	NB
Directions Served	TR	L	T	L	R
Maximum Queue (ft)	12	83	48	142	93
Average Queue (ft)	0	34	2	60	38
95th Queue (ft)	9	69	26	114	75
Link Distance (ft)	169		1000		1711
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		25		100	
Storage Blk Time (%)		11		2	0
Queuing Penalty (veh)		39		1	0

Intersection: 18: SW 115th Avenue & SW Hazelbrook Road

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	60	136
Average Queue (ft)	6	56
95th Queue (ft)	33	99
Link Distance (ft)	1163	1330
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 19: OR 99W (Pacific Highway) & SW Hazelbrook Road

Movement	WB	NB	NB	SB	SB
Directions Served	R	T	T	T	T
Maximum Queue (ft)	224	23	26	1973	1977
Average Queue (ft)	45	1	1	1229	1219
95th Queue (ft)	166	14	14	2701	2703
Link Distance (ft)	1290	1829	1829	1944	1944
Upstream Blk Time (%)				16	15
Queuing Penalty (veh)				149	141
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 20: SW Teton Avenue & SW Herman Road

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	78	514	133	290	159	410	85	202
Average Queue (ft)	10	214	16	133	120	135	13	99
95th Queue (ft)	54	400	63	235	178	305	51	182
Link Distance (ft)		994		1022		604		1711
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	100		100		60		50	
Storage Blk Time (%)		23		14	29	9	0	23
Queuing Penalty (veh)		3		3	56	30	1	4

Intersection: 21: OR 99W (Pacific Highway) & SW Fischer Road

Movement	EB	EB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	L	T	T	U	T	T	R
Maximum Queue (ft)	460	1127	417	684	704	348	2405	2411	400
Average Queue (ft)	328	585	249	347	365	69	1289	1285	144
95th Queue (ft)	531	1231	464	889	889	285	2970	2972	445
Link Distance (ft)		1160		1944	1944		2374	2374	
Upstream Blk Time (%)		19					15	16	
Queuing Penalty (veh)		0					115	124	
Storage Bay Dist (ft)	275		435			300			200
Storage Blk Time (%)	14	48	13	2			52	53	
Queuing Penalty (veh)	49	111	101	3			10	54	

Intersection: 22: OR 99W (Pacific Highway) & SW 116th Avenue/SW Durham Road

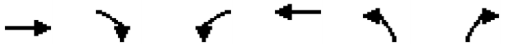
Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	LT	R	L	T	T	R	L	L	T
Maximum Queue (ft)	142	174	375	899	688	261	618	697	315	294	465	1411
Average Queue (ft)	18	77	229	374	169	75	345	375	215	156	322	721
95th Queue (ft)	70	142	396	846	611	183	578	649	394	298	545	1552
Link Distance (ft)		503		959	959		2374	2374				1364
Upstream Blk Time (%)				9	5							29
Queuing Penalty (veh)				0	0							0
Storage Bay Dist (ft)	275		300			550			140	265	265	
Storage Blk Time (%)	0	0	24	29			1	25	8	2	5	43
Queuing Penalty (veh)	0	0	43	45			1	131	46	15	31	170

Intersection: 22: OR 99W (Pacific Highway) & SW 116th Avenue/SW Durham Road

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	1402	464
Average Queue (ft)	695	28
95th Queue (ft)	1541	205
Link Distance (ft)	1364	
Upstream Blk Time (%)	22	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		400
Storage Blk Time (%)	36	
Queuing Penalty (veh)	5	

Network Summary

Network wide Queuing Penalty: 2521



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	903	212	645	1187	833	823
v/c Ratio	0.68	0.30	0.83	0.53	0.85	0.57
Control Delay (s/veh)	35.2	5.8	52.9	13.0	48.0	22.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	35.2	5.8	52.9	13.0	48.0	22.0
Queue Length 50th (ft)	312	4	236	244	304	208
Queue Length 95th (ft)	416	60	318	337	379	361
Internal Link Dist (ft)	1687			1822	503	
Turn Bay Length (ft)		225	550		300	275
Base Capacity (vph)	1330	697	864	2227	1092	1503
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.30	0.75	0.53	0.76	0.55

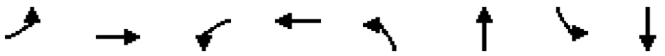
Intersection Summary



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	41	690	1049	52	450	446
v/c Ratio	0.16	0.73	0.81	0.09	0.63	0.17
Control Delay (s/veh)	38.1	20.8	36.6	13.8	28.2	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	38.1	20.8	36.6	13.8	28.2	4.3
Queue Length 50th (ft)	24	316	294	9	168	26
Queue Length 95th (ft)	53	457	#530	41	383	86
Internal Link Dist (ft)	1180		1024			503
Turn Bay Length (ft)	25	300		150	200	
Base Capacity (vph)	547	1194	1351	600	719	2668
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.58	0.78	0.09	0.63	0.17

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



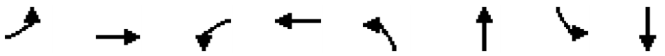
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	30	61	95	400	8	759	62	449
v/c Ratio	0.11	0.19	0.30	0.55	0.02	0.63	0.16	0.30
Control Delay (s/veh)	33.6	17.3	33.9	6.2	11.6	23.0	12.4	14.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	33.6	17.3	33.9	6.2	11.6	23.0	12.4	14.1
Queue Length 50th (ft)	10	11	32	1	1	128	11	46
Queue Length 95th (ft)	46	44	111	66	11	290	47	161
Internal Link Dist (ft)		981		1223		1392		1024
Turn Bay Length (ft)	100		150		150		150	
Base Capacity (vph)	533	984	363	1049	615	2158	897	2208
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.06	0.26	0.38	0.01	0.35	0.07	0.20

Intersection Summary



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	2	376	680	323	41
v/c Ratio	0.01	0.39	0.77	0.55	0.07
Control Delay (s/veh)	6.0	10.2	20.4	25.8	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	6.0	10.2	20.4	25.8	8.5
Queue Length 50th (ft)	0	73	170	90	0
Queue Length 95th (ft)	3	166	493	295	26
Internal Link Dist (ft)		877	1007	781	
Turn Bay Length (ft)	100			135	
Base Capacity (vph)	533	1729	1566	998	911
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.00	0.22	0.43	0.32	0.05

Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	3	779	59	435	314	226	16	179
v/c Ratio	0.01	0.95	0.36	0.44	0.81	0.40	0.06	0.68
Control Delay (s/veh)	13.0	52.2	18.9	19.4	46.3	33.9	25.2	58.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	13.0	52.2	18.9	19.4	46.3	33.9	25.2	58.4
Queue Length 50th (ft)	1	553	19	184	185	124	8	126
Queue Length 95th (ft)	5	#756	39	295	239	194	21	179
Internal Link Dist (ft)		1007		989		572		1708
Turn Bay Length (ft)	100		100		60		50	
Base Capacity (vph)	540	816	342	983	403	886	482	824
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.95	0.17	0.44	0.78	0.26	0.03	0.22

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Group Flow (vph)	170	329	338	1893	30	1579	305
v/c Ratio	0.86	0.79	0.90	0.69	0.31	0.78	0.31
Control Delay (s/veh)	97.5	25.4	81.0	10.2	66.6	30.9	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	97.5	25.4	81.0	10.2	66.6	30.9	7.0
Queue Length 50th (ft)	154	40	299	441	26	758	48
Queue Length 95th (ft)	#283	#177	#465	564	m36	842	m75
Internal Link Dist (ft)	1134			1909		2372	
Turn Bay Length (ft)	275		435		300		200
Base Capacity (vph)	202	420	391	2746	202	2032	974
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.78	0.86	0.69	0.15	0.78	0.31

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	203	308	312	378	151	1494	282	488	1164	22
v/c Ratio	0.57	0.92	0.92	0.64	0.90	1.09	0.29	0.90	0.74	0.03
Control Delay (s/veh)	46.4	87.6	87.5	11.5	94.5	94.3	5.4	78.9	35.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	46.4	87.6	87.5	11.5	94.5	94.3	5.4	78.9	35.0	0.0
Queue Length 50th (ft)	61	289	293	15	139	~806	54	226	457	0
Queue Length 95th (ft)	104	#491	#494	118	m#247	#951	m80	#318	545	0
Internal Link Dist (ft)	481		939			2372			1326	
Turn Bay Length (ft)		300		315	550		140	265		400
Base Capacity (vph)	393	338	342	594	171	1376	977	556	1571	767
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.91	0.91	0.64	0.88	1.09	0.29	0.88	0.74	0.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Intersection: 1: SW 124th Avenue & OR 99W (Pacific Highway)

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	T	T	R	L	L	T	T	L	L	R	R
Maximum Queue (ft)	469	455	258	770	579	404	432	479	496	410	320
Average Queue (ft)	298	279	87	468	332	207	221	327	346	243	188
95th Queue (ft)	428	407	227	787	613	391	417	469	506	428	288
Link Distance (ft)	1714	1714		1829	1829	1829	1829	496	496		
Upstream Blk Time (%)								0	1		
Queuing Penalty (veh)								1	5		
Storage Bay Dist (ft)			225							275	275
Storage Blk Time (%)		15							20	1	1
Queuing Penalty (veh)		32							159	3	2

Intersection: 2: SW 124th Avenue & SW Tualatin Road

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	R	L	T	T
Maximum Queue (ft)	124	593	719	904	335	398	340	209
Average Queue (ft)	40	300	323	477	100	250	57	55
95th Queue (ft)	105	505	597	824	321	421	222	146
Link Distance (ft)		1173	1027	1027			496	496
Upstream Blk Time (%)			0	0			0	
Queuing Penalty (veh)			0	0			0	
Storage Bay Dist (ft)	25				150	200		
Storage Blk Time (%)	25	41		52		20	0	
Queuing Penalty (veh)	164	16		25		42	1	

Intersection: 3: JAE Access/SW 115th Avenue & SW Tualatin Road

Movement	EB	EB	WB	NB	SB
Directions Served	L	TR	TR	TR	LTR
Maximum Queue (ft)	71	37	412	63	84
Average Queue (ft)	26	2	22	13	30
95th Queue (ft)	60	22	213	48	69
Link Distance (ft)		1193	800	552	1330
Upstream Blk Time (%)			1		
Queuing Penalty (veh)			10		
Storage Bay Dist (ft)	25				
Storage Blk Time (%)	13	0	3		
Queuing Penalty (veh)	61	0	0		

Intersection: 4: SW Tualatin Road & SW 112th Avenue

Movement	EB	WB	SB
Directions Served	L	TR	LR
Maximum Queue (ft)	45	213	63
Average Queue (ft)	6	12	16
95th Queue (ft)	29	177	48
Link Distance (ft)		1064	540
Upstream Blk Time (%)		0	
Queuing Penalty (veh)		0	
Storage Bay Dist (ft)	25		
Storage Blk Time (%)	1		
Queuing Penalty (veh)	4		

Intersection: 5: SW 108th Ave & SW Tualatin Road

Movement	WB	WB	NB
Directions Served	L	T	LR
Maximum Queue (ft)	35	28	129
Average Queue (ft)	3	0	56
95th Queue (ft)	20	0	104
Link Distance (ft)		727	285
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	25		
Storage Blk Time (%)	1	0	
Queuing Penalty (veh)	6	0	

Intersection: 6: SW 108th Ave & North Access

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	63	7
Average Queue (ft)	26	0
95th Queue (ft)	57	5
Link Distance (ft)	593	406
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: SW 108th Ave & Center Access

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	99	7
Average Queue (ft)	51	0
95th Queue (ft)	83	7
Link Distance (ft)	421	252
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 8: SW 108th Ave & South Access

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	110	34
Average Queue (ft)	47	3
95th Queue (ft)	80	18
Link Distance (ft)	415	207
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: SW 124th Avenue & SW Leveton Drive

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	117	189	154	226	45	227	299	100	181	214
Average Queue (ft)	24	53	58	103	5	100	143	40	63	84
95th Queue (ft)	70	134	113	180	26	187	249	81	150	176
Link Distance (ft)		1016		1226		1440	1440		1027	1027
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		150		150			150		
Storage Blk Time (%)	0	4	0	3		2		0	1	
Queuing Penalty (veh)	0	1	0	2		0		0	1	

Intersection: 10: SW 118th Drive/JAE Access & SW Leveton Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	86	224	81	40
Average Queue (ft)	45	88	21	16
95th Queue (ft)	74	163	52	44
Link Distance (ft)	1226	1030	498	610
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: SW Leveton Drive & West Access

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	50	96	126
Average Queue (ft)	12	42	65
95th Queue (ft)	41	77	107
Link Distance (ft)	1030	531	531
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 12: SW Leveton Drive & New Access

