



## CITY COUNCIL AGENDA

October 03, 2022 at 7:00 PM

Wilsonville City Hall & Remote Video Conferencing

---

### **PARTICIPANTS MAY ATTEND THE MEETING AT:**

City Hall, 29799 SW Town Center Loop East, Wilsonville, Oregon

YouTube: <https://youtube.com/c/CityofWilsonvilleOR>

Zoom: <https://us02web.zoom.us/j/81536056468>

### **TO PARTICIPATE REMOTELY OR PROVIDE PUBLIC COMMENT:**

Register with the City Recorder:

[CityRecorder@ci.wilsonville.or.us](mailto:CityRecorder@ci.wilsonville.or.us) or 503-570-1506

Individuals may submit comments online at: <https://www.ci.wilsonville.or.us/SpeakerCard>,

via email to the address above, or may mail written comments to:

City Recorder - Wilsonville City Hall

29799 SW Town Center Loop East, Wilsonville, OR 97070

### **CITY COUNCIL MISSION STATEMENT**

*To protect and enhance Wilsonville's livability by providing quality service to ensure a safe, attractive, economically vital community while preserving our natural environment and heritage.*

### **EXECUTIVE SESSION [5:00 PM]**

ORS 192.660(2)(i) Performance Evaluations of Public Officer and Employees

ORS 192.660(2)(h) Legal Counsel/Litigation

**ADJOURN [5:20 PM]** Break to switch Zoom accounts [10 min.]

### **REVIEW OF AGENDA AND ITEMS ON CONSENT [5:30 PM]**

### **COUNCILORS' CONCERNS [5:35 PM]**

### **PRE-COUNCIL WORK SESSION [5:40 PM]**

- A. [Frog Pond East and South Master Plan \(Pauly\)](#) [30 min.]
- B. [Review of the draft Solid Waste Collection Rate Report, September 2022 \(Ottenad\)](#) [25 min.]
- C. Local Discharge Limits Development (Gering) [15 min.]

**ADJOURN [6:50 PM]**

### **CITY COUNCIL MEETING**

*The following is a summary of the legislative and other matters to come before the Wilsonville City Council a regular session to be held, October 3, 2022 at City Hall. Legislative matters must have been filed in the office of the City Recorder by 10:00 a.m. on September 20, 2022. Remonstrances and other documents pertaining to any matters listed in said summary filed at or prior to the time of the meeting may be considered there with except where a time limit for filing has been fixed.*

**CALL TO ORDER [7:00 PM]**

1. Roll Call
2. Pledge of Allegiance
3. Motion to approve the following order of the agenda.

**MAYOR'S BUSINESS [7:05 PM]**

4. [Upcoming Meetings](#)

**COMMUNICATIONS [7:15 PM]**

5. [PGE Green Power Energy Report for Wilsonville \(Lisa DiMartino/Tiffany Delgado\)](#)
6. Boones Ferry Primary (BFP) Stormwater CEP Project Update (*Rappold*)
7. Boeckman Creek Primary Watershed CEP Update (*Rappold*)

**CITIZEN INPUT AND COMMUNITY ANNOUNCEMENTS [8:00 PM]**

*This is an opportunity for visitors to address the City Council on items not on the agenda. It is also the time to address items that are on the agenda but not scheduled for a public hearing. Staff and the City Council will make every effort to respond to questions raised during citizen input before tonight's meeting ends or as quickly as possible thereafter. Please limit your comments to three minutes.*

**COUNCILOR COMMENTS, LIAISON REPORTS AND MEETING ANNOUNCEMENTS [8:10 PM]**

8. Council President Akervall
9. Councilor Lehan
10. Councilor West
11. Councilor Linville

**CONSENT AGENDA [8:20 PM]**

12. [Resolution No. 2994](#)

[A Resolution Of The City Of Wilsonville Establishing Local Discharge Limitations To Control Conventional, Non-Conventional, And Toxic Pollutant Discharges From Non-Domestic Industrial Users Of The City Of Wilsonville Sanitary Sewer System And Repealing Resolution Nos. 1267, 1504 And 1888. \(Gering\)](#)

13. [Minutes of the September 19, 2022 City Council Meeting. \(Veliz\)](#)

**NEW BUSINESS [8:25 PM]**

**CONTINUING BUSINESS [8:25 PM]**

14. [Ordinance No. 868 - 2nd Reading \(Quasi-Judicial \)](#)

[An Ordinance Of The City Of Wilsonville Annexing Approximately 4.92 Acres Of Property Located North Of SW Frog Pond Lane At 7315 SW Frog Pond Lane For Development Of A 12-Lot Residential Subdivision. \(McAlister\)](#)

15. [Ordinance No. 869 - 2nd Reading \(Quasi-Judicial\)](#)

[An Ordinance Of The City Of Wilsonville Approving A Zone Map Amendment From The Clackamas County Rural Residential Farm Forest 5-Acre \(RRFF-5\) Zone To The Residential Neighborhood \(RN\) Zone On Approximately 4.07 Acres Located South Of SW Frog Pond Lane At 7314 SW Frog Pond Lane For Development Of A 12-Lot Residential Subdivision. \(McAlister\)](#)

**PUBLIC HEARING [8:35 PM]**

**CITY MANAGER’S BUSINESS [8:35 PM]**

**LEGAL BUSINESS [8:40 PM]**

**ADJOURN [8:45 PM]**

*Time frames for agenda items are not time certain (i.e. agenda items may be considered earlier than indicated). The City will endeavor to provide the following services, without cost, if requested at least 48 hours prior to the meeting by contacting the City Recorder at 503-570-1506 or [CityRecorder@ci.wilsonville.or.us](mailto:CityRecorder@ci.wilsonville.or.us): assistive listening devices (ALD), sign language interpreter, and/or bilingual interpreter. Those who need accessibility assistance can contact the City by phone through the Federal Information Relay Service at 1-800-877-8339 for TTY/Voice communication.*

*Habr   int  rpretes disponibles para aqu  llas personas que no hablan Ingl  s, previo acuerdo. Comun  quese al 503-570-1506.*



## CITY COUNCIL MEETING STAFF REPORT

<b>Meeting Date: October 3, 2022</b>		<b>Subject:</b> Frog Pond East and South Master Plan	
		<b>Staff Member:</b> Daniel Pauly, Planning Manager	
		<b>Department:</b> Community Development	
<b>Action Required</b>		<b>Advisory Board/Commission Recommendation</b>	
<input type="checkbox"/> Motion <input type="checkbox"/> Public Hearing Date: <input type="checkbox"/> Ordinance 1 <sup>st</sup> Reading Date: <input type="checkbox"/> Ordinance 2 <sup>nd</sup> Reading Date: <input type="checkbox"/> Resolution <input checked="" type="checkbox"/> Information or Direction <input type="checkbox"/> Information Only <input type="checkbox"/> Council Direction <input type="checkbox"/> Consent Agenda		<input type="checkbox"/> Approval <input type="checkbox"/> Denial <input type="checkbox"/> None Forwarded <input checked="" type="checkbox"/> Not Applicable	
		<b>Comments:</b> On September 14 Planning Commission held a work session and provided feedback that is integrated into the staff report and attachments.	
<b>Staff Recommendation:</b> Provide input regarding infrastructure for Frog Pond East and South.			
<b>Recommended Language for Motion:</b> N/A			
<b>Project / Issue Relates To:</b>			
<input checked="" type="checkbox"/> Council Goals/Priorities: Expand home ownership	<input checked="" type="checkbox"/> Adopted Master Plan(s): Frog Pond Area Plan	<input type="checkbox"/> Not Applicable	

### ISSUE BEFORE COUNCIL:

Provide feedback and input on infrastructure analyses and plans for Frog Pond East and South.



## EXECUTIVE SUMMARY:

Following designation of the subject land as an urban reserve in 2010, the City adopted the Frog Pond Area Plan in 2015 to set the stage for additional planning and eventual development to meet identified housing needs. Besides the urban reserve area, the Frog Pond Area Plan also established a vision for growth for undeveloped land already within the City's Urban Growth Boundary (UGB) now known as Frog Pond West. In 2017, a Master Plan and implementing zoning code was adopted for Frog Pond West. The Master Plan provided the necessary regulatory framework for the residential neighborhood currently under development north of Boeckman Road and west of Stafford Road.

In 2018, Metro expanded the UGB to include the urban reserve land known as Frog Pond East and South. As part of the Metro Ordinance adopting the UGB expansion, Metro required Wilsonville to complete master planning to make the area development ready, from a regulatory standpoint, by December 2022. Similar to past master planning efforts, such as Villebois and Frog Pond West, this master planning effort will identify the types and locations of the homes, other land uses, parks, open spaces, streets, trails and neighborhood amenities to be built over the next 10-20 years. To support implementation of the plan, the process will also identify water, sewer, stormwater, and transportation infrastructure needs and funding sources.

This will be the City Council's eighth work session on the Frog Pond East and South Master Plan. The previous work sessions and their content were as follows:

*Work Session 1-October 2021:* Focus on overall project scope and the outreach plan.

*Work Session 2-January 2022:* Initial feedback on the needs and opportunities for affordable housing and housing variety.

*Work Session 3-March 2022:* Continuation of the topic of housing needs for more detailed feedback and direction, introduction of the neighborhood commercial evaluation.

*Work Session 4-May 2022:* Further discussion of the neighborhood commercial center and discussion of the design concepts for development of land use and urban design alternatives.

*Work Session 5-June 2022:* Provided direction on draft land use alternatives, including mapping the locations of different housing types and forms (grouped into Type 1, Type 2, and Type 3).

*Work Session 6-July 2022:* Reviewed the draft preferred land use alternative and gave direction on land use policies around housing variety.

*Work Session 7-September 2022:* Discussion of housing variety policy and first time home ownership and public realm master plan components.

This *Work Session 8* will primarily focus on the Transportation Analysis (Attachment 1) and Infrastructure Technical Memo (Attachment 2). The project team will be available to discuss and answer any questions. In addition, the project team will be available to answer any outstanding questions or have discussion about other project elements from prior work sessions.

### **Transportation Analysis and Proposed Infrastructure**

The 2015 Frog Pond Area Plan set the vision for all three Frog Pond neighborhoods and thus, included a transportation evaluation that encompassed Frog Pond East and South. Traffic modeling has thus anticipated development of these neighborhoods consistent with the Plan. The attached Transportation Analysis (Attachment 1) refines the prior 2015 evaluation. The Transportation Analysis is based on the maximum potential amount of commercial - to test the system, the analysis assumed 50,000 square feet although the current recommendation is a maximum of 44,000 square feet - and the likely number of dwelling units (1,800) under the preferred land use alternative. As a next step, the information from the preferred land use alternative Transportation Analysis will be used to develop a street project list to include in the infrastructure plan.

Key points of the Transportation Analysis are as follows:

- With recommended improvements and construction of high-priority projects in the Wilsonville and Clackamas County Transportation System Plans (TSPs), level of service will be met at impacted intersections, both nearby and further away in Wilsonville. This includes the I-5 interchanges and the Elligsen/Stafford intersection.
- New round-a-bouts are recommended on Stafford Road at Kahle Road and Brisband Street and on Advance Road at 60<sup>th</sup> Avenue.
- A median/barrier is recommended on Stafford Road at Frog Pond Lane to prevent traffic from crossing Stafford Road while still allowing most movements to and from Stafford Road into Frog Pond West and Frog Pond East.
- A number of pedestrian crossing amenities are recommended subject to further refinement with public input, including from stakeholders such as the school district.

### **Water, Sanitary Sewer Proposed Infrastructure**

Similar to the transportation analysis, initial water, sanitary sewer, and stormwater analysis was completed for the 2015 Frog Pond Area Plan. In a June work session, an existing conditions analysis was presented, which included the discussion of existing conditions of the Frog Pond East and South area infrastructure, previously prepared plans, and a review of applicable standards. The Infrastructure Technical Memo (Attachment 2) builds on this previous work and lays out the proposed infrastructure to serve Frog Pond East and South in a manner that meets City standards. Like the Transportation Analysis, the Infrastructure Technical Memo tests the maximum potential amount of commercial and the likely number of dwelling units under the preferred land use alternative.

The information from the Infrastructure Technical Memo will be used to estimate infrastructure costs for the Frog Pond East and South Master Plan area. The following are some key points from the proposed infrastructure analysis regarding water and sanitary sewer:

- Key off-site infrastructure planned in the City’s existing infrastructure master plans are needed to provide infrastructure capacity to Frog Pond East and South:
  - Water storage capacity: Westside tank northwest of Villebois, anticipated completion 2025.
  - Downstream sanitary sewer capacity: Boeckman Road Sewer Trunk Line, construction planned in 2024. Boeckman Creek sewer interceptor, anticipated completion 2025.
- The exact amount of development that can occur in Frog Pond East and South prior to completion of the key planned off-site infrastructure projects will need further analysis. This may occur either as part of the Master Plan and/or at time of development proposal. Capacity will depend on the amount and timing of development in Frog Pond East and South relative to development in Frog Pond West and elsewhere in the City.
- Not previously identified in an infrastructure master plan, important off-site 12-inch water distribution connections are needed under Boeckman Creek from the end of Frog Pond Lane towards Canyon Creek Road and beneath Meridian Creek just south of Meridian Creek Middle School.
- Due to topography, Frog Pond East and South will require four sanitary sewer lift stations.

Stormwater infrastructure will also be part of the Frog Pond East and South Master Plan. Additional analysis and discussion is needed by the project team prior to presentation of stormwater infrastructure to the City Council. The team plans to bring this information forward in an upcoming work session.

Council may notice the Technical Memorandum includes a discussion of a hypothetical higher density scenario. State Administrative Rules adopted to implement House Bill 2001, as recently updated in September, provide a number of options for new master planned areas such as Frog Pond East and South to be found in compliance with House Bill 2001, the State’s middle housing law. One of the compliance options involves planning infrastructure for a higher hypothetical density. The project scope includes this sensitivity analysis for this higher hypothetical density to help inform selection of the compliance option. The project team does not plan discussion of this alternative density at this work session, but may bring up in the future as relevant to compliance options.

#### Discussion Questions:

1. What questions or comments does the Council have about the Transportation Analysis (Attachment 1)?

2. What questions or comments does the Council have about the Infrastructure Analysis (Attachment 2)?
3. What additional feedback or direction, if any, does the Council have on items previously discussed during work sessions?

**EXPECTED RESULTS:**

Feedback and direction from the City Council on infrastructure to support the development of Frog Pond East and South.

**TIMELINE:**

This is the eighth in a series of work sessions for the City Council. The next work session is planned for November. The Master Plan is scheduled to be completed by December 2022, with some implementation elements extending into the first half of 2023.

**CURRENT YEAR BUDGET IMPACTS:**

The project is funded by a combination of a \$350,000 Metro grant, an \$81,000 Oregon DLCD grant, and matching City funds in the form of staff time. \$311,000 is budgeted in FY 22/23 to complete the project.

**COMMUNITY INVOLVEMENT PROCESS:**

The project has a community engagement plan which lays out a robust public engagement program that will include meaningful and impactful involvement of people who identify with historically marginalized communities.

**POTENTIAL IMPACTS OR BENEFIT TO THE COMMUNITY:**

Furthering of the City's Equitable Housing Strategic Plan and Council's goal of affordable home ownership, while creating Wilsonville next great neighborhoods.

**ALTERNATIVES:**

The Planning Commission and City Council can continue to direct changes to the draft plan elements. In addition, the Planning Commission and City Council continues to have a number of options for policy related to housing variety.

**CITY MANAGER COMMENT:**

N/A

**ATTACHMENTS:**

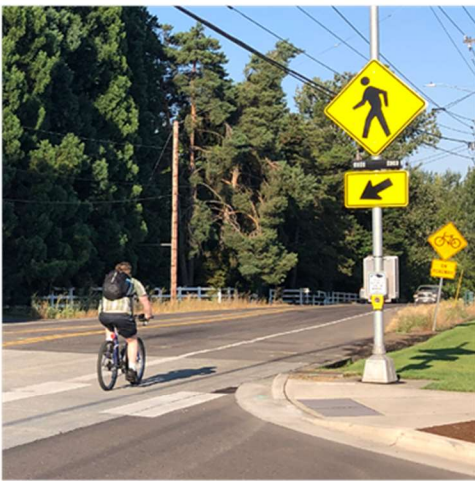
1. Transportation Analysis (dated September 7, 2022)
2. Infrastructure Technical Memo (dated September 6, 2022)

FROG POND EAST & SOUTH MASTER PLAN

Attachment 1

## TRANSPORTATION ANALYSIS: EXISTING AND FUTURE CONDITIONS

SEPTEMBER 2022



**EAST & SOUTH**  
MASTER PLAN

**PREPARED FOR THE CITY OF WILSONVILLE**



**PREPARED BY DKS ASSOCIATES**



## TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY .....</b>	<b>1</b>
<b>EXISTING TRAFFIC CONDITIONS (2022) .....</b>	<b>4</b>
EXISTING TRAFFIC VOLUMES.....	4
INTERSECTION PERFORMANCE MEASURES.....	4
EXISTING INTERSECTION OPERATIONS .....	5
BICYCLE, PEDESTRIAN, AND TRAIL NEEDS.....	8
<b>FUTURE BASELINE CONDITIONS (2040) .....</b>	<b>9</b>
FUTURE BASELINE TRAFFIC VOLUMES.....	9
FUTURE HIGH-PRIORITY TSP PROJECTS.....	11
FUTURE BASELINE INTERSECTION OPERATIONS .....	11
<b>ANTICIPATED BUILD CONDITIONS (2040).....</b>	<b>13</b>
LAND USE ASSUMPTIONS AND ADJUSTMENTS .....	13
ANTICIPATED BUILD TRAFFIC VOLUMES .....	13
ANTICIPATED BUILD INTERSECTION OPERATIONS .....	15
RECOMMENDED TRANSPORTATION IMPROVEMENTS .....	16
<b>IDENTIFIED PROJECTS.....</b>	<b>19</b>
<b>APPENDIX .....</b>	<b>20</b>





## LIST OF FIGURES

FIGURE 1: RECOMMENDED INTERSECTION IMPROVEMENTS.....	3
FIGURE 2: RECOMMENDED PEDESTRIAN, BICYCLE, AND TRAIL IMPROVEMENTS .....	3
FIGURE 3: EXISTING 2022 TRAFFIC VOLUMES, LANE GEOMETRIES, AND TRAFFIC CONTROL .....	6
FIGURE 4: BASELINE (2040) TRAFFIC VOLUMES, LANE GEOMETRIES, AND TRAFFIC CONTROL ..	10
FIGURE 5: BUILD (2040) TRAFFIC VOLUMES, LANE GEOMETRIES, AND TRAFFIC CONTROL .....	14

## LIST OF TABLES

TABLE 1: EXISTING (2022) INTERSECTION OPERATIONS .....	7
TABLE 2: FUTURE BASELINE (2040) INTERSECTION OPERATIONS .....	12
TABLE 3: TRAVEL DEMAND MODEL ADJUSTMENTS .....	13
TABLE 4: ANTICIPATED BUILD (2040) INTERSECTION OPERATIONS.....	15
TABLE 5: ANTICIPATED BUILD (2040) INTERSECTION OPERATIONS - IMPROVEMENTS.....	17





This report documents the traffic analysis performed in association with the Frog Pond East & South Master Plan in Wilsonville, Oregon. This report provides a more refined evaluation of the East and South land use as compared to the Frog Pond Area Plan,<sup>1</sup> which was adopted in 2015, and builds on the work of the Frog Pond West Master Plan,<sup>2</sup> which was adopted in 2017.

An executive summary of this transportation analysis is provided below. The following sections of this memorandum document the existing traffic conditions (2022), future baseline and build traffic conditions (2040), and a list of resulting transportation projects. The year 2040 was selected for future analysis to be consistent with the Metro Regional Transportation Plan (RTP) and Wilsonville Travel Demand Model's horizon year.

## EXECUTIVE SUMMARY

To determine existing and future transportation conditions for the Frog Pond East and South neighborhoods, a comprehensive traffic analysis was performed. The analysis focused on the major intersections both within the project vicinity and within Wilsonville at large, including the two I-5 interchange areas (i.e., Wilsonville Road and Elligsen Road). The study area includes 15 total intersections, including 4 key gateway intersections to the neighborhoods.