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	7	35
Average Queue (ft)	0	3
95th Queue (ft)	5	18
Link Distance (ft)	408	363
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: SW Leveton Drive & Center Access

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	40	63	62
Average Queue (ft)	4	24	33
95th Queue (ft)	23	54	59
Link Distance (ft)	403	352	352
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 14: Calmax Technology Access/East Access & SW Leveton Drive

Movement	WB	NB
Directions Served	LTR	LTR
Maximum Queue (ft)	26	81
Average Queue (ft)	1	33
95th Queue (ft)	13	71
Link Distance (ft)	556	617
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 15: SW 108th Ave & SW Leveton Drive

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	101	76	34
Average Queue (ft)	53	19	2
95th Queue (ft)	85	57	14
Link Distance (ft)	556	796	207
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 16: SW Herman Road & SW 108th Ave

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	12	228	346	193	136
Average Queue (ft)	1	95	151	100	15
95th Queue (ft)	8	181	271	171	70
Link Distance (ft)		933	994		796
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100			135	
Storage Blk Time (%)		6		2	
Queuing Penalty (veh)		0		1	

Intersection: 17: SW Teton Avenue & SW Tualatin Road

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	10	63	195	331
Average Queue (ft)	0	11	109	70
95th Queue (ft)	4	41	194	286
Link Distance (ft)	169			1711
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		25	100	
Storage Blk Time (%)		2	26	0
Queuing Penalty (veh)		16	9	0

Intersection: 18: SW 115th Avenue & SW Hazelbrook Road

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	278	1000
Average Queue (ft)	52	205
95th Queue (ft)	313	753
Link Distance (ft)	1163	1330
Upstream Blk Time (%)		3
Queuing Penalty (veh)		9
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 19: OR 99W (Pacific Highway) & SW Hazelbrook Road

Movement	WB	NB	NB	NB	SB	SB
Directions Served	R	T	T	R	T	T
Maximum Queue (ft)	1300	378	373	85	221	216
Average Queue (ft)	825	34	32	3	8	8
95th Queue (ft)	1490	194	205	62	162	158
Link Distance (ft)	1290	1829	1829		1944	1944
Upstream Blk Time (%)	18					
Queuing Penalty (veh)	62					
Storage Bay Dist (ft)				335		
Storage Blk Time (%)			1			
Queuing Penalty (veh)			0			

Intersection: 20: SW Teton Avenue & SW Herman Road

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	18	810	149	351	160	563	99	256
Average Queue (ft)	1	348	35	139	109	163	13	90
95th Queue (ft)	9	776	98	269	184	423	51	190
Link Distance (ft)		994		1022		604		1711
Upstream Blk Time (%)		1				1		
Queuing Penalty (veh)		5				0		
Storage Bay Dist (ft)	100		100		60		50	
Storage Blk Time (%)		31	0	13	30	12	0	21
Queuing Penalty (veh)		1	0	7	57	31	0	3

Intersection: 21: OR 99W (Pacific Highway) & SW Fischer Road

Movement	EB	EB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	L	T	T	U	T	T	R
Maximum Queue (ft)	460	690	460	1953	2016	354	1254	1258	400
Average Queue (ft)	245	292	439	1164	1139	53	526	529	172
95th Queue (ft)	433	560	519	2117	2221	201	1097	1100	451
Link Distance (ft)		1160		1944	1944		2374	2374	
Upstream Blk Time (%)				2	20				
Queuing Penalty (veh)				18	192				
Storage Bay Dist (ft)	275		435			300			200
Storage Blk Time (%)	11	21	45	10			21	29	0
Queuing Penalty (veh)	34	33	390	31			6	81	1

Intersection: 22: OR 99W (Pacific Highway) & SW 116th Avenue/SW Durham Road

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	LT	R	L	T	T	R	L	L	T
Maximum Queue (ft)	228	270	375	576	380	675	2313	2320	315	344	428	544
Average Queue (ft)	74	149	305	370	199	378	1644	1671	224	228	278	324
95th Queue (ft)	183	242	412	537	332	825	2800	2814	425	332	409	474
Link Distance (ft)		503		959	959		2374	2374				1364
Upstream Blk Time (%)							2	2				
Queuing Penalty (veh)							18	24				
Storage Bay Dist (ft)	275		300			550			140	265	265	
Storage Blk Time (%)		0	5	24		0	45	56	0	4	12	14
Queuing Penalty (veh)		0	17	60		0	64	149	2	22	65	64

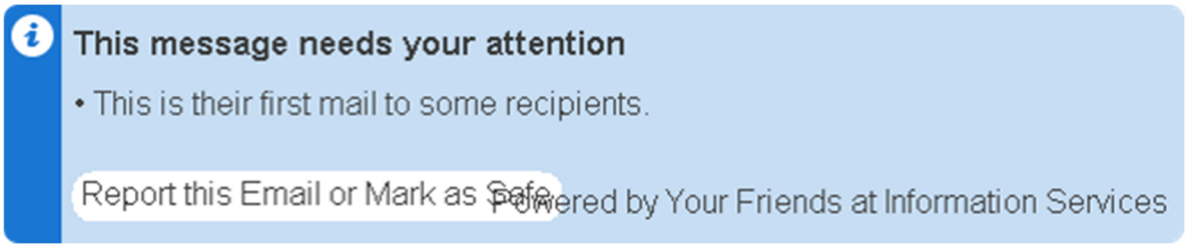
Intersection: 22: OR 99W (Pacific Highway) & SW 116th Avenue/SW Durham Road

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	513	112
Average Queue (ft)	318	8
95th Queue (ft)	465	73
Link Distance (ft)	1364	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		400
Storage Blk Time (%)	2	
Queuing Penalty (veh)	0	

Network Summary

Network wide Queuing Penalty: 2008

From: RUSSELL John <John.RUSSELL@odot.oregon.gov>
Sent: Tuesday, July 29, 2025 11:49 AM
To: Mike McCarthy; Joel Rabinovitz; Jinde Zhu
Cc: Abby McFetridge; Garth Appanaitis; ODOT_R1_DevRev; Steve Koper; Keith Leonard; Aquilla Hurd-Ravich
Subject: RE: Document Issue No. 4 - Updated submittal materials for Lam Campus AR and IMP (ODOT DRS #13340 Lam TUX)



Mike,

All ODOT intersections are projected to meet ODOT mobility standards in this and previous TIA revisions, with this revision appearing to better spread out traffic across ODOT intersections, rather than concentrating more traffic on Hazelbrook Rd. As such, there are no significant changes to the comments ODOT provided on 11/12/2024, which are as follows:

> ODOT concurs with the findings of the TIA that **all ODOT intersections are projected to meet ODOT mobility standards** following completion of both phases of the project in 2030.
>
> While there are a number intersections along OR 99W where 95th percentile queues may be expected to exceed existing storage capacity under some models, the applicant has gone to the effort of correlating HCM 2000 queue outputs to better reflect actual conditions. ODOT concurs with their conclusion that these intersections along OR 99W "**are built out to their full capacity, and little can be done to mitigate these queues**" at the applicant level. While the applicant recommends "coordination of the left turn movement from OR 99W with the left turn movement to SW Tualatin Road," **ODOT policy does not consider signal retiming as a mitigation for development**. This signal coordination is outside the scope of this development at this time, particularly given the different ownership of each signal, which would require further coordination between ODOT and the City of Tualatin.
>
> Lastly, long delays were identified for westbound traffic on Hazelbrook on the stop-controlled approach OR 99W. Given that this has not been shown to present safety or operation issues for northbound traffic on OR 99W, ODOT concurs that "**mitigation is not recommended [at Hazelbrook]** because it would encourage vehicles to travel this route from SW Tualatin Road instead of using SW 124th Avenue to access OR 99W northbound."
>
> **No further analysis of state highway facilities is required**.

Thank you again for the for the opportunity to review the revisions to the TIA for Lam TUX expansion.

Please let me know if you have additional questions.

John Russell, PE [he/him]
Traffic Analysis Engineer
Oregon Dept of Transportation
John.Russell@odot.oregon.gov
503.731.8282

From: Mike McCarthy <mmccarthy@tualatin.gov>
Sent: Monday, July 21, 2025 5:36 PM
To: Joel Rabinovitz <joel.rabinovitz@dksassociates.com>; RUSSELL John <John.RUSSELL@odot.oregon.gov>; Jinde Zhu <jinde_zhu@washingtoncountyor.gov>
Cc: Abby McFetridge <Amcfetridge@tualatin.gov>; Garth Appanaitis <gaa@dksassociates.com>; ODOT_R1_DevRev <ODOT_R1_DevRev@odot.oregon.gov>; Steve Koper <skoper@tualatin.gov>; Keith Leonard <kleonard@tualatin.gov>; Aquilla Hurd-Ravich <ahurd-ravich@tualatin.gov>
Subject: FW: Document Issue No. 4 - Updated submittal materials for Lam Campus AR and IMP

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Hi Joel, John, and Jinde,

Attachment 9 at the link below is the updated traffic study for the proposed Lam Research development on Leveton Drive east of 124th Ave in Tualatin. Please review it and let us know any comments you have (or if it doesn't meet your agency's threshold for review) by the end of next week.

Thanks,

Mike McCarthy
Tualatin City Engineer
Phone: 503.691.3674
Cell: 971.666.0000

From: Ian Sisson (Mackenzie (Portland)) <isisson@mcknze.com>
Sent: Monday, July 21, 2025 5:05 PM
To: Mike McCarthy <mmccarthy@tualatin.gov>
Subject: Document Issue No. 4 - Updated submittal materials for Lam Campus AR and IMP

2250180.00 - Tualatin Exp Lab/CUB/Bldg H Issue 4

Issued by: Ian Sisson (Mackenzie)
On: 21 Jul 2025

Hello Keith,

The updated submittal materials for IMP 24-0001 and AR 24-0002 are available for download via the link below. This includes revised application narratives for each, as well as updated exhibits. Only the exhibits that have been modified are included in this transmittal.

Please let me know if you have any questions or issues accessing the files.

Thank you,

Ian Sisson
isisson@mcknze.com
971-346-3725

Access the documents for this issue

Recipients:

Bill Bezio (Mackenzie (Portland))
Mike Rueter (Mackenzie (Portland))
Nicole Burrell (Mackenzie (Portland))
Suzannah Stanley (Mackenzie (Portland))
Brent Ahrend (Mackenzie (Portland))
Steve Koper (City of Tualatin (<Default>))
Mike McCarthy (City of Tualatin (<Default>))
Keith Leonard (City of Tualatin (<Default>))
Ian Sisson (Mackenzie (Portland))
Danielle Nonamaker (Lam Research Corporation (NEW 11155 SW Leveton))

By opening these documents, you agree to the following terms and conditions, click here.

Ian Sisson AICP
D 971-346-3725 **C** 503-501-8588

Land Use Planning
Professional Licenses & Certifications

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Disclaimer

III. ARCHITECTURAL REVIEW APPROVAL CRITERIA

This application addresses the necessary approval standards of the Tualatin Development Code relevant to Architectural Review for industrial development. As described in the following narrative, the proposal meets the standards of TDC *Chapter 62: Manufacturing Park Planning District (MP), Chapter 73: Community Design Standards, Chapter 74: Public Improvement Requirements, Chapter 75: Access Management,* and specific standards applicable to the subject property proposed through the concurrently reviewed Industrial Master Plan.

Chapter 32 - Procedures

Section 32.120. – Neighborhood/Developer Meetings.

(1) Purpose. The purpose of this meeting is to provide a means for the applicant and surrounding property owners to meet to review a development proposal and identify issues regarding the proposal so they can be considered prior to the application submittal. The meeting is intended to allow the developer and neighbors to share information and concerns regarding the project. The applicant may consider whether to incorporate solutions to these issues prior to application submittal.

(2) When Mandatory. Neighborhood/developer meetings are mandatory for all land use actions identified in Table 32-1 as requiring a neighborhood/developer meeting. An applicant may voluntarily conduct a neighborhood/developer meeting even if it is not required and may conduct more than one neighborhood/developer meeting at their election.

(3) Timing. A neighborhood/developer meeting must be held after a pre-application meeting with City staff, but before submittal of an application.

(4) Time and Location. Required neighborhood/developer meetings must be held within the city limits of the City of Tualatin at the following times:

- *(a) If scheduled on a weekday, the meeting must begin no earlier than 6:00 p.m.*
- *(b) If scheduled on a weekend, the meeting must begin between 10:00 a.m. and 6:00 p.m.*

(5) Notice Requirements.