The existing conditions analysis was based on recent 2021 and 2022 traffic counts and existing intersection geometries, while the future analysis was based on traffic forecasts for the 2040 horizon year and improved intersection geometries associated with all High Priority Projects included in Wilsonville's Transportation System Plan (TSP). The future analysis consisted of two scenarios: 2040 Baseline and 2040 Build. The future land use assumptions are consistent with the Metro model, which was used to update the travel demand model for the Build scenario. The 2040 Baseline scenario assumes no additional growth beyond what is currently assumed in the 2040 model and the 2040 Build scenario represents the likely build-out of the study area, which includes up to 1,800 housing units and up to 44,000 square feet of commercial space within the East and South neighborhoods.

The City has also identified a hypothetical higher-density alternative which calls for approximately 2,400 total units in the combined East and South neighborhoods. This higher dwelling unit amount reflects 20 units per net acre, which is a density prescribed in one of the compliance options in State administrative rules for new urban areas to comply with House Bill 2001 middle housing law. The project team is still analyzing and confirming the impact of a hypothetical higher unit count and will incorporate it into a future draft of this Transportation Analysis.

Intersection traffic operations were analyzed for the weekday PM peak hour under the existing and both future scenarios to evaluate if the study intersections meet desired performance levels as required by the City of Wilsonville, Clackamas County, and Oregon Department of Transportation

---

<sup>1</sup> Frog Pond West Master Plan, City of Wilsonville, July 17, 2017.

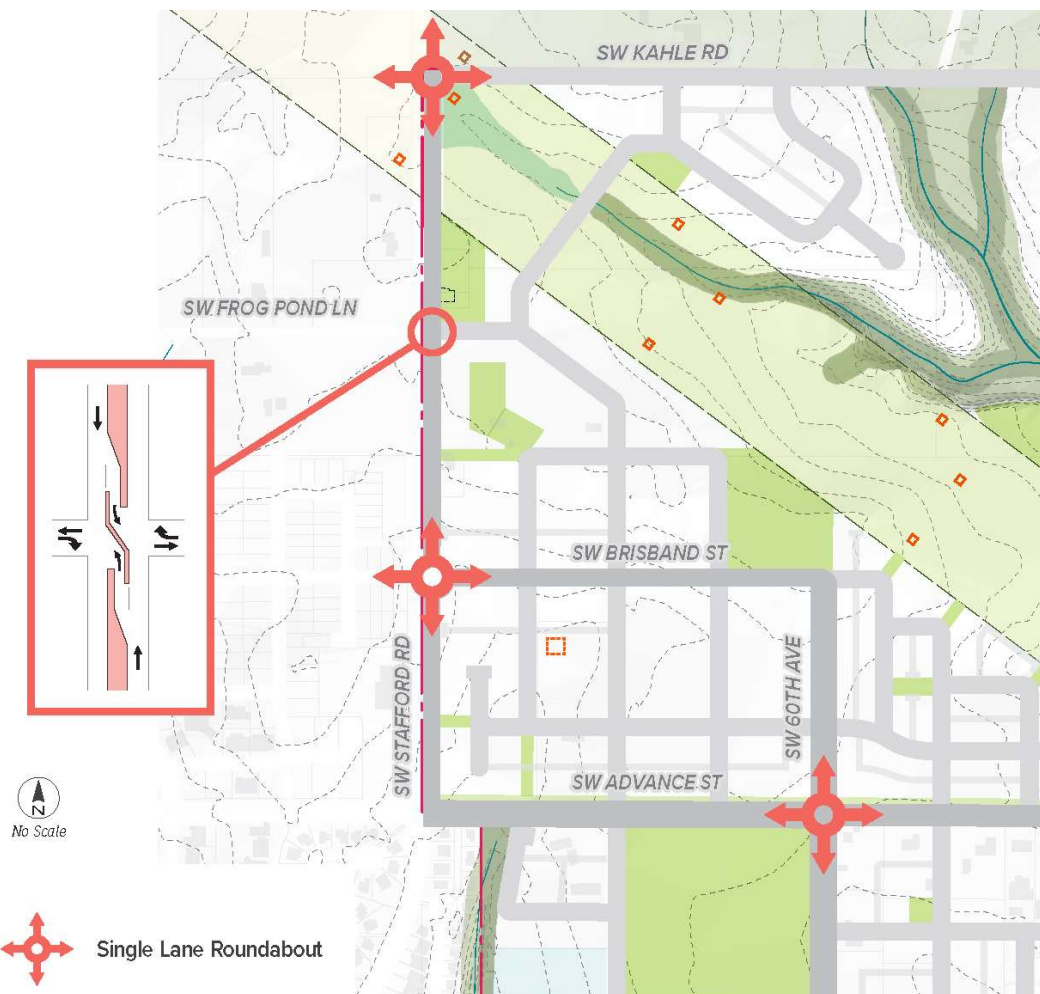
<sup>2</sup> Frog Pond Area Plan, City of Wilsonville, November 16, 2015.



(ODOT). All intersections except the Stafford Road/65<sup>th</sup> Avenue intersection currently meet operating standards and targets. Additional coordination between Clackamas County and City of Wilsonville is recommended regarding the necessary improvements to that intersection to accommodate future Frog Pond development.

In the future 2040 scenarios, all but three of the study intersections are expected to continue to meet standards and targets in the future assuming the completion of the High Priority Projects identified in the TSP. Those three intersections are located along Stafford Road and are the gateway intersections to the Frog Pond East neighborhood and were analyzed as stop controlled intersections. The following transportation improvements are recommended for these intersections.

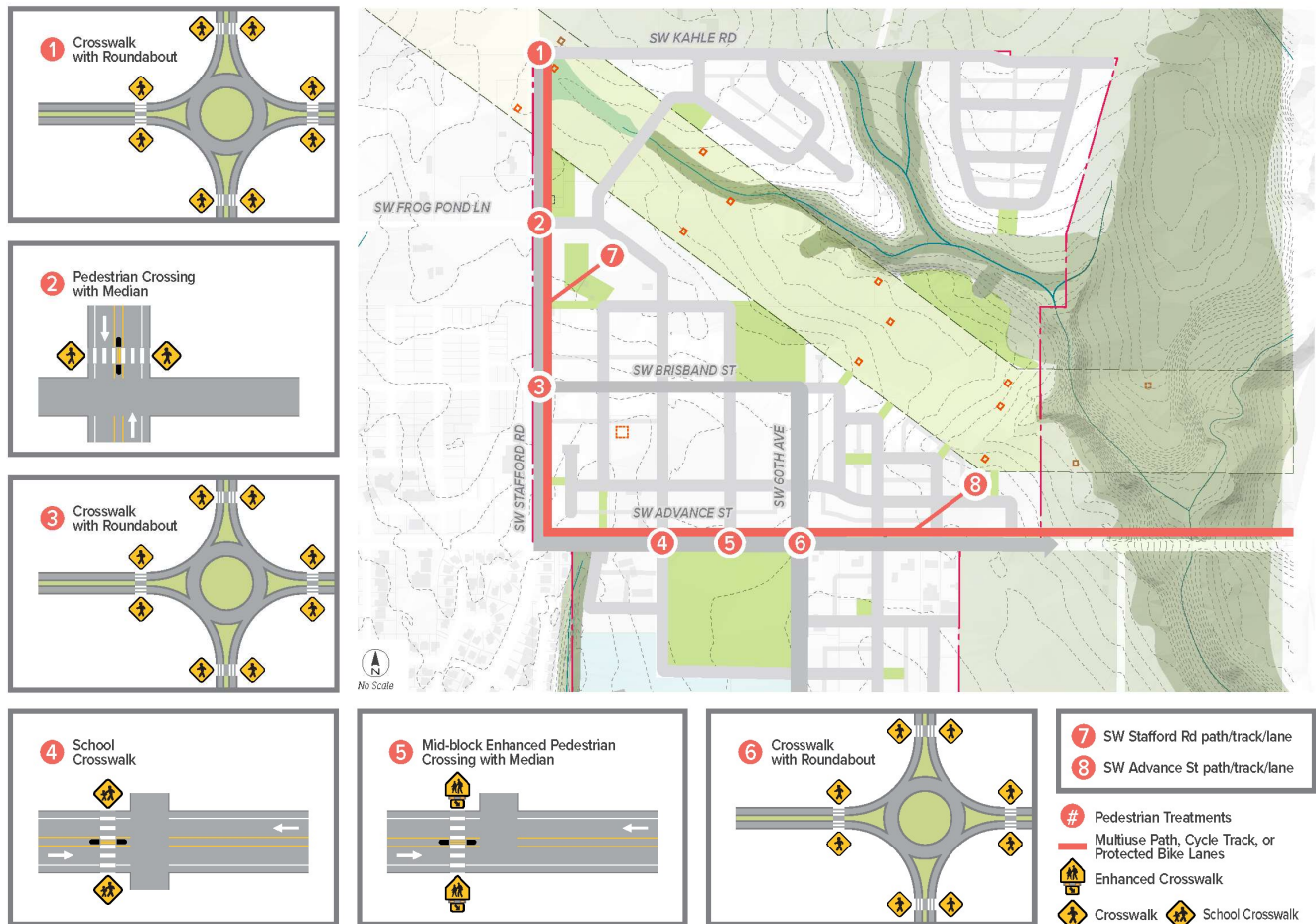
- **Stafford Road/Kahle Road:** Install a single-lane roundabout
- **Stafford Road/Frog Pond Lane:** Install a raised median to prohibit minor street through and left turns and install an enhanced pedestrian crossing with a center refuge median.
- **Stafford Road/Brisband Street:** Install a single-lane roundabout



**FIGURE 1: RECOMMENDED INTERSECTION IMPROVEMENTS**

Additional transportation projects were identified for the East and South neighborhood to enhance safety, which are listed below:

- Install a roundabout at Advance Road/60<sup>th</sup> Avenue. The installation of a roundabout at this location will create a gateway between the high-speed rural traffic and the new desired slower urban speeds. The roundabout will also provide for slower speeds and improved access to the Frog Pond neighborhoods.
- Install various pedestrian, bicycle, and trail improvements on Stafford Road and Advance Road (shown below).



**FIGURE 2: RECOMMENDED PEDESTRIAN, BICYCLE, AND TRAIL IMPROVEMENTS**

## EXISTING TRAFFIC CONDITIONS (2022)

Existing traffic conditions were evaluated for the study area and include traffic volumes; intersection operations; and bike, pedestrian, and trail conditions.

### EXISTING TRAFFIC VOLUMES

Traffic counts were collected for the PM peak period (4:00 to 6:00 p.m.) at the following study intersections.<sup>3</sup> The PM peak hour traffic volumes (i.e., the highest hourly volumes during the peak period) are shown in Figure 3 and the traffic counts are provided in the appendix.

- Elligsen Road/I-5 Southbound Ramp
- Elligsen Road/I-5 Northbound Ramp
- Elligsen Road/Parkway Avenue
- Elligsen Road/Parkway Center Drive
- Stafford Road/65<sup>th</sup> Avenue
- Boeckman Road/Parkway Avenue
- Boeckman Road/Canyon Creek Road
- Boeckman Road-Advance Road/Stafford Road-Wilsonville Road
- Advance Road/60<sup>th</sup> Avenue
- Stafford Road/Brisband Street
- Stafford Road/Frog Pond Lane
- Stafford Road/Kahle Road
- Wilsonville Road/I-5 Southbound Ramp
- Wilsonville Road/I-5 Northbound Ramp
- Wilsonville Road/Town Center Loop West

### INTERSECTION PERFORMANCE MEASURES

Agency mobility standards often require intersections to meet level of service (LOS) or volume-to-capacity (v/c) intersection operation thresholds. Additional operational details are provided in the appendix.

- The intersection LOS is similar to a “report card” rating based upon average vehicle delay. Level of service A, B, and C indicate conditions where traffic moves without significant delays over periods of peak hour travel demand. Level of service D and E are progressively worse operating conditions. Level of service F represents conditions where average vehicle delay has become excessive and demand has exceeded capacity. This condition is typically evident in long queues and delays.
- The volume-to-capacity (v/c) ratio represents the level of saturation of the intersection or individual movement. It is determined by dividing the peak hour traffic volume by the maximum hourly capacity of an intersection or turn movement. When the V/C ratio

<sup>3</sup> The counts were collected on September 22, 2021; September 30, 2021; March 30, 2022; May 18, 2022; and June 7, 2022.



approaches 0.95, operations become unstable and small disruptions can cause the traffic flow to break down, resulting in the formation of excessive queues.

The City of Wilsonville requires all intersections to meet its minimum acceptable level of service (LOS) standard of LOS D for the PM peak period.<sup>4</sup>

Clackamas County requires that, for intersections outside of city limits, signalized and roundabout intersections must meet the volume-to-capacity ratio (v/c) of 0.90 or less and unsignalized intersections must meet the minimum LOS standard of LOS E during the PM peak period.<sup>5</sup>

ODOT specifies a typical mobility target for interchange ramps of a volume-to-capacity ratio (v/c) of 0.85. However, when the interchange vicinity is fully developed and adequate storage is available on the interchange ramp to prevent queues from backing up on the main line, then the target can be increased to a 0.90 v/c ratio.<sup>6</sup> This is the case for both of the I-5 interchange areas in Wilsonville.

## EXISTING INTERSECTION OPERATIONS

---

Intersection operations were analyzed for the PM peak hour to evaluate whether the transportation network currently operates within desired performance levels as required by the City of Wilsonville, Clackamas County, and ODOT. Intersections are the focus of the analysis because they are the controlling bottlenecks of traffic flow and the ability of a roadway system to carry traffic efficiently is nearly always diminished in their vicinity.

The existing PM peak hour intersection operations at the study intersection were determined based on the 6<sup>th</sup> Edition Highway Capacity Manual methodology.<sup>7</sup> Table 1 lists the estimated average delay (in seconds), level of service (LOS), and volume to capacity (v/c) ratio for each study intersection. As shown, all intersections currently meet operating standards and targets with exception of Stafford Road/65th Avenue, which is within Clackamas County's jurisdiction. Additional coordination between Clackamas County and City of Wilsonville is recommended regarding the necessary improvements at this intersection to accommodate future Frog Pond development.

---

<sup>4</sup> Policy 5, Wilsonville Transportation System Plan, Amended November 16, 2020.

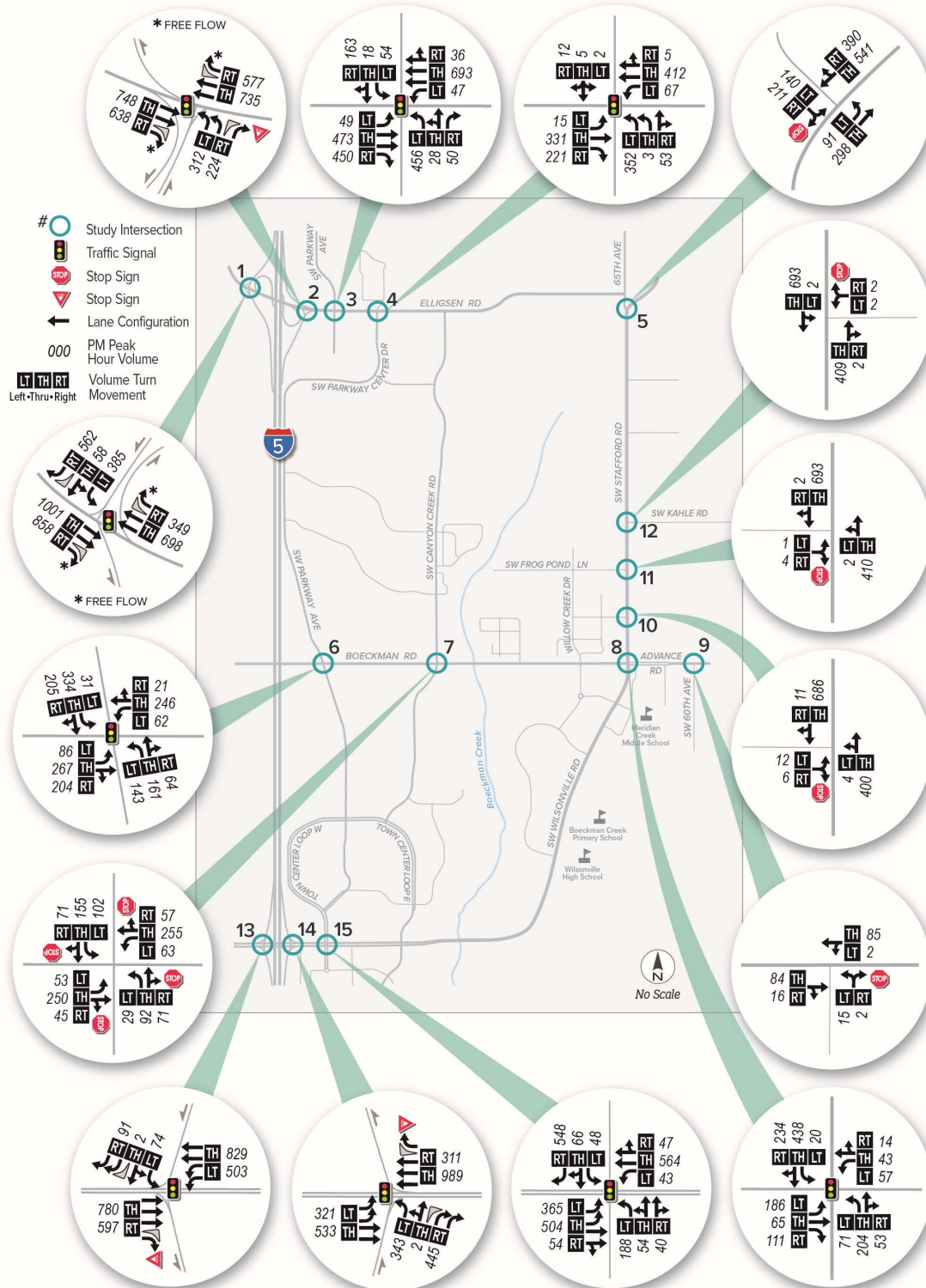
<sup>5</sup> System Performance Policies, Chapter 5: Transportation System Plan, Clackamas County Comprehensive Plan, Amended January 1, 2022.

<sup>6</sup> Oregon Highway Plan, Action 1F.1, Oregon Department Of Transportation, Amended May 2015.

<sup>7</sup> Highway Capacity Manual, 6th Edition, Transportation Research Board, 2017.







**FIGURE 3: EXISTING 2022 TRAFFIC VOLUMES, LANE GEOMETRIES, AND TRAFFIC CONTROL**



**TABLE 1: EXISTING (2022) INTERSECTION OPERATIONS**

INTERSECTION	OPERATING STANDARD	PM PEAK HOUR		
		V/C	DELAY	LOS
SIGNALIZED				
ELLIGSEN RD/I-5 SB RAMPS	v/c ≤ 0.90	0.74	19.5	B
ELLIGSEN RD/I-5 NB RAMPS	v/c ≤ 0.90	0.34	8.4	A
ELLIGSEN RD/PARKWAY AVE	LOS D	0.32	15.9	B
ELLIGSEN RD/PARKWAY CENTER DR	LOS D	0.40	14.9	B
BOECKMAN RD/PARKWAY AVE	LOS D	0.84	25.6	C
STAFFORD RD-WILSONVILLE RD /BOECKMAN RD-ADVANCE RD	LOS D	0.65	17.0	B
WILSONVILLE RD/I-5 SB RAMPS	v/c ≤ 0.90	0.38	19.3	B
WILSONVILLE RD/I-5 NB RAMPS	v/c ≤ 0.90	0.44	16.2	B
WILSONVILLE RD/TOWN CENTER LP WEST	LOS D	0.38	28.1	C
TWO-WAY STOP-CONTROLLED				
STAFFORD RD/65 <sup>TH</sup> AVE	LOS E	>1.20	>120	B/F
ADVANCE RD/60 <sup>TH</sup> AVE	LOS D	0.03	9.8	A/A
STAFFORD RD/BRISBAND ST	LOS D	0.08	20.9	A/C
STAFFORD RD/FROG POND LN	LOS D	0.02	15.7	A/C
STAFFORD RD/KAHLE RD	LOS D	0.01	16.9	A/C
ALL-WAY STOP-CONTROLLED				
BOECKMAN RD/CANYON CREEK RD	LOS D	0.71	20.3	C

**SIGNALIZED INTERSECTION:**

Delay = Average Intersection Delay (secs)  
v/c = Total Volume-to-Capacity Ratio  
LOS = Total Level of Service

**TWO-WAY STOP-CONTROLLED INTERSECTION:**

Delay = Critical Movement Delay (secs)  
v/c = Critical Movement Volume-to-Capacity Ratio  
LOS = Critical Levels of Service (Major/Minor Road)

**ALL-WAY STOP CONTROLLED INTERSECTION:**

Delay = Average Intersection Delay (secs)  
v/c = Critical Movement Volume-to-Capacity Ratio  
LOS = Total Level of Service



## BICYCLE, PEDESTRIAN, AND TRAIL NEEDS

---

Bicycle, pedestrian, transit, and trail conditions and needs were considered for the study area, with particular emphasis on connectivity to the rest of Wilsonville's neighborhoods, trails, parks, and schools.

The Wilsonville TSP identifies various multimodal improvement projects that are intended to address the deficiencies. Projects within the vicinity of the Frog Pond Area include urban upgrades to Boeckman Road and Stafford Road, which include bike lanes, sidewalks, and transit stop improvements/additions. The TSP also includes a project for new trails through the Frog Pond East and South neighborhoods.

### ADVANCE ROAD NEEDS

Additional school safety improvements should be considered on Advance Road near Meridian Creek Middle School. An increase in pedestrian and bicycle traffic to and from the school can be expected with the buildout of the East and South neighborhoods, necessitating pedestrian crossing enhancements on Advance Road.

The urban upgrade improvements on Boeckman Road are currently in the design phase and a separated multi-use path, cycle track, or protected bike lanes are being considered along Boeckman Road. It is desired by the City to extend the identified multimodal improvements on Boeckman Road to the west of Stafford Road along Advance Road fronting the Frog Pond development.

### STAFFORD ROAD NEEDS

Pedestrian crossing enhancements on Stafford Road will be needed as the East neighborhood is built out. A significant increase in pedestrian and bicycle trips are expected across Stafford Road between the existing Frog Pond West neighborhood and the planned primary school (in Frog Pond West) to housing and commercial uses in the East neighborhood. Key locations for crossing enhancements would be at Frog Pond Lane and Brisband Street. A signalized crossing already exists at the Stafford Road-Wilsonville Road/Boeckman Road-Advance Road intersection.

Separated pedestrian and bicycle facilities are also desired along Stafford Road since it is a higher speed, higher volume facility. A separated multi-use path, cycle track, or protected bike lanes should be considered along Stafford Road fronting the Frog Pond development on either the west or east side. Given that the majority of the west side of Stafford Road has already gone through development review, the east side of Stafford Road would be the preferred location for a separated pedestrian and bicycle facility.

Recommendations for bicycle and pedestrian projects are listed on page 18 of this memo.





## FUTURE BASELINE CONDITIONS (2040)

Future baseline (2040) traffic conditions were evaluated for the study area and include the forecasted baseline traffic volumes and intersection operations. For analysis purposes, the East and South neighborhoods are assumed to experience full build-out by the year 2040.

### FUTURE BASELINE TRAFFIC VOLUMES

Future traffic volumes were forecasted for the study intersections using the recently updated travel forecast models developed specifically for Wilsonville. The models apply trip generation and trip distribution data directly taken from the Metro regional travel demand forecast models but add additional detail to better represent local travel conditions and routing within Wilsonville.

Figure 4 shows the PM peak hour traffic volumes for the study intersections based on the Metro model assumptions. As the forecasts are consistent with the current Metro land use assumptions, this scenario is referred to as the 2040 Baseline scenario. This scenario already accounts for some existing homes in the West neighborhood and contains land use assumptions (housing and some employment) in the East and South neighborhoods in 2040.

It should be noted that the Metro model was used for this study because it represents the latest regionally approved land use for Wilsonville and the Region. This model was completed by Metro, in collaboration with the City, after the City's TSP was approved and includes additional land use and transportation network assumptions adopted by Metro after the TSP was adopted.



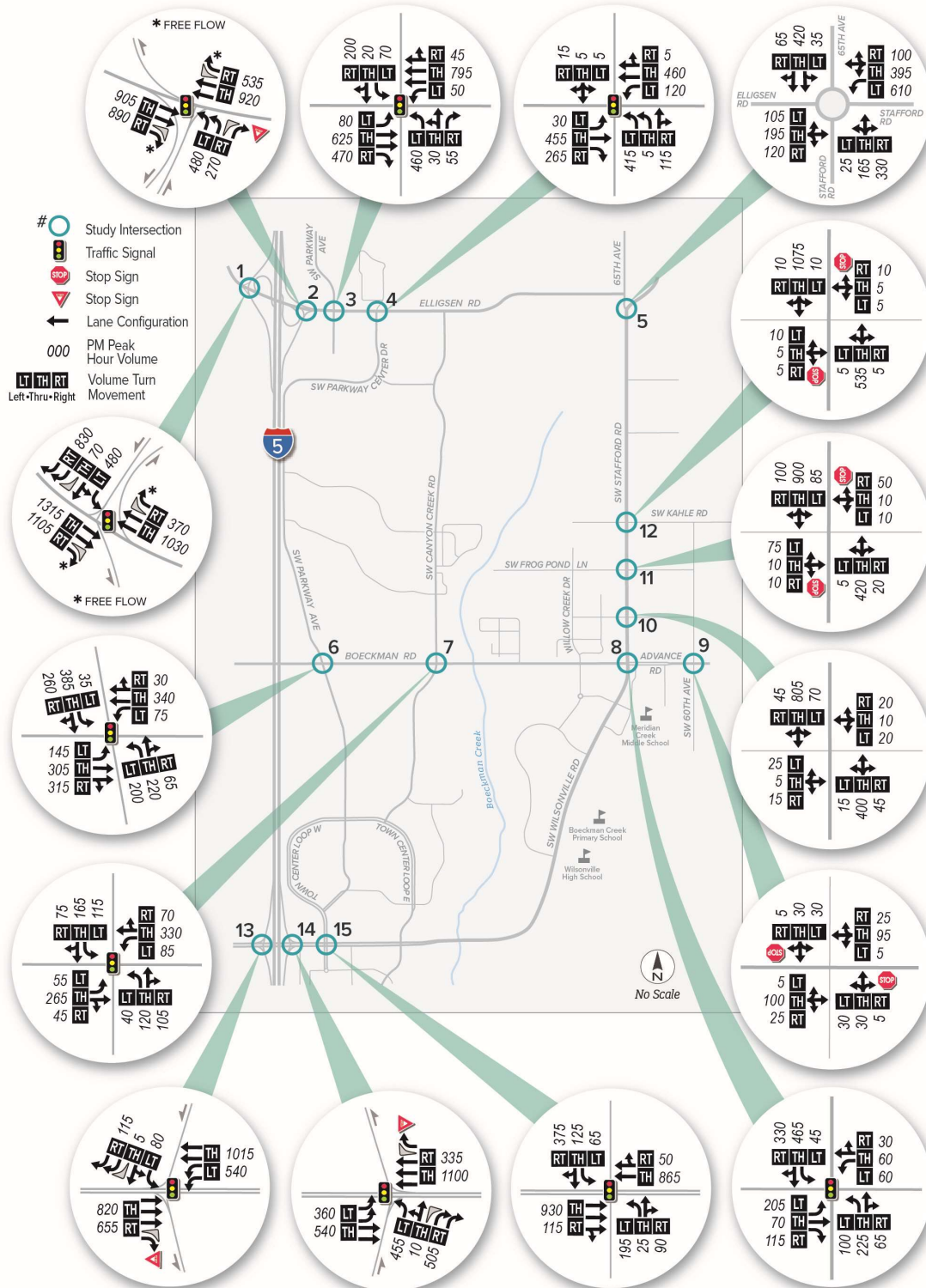


FIGURE 4: BASELINE (2040) TRAFFIC VOLUMES, LANE GEOMETRIES, AND TRAFFIC CONTROL



## FUTURE HIGH-PRIORITY TSP PROJECTS

---

The future baseline scenario assumed improved intersection geometries associated with all High Priority Projects included in Wilsonville's TSP. The High Priority Projects applicable to the Frog Pond study area include the following:

- Addition of a second southbound right turn lane on the I-5 Southbound Off-Ramp at Elligsen Road (SI-07).
- Addition of dual eastbound and westbound through lanes at Boeckman Road/Parkway Avenue intersection (RW-01).
- Installation of traffic signal at Boeckman Road/Canyon Creek Road (UU-01). The City of Wilsonville is currently in the conceptual design phase for this intersection and a roundabout is also under consideration.
- Intersection modifications at Wilsonville Road/Town Center Loop West which including eliminating westbound and eastbound left turns, addition of an eastbound through "trap" lane, and reduction of the northbound and southbound approaches to a left turn lane and shared through-right turn lane (SI-09).
- Installation of a roundabout and combination of the existing intersections of Elligsen Road/65th Avenue and Stafford Road/65th Avenue (SI-03). This intersection is located within Clackamas County and is identified in their TSP but is also referenced in the Wilsonville TSP. For this analysis, the roundabout was evaluated as a partial dual-lane roundabout.

## FUTURE BASELINE INTERSECTION OPERATIONS

---

Intersection traffic operations under the future 2040 Baseline scenario were analyzed for the PM peak hour to evaluate whether the transportation network is expected to remain within desired performance levels as required by the City of Wilsonville, Clackamas County, and ODOT.

Table 2 lists the estimated average delay (in seconds), level of service (LOS), and volume to capacity (v/c) ratio that each study intersection and future access is expected to experience.

As shown, all intersections are expected to meet operating standards and targets under Baseline conditions with exception of the Stafford Road/Kahle Road, Stafford Road/Frog Pond Lane, and Stafford Road/Brisband Street intersections, which were analyzed as key gateways to the Frog Pond East neighborhood.



**TABLE 2: FUTURE BASELINE (2040) INTERSECTION OPERATIONS**

INTERSECTION	OPERATING STANDARD	PM PEAK HOUR		
		V/C	DELAY	LOS
SIGNALIZED				
ELLIGSEN RD/I-5 SB RAMPS	v/c ≤ 0.90	0.73	18.1	B
ELLIGSEN RD/I-5 NB RAMPS	v/c ≤ 0.90	0.45	9.3	A
ELLIGSEN RD/PARKWAY AVE	LOS D	0.52	24.4	C
ELLIGSEN RD/PARKWAY CENTER DR	LOS D	0.55	16.9	B
BOECKMAN RD/PARKWAY AVE	LOS D	0.82	23.5	C
BOECKMAN RD/CANYON CREEK RD	LOS D	0.57	15.2	B
STAFFORD RD-WILSONVILLE RD /BOECKMAN RD-ADVANCE RD	LOS D	0.79	22.5	C
WILSONVILLE RD/I-5 SB RAMPS	v/c ≤ 0.90	0.40	14.0	B
WILSONVILLE RD/I-5 NB RAMPS	v/c ≤ 0.90	0.52	22.2	C
WILSONVILLE RD/TOWN CENTER LP WEST	LOS D	0.82	44.3	D
TWO-WAY STOP-CONTROLLED				
ADVANCE RD/60 <sup>TH</sup> AVE	LOS D	0.11	11.4	A/B
STAFFORD RD/BRISBAND ST	LOS D	0.49	72.6	A/F
STAFFORD RD/FROG POND LN	LOS D	>1.20	>120	B/F
STAFFORD RD/KAHLE RD	LOS D	0.29	70.3	B/F
ROUNDBOUT				
STAFFORD RD/65 <sup>TH</sup> AVE/ELLIGSEN RD	v/c ≤ 0.90	0.84	17.9	B

**SIGNALIZED INTERSECTION:**

Delay = Average Intersection Delay (secs)  
v/c = Total Volume-to-Capacity Ratio  
LOS = Total Level of Service

**TWO-WAY STOP-CONTROLLED INTERSECTION:**

Delay = Critical Movement Delay (secs)  
v/c = Critical Movement Volume-to-Capacity Ratio  
LOS = Critical Levels of Service (Major/Minor Road)

**ROUNDBOUT INTERSECTION:**

Delay = Average Intersection Delay (secs)  
v/c = Critical Movement Volume-to-Capacity Ratio  
LOS = Total Level of Service



## ANTICIPATED BUILD CONDITIONS (2040)

Anticipated build (2040) traffic conditions were evaluated for the study area and include the land use assumptions, anticipated build traffic volumes and intersection operations, and identified transportation improvements.

### LAND USE ASSUMPTIONS AND ADJUSTMENTS

As mentioned previously, the 2040 Wilsonville Travel Demand model currently contains housing and job land use assumptions for the Frog Pond East and South neighborhoods. Now that the East and South neighborhood layouts have been further refined, the assumed quantity of housing units and commercial space have been estimated. To best analyze the impact of the estimated full buildout of the East and South neighborhoods, DKS adjusted the Wilsonville Travel Demand Model assumptions for the transportation analysis zones (TAZs) that comprise the Frog Pond East and South neighborhoods to account for a higher number of housing units than what is currently assumed.

Table 3 lists the land use adjustments that were applied to the 2040 Travel Demand Model to emulate the anticipated land use generation for Frog Pond (Build scenario). As shown below, the number of household units for both neighborhoods was increased by 136% and 0 jobs were increased.

**TABLE 3: TRAVEL DEMAND MODEL ADJUSTMENTS**

	HOUSEHOLDS	JOBS
<b>EAST NEIGHBORHOOD</b>	Increase by 103%	No Change 0%
<b>SOUTH NEIGHBORHOOD</b>	Increase by 225%	No Change 0%
<b>TOTAL</b>	<b>Increase by 130%</b>	<b>No Change 0%</b>

### ANTICIPATED BUILD TRAFFIC VOLUMES

The future 2040 Build traffic volumes were forecasted for the study area using the Wilsonville travel forecast model with the adjustments as previously discussed. Intersection operations were then evaluated to determine how sufficiently the City's future transportation system would support the long-term estimated build-out of the Frog Pond East and South neighborhoods, therefore determining what improvements might be needed. The PM peak hour traffic volumes, lane geometries, and intersection operating conditions are shown in Figure 5.



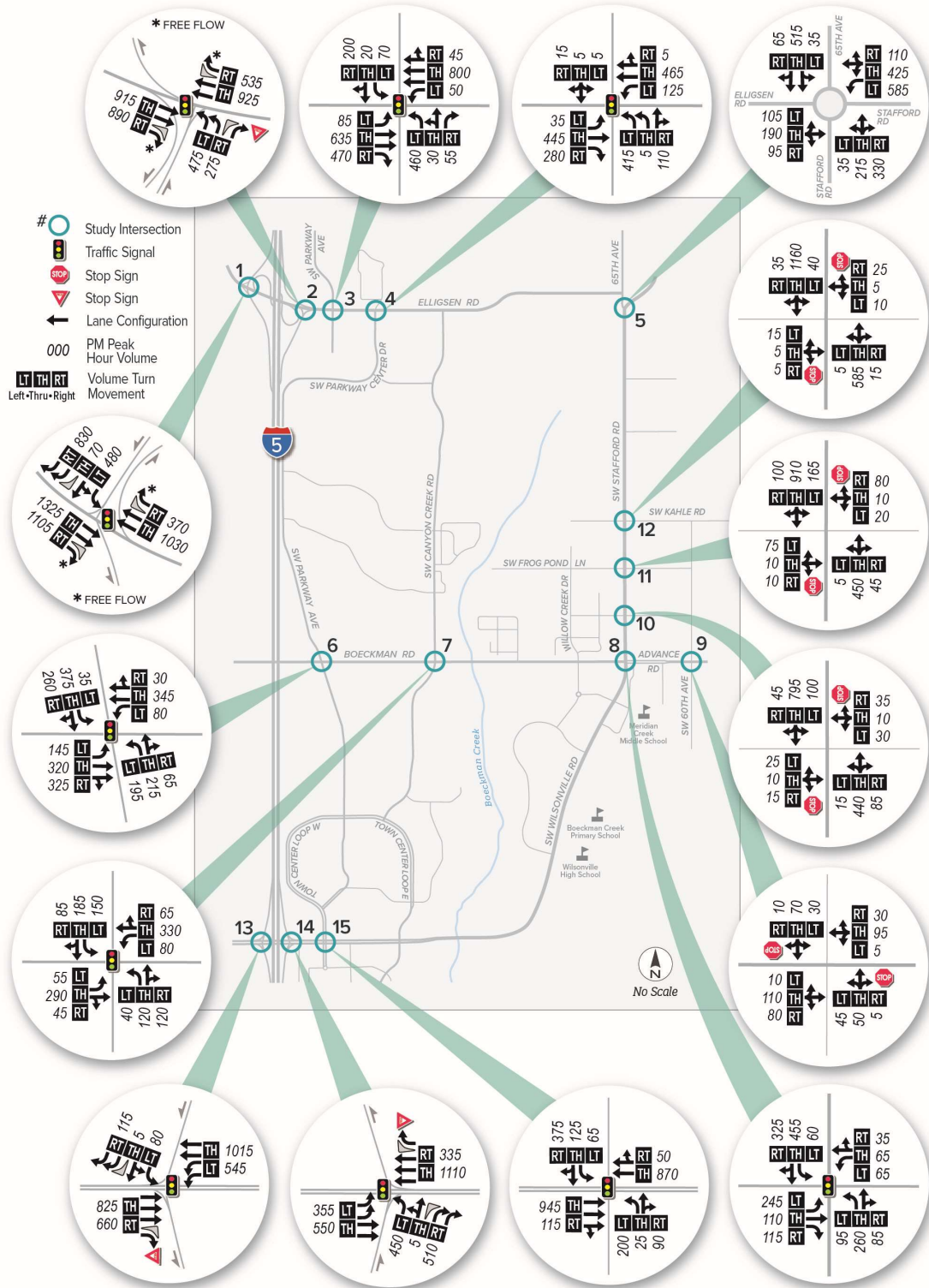


FIGURE 5: BUILD (2040) TRAFFIC VOLUMES, LANE GEOMETRIES, AND TRAFFIC CONTROL



## ANTICIPATED BUILD INTERSECTION OPERATIONS

Intersection traffic operations under the future 2040 Build scenario were analyzed for the PM peak hour with the same intersection geometries that were assumed in the Baseline scenario. Table 4 the estimated average delay (in seconds), level of service (LOS), and volume to capacity (v/c) ratio for each study intersection.

**TABLE 4: ANTICIPATED BUILD (2040) INTERSECTION OPERATIONS**

INTERSECTION	OPERATING STANDARD	PM PEAK HOUR		
		V/C	DELAY	LOS
SIGNALIZED				
ELLIGSEN RD/I-5 SB RAMPS	v/c ≤ 0.90	0.73	18.2	B
ELLIGSEN RD/I-5 NB RAMPS	v/c ≤ 0.90	0.45	9.2	A
ELLIGSEN RD/PARKWAY AVE	LOS D	0.53	24.5	C
ELLIGSEN RD/PARKWAY CENTER DR	LOS D	0.54	16.8	B
BOECKMAN RD/PARKWAY AVE	LOS D	0.81	23.3	C
BOECKMAN RD/CANYON CREEK RD	LOS D	0.60	15.9	B
BOECKMAN RD-ADVANCE RD/ STAFFORD RD-WILSONVILLE RD	LOS D	0.81	22.6	C
WILSONVILLE RD/I-5 SB RAMPS	v/c ≤ 0.90	0.40	14.0	B
WILSONVILLE RD/I-5 NB RAMPS	v/c ≤ 0.90	0.52	22.1	C
WILSONVILLE RD/TOWN CENTER LP WEST	LOS D	0.82	44.1	D
TWO-WAY STOP-CONTROLLED				
ADVANCE RD/60 <sup>TH</sup> AVE	LOS D	0.20	13.2	A/B
STAFFORD RD/BRISBAND ST	LOS D	0.85	>120	A/F
STAFFORD RD/FROG POND LN	LOS D	>1.20	>120	B/F
STAFFORD RD/KAHLE RD	LOS D	0.65	>120	B/F
ROUNDBABOUT				
STAFFORD RD/65 <sup>TH</sup> AVE/ ELLIGSEN RD	v/c ≤ 0.90	0.85	21.0	C

**SIGNALIZED INTERSECTION:**

Delay = Average Intersection Delay (secs)  
v/c = Total Volume-to-Capacity Ratio  
LOS = Total Level of Service

**TWO-WAY STOP-CONTROLLED INTERSECTION:**

Delay = Critical Movement Delay (secs)  
v/c = Critical Movement Volume-to-Capacity Ratio  
LOS = Critical Levels of Service (Major/Minor Road)

**ROUNDBABOUT INTERSECTION:**

Delay = Average Intersection Delay (secs)  
v/c = Critical Movement Volume-to-Capacity Ratio  
LOS = Total Level of Service



As shown, the unsignalized intersections/accesses along Stafford Road (Kahle Road, Frog Pond Lane, and Brisband Street) are expected to exceed the City's LOS D performance standard. The primary reason is the high through volumes that influence delay experienced by side street vehicles attempting to turn left.