- *(a) The applicant must provide notice of the meeting at least* 14 *calendar days and no more than 28 calendar days before the meeting. The notice must be by first class mail providing the date, time, and location of the meeting, as well as a brief description of the proposal and its location. The applicant must keep a copy of the notice to be submitted with their land use application.*
- *(b) The applicant must mail notice of a neighborhood/developer meeting to the following persons:*
  - *(i) All property owners within 1,000 feet measured from the boundaries of the subject property;*
  - *(ii) All property owners within a platted residential subdivision that is located within 1,000 feet of the boundaries of the subject property. The notice area includes the entire subdivision and not just those lots within 1,000 feet. If the residential subdivision is one of two or more individually platted phases sharing a single subdivision name, the notice area need not include the additional phases; and*
  - *(iii) All designated representatives of recognized Citizen Involvement Organizations as established in TMC Chapter 11-9.*
- *(c) The City will provide the applicant with labels for mailing for a fee.*
- *(d) Failure of a property owner to receive notice does not invalidate the neighborhood/developer meeting proceedings.*

(6) Neighborhood/Developer Sign Posting Requirements. The applicant must provide and post on the subject property, at least 14 *calendar days before the meeting. The sign must conform to the design and placement standards established by the City for signs notifying the public of land use actions in TDC* 32.150*.*

(7) Neighborhood/Developer Meeting Requirements. The applicant must have a sign-in sheet for all attendees to provide their name, address, telephone number, and email address and keep a copy of the sign-in sheet to provide with their land use application. The applicant must prepare meeting notes identifying the persons attending, those commenting and the substance of the comments expressed, and the major points that were discussed. The applicant must keep a copy of the meeting notes for submittal with their land use application.

Response: A Neighborhood/Developer Meeting was held at the Juanita Pohl Center in Tualatin at 6:00 PM on June 5, 2024. Mailed notice was provided to surrounding property owners using a mailing list prepared by City staff, and the required meeting notice signs were posted on the subject site on May 22, 2024. A sign-in sheet was provided for attendees to provide their contact information. Meeting notes were recorded to document the substance of the meeting and neighbor comments. All documentation of the Neighborhood/Developer Meeting can be found in Attachment 8, demonstrating the requirements of this section have been met.

A board member of the Riverpark CIO, Janine Wilson, attended the Neighborhood/Developer Meeting. Ms. Wilson was concerned that residents of the apartment buildings near the Lam campus did not receive notice of the neighborhood meeting and expressed interest in assisting the project team contact those residents for future meetings and public hearings on the proposal. She provided her name and email address to the project team for this purpose. The project team sent emails to Ms. Wilson on June 10 and June 12, 2024, to request coordination but did not receive any response or further communication.

Section 32.130. – Initiation of Applications.

(1) Type I, Type II, Type III, and Type IV-A Applications. Type I, Type II, Type III, and Type IV-A applications may be submitted by one or more of the following persons:

- *(a) The owner of the subject property;*
- *(b) The contract purchaser of the subject property, when the application is accompanied by proof of the purchaser's status as such and by the seller's written consent;*
- *(c) A lessee in possession of the property, when the application is accompanied by the owners' written consent; or*
- *(d) The agent of any of the foregoing, when the application is duly authorized in writing by a person authorized to submit an application by paragraphs (a), (b) or (c) of this subsection, and accompanied by proof of the agent's authority.*

(2) Type IV-A or B Applications. Type IV-A or B applications may be initiated by the City.

Response: This Type III application has been submitted by Mackenzie on behalf of the property Owner, Lam Research Corporation. The application form has been signed by Lam's Senior Director of Real Estate and Construction, Ajay Changaran. This standard is met.

Section 32.150. – Sign Posting.

(1) When Signs Posted. Signs in conformance with these standards must be posted as follows:

- *(a) Signs providing notice of an upcoming neighborhood/developer meeting must be posted prior to a required neighborhood/developer meeting in accordance with Section 32.120(6); and*
- *(b) Signs providing notice of a pending land use application must be posted after land use application has been submitted for Type II, III and IV-A applications.*

Andrew Mulkey

Attorney at Law

PO Box 66562, Portland, OR 97290 • (208) 596-3235 • andrew@mulkeylegal.com

October 10, 2025

Via Email

Bryan LaVigne
Code Compliance Officer
Community Development, City of Tualatin
(503) 691-3675
blavigne@tualatin.gov

Kevin McConnell
City of Tualatin City Attorney
(503) 691-3015
kmcconnell@tualatin.gov

Re: Noise Complaints for Lam Research and the City's Code Compliance response.

Mr. LaVigne,

I represent Mr. Brett Hamilton, who has submitted a noise complaint to the City regarding noise generated by the Lam Research campus on SW Leveton Drive. Mr. Hamilton sent in a complaint by email on November 21, 2024 and sent another email to the City Council on August 12, 2025. In addition, Mr. Hamilton let me know that the City has received dozens of noise complaints from other residents for noise generated by Lam's facilities.

I am writing for a number of reasons. First, and based on the City's response to Mr. Hamilton's complaint, I am concerned that the City may be ignoring an important aspect of its noise ordinance in its response to Mr. Hamilton and others. Second, I request that the City consider both the decibel level of the noise that comes from Lam's campus and the fact that the noise generated by Lam meets the definition of a "noise disturbance." Next, to the extent that the City needs additional evidence that the sounds coming from Lam's campus meet the requirements of a "noise disturbance," I have included a summary of that evidence at the end of this letter. Finally, if the City decides to take additional sound readings, I ask that the City coordinate with Mr. Hamilton or other residents who experience the disruptions caused by Lam's equipment. The sound produced by the equipment on Lam's campus is constant. However, the degree to which that sound carries into the nearby residential areas depends in part on weather conditions and wind direction. Coordination will ensure that the City fully understands the nature of the sound and the disruption it causes to Mr. Hamilton and others.

The City Cannot Overlook TMC 6-14-030 and 6-14-110(1).

Mr. Hamilton provided me with a copy of an October 3, 2025 email that Mr. LaVigne sent out in response to noise complaints for sounds coming from Lam's campus and facilities. Mr. LaVigne's email implies that the noise complaints are limited to loud noise, or noises above a certain decibel level:

> "in order to determine if a noise violation is occurring, a noise level reading will be needed from each address to determine if there is a possible violation of TMC 6-14-050 - Exceeding Decibel level."

Based on the code, I believe there is a difference between a violation for "any noise" that exceeds a specific decibel level (i.e. loud noise) and what the code refers to and defines as a "noise disturbance." The noise ordinance prohibits "any noise from any sound source that exceeds" the decibel levels listed in TMC 6-14-050. But the code at TMC 6-14-030 also prohibits "the creation or continuance of any noise disturbance," a term the code defines in TMC 6-14-020 as including "any sound that… disturbs a reasonable person of normal sensitivities from enjoying their property."

In response to Mr. Hamilton's complaint and those of other residents, it appears that Mr. LaVigne and the City are focused on the decibel thresholds listed in TMC 6-14-050. As explained in greater detail below, Mr. Hamilton has demonstrated on a number of occasions that the sound coming from Lam's facility can exceed the 50 decibel threshold set for noise sensitive properties. However, I want to bring to the City's attention that in this instance, the City is overlooking, and potentially misinterpreting and misapplying, the noise ordinance provisions that prohibit "noise disturbance." TMC 6-14-030, 6-14-020, 6-14-0110(1).

It is my understanding that many of the people complaining about the noise from Lam Research, including Mr. Hamilton, are specifically complaining that the noise from Lam's facilities violates the provisions of TMC 6-14-030. That section of the code prohibits the knowing "creation or continuance of any noise disturbance." TMC 6-14-030. Moreover, the existence of a "noise disturbance" does not depend on a particular decibel reading. By its terms– and unlike the prohibition in TMC 6-14-050 on "any noise" that exceeds one of the listed decibel levels–the City's noise ordinance and TMC 6-14-030 do *NOT* require that a "noise disturbance" exceed any specific decibel level before the City will consider the noise to be a violation of TMC 6-14-030. *Compare* TMC 6-14-110(1) and 6-14-110(2).

Text and Context of the Noise Ordinance

Here's what the ordinance says:

> "No person shall knowingly create, permit, or assist in the creation or continuance of any noise disturbance."

TMC 6-14-030. The code defines "noise disturbance" as follows:

> "any sound that: (a) injures or endangers the health or safety of a person; (b) disturbs a reasonable person of normal sensitivities from enjoying their private real property; or (c) injures or endangers personal or real property."

TMC 6-14-020. In addition to TMC 6-14-030, the code lists noises that it considers "per se" "noise disturbances." These include noise disturbances made by sound equipment, animals, power equipment, dynamic breaking devices, idling engines, and motor vehicle repair. TMC 6-14-040.

Therefore, the code identifies three different ways that a noise can violate the noise ordinance. A noise can meet the definition of a "noise disturbance," it can be listed as a "per se" noise disturbance, or as described in TMC 6-14-050, it can be "any noise" that exceeds a particular decibel level. Depending on the category, TMC 6-14-110 establishes different evidentiary requirements to establish a violation. One standard applies to a"noise disturbance" based on TMC 6-14-030 and TMC 6-14-040; and a different standard for loud noises described in TMC 6-14-050:

> "(1) To establish a violation in an enforcement action based on sections 6-14-030 and 6-14-040 requires the evidence of at least two persons from different households. Any police officer, code enforcement officer, or other city employee who witnessed the violation shall be counted as a witness for purposes of the two witness requirement."
>
> "(2) To establish a violation in an enforcement action based on TMC 6-14-050 requires the evidence of a sound measurement device that:
> (a) Is in good operating condition;
> (b)Meets the requirements of a Type I or Type II meter;
> (c)Contains at least an A-weighted scale and both fast and slow meter response;
> (d)Was operated by a person trained in the use of a sound meter and used in a manner consistent with that training."

TMC 6-14-110. The text and structure of TMC 6-14-110 demonstrates that "to establish a violation" of TMC 6-14-030, the City and the complaining party do NOT need to demonstrate that a "noise disturbance" exceeds any particular decibel threshold listed in TMC 6-14-050. A violation "based on" section 6-14-030 may be established by providing evidence of at least two persons from different households. TMC 6-14-110(1).

Conclusion

By focusing only on the decibel levels in TMC 6-14-050 and the "per se" or "specific noise disturbances" listed in TMC 6-14-040, the City appears to ignore the text of TMC 6-14-030 and TMC 6-14-110(1). Those provisions allow the City to enforce against a "noise disturbance" that is not listed as a "per se" noise disturbance. Mr. LaVigne's October 3, 2025 response appears to incorrectly ignore an entire category of "noise disturbances" prohibited by the City's noise ordinance.

Based on the characteristics of the sounds produced by Lam's facilities, it is appropriate for the City to consider *both*, TMC 6-14-030 and TMC 6-14-050. The sounds produced by Lam meet the criteria required for a "noise disturbance," and in many instances they also fall within the prohibition for loud noise that exceeds the decibel limits described in TMC 6-14-050. For that reason, in its response to Mr. Hamilton's complaint and the complaints of others in the neighborhood, I ask that the City also address and consider TMC 6-14-030 and TMC 6-14-110(1) when evaluating the sounds generated by Lam's facilities.

For ease of reference, I have included with this letter a consolidated summary of the evidence and statements from nearby residents that explains how the sound generated by Lam's facilities and equipment meet the requirements for a "noise disturbance." See Attached "*Consolidated Evidence that Lam's Facilities Create a 'Noise Disturbance' and also Violate TMC 6-14-050*." The same attachment also demonstrates that Lam's facilities violate 6-14-050. I ask that the City please consider that evidence when evaluating and responding to Mr. Hamilton's complaints.

Finally, if Mr. LaVigne or others responsible for documenting and verifying the noise coming from Lam's facilities decide to gather additional evidence, I ask that they coordinate with Mr. Hamilton and others to ensure they document the sounds generated by Lam at the times and conditions in which they are at their most disruptive.

Thank you for your consideration and attention to this matter. Please let me know if you have any questions, need clarification, or would like additional information.

Date: October 10, 2025

Andrew Mulkey (OSB No. 171237)
PO Box 66562
Portland, OR 97290
(208) 596-3235
andrew@mulkeylegal.com

Enclosures:
Attachment: "Consolidated Evidence that Lam's Facilities Create a 'Noise Disturbance' and also Violate TMC 6-14-050."

cc w/ enclosures:
Client
Kevin McConnell, Tualatin City Attorney

Consolidated Evidence that Lam's Facilities Create a "Noise Disturbance" and also Violates TMC 6-14-050

The level and frequency of noise complained of by Mr. Hamilton and others meets the definition of a "noise disturbance"–specifically "any sound that: … (b) disturbs a reasonable person of normal sensitivities from enjoying their private real property." To the extent that the City believes that the information contained in any existing complaints falls short of what is required by TMC 6-14-110(1), please consider the following information:

1. Mr. Hamilton lives at 11430 SW Kalispell St. in Tualatin.

2. Mr. Hamilton has provided the City with a video that explains the frequencies and pulsing noises generated by Lam's facilities.[1] For reference, here is a summary of the statements in the video:

- Lam's rooftop equipment generates a continuous and pulsing sound that penetrates inside homes, even when windows and doors are closed.
- The nature of the sound is objectionable and disrupts residents' ability to sleep, including Mr. Hamilton's.
- The sound has been measured at a private residence across the street from Lam's facility, that sound was measured at 52 decibels at night by a licensed acoustical engineer at a residence across the street from Lam's facility. Note that this measurement was taken from a different residence than Mr. Hamilton's.