## RECOMMENDED TRANSPORTATION IMPROVEMENTS

The three intersections along Stafford Road are located approximately within 800–900 feet from one another. Therefore, the interaction of all improvements at these intersections must be carefully considered due to their proximity. The following projects have therefore been identified to improve the three gateway intersections along Stafford Road to meet the City's level of service D performance standard.

Due to the planned location of the commercial uses off Brisband Street, it is desirable to allow all vehicle turning movements at the Brisband Street intersection to provide full access and connectivity to those land uses. It is also desirable to have a full-access gateway intersection at the far north end of the housing development to function as a gateway between the rural higher speed traffic and urban slower speed traffic and provide safe access to the Frog Pond development. There is a strong desire to preserve the historic Grange building on the northeast corner of Stafford Road/Frog Pond Lane intersection. Turn restrictions could be implemented at the Stafford Road/Frog Pond Lane intersection (restrict minor street through and left turns) to allow access to safe movements (left in, right in and right out). A full access roundabout at Frog Pond Lane would likely require the removal or relocation of the historic Grange building due to the required footprint of the improvement.

If two intersections are improved with roundabouts with a limited access between the two full-access locations, it is likely that many of the residents and drivers familiar with the area would choose to turn left or go through at those improved intersections during the peak periods, particularly with good Collector/Local Street connectivity. Local street connections in both the East and West neighborhoods are planned that would allow sufficient connectivity for vehicles to access the proposed roundabouts Kahle Road or Brisband Street to cross Stafford Road or turn left onto Stafford Road. A discussion on the advantages and disadvantages of roundabouts are provided in a subsequent section.

The recommended improvements are highlighted below.

### KAHLE ROAD/STAFFORD ROAD

**At this intersection, install a single-lane roundabout with pedestrian island.** In addition to meeting capacity needs, the proposed roundabout would improve safety and provide a distinct transition between the rural and urban land use and traffic speeds in the area. The roundabout should include pedestrian medians for enhanced pedestrian crossings.

### FROG POND LANE/STAFFORD ROAD

**At this intersection, install a raised center median and traffic separator that allows northbound and southbound right and left turns from Stafford Road and minor street**





**right turns but restricts minor street eastbound and westbound through and left turn movements to and from Frog Pond West and East.** The restriction is needed to facilitate safe vehicle and pedestrian/bicycle movements at the intersection and to meet the City's LOS standard. This intersection should include enhanced pedestrian crossings with median breaks for safe and improved pedestrian connectivity.

## BRISBAND STREET/STAFFORD ROAD

**At this intersection, install a single-lane roundabout.** This will require a slight shift of Stafford Road to the east to accommodate the necessary right-of-way. The roundabout should include pedestrian medians for enhanced pedestrian crossings.

## 60<sup>TH</sup> AVENUE/ADVANCE ROAD

**At this intersection, install a single-lane roundabout.** While not a necessary improvement for traffic operating conditions, the proposed roundabout would improve safety and provide a distinct transition between the rural land use with high-speed traffic and urban land use with slower vehicle speeds and the need for multimodal safety in the area.

## IMPROVED OPERATING CONDITIONS

The table below shows the intersection operations for the four intersections with the identified transportation improvements in place. As shown, all four intersections will meet the City LOS standard while providing safe multimodal improvements for pedestrian and bicycles.

**TABLE 5: ANTICIPATED BUILD (2040) INTERSECTION OPERATIONS - IMPROVEMENTS**

INTERSECTION	IMPROVEMENT	OPERATING STANDARD	PM PEAK HOUR		
			V/C	DELAY	LOS
ADVANCE RD/ 60 <sup>TH</sup> AVE	Roundabout	LOS D	0.19	4.3	A
STAFFORD RD/ BRISBAND ST	Roundabout	LOS D	0.78	12.7	B
STAFFORD RD/ FROG POND LN	Two-Way Stop-Controlled with Minor Street Turn Restrictions	LOS D	0.04	18.5	B/C
STAFFORD RD/ KAHLE RD	Roundabout	LOS D	0.99	29.6	D

**TWO-WAY STOP-CONTROLLED INTERSECTION:**

Delay = Critical Movement Delay (secs)  
v/c = Critical Movement Volume-to-Capacity Ratio  
LOS = Critical Levels of Service (Major/Minor Road)

**ROUNDABOUT INTERSECTION:**

Delay = Average Intersection Delay (secs)  
v/c = Critical Movement Volume-to-Capacity Ratio  
LOS = Total Level of Service



### Advantages of Installing a Roundabout

- Roundabouts can reduce delay for side street traffic because no approach is given more priority than another. Therefore, the Kahle Road and Brisband Street intersections would no longer be anticipated to operate at LOS F in the future scenarios.
- Roundabouts can help to slow traffic speeds on the roadway. Typical circulating speeds for a roundabout are 15 – 20 miles per hour (mph), which would help to calm traffic in the vicinity of the Frog Pond development area.
- Converting a stop-controlled intersection to a single-lane roundabout can reduce fatal and injury crashes by 82%.
- Roundabouts reduce the number of conflict points between vehicles and between vehicles and pedestrians/bicycles.
- Roundabouts at Stafford Road/Kahle Road and Advance Road/60<sup>th</sup> Avenue would provide clear gateways between the rural and urban environments. The Stafford Road/Kahle Road location is under the BPA power line easement and would have underutilized land available to accommodate the larger footprint that roundabouts require.

### Disadvantages of Installing a Roundabout

- Because all approaches are treated the same and must yield to traffic within the roundabout, this would introduce delay for traffic on the major approaches (Stafford Road).
- Roundabouts are more difficult for large trucks and agricultural vehicles to navigate and may result in complaints from the freight community and farmers.
- Roundabouts can be difficult for school aged pedestrians and bicyclists to cross because there is no exclusive stop phase (as is provided with a traffic signal). The lack of straight paths and clear turns can also be difficult for the vision impaired.
- Roundabouts require a larger footprint, which would require additional right-of-way dedication or acquisition.



## IDENTIFIED PROJECTS

The following lists of transportation projects have been identified through the evaluation of the proposed Frog Pond East and South neighborhoods.

### STREET PROJECTS

- Widen Stafford Road to a three-lane cross section (two travel lanes with a center turn lane). Include curb, gutter, sidewalks, landscape strips, and bicycle facilities on both sides. Additionally, acquire the necessary right-of-way to accommodate a five-lane cross section. See sensitivity analysis in next section for explanation.
- Widen Advance Road to a three-lane cross section (two travel lanes with a center turn lane). Include curb, gutter, sidewalks, landscape strips, and bicycle facilities on both sides.
- Construct Local And Neighborhood Collector streets through the East and South neighborhoods consistent with the draft master plan to provide connections to the internal land uses.

### INTERSECTION PROJECTS

- Install a single-lane roundabout at Stafford Road/Kahle Road.
- Install a median that restricts minor street left turn and through movements at Stafford Road/Frog Pond Lane.
- Install a single-lane roundabout at Stafford Road/Brisband Street.
- Install a single-lane roundabout at Advance Road/60<sup>th</sup> Avenue.

### PEDESTRIAN, BICYCLE, AND TRAIL PROJECTS

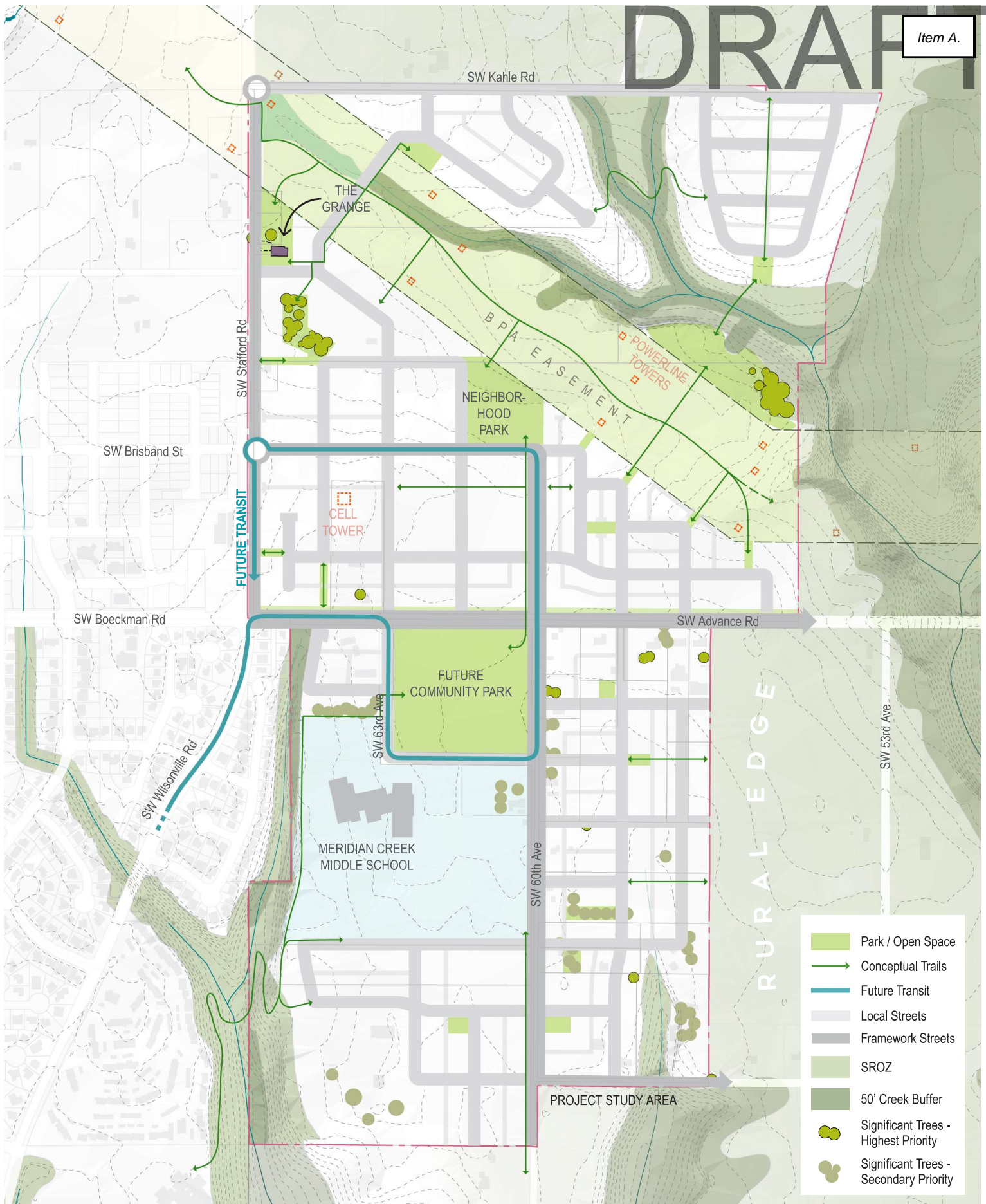
- Install a mid-block crossing on Advance Road between 60<sup>th</sup> Avenue and 63<sup>rd</sup> Avenue to facilitate safe crossings between the future park and East neighborhood. A Rectangular Rapid Flashing Beacon (RRFB) should be added to one of the crossings at either 63<sup>rd</sup> Avenue, 60<sup>th</sup> Avenue, or the midblock crossing between them.
- Install a crosswalk with median at the Frog Pond Lane/Stafford Road. It is assumed that additional safe and accessible bicycle and pedestrian crossings will be provided via the identified roundabouts at Kahle Road/Stafford Road and Brisband Street/Stafford Road.
- Extend the planned pedestrian and bicycle facility improvements on Boeckman Road to Advance Road east of Stafford Road. The desired cross section for Boeckman Road is still in the design stage but will likely include a multi-use path, cycle track, or protected bike lanes.
- Construct a separated multi-use path, two-way cycle track, or protected bike lanes along the east side of Stafford Road.
- Construct pedestrian and bicycle trails through the East and South neighborhoods consistent with the draft master plan to provide connections to existing local and regional trails in Wilsonville



## APPENDIX



## EAST & SOUTH MASTER PLAN



## CONTENTS

TRAFFIC COUNT DATA

LOS DESCRIPTION

EXISTING 2022 HCM REPORTS

FUTURE BASELINE 2040 HCM REPORTS

ANTICIPATED BUILD 2040 HCM REPORTS

RECOMMENDED IMPROVEMENTS HCM REPORTS



## TRAFFIC COUNT DATA

---







ALL TRAFFIC DATA SERVICES

(303) 216-2439

www.alltrafficdata.net

Location: 4 I-5 SB Ramp & SW Elligsen Rd PM

Date: Wednesday, September 22, 2021

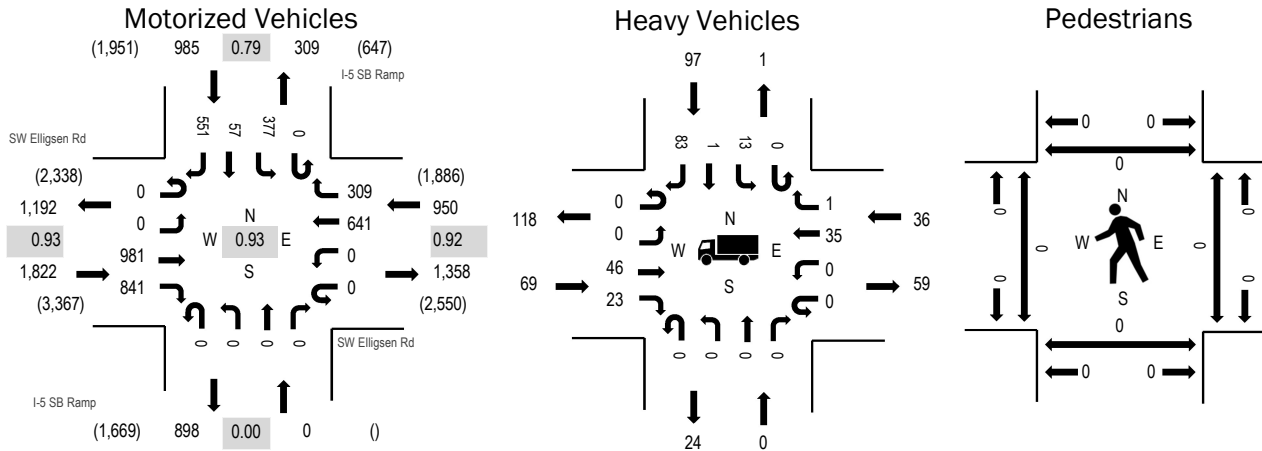
Peak Hour: 04:00 PM - 05:00 PM

Peak 15-Minutes: 04:00 PM - 04:15 PM

DRAFT

Item A.

## Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	3.8%	0.93
WB	3.8%	0.92
NB	0.0%	0.00
SB	9.8%	0.79
All	5.4%	0.93

## Traffic Counts - Motorized Vehicles

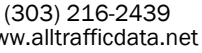
Interval Start Time	SW Elligsen Rd Eastbound				SW Elligsen Rd Westbound				I-5 SB Ramp Northbound				I-5 SB Ramp Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	0	74	72	0	0	41	26	0	0	0	0	0	47	8	53	321	3,757
4:05 PM	0	0	92	65	0	0	48	29	0	0	0	0	0	46	10	56	346	3,746
4:10 PM	0	0	97	77	0	0	55	23	0	0	0	0	0	37	13	43	345	3,709
4:15 PM	0	0	65	74	0	0	54	20	0	0	0	0	0	40	5	45	303	3,652
4:20 PM	0	0	76	71	0	0	60	31	0	0	0	0	0	24	8	50	320	3,655
4:25 PM	0	0	67	68	0	0	67	32	0	0	0	0	0	25	6	42	307	3,601
4:30 PM	0	0	108	61	0	0	50	28	0	0	0	0	0	34	0	37	318	3,622
4:35 PM	0	0	86	72	0	0	56	31	0	0	0	0	0	13	0	47	305	3,585
4:40 PM	0	0	86	78	0	0	40	31	0	0	0	0	0	25	1	54	315	3,573
4:45 PM	0	0	75	73	0	0	59	17	0	0	0	0	0	31	1	32	288	3,553
4:50 PM	0	0	71	63	0	0	53	23	0	0	0	0	0	32	3	54	299	3,538
4:55 PM	0	0	84	67	0	0	58	18	0	0	0	0	0	23	2	38	290	3,483
5:00 PM	0	0	78	75	0	0	48	31	0	0	0	0	0	26	6	46	310	3,447
5:05 PM	0	0	85	67	0	0	51	33	0	0	0	0	0	31	2	40	309	
5:10 PM	0	0	87	58	0	0	48	35	0	0	0	0	0	21	3	36	288	
5:15 PM	0	0	75	65	0	0	55	53	0	0	0	0	0	22	0	36	306	
5:20 PM	0	0	65	59	0	0	49	24	0	0	0	0	0	31	0	38	266	
5:25 PM	0	0	76	74	0	0	54	29	0	0	0	0	0	35	5	55	328	
5:30 PM	0	0	65	54	0	0	42	30	0	0	0	0	0	30	6	54	281	
5:35 PM	0	0	69	66	0	0	68	26	0	0	0	0	0	20	7	37	293	
5:40 PM	0	0	72	57	0	0	45	29	0	0	0	0	0	33	10	49	295	
5:45 PM	0	0	54	50	0	0	56	19	0	0	0	0	0	32	6	56	273	
5:50 PM	0	0	53	47	0	0	38	15	0	0	0	0	0	33	9	49	244	
5:55 PM	0	0	54	40	0	0	44	14	0	0	0	0	0	45	5	52	254	
Count Total	0	0	1,814	1,553	0	0	1,239	647	0	0	0	0	0	736	116	1,099	7,204	
Peak Hour	0	0	981	841	0	0	641	309	0	0	0	0	0	377	57	551	3,757	



# Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Item A.

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	9	0	2	6	17	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	10	0	2	6	18	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	2	0	3	8	13	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	2	0	6	10	18	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	5	0	1	6	12	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	6	0	3	7	16	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	6	0	4	7	17	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	1	0	1	9	11	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	10	0	4	11	25	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	7	0	1	7	15	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	5	0	2	12	19	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	6	0	7	8	21	4:55 PM	0	0	1	0	1	4:55 PM	0	0	0	1	1
5:00 PM	4	0	1	7	12	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	2	0	3	3	8	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	4	0	2	7	13	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	0	2	6	8	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	3	0	4	10	17	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	7	0	2	4	13	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	4	0	2	5	11	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	4	0	5	5	14	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	7	0	2	2	11	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	7	0	1	6	14	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	9	0	3	7	19	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	5	0	3	7	15	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	125	0	66	166	357	Count Total	0	0	1	0	1	Count Total	0	0	0	1	1
Peak Hour	69	0	36	97	202	Peak Hour	0	0	1	0	1	Peak Hour	0	0	0	1	1



*Item A.*

# Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Item A.