3. In addition to the information provided in the video, Mr. Hamilton has submitted six noise complaints with Washington County non-emergency dispatch. The sounds generated by Lam's facilities have kept Mr. Hamilton up at night, and at times have caused him to have to sleep in a different room in his house. The pulsing, clear tones are invasive and very difficult to ignore, and they share some similarities with an alarm clock.

4. The sound from Lam's facilities, specifically Lam's gas plant, has been measured at the residential property located at 11045 SW Tualatin Road at night above the 50-decibel threshold set by TMC 6-14-050.

5. The sound from the gas plant travels far into the residential neighborhood to the north of Lam's campus, and the noise from Lam's rooftop air handling equipment (located near building D) carries even further than the gas plant noise. Lam's rooftop air handlers are so loud that, in the winter, you can hear them over a mile away on Durham Road in Tigard.

6. The degree of the disturbance that results from the sounds produced by Lam's equipment can depend in part on the weather and direction of the wind. In the winter when the wind is from the south, clearly-audible tones from Lam's fans can be heard inside Mr. Hamilton's house with the windows closed. One of these tones can even be heard in Mr. Hamilton's upstairs guest bathroom (which has no windows) because the sound carries through the roof vent.

[1] https://www.youtube.com/watch?v=lyzioqzFeXw

7. Mr. Hamilton has communicated with Lam about the sounds generated by their equipment since January 2023. Although Lam has attempted to mitigate some of the sounds coming from their facilities, the company has not been able to resolve the issue or stop the noise from disturbing nearby residents. Lam is aware that their equipment produces the sounds that Mr. Hamilton and others are hearing on their properties.

8. Other households are also able to hear the sounds generated by Lam's facility, and they have provided Mr. Hamilton with statements about their own experiences that explain how the sounds have disrupted the use and enjoyment of their property. They also agreed that Mr. Hamilton may share their statements here:

> Mr. Harvey Light who lives at 11405 SW Kalispell St. writes, "I am acutely aware of the noises from Lam and other neighbors to the south as I am often up in the wee hours of the morning."
>
> Mr. Marius Brisan who lives at 17850 SE 113th Ave. writes about the "[i]mpact of LAM noise on our life:"
>
> > " - there were many nights when we could not fall asleep due to high pitch sounds coming from LAM campus, even with the windows closed
> >
> > "- when the sound is too annoying to sleep we have to use ear plugs, which is unsafe since we cannot hear if our phone goes off or if anyone breaks into the house
> >
> > "- many nights during the warmer season we went to sleep with the windows open, only to be awakened by the 'buzzing' sound from LAM, once we closed the windows the sound could still be heard
> >
> > "- all the restless nights affects out basic quality of life: we drive to/from work in a tired state; at work our performance is lacking since we are cranky and tired; with only a few hrs of sleep we are not getting along with our family members and friends"
>
> Ms. Sue Hein who lives at 10975 SW Tunica St. has stated the following:
>
> > "It was an ongoing 'pain' this summer to open my window, cool breeze and crickets chirping, all to be drowned out by beeping overtaking the calm of the night. Closing the window lessened the beeping noise, but it was still there. Come morning, I'd open it again, only to hear the same."

Andrew Mulkey

Attorney at Law

PO Box 66562, Portland, OR 97290 • (208) 596-3235 • andrew@mulkeylegal.com

November 3, 2025

Via Email

City Council
City of Tualatin
c/o Keith Leonard, Associate Planner
18880 SW Martinazzi Ave.,
Tualatin, OR 97062
kleonard@tualatin.gov
council@tualatin.gov

Tualatin Planning Division
planning@tualatin.gov

Re: Appeal Hearing for AR 24-0002, Lam Research Campus, SW Leveton Dr.

Dear Mayor Bubenik and City Councilors:

On behalf of Mr. Hamilton, please accept the following letter for the record in Mr. Hamilton's appeal of AR 24-0002.

Some of the most concerning issues with Lam's proposal include the additional noise and traffic generated by the proposed expansion. This letter addresses the noise that Lam's proposed facilities would generate, if approved by the City Council. The letter explains that Lam has failed to demonstrate compliance with applicable approval criteria for objectionable noises and vibrations.

A. Lam's proposed facilities would produce "objectionable noise" and would unlawfully generate a "noise disturbance."

The sounds and vibrations generated by Lam's current facilities include a range of frequencies that produce disruptive hums, hisses, and pulsing tones. Mr. Hamilton has documented and described the noises that penetrate into his neighborhood, and more distressingly, his home. This issue is not limited to Mr. Hamilton. These sounds and vibrations can be generally heard off-site in the adjacent neighborhood and within nearby residents' homes. Lam's proposed expansion would add equipment and facilities that would result in additional hums, hisses, and pulsing tones.

The provisions of the City's manufacturing park zone address noise concerns, requiring that the "large-scale specialized manufacturing and related uses and research facilities" permitted in the zone "must not cause objectionable noise, smoke, odor, dust, noxious gases, vibration, glare… or other wastes emanating from the property." TDC 62.100. In addition, Chapter 63, which applies to "all industrial uses" and [a]ll Manufacturing Planning Districts, regardless of the use category," requires that "[a]ll uses and development must comply with Oregon State Department of Environmental Quality standards relating to noise and the City of Tualatin noise ordinance in, TMC 6-14." TDC 63.051. For noise and vibrations, Lam Research has failed to demonstrate compliance with those requirements.

In this case, Mr. Hamilton and others have already documented "objectionable noise" and "vibration" produced by the existing facility. TDC 62.100. Mr. Hamilton has also documented violations of TMC 6-14. The hums, hisses, pulsing tones, and vibrations produced by Lam certainly qualify as "objectionable." The noises that Lam's existing facilities generate also meet the City's definition of a "noise disturbance," defined as sounds that "disturb[] a reasonable person of normal sensitivities from enjoying their private real property." TMC 6-14-030(b). There is also evidence that Lam's facilities produce sounds that exceed the decibel limits described in TMC 6-14-050. The evidence in the record indicates that the additional research laboratory and manufacturing facilities proposed by Lam would add to those already non-compliant existing sounds and vibrations.