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	7	1	2	0	10	4:00 PM	1	0	0	0	1	4:00 PM	0	0	0	0	0
4:05 PM	4	2	1	0	7	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	2	2	2	0	6	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	3	3	1	0	7	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	7	2	5	0	14	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	4	2	2	0	8	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	7	2	3	0	12	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	2	1	2	0	5	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	6	0	4	0	10	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	6	0	0	0	6	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	6	2	2	0	10	4:50 PM	0	0	0	0	0	4:50 PM	0	1	0	0	1
4:55 PM	4	5	2	0	11	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	1	0	2	0	3	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	4	3	1	0	8	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	3	0	1	0	4	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	1	4	1	0	6	5:15 PM	0	0	0	0	0	5:15 PM	0	1	0	0	1
5:20 PM	2	4	1	0	7	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	4	2	0	0	6	5:25 PM	0	0	1	0	1	5:25 PM	0	0	0	0	0
5:30 PM	7	1	2	0	10	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	5	3	3	0	11	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	4	2	1	0	7	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	3	1	1	0	5	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	4	2	2	0	8	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	3	2	5	0	10	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	99	46	46	0	191	Count Total	1	0	1	0	2	Count Total	0	2	0	0	2
Peak Hour	52	21	26	0	99	Peak Hour	0	0	0	0	0	Peak Hour	0	1	0	0	1



(303) 216-2439

www.alltrafficdata.net

**Location:** 2 SW Canyon Creek Rd & Boeckman Rd PM

**Date:** Thursday, September 30, 2021

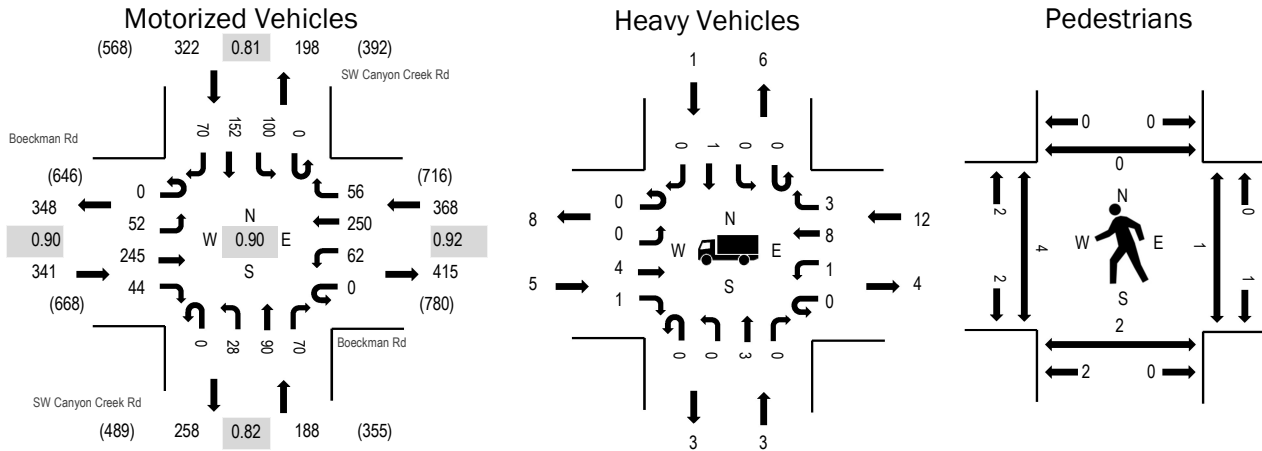
**Peak Hour:** 04:45 PM - 05:45 PM

**Peak 15-Minutes:** 04:50 PM - 05:05 PM

**DRAFT**

Item A.

## Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	1.5%	0.90
WB	3.3%	0.92
NB	1.6%	0.82
SB	0.3%	0.81
All	1.7%	0.90

## Traffic Counts - Motorized Vehicles

Interval Start Time	Boeckman Rd Eastbound				Boeckman Rd Westbound				SW Canyon Creek Rd Northbound				SW Canyon Creek Rd Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	6	17	8	0	11	31	4	0	4	5	2	0	5	9	4	106	1,142
4:05 PM	0	4	22	2	0	4	18	7	0	0	8	6	0	2	9	1	83	1,148
4:10 PM	0	5	21	3	0	3	20	4	0	1	5	5	0	3	15	7	92	1,172
4:15 PM	0	5	14	3	0	2	15	5	0	2	15	6	0	8	7	3	85	1,184
4:20 PM	0	2	28	2	0	4	14	6	0	2	11	4	0	5	15	3	96	1,201
4:25 PM	0	3	19	7	0	7	22	4	0	3	7	4	0	7	9	2	94	1,201
4:30 PM	0	3	23	3	0	8	21	4	0	2	4	5	0	7	5	9	94	1,202
4:35 PM	0	4	22	5	0	2	19	5	0	3	10	1	0	3	13	3	90	1,214
4:40 PM	0	3	19	2	0	6	12	3	0	3	8	4	0	11	14	7	92	1,215
4:45 PM	0	3	18	4	0	1	20	3	0	3	5	3	0	9	9	7	85	1,219
4:50 PM	0	8	12	4	0	5	31	6	0	2	9	5	0	12	16	3	113	1,214
4:55 PM	0	7	25	2	0	6	19	3	0	3	7	8	0	9	13	10	112	1,190
5:00 PM	0	5	22	0	0	2	12	6	0	5	9	11	0	16	15	9	112	1,165
5:05 PM	0	2	27	7	0	8	24	6	0	1	7	3	0	9	10	3	107	
5:10 PM	0	3	21	6	0	8	20	5	0	1	11	4	0	6	12	7	104	
5:15 PM	0	7	19	3	0	4	20	6	0	3	10	7	0	6	14	3	102	
5:20 PM	0	5	14	5	0	7	23	7	0	3	4	5	0	6	11	6	96	
5:25 PM	0	4	19	6	0	7	18	5	0	2	3	3	0	7	16	5	95	
5:30 PM	0	2	25	5	0	3	20	3	0	1	10	7	0	10	11	9	106	
5:35 PM	0	3	21	1	0	6	17	5	0	3	8	5	0	4	17	1	91	
5:40 PM	0	3	22	1	0	5	26	1	0	1	7	9	0	6	8	7	96	
5:45 PM	0	1	21	3	0	7	20	2	0	2	8	6	0	6	2	2	80	
5:50 PM	0	2	16	4	0	5	20	6	0	0	11	2	0	10	10	3	89	
5:55 PM	0	4	19	2	0	6	16	5	0	0	5	3	0	9	14	4	87	
Count Total	0	94	486	88	0	127	478	111	0	50	187	118	0	176	274	118	2,307	
Peak Hour	0	52	245	44	0	62	250	56	0	28	90	70	0	100	152	70	1,219	

# Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Item A.

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	3	0	3	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	2	2	0	4	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	1	0	1	0	2	4:10 PM	0	0	0	0	0	4:10 PM	0	2	0	0	2
4:15 PM	1	1	0	1	3	4:15 PM	0	0	0	0	0	4:15 PM	1	2	2	0	5
4:20 PM	0	1	1	0	2	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	1	0	2	0	3	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	1	0	2	0	3	4:30 PM	0	0	0	0	0	4:30 PM	0	2	0	0	2
4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0	4:35 PM	0	0	2	0	2
4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	1	1	4:40 PM	0	0	0	0	0
4:45 PM	0	0	1	0	1	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	0	0	1	0	1	4:50 PM	0	0	0	1	1	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	1	0	0	0	1	5:00 PM	0	0	0	0	0	5:00 PM	0	1	0	0	1
5:05 PM	1	0	0	0	1	5:05 PM	0	0	0	0	0	5:05 PM	1	0	0	0	1
5:10 PM	1	0	1	0	2	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	0	1	1	2	5:15 PM	0	0	0	0	0	5:15 PM	1	0	0	0	1
5:20 PM	2	0	2	0	4	5:20 PM	0	0	0	0	0	5:20 PM	0	1	0	0	1
5:25 PM	0	0	1	0	1	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	1	2	0	3	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	2	3	0	5	5:35 PM	0	0	0	0	0	5:35 PM	0	0	1	0	1
5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0	5:40 PM	2	0	0	0	2
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	2	0	0	0	2
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	1	0	0	1
5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	9	7	23	2	41	Count Total	0	0	0	2	2	Count Total	7	9	5	0	21
Peak Hour	5	3	12	1	21	Peak Hour	0	0	0	1	1	Peak Hour	4	2	1	0	7



ALL TRAFFIC DATA SERVICES

(303) 216-2439

www.alltrafficdata.net

**Location:** 4 SW Wilsonville Rd & SW Advance Rd PM

**Date:** Thursday, September 30, 2021

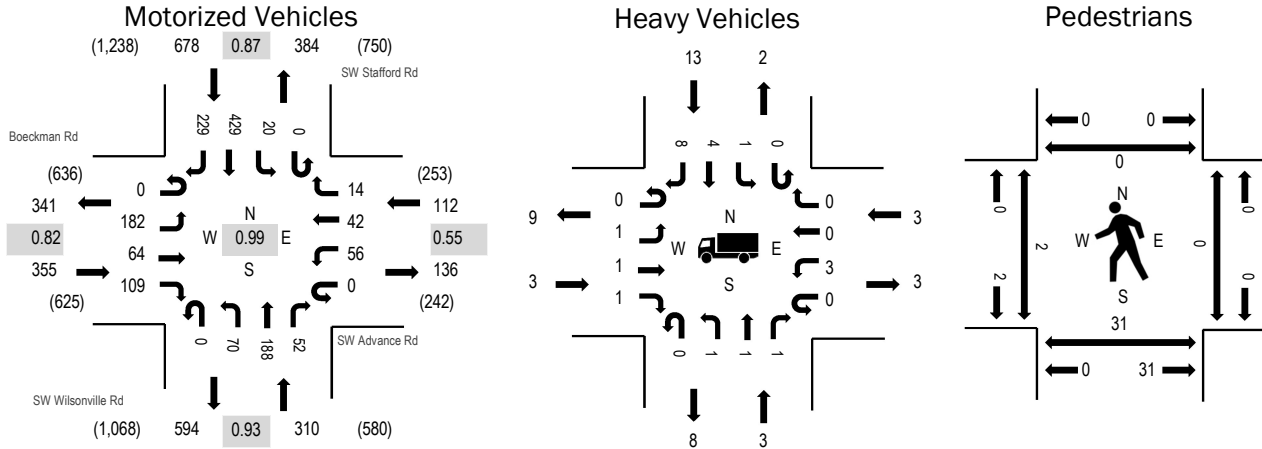
**Peak Hour:** 04:45 PM - 05:45 PM

**Peak 15-Minutes:** 05:00 PM - 05:15 PM

**DRAFT**

Item A.

## Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.8%	0.82
WB	2.7%	0.55
NB	1.0%	0.93
SB	1.9%	0.87
All	1.5%	0.99

## Traffic Counts - Motorized Vehicles

Interval Start Time	Boeckman Rd Eastbound				SW Advance Rd Westbound				SW Wilsonville Rd Northbound				SW Stafford Rd Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	11	4	8	0	16	19	12	0	4	14	1	0	5	26	16	136	1,289
4:05 PM	0	16	1	0	0	3	2	3	0	4	20	1	0	2	22	19	93	1,263
4:10 PM	0	17	6	3	0	4	2	6	0	4	16	3	0	0	31	14	106	1,294
4:15 PM	0	10	2	0	0	4	1	3	0	7	14	4	0	0	23	15	83	1,323
4:20 PM	0	20	7	6	0	9	2	5	0	5	13	1	0	0	30	12	110	1,350
4:25 PM	0	12	3	7	0	5	5	3	0	1	18	7	0	3	25	27	116	1,363
4:30 PM	0	11	5	8	0	3	2	0	0	2	10	3	0	1	24	23	92	1,376
4:35 PM	0	18	2	6	0	2	3	2	0	2	14	3	0	3	29	14	98	1,399
4:40 PM	0	11	3	8	0	3	1	4	0	3	14	5	0	1	31	13	97	1,424
4:45 PM	0	15	4	12	0	8	2	0	0	5	17	7	0	0	25	23	118	1,455
4:50 PM	0	15	6	1	0	2	6	2	0	8	15	7	0	2	35	21	120	1,435
4:55 PM	0	16	13	9	0	0	1	2	0	3	9	4	0	1	41	21	120	1,424
5:00 PM	0	19	10	6	0	6	1	0	0	6	16	6	0	2	21	17	110	1,407
5:05 PM	0	12	6	15	0	8	8	5	0	6	15	5	0	1	28	15	124	
5:10 PM	0	23	3	14	0	11	12	2	0	8	15	4	0	2	28	13	135	
5:15 PM	0	14	2	9	0	4	3	1	0	6	14	2	0	3	30	22	110	
5:20 PM	0	7	2	15	0	2	1	0	0	6	22	3	0	1	42	22	123	
5:25 PM	0	13	3	8	0	4	2	0	0	5	19	4	0	2	54	15	129	
5:30 PM	0	15	5	5	0	6	0	0	0	8	16	1	0	2	41	16	115	
5:35 PM	0	16	4	7	0	2	3	2	0	3	16	3	0	2	45	20	123	
5:40 PM	0	17	6	8	0	3	3	0	0	6	14	6	0	2	39	24	128	
5:45 PM	0	7	4	4	0	5	2	2	0	2	13	6	0	0	35	18	98	
5:50 PM	0	13	2	11	0	3	3	0	0	14	11	2	0	3	31	16	109	
5:55 PM	0	8	4	12	0	1	1	0	0	6	15	8	0	1	36	11	103	
Count Total	0	336	107	182	0	114	85	54	0	124	360	96	0	39	772	427	2,696	
Peak Hour	0	182	64	109	0	56	42	14	0	70	188	52	0	20	429	229	1,455	

# DRAFT

## Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Item A.

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	4	1	5	4:00 PM	0	0	0	0	0	4:00 PM	0	8	0	0	8
4:05 PM	0	0	1	0	1	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	1	2	1	0	4	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	1	1	0	0	2	4:15 PM	0	0	0	0	0	4:15 PM	0	1	0	0	1
4:20 PM	0	4	0	1	5	4:20 PM	0	0	0	0	0	4:20 PM	0	1	0	0	1
4:25 PM	0	1	0	1	2	4:25 PM	0	0	0	0	0	4:25 PM	0	44	0	0	44
4:30 PM	0	0	1	3	4	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	0	0	0	1	1	4:40 PM	0	0	0	0	0	4:40 PM	0	11	0	0	11
4:45 PM	0	0	0	1	1	4:45 PM	0	0	0	0	0	4:45 PM	0	9	0	0	9
4:50 PM	0	0	0	2	2	4:50 PM	0	0	0	0	0	4:50 PM	0	22	0	0	22
4:55 PM	0	1	0	1	2	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	0	0	1	0	1	5:00 PM	0	0	0	0	0	5:00 PM	0	1	0	0	1
5:05 PM	0	0	0	1	1	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	2	0	0	1	3	5:10 PM	0	0	0	0	0	5:10 PM	1	0	0	0	1
5:15 PM	0	0	1	2	3	5:15 PM	0	0	0	0	0	5:15 PM	0	3	0	0	3
5:20 PM	0	0	0	1	1	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	1	0	0	0	1	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	2	1	0	3	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	0	3	3	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	0	0	0	1	1	5:40 PM	0	0	0	0	0	5:40 PM	2	0	0	0	2
5:45 PM	0	0	1	0	1	5:45 PM	0	0	0	0	0	5:45 PM	2	0	0	0	2
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	5	11	11	20	47	Count Total	0	0	0	0	0	Count Total	5	100	0	0	105
Peak Hour	3	3	3	13	22	Peak Hour	0	0	0	0	0	Peak Hour	3	35	0	0	38



**Location:** 6 SW Stafford Rd & SW Frog Pond Ln PM

**Date:** Thursday, September 30, 2021

**Peak Hour:** 04:45 PM - 05:45 PM

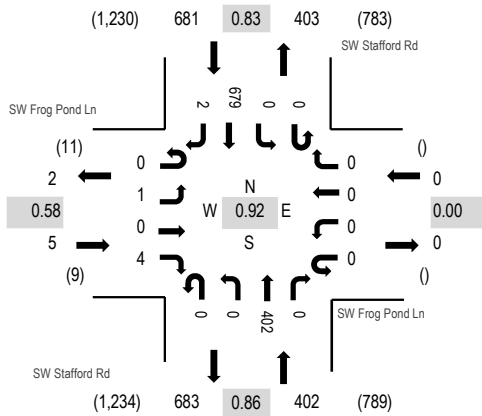
**Peak 15-Minutes:** 05:20 PM - 05:35 PM

Ln PM **DRAFT** Item A.

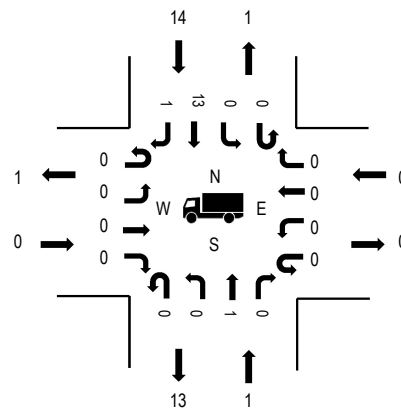
*Item A.*

## Peak Hour

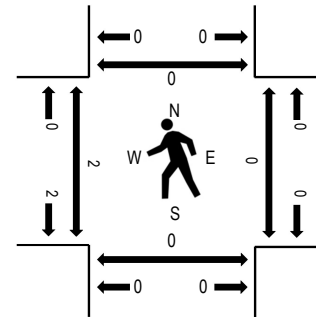
## Motorized Vehicles



## Heavy Vehicles



## Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.58
WB	0.0%	0.00
NB	0.2%	0.86
SB	2.1%	0.83
All	1.4%	0.92

## Traffic Counts - Motorized Vehicles

Interval Start Time	SW Frog Pond Ln Eastbound				SW Frog Pond Ln Westbound				SW Stafford Rd Northbound				SW Stafford Rd Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	0	0	1	0	0	0	0	0	1	38	0	0	0	47	0	87	971
4:05 PM	0	0	0	0	0	0	0	0	0	0	39	0	0	0	31	0	70	965
4:10 PM	0	0	0	0	0	0	0	0	0	1	33	0	0	0	48	0	82	983
4:15 PM	0	0	0	0	0	0	0	0	0	1	28	0	0	0	41	0	70	988
4:20 PM	0	0	0	0	0	0	0	0	0	1	39	0	0	0	52	0	92	1,004
4:25 PM	0	0	0	1	0	0	0	0	0	0	36	0	0	0	43	0	80	1,011
4:30 PM	0	0	0	1	0	0	0	0	0	2	19	0	0	0	44	1	67	1,036
4:35 PM	0	0	0	0	0	0	0	0	0	0	36	0	0	0	47	1	84	1,060
4:40 PM	0	0	0	0	0	0	0	0	0	0	33	0	0	0	44	0	77	1,064
4:45 PM	0	0	0	0	0	0	0	0	0	0	29	0	0	0	59	0	88	1,088
4:50 PM	0	0	0	2	0	0	0	0	0	0	34	0	0	0	57	0	93	1,084
4:55 PM	0	0	0	1	0	0	0	0	0	0	31	0	0	0	49	0	81	1,066
5:00 PM	0	0	0	0	0	0	0	0	0	0	38	0	0	0	43	0	81	1,057
5:05 PM	0	0	0	1	0	0	0	0	0	0	36	0	0	0	50	1	88	
5:10 PM	0	0	0	0	0	0	0	0	0	0	46	0	0	0	41	0	87	
5:15 PM	0	0	0	0	0	0	0	0	0	0	32	0	0	0	53	1	86	
5:20 PM	0	1	0	0	0	0	0	0	0	0	28	0	0	0	70	0	99	
5:25 PM	0	0	0	0	0	0	0	0	0	0	29	0	0	0	76	0	105	
5:30 PM	0	0	0	0	0	0	0	0	0	0	31	0	0	0	60	0	91	
5:35 PM	0	0	0	0	0	0	0	0	0	0	32	0	0	0	56	0	88	
5:40 PM	0	0	0	0	0	0	0	0	0	0	36	0	0	0	65	0	101	
5:45 PM	0	0	0	0	0	0	0	0	0	1	33	0	0	0	50	0	84	
5:50 PM	0	0	0	1	0	0	0	0	0	0	24	0	0	0	50	0	75	
5:55 PM	0	0	0	0	0	0	0	0	0	0	22	0	0	0	50	0	72	
Count Total	0	1	0	8	0	0	0	0	0	7	782	0	0	0	1,226	4	2,028	
Peak Hour	0	1	0	4	0	0	0	0	0	0	402	0	0	0	679	2	1,088	

# Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Item A.

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	2	0	1	3	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	0	0	1	1	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	0	2	0	1	3	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	0	2	0	1	3	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	0	2	0	2	4	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	1	0	0	0	1	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	1	0	0	1	2	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	0	0	0	1	1	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	0	0	0	2	2	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	0	0	0	1	1	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	1	1	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	0	0	0	2	2	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	0	1	0	2	3	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	0	0	1	1	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	0	0	0	1	1	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	0	0	2	2	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	0	1	1	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	0	0	0	1	1	5:40 PM	0	0	0	0	0	5:40 PM	2	0	0	0	2
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	2	0	0	0	2
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	2	9	0	22	33	Count Total	0	0	0	0	0	Count Total	4	0	0	0	4
Peak Hour	0	1	0	14	15	Peak Hour	0	0	0	0	0	Peak Hour	2	0	0	0	2



(303) 216-2439  
www.alltrafficdata.net

**Location:** 1 SW Parkway Ave & Boeckman Rd PM

**Date:** Wednesday, March 30, 2022

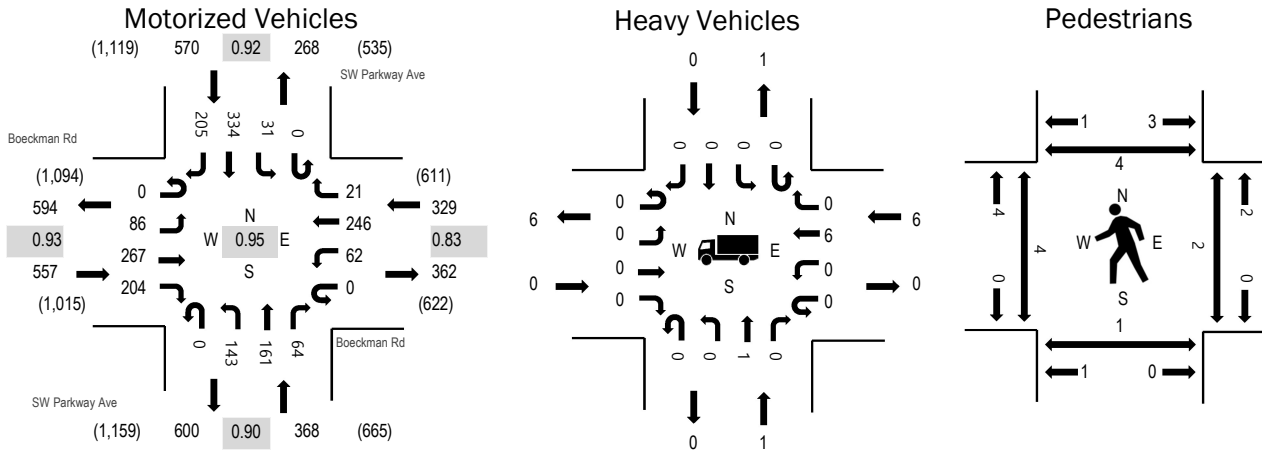
**Peak Hour:** 04:20 PM - 05:20 PM

**Peak 15-Minutes:** 05:05 PM - 05:20 PM

**DRAFT**

Item A.

## Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.93
WB	1.8%	0.83
NB	0.3%	0.90
SB	0.0%	0.92
All	0.4%	0.95

## Traffic Counts - Motorized Vehicles

Interval Start Time	Boeckman Rd Eastbound				Boeckman Rd Westbound				SW Parkway Ave Northbound				SW Parkway Ave Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	8	17	21	0	4	14	3	0	8	12	7	0	4	29	22	149	1,773
4:05 PM	0	9	20	20	0	1	10	5	0	10	12	5	0	0	29	13	134	1,780
4:10 PM	0	3	19	13	0	5	22	2	0	11	10	5	0	1	30	28	149	1,811
4:15 PM	0	5	16	18	0	4	25	1	0	12	12	2	0	1	35	22	153	1,809
4:20 PM	0	10	27	18	0	4	18	2	0	9	9	4	0	3	28	15	147	1,824
4:25 PM	0	6	20	19	0	3	15	2	0	9	16	5	0	2	26	12	135	1,814
4:30 PM	0	7	13	12	0	5	13	0	0	13	15	4	0	1	37	26	146	1,822
4:35 PM	0	9	33	22	0	6	22	3	0	12	13	6	0	1	27	17	171	1,821
4:40 PM	0	4	23	20	0	1	16	0	0	14	18	9	0	2	29	17	153	1,789
4:45 PM	0	7	23	8	0	3	30	2	0	12	6	7	0	2	25	14	139	1,754
4:50 PM	0	10	22	16	0	9	17	2	0	17	18	3	0	4	24	15	157	1,726
4:55 PM	0	4	18	14	0	7	15	0	0	9	14	4	0	5	25	25	140	1,668
5:00 PM	0	11	15	16	0	5	22	1	0	14	11	5	0	1	34	21	156	1,637
5:05 PM	0	6	22	25	0	4	35	4	0	8	11	7	0	3	20	20	165	
5:10 PM	0	6	16	18	0	7	14	3	0	11	18	5	0	3	34	12	147	
5:15 PM	0	6	35	16	0	8	29	2	0	15	12	5	0	4	25	11	168	
5:20 PM	0	8	16	18	0	6	23	0	0	6	16	6	0	2	25	11	137	
5:25 PM	0	11	13	17	0	6	24	2	0	12	13	2	0	1	22	20	143	
5:30 PM	0	8	20	10	0	3	18	2	0	14	19	2	0	2	29	18	145	
5:35 PM	0	11	15	16	0	8	16	3	0	7	6	6	0	3	30	18	139	
5:40 PM	0	8	17	14	0	10	13	1	0	5	9	3	0	4	21	13	118	
5:45 PM	0	3	13	10	0	6	10	4	0	6	17	2	0	1	26	13	111	
5:50 PM	0	9	8	9	0	5	5	3	0	6	12	0	0	4	25	13	99	
5:55 PM	0	10	13	12	0	1	15	2	0	6	8	8	0	2	21	11	109	
Count Total	0	179	454	382	0	121	441	49	0	246	307	112	0	56	656	407	3,410	
Peak Hour	0	86	267	204	0	62	246	21	0	143	161	64	0	31	334	205	1,824	

Location: 1 SW Parkway Ave & Boeckman Rd PM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	0	0	0	4:00 PM	0	0	1	1	2	4:00 PM	0	0	0	0	0
4:05 PM	2	0	0	0	2	4:05 PM	0	0	1	0	1	4:05 PM	0	1	0	0	1
4:10 PM	0	1	0	0	1	4:10 PM	1	0	0	1	2	4:10 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	1	1
4:20 PM	0	0	2	0	2	4:20 PM	0	0	1	0	1	4:20 PM	0	0	0	0	0
4:25 PM	0	0	0	0	0	4:25 PM	0	1	0	0	1	4:25 PM	0	0	0	0	0
4:30 PM	0	0	1	0	1	4:30 PM	0	0	1	0	1	4:30 PM	0	0	0	0	0
4:35 PM	0	0	1	0	1	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	0	1	1	0	2	4:40 PM	0	0	0	0	0	4:40 PM	1	0	0	0	1
4:45 PM	0	0	1	0	1	4:45 PM	0	0	0	0	0	4:45 PM	0	1	0	1	2
4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	0	0	4:55 PM	1	0	0	0	1	4:55 PM	1	0	0	1	2
5:00 PM	0	0	0	0	0	5:00 PM	1	0	0	0	1	5:00 PM	2	0	0	2	4
5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0	5:05 PM	0	0	2	0	2
5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0	5:15 PM	0	0	1	0	1
5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0	5:20 PM	0	2	2	0	4
5:25 PM	0	0	0	0	0	5:25 PM	1	0	1	0	2	5:25 PM	0	0	1	0	1
5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0	5:35 PM	2	0	1	2	5
5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	1	1	5:45 PM	0	0	1	1	2
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	1	1	1	3
5:55 PM	0	0	2	0	2	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	2	2	8	0	12	Count Total	4	1	5	3	13	Count Total	6	5	9	9	29
Peak Hour	0	1	6	0	7	Peak Hour	2	1	2	0	5	Peak Hour	4	1	3	4	12

Location: 4 Parkway Center Dr & SW Elligsen Rd PM



(303) 216-2439  
www.alltrafficdata.net

Location: 4 Parkway Center Dr & SW Elligsen Rd PM

Date: Wednesday, March 30, 2022

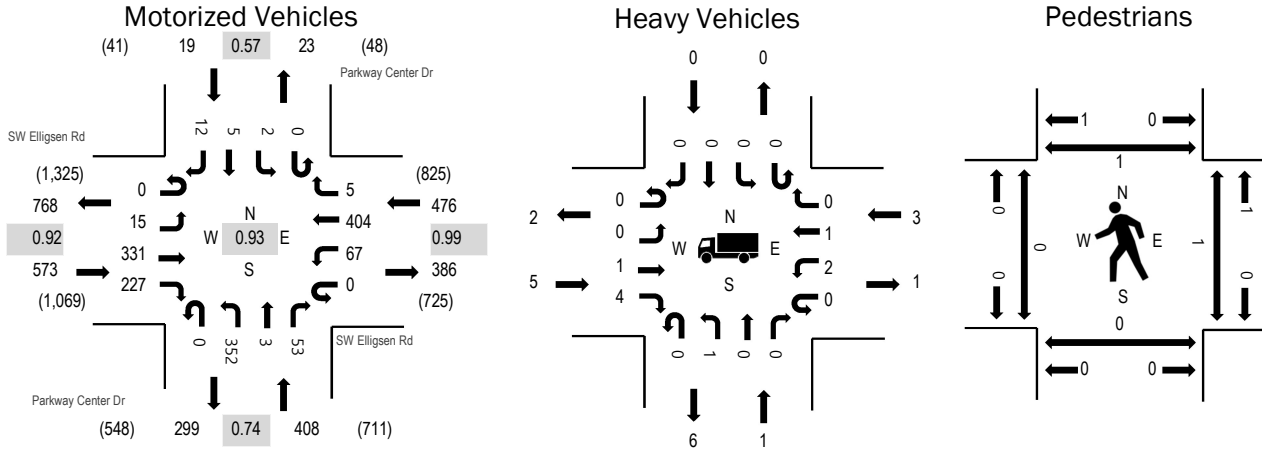
Peak Hour: 04:15 PM - 05:15 PM

Peak 15-Minutes: 04:30 PM - 04:45 PM

DRAFT

Item A.

## Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.9%	0.92
WB	0.6%	0.99
NB	0.2%	0.74
SB	0.0%	0.57
All	0.6%	0.93

## Traffic Counts - Motorized Vehicles

Interval Start Time	SW Elligsen Rd Eastbound				SW Elligsen Rd Westbound				Parkway Center Dr Northbound				Parkway Center Dr Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	0	19	18	0	3	19	0	0	24	0	4	0	0	0	0	87	1,408
4:05 PM	0	1	33	13	0	5	26	0	0	23	0	10	0	0	1	2	114	1,455
4:10 PM	0	0	19	18	0	4	26	0	0	26	0	6	0	0	2	3	104	1,463
4:15 PM	0	0	34	23	0	9	37	0	0	18	0	5	0	0	0	3	129	1,476
4:20 PM	0	1	16	11	0	9	33	0	0	25	1	5	0	0	0	2	103	1,467
4:25 PM	0	2	34	31	0	4	28	0	0	28	0	6	0	0	1	1	135	1,472
4:30 PM	0	0	24	19	0	7	36	1	0	31	1	5	0	1	1	1	127	1,432
4:35 PM	0	0	19	14	0	4	39	1	0	45	0	5	0	0	0	1	128	1,388
4:40 PM	0	0	26	25	0	7	25	0	0	56	0	2	0	0	1	0	142	1,359
4:45 PM	0	1	32	15	0	2	31	0	0	21	1	5	0	0	0	1	109	1,316
4:50 PM	0	3	28	21	0	7	34	1	0	19	0	5	0	1	0	0	119	1,308
4:55 PM	0	0	26	16	0	6	35	0	0	24	0	3	0	0	0	1	111	1,253
5:00 PM	0	3	27	16	0	4	29	1	0	42	0	10	0	0	1	1	134	1,238
5:05 PM	0	3	34	17	0	3	40	1	0	23	0	1	0	0	0	0	122	
5:10 PM	0	2	31	19	0	5	37	0	0	20	0	1	0	0	1	1	117	
5:15 PM	0	3	30	18	0	7	27	0	0	22	1	9	0	0	1	2	120	
5:20 PM	0	1	28	10	0	3	34	1	0	25	0	4	0	0	0	2	108	
5:25 PM	0	6	24	19	0	5	26	0	0	12	1	2	0	0	0	0	95	
5:30 PM	0	0	11	18	0	5	26	0	0	19	1	3	0	0	0	0	83	
5:35 PM	0	4	31	11	0	1	23	0	0	18	0	6	0	0	0	5	99	
5:40 PM	0	1	21	22	0	5	28	0	0	17	0	3	0	0	0	2	99	
5:45 PM	0	1	23	19	0	4	23	0	0	27	0	3	0	0	1	0	101	
5:50 PM	0	1	15	14	0	4	13	0	0	13	0	3	0	0	0	1	64	
5:55 PM	0	3	26	15	0	3	28	0	0	15	0	6	0	0	0	0	96	
Count Total	0	36	611	422	0	116	703	6	0	593	6	112	0	2	10	29	2,646	
Peak Hour	0	15	331	227	0	67	404	5	0	352	3	53	0	2	5	12	1,476	

Location: 4 Parkway Center Dr & SW Elligsen Rd PM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	1	1	0	2	4:05 PM	1	0	0	0	1	4:05 PM	0	0	0	0	0
4:10 PM	0	0	1	0	1	4:10 PM	0	0	0	0	0	4:10 PM	0	1	1	0	2
4:15 PM	0	0	1	0	1	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	0	0	1	0	1	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	1	0	0	0	1	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	1	0	0	0	1	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	1	0	0	0	1	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0	4:45 PM	0	0	1	1	2
4:50 PM	0	1	0	0	1	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	1	0	0	0	1	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	1	0	1	0	2	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	1	0	0	0	1	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	3	0	2	0	5	5:20 PM	0	0	0	0	0	5:20 PM	0	0	1	0	1
5:25 PM	4	0	0	0	4	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	1	0	0	0	1	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	1	0	0	0	1	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	1	0	0	0	1	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	1	0	0	0	1	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	2	0	0	0	2	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	19	2	7	0	28	Count Total	1	0	0	0	1	Count Total	0	1	3	1	5
Peak Hour	5	1	3	0	9	Peak Hour	0	0	0	0	0	Peak Hour	0	0	1	1	2



(303) 216-2439  
www.alltrafficdata.net

Location: 1 SW Parkway Ave & SW Elligsen Rd PM

Date: Tuesday, June 7, 2022

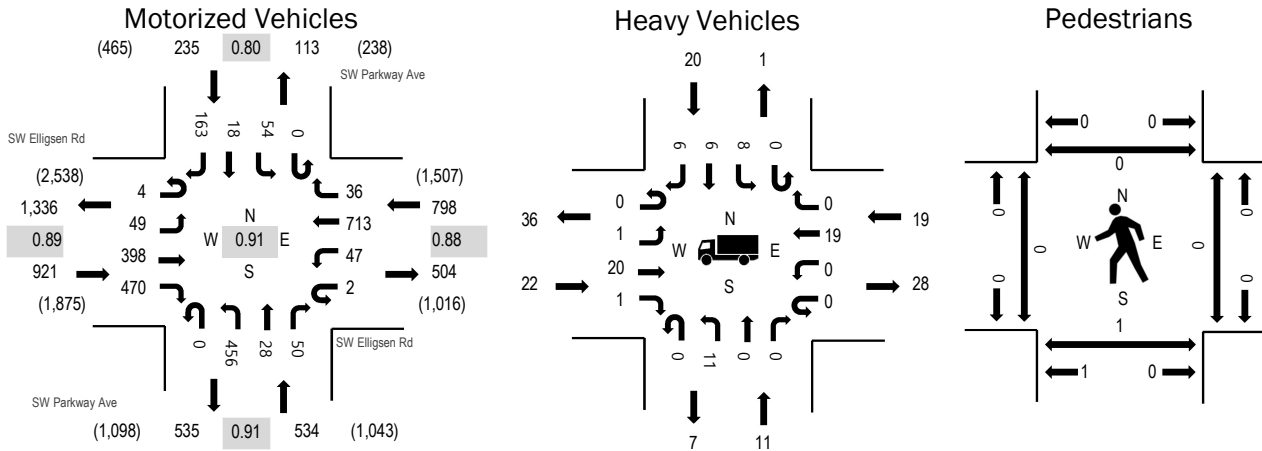
Peak Hour: 04:00 PM - 05:00 PM

Peak 15-Minutes: 04:00 PM - 04:15 PM

**DRAFT**

Item A.

## Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	2.4%	0.89
WB	2.4%	0.88
NB	2.1%	0.91
SB	8.5%	0.80
All	2.9%	0.91

## Traffic Counts - Motorized Vehicles

Interval Start Time	SW Elligsen Rd Eastbound				SW Elligsen Rd Westbound				SW Parkway Ave Northbound				SW Parkway Ave Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	10	44	50	0	6	52	4	0	44	4	5	0	6	0	12	237	2,488
4:05 PM	0	7	36	56	0	5	56	4	0	42	2	3	0	6	2	17	236	2,463
4:10 PM	1	5	33	42	1	4	61	3	0	40	1	5	0	3	0	15	214	2,464
4:15 PM	0	3	31	30	0	6	63	5	0	38	3	7	0	5	3	18	212	2,479
4:20 PM	1	2	18	34	0	5	63	4	0	41	4	5	0	7	0	18	202	2,487
4:25 PM	0	3	23	30	0	4	64	3	0	42	1	3	0	7	3	17	200	2,463
4:30 PM	0	4	29	32	0	4	68	2	0	38	2	4	0	3	1	12	199	2,472
4:35 PM	1	5	32	32	0	5	69	3	0	34	4	7	0	3	1	9	205	2,471
4:40 PM	0	4	28	41	0	2	54	2	0	30	2	4	0	4	1	10	182	2,454
4:45 PM	1	3	32	44	1	1	51	1	0	37	2	2	0	3	2	12	192	2,467
4:50 PM	0	2	43	42	0	2	54	2	0	36	1	3	0	4	2	10	201	2,475
4:55 PM	0	1	49	37	0	3	58	3	0	34	2	2	0	3	3	13	208	2,439
5:00 PM	0	1	24	28	0	6	71	6	0	41	4	5	0	2	2	22	212	2,402
5:05 PM	0	7	34	46	0	7	68	5	0	39	2	2	0	3	4	20	237	
5:10 PM	0	8	39	46	0	6	65	6	0	33	1	2	0	3	2	18	229	
5:15 PM	0	7	38	52	0	8	51	4	0	29	3	5	0	4	4	15	220	
5:20 PM	0	5	23	33	0	5	51	3	0	31	3	3	0	3	7	11	178	
5:25 PM	0	5	45	44	0	4	53	4	0	29	2	5	0	2	4	12	209	
5:30 PM	0	3	43	32	0	6	51	3	0	40	1	2	0	4	3	10	198	
5:35 PM	0	3	28	37	0	6	43	2	0	46	3	3	0	4	4	9	188	
5:40 PM	0	6	43	34	0	3	45	1	0	42	2	7	0	2	3	7	195	
5:45 PM	0	6	44	46	0	4	40	2	0	36	2	6	0	2	2	10	200	
5:50 PM	0	3	33	31	0	2	39	1	0	31	2	7	0	2	1	13	165	
5:55 PM	0	7	33	37	0	2	35	1	0	35	1	4	0	3	2	11	171	
Count Total	4	110	825	936	2	106	1,325	74	0	888	54	101	0	88	56	321	4,890	
Peak Hour	4	49	398	470	2	47	713	36	0	456	28	50	0	54	18	163	2,488	



Location: 1 SW Parkway Ave & SW Elligsen Rd PM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	4	2	1	0	7	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	1	1	1	3	6	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	2	1	2	0	5	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	2	1	2	3	8	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	4	1	1	2	8	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	1	1	1	3	6	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	1	0	3	2	6	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	2	1	1	1	5	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	0	0	3	2	5	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	2	1	1	1	5	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	2	1	2	1	6	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	1	1	1	2	5	4:55 PM	0	0	0	0	0	4:55 PM	0	1	0	0	1
5:00 PM	0	2	3	0	5	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	1	1
5:05 PM	0	1	2	1	4	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	0	1	3	1	5	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	1	1	1	3	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	0	1	2	1	4	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	2	1	0	3	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	0	3	1	4	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	2	1	1	4	5:35 PM	0	0	0	0	0	5:35 PM	0	0	1	0	1
5:40 PM	0	2	4	1	7	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	2	1	1	4	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	0	1	2	1	4	5:50 PM	0	1	0	0	1	5:50 PM	0	0	0	0	0
5:55 PM	0	1	1	1	3	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	22	27	43	30	122	Count Total	0	1	0	0	1	Count Total	0	1	1	1	3
Peak Hour	22	11	19	20	72	Peak Hour	0	0	0	0	0	Peak Hour	0	1	0	0	1



(303) 216-2439

www.alltrafficdata.net

Location: 2 SW STAFFORD RD & SW 65TH AVE PM

Date: Wednesday, May 18, 2022

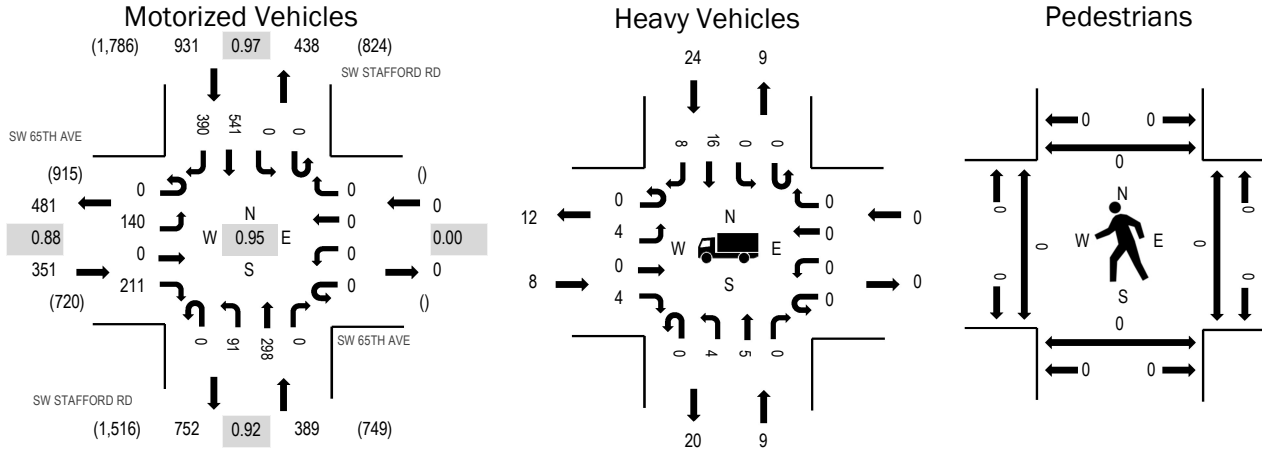
Peak Hour: 04:00 PM - 05:00 PM

Peak 15-Minutes: 04:10 PM - 04:25 PM

DRAFT

Item A.

## Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	2.3%	0.88
WB	0.0%	0.00
NB	2.3%	0.92
SB	2.6%	0.97
All	2.5%	0.95

## Traffic Counts - Motorized Vehicles

Interval Start Time	SW 65TH AVE Eastbound				SW 65TH AVE Westbound				SW STAFFORD RD Northbound				SW STAFFORD RD Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	9	0	9	0	0	0	0	0	13	19	0	0	0	52	37	139	1,671
4:05 PM	0	11	0	21	0	0	0	0	0	9	24	0	0	0	34	36	135	1,659
4:10 PM	0	12	0	16	0	0	0	0	0	8	30	0	0	0	48	38	152	1,666
4:15 PM	0	18	0	13	0	0	0	0	0	1	31	0	0	0	43	42	148	1,657
4:20 PM	0	17	0	13	0	0	0	0	0	12	24	0	0	0	45	31	142	1,652
4:25 PM	0	12	0	27	0	0	0	0	0	5	22	0	0	0	36	28	130	1,651
4:30 PM	0	7	0	17	0	0	0	0	0	8	22	0	0	0	49	35	138	1,652
4:35 PM	0	10	0	30	0	0	0	0	0	7	24	0	0	0	43	21	135	1,644
4:40 PM	0	11	0	13	0	0	0	0	0	4	26	0	0	0	47	34	135	1,670
4:45 PM	0	9	0	16	0	0	0	0	0	8	28	0	0	0	50	31	142	1,656
4:50 PM	0	9	0	23	0	0	0	0	0	9	26	0	0	0	48	25	140	1,622
4:55 PM	0	15	0	13	0	0	0	0	0	7	22	0	0	0	46	32	135	1,604
5:00 PM	0	11	0	18	0	0	0	0	0	8	16	0	0	0	47	27	127	1,584
5:05 PM	0	7	0	21	0	0	0	0	0	7	26	0	0	0	52	29	142	
5:10 PM	0	13	0	16	0	0	0	0	0	12	21	0	0	0	49	32	143	
5:15 PM	0	12	0	22	0	0	0	0	0	5	25	0	0	0	41	38	143	
5:20 PM	0	17	0	13	0	0	0	0	0	15	23	0	0	0	48	25	141	
5:25 PM	0	9	0	14	0	0	0	0	0	8	20	0	0	0	55	25	131	
5:30 PM	0	12	0	26	0	0	0	0	0	7	28	0	0	0	30	27	130	
5:35 PM	0	11	0	25	0	0	0	0	0	10	17	0	0	0	48	50	161	
5:40 PM	0	9	0	25	0	0	0	0	0	8	18	0	0	0	37	24	121	
5:45 PM	0	12	0	26	0	0	0	0	0	14	10	0	0	0	33	13	108	
5:50 PM	0	11	0	15	0	0	0	0	0	7	24	0	0	0	43	22	122	
5:55 PM	0	7	0	17	0	0	0	0	0	4	27	0	0	0	43	17	115	
Count Total	0	271	0	449	0	0	0	0	0	196	553	0	0	0	1,067	719	3,255	
Peak Hour	0	140	0	211	0	0	0	0	0	91	298	0	0	0	541	390	1,671	

# Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Item A.

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	1	2	0	2	5	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	2	0	2	4	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	0	1	0	2	3	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	0	0	0	4	4	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	1	0	0	1	2	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	0	0	0	3	3	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	2	0	0	2	4	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	0	1	0	2	3	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	0	1	0	1	2	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	4	0	0	0	4	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	2	0	5	7	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	0	0	0	2	2	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	0	0	0	2	2	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	0	1	0	2	3	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	1	0	0	3	4	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	0	0	2	2	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	0	1	0	0	1	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	9	11	0	35	55	Count Total	0	0	0	0	0	Count Total	0	0	0	0	0
Peak Hour	8	9	0	24	41	Peak Hour	0	0	0	0	0	Peak Hour	0	0	0	0	0



ALL TRAFFIC DATA SERVICES

(303) 216-2439

www.alltrafficdata.net

Location: 3 SW 60TH AVE & SW ADVANCE RD PM

Date: Wednesday, May 18, 2022

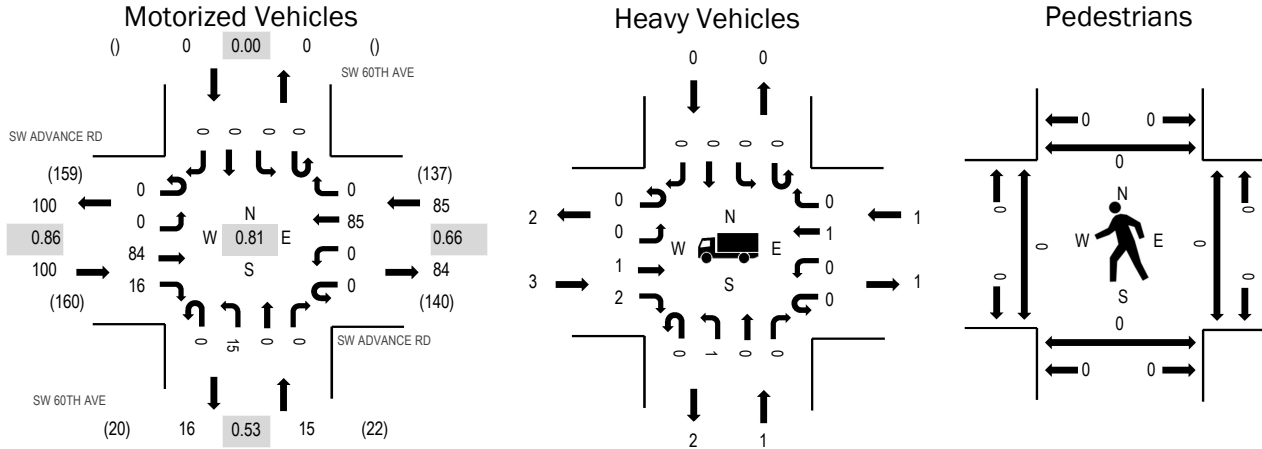
Peak Hour: 04:20 PM - 05:20 PM

Peak 15-Minutes: 04:40 PM - 04:55 PM

DRAFT

Item A.

## Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	3.0%	0.86
WB	1.2%	0.66
NB	6.7%	0.53
SB	0.0%	0.00
All	2.5%	0.81

## Traffic Counts - Motorized Vehicles

Interval Start Time	SW ADVANCE RD Eastbound				SW ADVANCE RD Westbound				SW 60TH AVE Northbound				SW 60TH AVE Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	158
4:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	179
4:10 PM	0	0	9	0	0	0	6	0	0	1	0	0	0	0	0	0	16	189
4:15 PM	0	0	4	2	0	0	3	0	0	0	0	0	0	0	0	0	9	193
4:20 PM	0	0	12	0	0	0	5	0	0	0	0	0	0	0	0	0	17	200
4:25 PM	0	0	6	2	0	0	3	0	0	3	0	0	0	0	0	0	14	196
4:30 PM	0	0	6	2	0	0	5	0	0	1	0	0	0	0	0	0	14	194
4:35 PM	0	0	5	1	0	0	6	0	0	1	0	0	0	0	0	0	13	193
4:40 PM	0	0	9	1	0	0	9	0	0	4	0	0	0	0	0	0	23	192
4:45 PM	0	0	2	1	0	0	14	0	0	3	0	0	0	0	0	0	20	180
4:50 PM	0	0	6	2	0	0	10	0	0	1	0	0	0	0	0	0	19	164
4:55 PM	0	0	6	1	0	0	6	0	0	0	0	0	0	0	0	0	13	161
5:00 PM	0	0	11	2	0	0	8	0	0	0	0	0	0	0	0	0	21	161
5:05 PM	0	0	5	1	0	0	4	0	0	0	0	0	0	0	0	0	10	
5:10 PM	0	0	10	0	0	0	9	0	0	1	0	0	0	0	0	0	20	
5:15 PM	0	0	6	3	0	0	6	0	0	1	0	0	0	0	0	0	16	
5:20 PM	0	0	6	1	0	0	4	0	0	2	0	0	0	0	0	0	13	
5:25 PM	0	0	3	0	0	0	6	0	0	3	0	0	0	0	0	0	12	
5:30 PM	0	0	8	0	0	0	4	0	0	1	0	0	0	0	0	0	13	
5:35 PM	0	0	5	0	0	0	7	0	0	0	0	0	0	0	0	0	12	
5:40 PM	0	0	5	0	0	0	6	0	0	0	0	0	0	0	0	0	11	
5:45 PM	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	4	
5:50 PM	0	0	10	0	0	0	6	0	0	0	0	0	0	0	0	0	16	
5:55 PM	0	0	6	1	0	0	6	0	0	0	0	0	0	0	0	0	13	
Count Total	0	0	140	20	0	0	137	0	0	22	0	0	0	0	0	0	319	
Peak Hour	0	0	84	16	0	0	85	0	0	15	0	0	0	0	0	0	200	

# Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Item A.

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	1	0	0	0	1	4:15 PM	1	0	0	0	1	4:15 PM	0	0	0	0	0
4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	0	1	0	0	1	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	1	0	0	0	1	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	0	0	1	0	1	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	1	0	0	0	1	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	1	0	0	0	1	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	0	0	0	0	5:25 PM	1	0	0	0	1	5:25 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	1	0	1	5:35 PM	0	1	0	0	1	5:35 PM	0	0	0	0	0
5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	1	0	0	0	1	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	5	1	2	0	8	Count Total	2	1	0	0	3	Count Total	0	0	0	0	0
Peak Hour	3	1	1	0	5	Peak Hour	0	0	0	0	0	Peak Hour	0	0	0	0	0



(303) 216-2439  
www.alltrafficdata.net

**Location:** 4 TOWN CENTER LOOP W & SW WILSONVILLE RD PM

**Date:** Wednesday, May 18, 2022

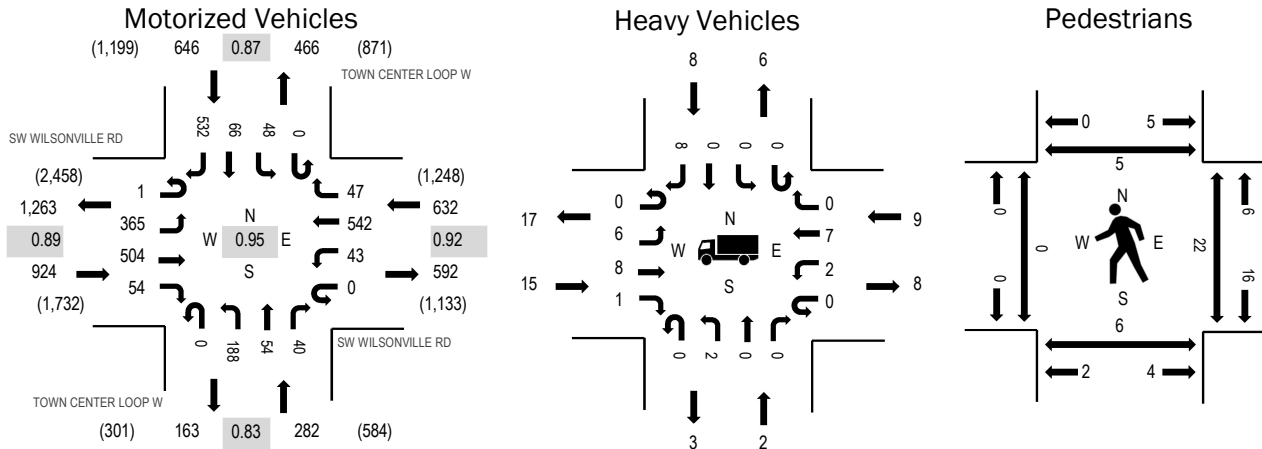
**Peak Hour:** 04:05 PM - 05:05 PM

**Peak 15-Minutes:** 04:35 PM - 04:50 PM

**DRAFT**

Item A.

## Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	1.6%	0.89
WB	1.4%	0.92
NB	0.7%	0.83
SB	1.2%	0.87
All	1.4%	0.95

## Traffic Counts - Motorized Vehicles

Interval Start Time	SW WILSONVILLE RD Eastbound				SW WILSONVILLE RD Westbound				TOWN CENTER LOOP W Northbound				TOWN CENTER LOOP W Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	27	36	3	0	0	50	0	0	15	6	1	0	1	0	27	166	2,446
4:05 PM	0	31	47	5	0	6	44	3	0	10	6	4	0	5	4	60	225	2,484
4:10 PM	0	40	40	2	0	2	24	6	0	13	7	2	0	2	7	36	181	2,468
4:15 PM	0	30	33	2	0	6	44	2	0	20	6	3	0	6	4	50	206	2,463
4:20 PM	0	32	31	2	0	4	52	3	0	16	4	5	0	2	4	39	194	2,450
4:25 PM	0	26	42	3	0	2	42	6	0	12	4	1	0	5	8	54	205	2,458
4:30 PM	0	28	40	6	0	0	38	4	0	22	4	3	0	3	6	58	212	2,454
4:35 PM	0	29	36	7	0	1	58	5	0	16	4	4	0	4	3	45	212	2,445
4:40 PM	0	45	49	2	0	4	40	3	0	17	5	2	0	2	6	35	210	2,417
4:45 PM	0	33	47	5	0	5	59	4	0	15	2	4	0	7	6	42	229	2,396
4:50 PM	0	26	46	7	0	4	38	3	0	19	4	6	0	5	8	36	202	2,386
4:55 PM	0	26	51	9	0	6	42	4	0	13	3	2	0	5	6	37	204	2,352
5:00 PM	1	19	42	4	0	3	61	4	0	15	5	4	0	2	4	40	204	2,317
5:05 PM	0	19	47	3	0	3	37	2	0	24	8	1	0	4	4	57	209	
5:10 PM	0	13	24	3	0	2	50	9	0	23	5	3	0	5	6	33	176	
5:15 PM	0	23	37	3	0	1	54	1	0	20	9	3	0	1	3	38	193	
5:20 PM	0	23	47	8	1	2	51	3	0	20	3	1	0	4	7	32	202	
5:25 PM	0	31	44	3	0	1	36	1	0	19	8	2	0	3	12	41	201	
5:30 PM	0	21	41	3	0	1	52	6	0	17	7	6	0	3	3	43	203	
5:35 PM	0	26	43	2	0	2	48	6	0	7	4	5	1	1	9	30	184	
5:40 PM	0	26	32	10	0	2	38	7	0	20	4	2	0	3	4	41	189	
5:45 PM	0	34	51	2	0	1	44	5	0	19	7	1	0	5	11	39	219	
5:50 PM	0	18	27	1	0	4	50	4	0	15	4	3	0	3	6	33	168	
5:55 PM	0	28	44	5	0	3	35	4	0	7	2	1	0	5	5	30	169	
Count Total	1	654	977	100	1	65	1,087	95	0	394	121	69	1	86	136	976	4,763	
Peak Hour	1	365	504	54	0	43	542	47	0	188	54	40	0	48	66	532	2,484	

# DRAFT

## Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Item A.

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	2	0	0	0	2	4:00 PM	0	0	0	0	0	4:00 PM	0	0	1	0	1
4:05 PM	3	0	0	0	3	4:05 PM	0	0	0	0	0	4:05 PM	0	2	1	1	4
4:10 PM	2	0	0	2	4	4:10 PM	0	0	0	0	0	4:10 PM	0	1	5	0	6
4:15 PM	2	0	0	0	2	4:15 PM	0	0	0	0	0	4:15 PM	0	1	4	0	5
4:20 PM	0	0	2	1	3	4:20 PM	0	0	0	0	0	4:20 PM	0	0	2	2	4
4:25 PM	0	1	0	1	2	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	0	0	0	1	1	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	1	0	0	0	1	4:35 PM	0	0	0	0	0	4:35 PM	0	0	2	0	2
4:40 PM	5	0	2	1	8	4:40 PM	0	0	0	0	0	4:40 PM	0	1	2	1	4
4:45 PM	0	0	2	1	3	4:45 PM	0	0	0	0	0	4:45 PM	0	0	2	0	2
4:50 PM	1	0	0	0	1	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	1	1	2	0	4	4:55 PM	0	0	0	0	0	4:55 PM	0	0	3	2	5
5:00 PM	0	0	1	1	2	5:00 PM	0	0	0	0	0	5:00 PM	0	1	2	0	3
5:05 PM	2	1	2	1	6	5:05 PM	0	0	0	0	0	5:05 PM	0	1	0	0	1
5:10 PM	3	1	2	0	6	5:10 PM	0	0	0	0	0	5:10 PM	0	0	1	0	1
5:15 PM	1	0	1	2	4	5:15 PM	1	0	0	0	1	5:15 PM	0	0	2	0	2
5:20 PM	1	0	2	0	3	5:20 PM	0	0	0	0	0	5:20 PM	0	0	3	0	3
5:25 PM	1	0	1	1	3	5:25 PM	0	0	0	1	1	5:25 PM	0	2	4	0	6
5:30 PM	0	1	0	0	1	5:30 PM	0	0	0	0	0	5:30 PM	0	1	4	1	6
5:35 PM	1	0	0	0	1	5:35 PM	1	0	0	0	1	5:35 PM	0	3	0	1	4
5:40 PM	1	0	0	1	2	5:40 PM	0	0	0	0	0	5:40 PM	0	2	3	1	6
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	0	2	1	3
5:55 PM	0	0	1	1	2	5:55 PM	0	0	0	0	0	5:55 PM	0	0	9	3	12
Count Total	27	5	18	14	64	Count Total	2	0	0	1	3	Count Total	0	15	52	13	80
Peak Hour	15	2	9	8	34	Peak Hour	0	0	0	0	0	Peak Hour	0	6	23	6	35





(303) 216-2439

www.alltrafficdata.net

Location: 5 I-5 NB RAMPS & SW WILSONVILLE RD PM

Date: Wednesday, May 18, 2022

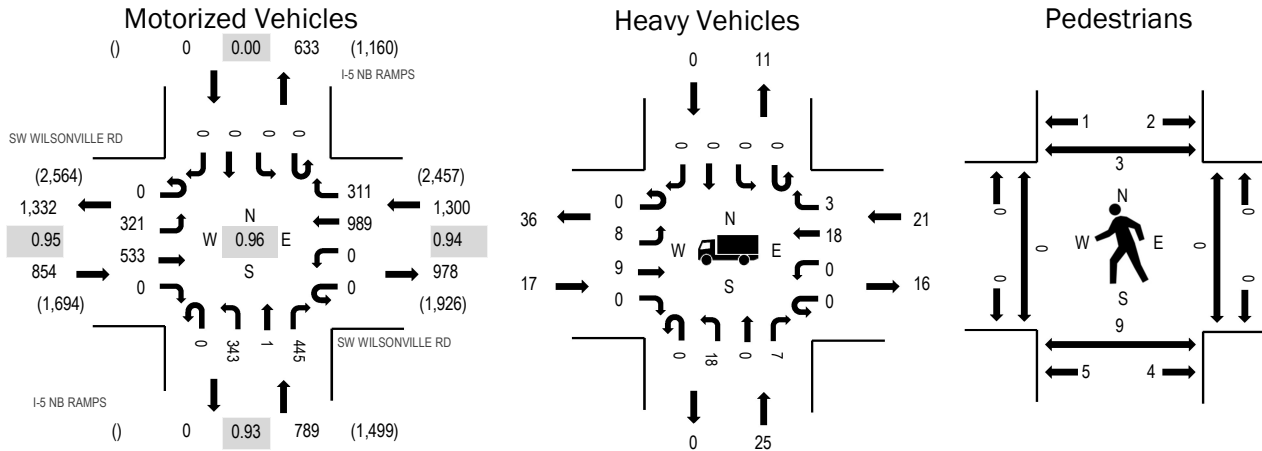
Peak Hour: 04:15 PM - 05:15 PM

Peak 15-Minutes: 04:35 PM - 04:50 PM

DRAFT

Item A.