Lam's expansion would only increase the number of facilities and equipment that produce noises and vibrations that emanate from the property. Yet Lam has not demonstrated that its proposed expansion could comply with the requirements in TDC 62.100 and TDC 63.051 that prohibit objectionable noises and vibrations. For that reason, Lam's proposal does not meet the requirements for uses permitted in the zone. TDC 62.100; TDC 63.051. The applicant's own noise study documents the additional sounds and vibrations that their new facilities would produce. Those sounds would only combine with, and add to, the already objectionable hums, hisses, and pulsing tones produced by the property. Rather than demonstrate how its proposed construction could be modified or designed to reduce or cancel the noises, Lam asks the City Council to simply ignore the criteria all together.

B. Lam has failed to demonstrate that its proposed facilities will comply with the City's noise limits for the zone.

In its letter, Lam suggests that the criteria listed above are not relevant, and can only be addressed as part of a subsequent code enforcement proceeding. Lam's interpretation is wrong. Lam's understanding of the code would leave the City without any ability to ensure that proposed uses must demonstrate compliance with applicable criteria, before issuing final approval. Of course the City has the authority–prior to approval–to require that Lam demonstrate that its proposed facilities will comply with the code provisions that prohibit the approval of facilities that generate objectionable noises or violate the City's noise ordinance.

The City's planning staff have consistently stated that Lam has the burden to show that its new facilities will comply with the City's noise limits. The Staff lists TDC 62 and TDC 63.051 among the applicable approval criteria. The City's planning staff describe the Architectural

Review as the proceedings that will ultimately provide "approval" for the applicant's request to construct a 90,000 square foot lab building and other facilities. Therefore, the time to ensure that Lam's proposed facilities are designed in a way that they will not violate TDC 62.100 and TDC 63.051 is now. Lam must demonstrate compliance with the applicable criteria *before* the City's final approval of the proposed use.

To that end, Architectural Review decisions may impose conditions of approval that "[i]mplement the requirements of the Tualatin Development Code." TDC 33.020(6)(iii). The conditions of approval "that may be imposed include, but are not limited to… changes in the design or intensity of the proposed development… necessary to assure compliance with this chapter." TDC 33.020(6)(b). Architectural Review also provides broad authority to "sustain the comfort, health, safety, *tranquility and contentment* of residents and attract residents by reason of the City's favorable environment and thus *promote and protect the peace, health, and welfare of the City*." TDC 33.020(1)(i). The City Council has the authority to require Lam to comply with TDC 62.100 and TDC 63.051.

C. Conclusion: require Lam to modify the facilities and equipment to ensure that its facilities and equipment do not cause objectionable noise to emanate from the property.

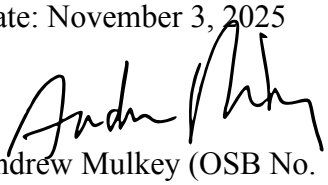
This proceeding appears to provide the only land use approval required before Lam can begin construction of the proposed facilities. *See* Chapter 33.020. The planning staff have described this proceeding as providing the required land use approval required prior to construction. Staff have also listed approval criteria, such as TDC 62 and TDC 63.051, as among the relevant criteria to be considered during Architectural Review. Moreover, the City has the authority needed to impose conditions of approval to ensure compliance with the requirements of the development code, which includes requirements in TDC 62.100 and TDC 63.051. TDC 33.020(6)(iii).

For those reasons, Mr. Hamilton requests that the City deny Lam's proposal for failing to demonstrate compliance with TDC 62.100 and TDC 63.051. Lam has not demonstrated that its facilities, especially when added to its existing facilities, will comply with the applicable noise criteria. Lam has also failed to propose conditions of approval that would ensure that the sounds generated by its equipment could be or would be dampened or canceled out. Lam has the knowledge about the equipment its facilities will use and the noises that the equipment will produce. For that reason, Lam has the burden to propose changes to its facilities' design to ensure compliance with TDC 62.100 and TDC 63.051. The development code does not allow applicants to obtain approval for, and then construct uses that would generate objectionable noises and vibrations or otherwise violate the City's noise ordinance. TDC 62.100, 63.020, 63.051.

Simply put, the development code does not allow Lam to impose a nuisance on its neighbors and residents of the City of Tualatin. The City has the necessary tools to require Lam to demonstrate compliance *prior* to the City's approval of the new and expanded facilities. And the City may impose conditions of approval during the Architectural Review to make compliance a reality. Mr. Hamilton respectfully requests that the City require Lam to explain how it will design

its new equipment and facilities in a way that ensures compliance with the City's development code. If Lam cannot meet its burden to demonstrate compliance, then Mr. Hamilton asks that the City deny approval until Lam can demonstrate that its expanded facilities will not produce objectionable noises beyond the property line.

Date: November 3, 2025



Andrew Mulkey (OSB No. 171237)
PO Box 66562
Portland, OR 97290
(208) 596-3235
andrew@mulkeylegal.com

CITY OF TUALATIN

Staff Report

TO: Honorable Mayor and Members of the City Council

THROUGH: Sherilyn Lombos, City Manager

FROM: Nicole Morris, Deputy City Recorder

DATE: November 10, 2025

SUBJECT:
Consideration of Recommendations from the Council Committee on Advisory Appointments

RECOMMENDATION:
Staff recommends the City Council approve the recommendations from the Council Committee on Advisory Appointments (CCAA)

EXECUTIVE SUMMARY:
In accordance with Council Rule 7E(1), the CCAA met and interviewed community members interested in participating on City advisory committees. The Committee recommends appointments of the following individuals:

Individuals	Board	Term
Ursula Kuhn	Planning Commission	Term Expiring 8/31/28
Rae Litz	Planning Commission	Term Expiring 8/31/28
Dana Paulino	Library Advisory Committee	Term Expiring 10/31/28
Melissa Lawerence	Library Advisory Committee	Term Expiring 10/31/28
Emily Baker	I.D.E.A. Committee	Partial Term Expiring 11/1/26
Erinn Stimson	I.D.E.A. Committee	Term Expiring 11/1/28
Samantha Peterson	I.D.E.A. Committee	Term Expiring 11/1/28
Maia Schroeder	I.D.E.A. Committee	Term Expiring 11/1/28
Laura Engberson	I.D.E.A. Committee	Term Expiring 11/1/28
Nina Ichikawa	I.D.E.A. Committee- Student	Term Expiring 11/1/26