## Peak Hour



	HV%	PHF
EB	2.0%	0.95
WB	1.6%	0.94
NB	3.2%	0.93
SB	0.0%	0.00
All	2.1%	0.96

## Traffic Counts - Motorized Vehicles

Interval Start Time	SW WILSONVILLE RD Eastbound				SW WILSONVILLE RD Westbound				I-5 NB RAMPS Northbound				I-5 NB RAMPS Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	21	40	0	0	0	72	20	0	29	0	23	0	0	0	0	205	2,877
4:05 PM	0	29	57	0	0	0	82	32	0	13	0	38	0	0	0	0	251	2,913
4:10 PM	0	19	49	0	0	0	60	12	0	36	0	31	0	0	0	0	207	2,910
4:15 PM	0	32	44	0	0	0	64	51	0	34	0	43	0	0	0	0	268	2,943
4:20 PM	0	36	28	0	0	0	79	27	0	27	0	38	0	0	0	0	235	2,906
4:25 PM	0	28	42	0	0	0	90	19	0	19	0	35	0	0	0	0	233	2,915
4:30 PM	0	18	48	0	0	0	92	26	0	25	0	35	0	0	0	0	244	2,907
4:35 PM	0	29	40	0	0	0	70	49	0	29	0	47	0	0	0	0	264	2,904
4:40 PM	0	31	53	0	0	0	83	7	0	21	0	41	0	0	0	0	236	2,855
4:45 PM	0	22	51	0	0	0	99	19	0	40	0	34	0	0	0	0	265	2,839
4:50 PM	0	21	51	0	0	0	75	18	0	31	0	39	0	0	0	0	235	2,821
4:55 PM	0	23	53	0	0	0	69	23	0	28	0	38	0	0	0	0	234	2,781
5:00 PM	0	24	45	0	0	0	86	30	0	22	0	34	0	0	0	0	241	2,773
5:05 PM	0	24	48	0	0	0	111	7	0	26	1	31	0	0	0	0	248	
5:10 PM	0	33	30	0	0	0	71	35	0	41	0	30	0	0	0	0	240	
5:15 PM	0	20	31	0	0	0	78	34	0	33	0	35	0	0	0	0	231	
5:20 PM	0	17	58	0	0	0	82	21	0	32	0	34	0	0	0	0	244	
5:25 PM	0	16	50	0	0	0	83	13	0	24	1	38	0	0	0	0	225	
5:30 PM	0	27	44	0	0	0	67	45	0	26	0	32	0	0	0	0	241	
5:35 PM	0	29	51	0	0	0	62	23	0	25	1	24	0	0	0	0	215	
5:40 PM	0	16	41	0	0	0	88	10	0	35	0	30	0	0	0	0	220	
5:45 PM	0	25	53	0	0	0	89	14	0	27	0	39	0	0	0	0	247	
5:50 PM	0	24	35	0	0	0	57	21	0	33	0	25	0	0	0	0	195	
5:55 PM	0	25	63	0	0	0	81	11	0	18	1	27	0	0	0	0	226	
Count Total	0	589	1,105	0	0	0	1,890	567	0	674	4	821	0	0	0	0	5,650	
Peak Hour	0	321	533	0	0	0	989	311	0	343	1	445	0	0	0	0	2,943	

# DRAFT

## Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Item A.

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	3	2	0	0	5	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	1	1
4:05 PM	3	1	0	0	4	4:05 PM	0	0	0	0	0	4:05 PM	0	1	0	1	2
4:10 PM	3	2	1	0	6	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	2	2
4:15 PM	2	4	1	0	7	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	3	1	2	0	6	4:20 PM	0	0	0	0	0	4:20 PM	0	1	0	0	1
4:25 PM	1	1	3	0	5	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	0	0	1	0	1	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	0	1	0	0	1	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	5	3	0	0	8	4:40 PM	0	0	0	0	0	4:40 PM	0	3	0	1	4
4:45 PM	1	4	5	0	10	4:45 PM	0	0	0	0	0	4:45 PM	0	4	0	0	4
4:50 PM	1	3	0	0	4	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	4	4
4:55 PM	2	1	2	0	5	4:55 PM	0	0	0	0	0	4:55 PM	0	1	0	0	1
5:00 PM	0	2	2	0	4	5:00 PM	0	0	0	0	0	5:00 PM	0	2	0	0	2
5:05 PM	1	1	3	0	5	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	1	4	2	0	7	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	2	1	3	0	6	5:15 PM	0	0	0	0	0	5:15 PM	0	2	0	1	3
5:20 PM	0	3	2	0	5	5:20 PM	0	0	0	0	0	5:20 PM	0	1	0	0	1
5:25 PM	0	3	2	0	5	5:25 PM	0	0	0	0	0	5:25 PM	0	2	0	0	2
5:30 PM	1	0	1	0	2	5:30 PM	0	0	0	0	0	5:30 PM	0	1	0	2	3
5:35 PM	2	1	0	0	3	5:35 PM	1	0	0	0	1	5:35 PM	0	3	0	0	3
5:40 PM	2	3	0	0	5	5:40 PM	0	0	0	0	0	5:40 PM	0	3	0	0	3
5:45 PM	2	0	1	0	3	5:45 PM	0	0	0	0	0	5:45 PM	0	1	0	2	3
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	0	0	2	0	2	5:55 PM	0	0	0	0	0	5:55 PM	0	1	0	2	3
Count Total	35	41	33	0	109	Count Total	1	0	0	0	1	Count Total	0	26	0	16	42
Peak Hour	17	25	21	0	63	Peak Hour	0	0	0	0	0	Peak Hour	0	11	0	5	16

(303) 216-2439

(303) 216-2439

www.alltrafficdata.net

**Location:** 6 I-5 SB RAMPS & SW WILSONVILLE RD PM

**Date:** Wednesday, May 18, 2022

**Peak Hour:** 04:15 PM - 05:15 PM

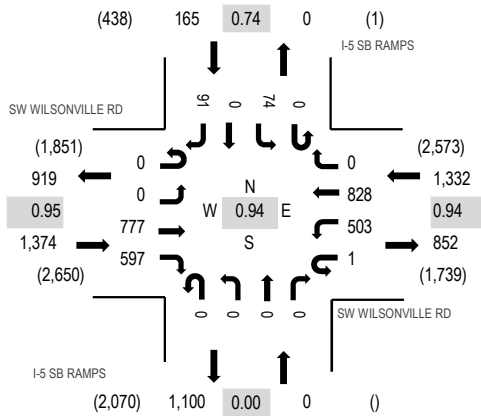
**Peak 15-Minutes:** 04:35 PM - 04:50 PM

DRAFT

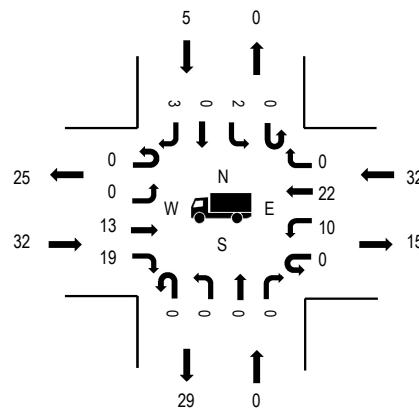
*Item A.*

## Peak Hour

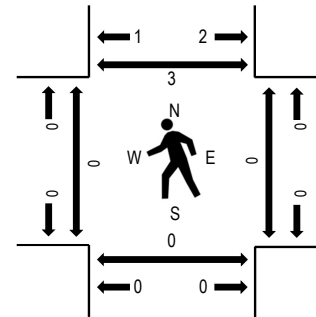
## Motorized Vehicles



## Heavy Vehicles



## Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	2.3%	0.95
WB	2.4%	0.94
NB	0.0%	0.00
SB	3.0%	0.74
All	2.4%	0.94

## Traffic Counts - Motorized Vehicles

Interval Start Time	SW WILSONVILLE RD				SW WILSONVILLE RD				I-5 SB RAMP				I-5 SB RAMP				Total	Rolling Hour
	Eastbound				Westbound				Northbound				Southbound					
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	0	72	61	0	40	69	0	0	0	0	0	0	10	0	10	262	2,863
4:05 PM	0	0	73	49	0	38	63	0	0	0	0	0	0	7	0	5	235	2,849
4:10 PM	0	0	67	47	0	32	57	0	0	0	0	0	0	9	0	7	219	2,870
4:15 PM	0	0	65	60	0	27	77	0	0	0	0	0	0	6	0	8	243	2,871
4:20 PM	0	0	56	58	1	48	65	0	0	0	0	0	0	7	0	13	248	2,860
4:25 PM	0	0	77	36	0	51	51	0	0	0	0	0	0	3	0	8	226	2,841
4:30 PM	0	0	56	53	0	37	63	0	0	0	0	0	0	5	0	9	223	2,813
4:35 PM	0	0	71	61	0	45	86	0	0	0	0	0	0	6	0	7	276	2,870
4:40 PM	0	0	76	52	0	48	64	0	0	0	0	0	0	4	0	4	248	2,832
4:45 PM	0	0	65	40	0	47	71	0	0	0	0	0	0	8	0	7	238	2,808
4:50 PM	0	0	55	36	0	33	68	0	0	0	0	0	0	6	0	4	202	2,762
4:55 PM	0	0	77	44	0	42	69	0	0	0	0	0	0	6	0	5	243	2,811
5:00 PM	0	0	68	49	0	44	72	0	0	0	0	0	0	5	0	10	248	2,798
5:05 PM	0	0	70	50	0	44	74	0	0	0	0	0	0	9	0	9	256	
5:10 PM	0	0	41	58	0	37	68	0	0	0	0	0	0	9	0	7	220	
5:15 PM	0	0	54	38	0	52	75	0	0	0	0	0	0	3	0	10	232	
5:20 PM	0	0	66	37	0	44	55	1	0	0	0	0	0	10	0	16	229	
5:25 PM	0	0	51	36	0	38	56	0	0	0	0	0	0	8	0	9	198	
5:30 PM	0	0	88	57	0	38	71	0	0	0	0	0	0	10	0	16	280	
5:35 PM	0	0	63	42	0	33	78	0	0	0	0	0	0	6	0	16	238	
5:40 PM	0	0	60	32	0	44	60	0	0	0	0	0	0	13	0	15	224	
5:45 PM	0	0	48	31	0	27	62	0	0	0	0	0	0	9	0	15	192	
5:50 PM	0	0	70	37	0	45	72	0	0	0	0	0	0	8	0	19	251	
5:55 PM	0	0	60	37	0	35	56	0	0	0	0	0	0	22	0	20	230	
Count Total	0	0	1,549	1,101	1	969	1,602	1	0	0	0	0	0	189	0	249	5,661	
Peak Hour	0	0	777	597	1	503	828	0	0	0	0	0	0	74	0	91	2,871	

# Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Item A.

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	6	0	2	3	11	4:00 PM	0	0	0	0	0	4:00 PM	1	0	0	2	3
4:05 PM	2	0	0	2	4	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	2	2
4:10 PM	8	0	4	2	14	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	3	0	2	1	6	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	5	0	5	0	10	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	1	0	1	0	2	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	2	0	1	0	3	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	7	0	0	0	7	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	1	1
4:40 PM	7	0	7	1	15	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	0	0	3	1	4	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	2	2
4:50 PM	2	0	5	1	8	4:50 PM	0	0	0	0	0	4:50 PM	1	0	0	1	2
4:55 PM	1	0	1	0	2	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	1	0	2	0	3	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	2	0	1	1	4	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	1	0	4	0	5	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	1	1
5:15 PM	3	0	4	1	8	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	0	0	4	0	4	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	1	0	0	0	1	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	2	0	1	3	6	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	2	2
5:35 PM	2	0	1	0	3	5:35 PM	1	0	0	0	1	5:35 PM	0	0	0	0	0
5:40 PM	6	0	3	1	10	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	2	2
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	1	1
5:55 PM	2	0	2	1	5	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	1	1
Count Total	64	0	53	18	135	Count Total	1	0	0	0	1	Count Total	2	0	0	15	17
Peak Hour	32	0	32	5	69	Peak Hour	0	0	0	0	0	Peak Hour	1	0	0	5	6

## LOS DESCRIPTION

---



## TRAFFIC LEVELS OF SERVICE

Analysis of traffic volumes is useful in understanding the general nature of traffic in an area, but by itself indicates neither the ability of the street network to carry additional traffic nor the quality of service afforded by the street facilities. For this, the concept of level of service has been developed to subjectively describe traffic performance. Level of service can be measured at intersections and along key roadway segments.

Levels of service categories are similar to report card ratings for traffic performance. Intersections are typically the controlling bottlenecks of traffic flow and the ability of a roadway system to carry traffic efficiently is generally diminished in their vicinities. Levels of Service A, B and C indicate conditions where traffic moves without significant delays over periods of peak travel demand. Level of service D and E are progressively worse peak hour operating conditions and F conditions represent where demand exceeds the capacity of an intersection. Most urban communities set level of service D as the minimum acceptable level of service for peak hour operation and plan for level of service C or better for all other times of the day. The Highway Capacity Manual provides level of service calculation methodology for both intersections and arterials<sup>1</sup>. The following two sections provide interpretations of the analysis approaches.

---

<sup>1</sup> 2000 *Highway Capacity Manual*, Transportation Research Board, Washington D.C., 2000, Chapter 16 and 17.

## UNSIGNALIZED INTERSECTIONS (Two-Way Stop Controlled)

Unsignalized intersection level of service is reported for the major street and minor street (generally, left turn movements). The method assesses available and critical gaps in the traffic stream which make it possible for side street traffic to enter the main street flow. The 2010 Highway Capacity Manual describes the detailed methodology. It is not unusual for an intersection to experience level of service E or F conditions for the minor street left turn movement. It should be understood that, often, a poor level of service is experienced by only a few vehicles and the intersection as a whole operates acceptably.

Unsignalized intersection levels of service are described in the following table.

### *Level-of-Service Criteria: Automobile Mode*

Control Delay (s/vehicle)	LOS by Volume-to-Capacity Ratio	
	$v/c \leq 1.0$	$v/c > 1.0$
0-10	A	F
>10-15	B	F
>15-25	C	F
>25-35	D	F
>35-50	E	F
>50	F	F

Note: The LOS criteria apply to each lane on a given approach and to each approach on the minor street.  
LOS is not calculated for major-street approaches or for the intersection as a whole



## SIGNALIZED INTERSECTIONS

For signalized intersections, level of service is evaluated based upon average vehicle delay experienced by vehicles entering an intersection. Control delay (or signal delay) includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. In previous versions of this chapter of the HCM (1994 and earlier), delay included only stopped delay. As delay increases, the level of service decreases. Calculations for signalized and unsignalized intersections are different due to the variation in traffic control. The 2000 Highway Capacity Manual provides the basis for these calculations.

Level of Service	Delay (secs.)	Description
A	<10.00	<b>Free Flow/Insignificant Delays:</b> No approach phase is fully utilized by traffic and no vehicle waits longer than one red indication. Most vehicles do not stop at all. Progression is extremely favorable and most vehicles arrive during the green phase.
B	10.1-20.0	<b>Stable Operation/Minimal Delays:</b> An occasional approach phase is fully utilized. Many drivers begin to feel somewhat restricted within platoons of vehicles. This level generally occurs with good progression, short cycle lengths, or both.
C	20.1-35.0	<b>Stable Operation/Acceptable Delays:</b> Major approach phases fully utilized. Most drivers feel somewhat restricted. Higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level, and the number of vehicles stopping is significant.
D	35.1-55.0	<b>Approaching Unstable/Tolerable Delays:</b> The influence of congestion becomes more noticeable. Drivers may have to wait through more than one red signal indication. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. The proportion of vehicles not stopping declines, and individual cycle failures are noticeable.
E	55.1-80.0	<b>Unstable Operation/Significant Delays:</b> Volumes at or near capacity. Vehicles may wait through several signal cycles. Long queues form upstream from intersection. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are a frequent occurrence.
F	>80.0	<b>Forced Flow/Excessive Delays:</b> Represents jammed conditions. Queues may block upstream intersections. This level occurs when arrival flow rates exceed intersection capacity, and is considered to be unacceptable to most drivers. Poor progression, long cycle lengths, and v/c ratios approaching 1.0 may contribute to these high delay levels.

---

Source: 2000 Highway Capacity Manual, Transportation Research Board, Washington D.C.

## EXISTING 2022 HCM REPORTS

---



# HCM 6th Signalized Intersection Summary 1: I-5 SB Ramp & Elligsen Rd

WV Frog Pond East & South Master Plan Item A.

Existing 2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗				↗	↑↑	↗
Traffic Volume (veh/h)	0	1001	858	0	698	349	0	0	0	385	58	562
Future Volume (veh/h)	0	1001	858	0	698	349	0	0	0	385	58	562
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	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
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1826	1856	0	1826	1900				1856	1870	1678
Adj Flow Rate, veh/h	0	1076	0	0	751	0				458	0	547
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93				0.93	0.93	0.93
Percent Heavy Veh, %	0	5	3	0	5	0				3	2	15
Cap, veh/h	0	1740		0	1740					1492	0	600
Arrive On Green	0.00	0.50	0.00	0.00	1.00	0.00				0.42	0.00	0.42
Sat Flow, veh/h	0	3561	1572	0	3561	1610				3534	0	1422
Grp Volume(v), veh/h	0	1076	0	0	751	0				458	0	547
Grp Sat Flow(s),veh/h/ln	0	1735	1572	0	1735	1610				1767	0	1422
Q Serve(g_s), s	0.0	23.5	0.0	0.0	0.0	0.0				9.0	0.0	37.9
Cycle Q Clear(g_c), s	0.0	23.5	0.0	0.0	0.0	0.0				9.0	0.0	37.9
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1740		0	1740					1492	0	600
V/C Ratio(X)	0.00	0.62		0.00	0.43					0.31	0.00	0.91
Avail Cap(c_a), veh/h	0	1740		0	1740					1818	0	731
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00				1.00	1.00	1.00
Upstream Filter(l)	0.00	1.00	0.00	0.00	0.93	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	18.9	0.0	0.0	0.0	0.0				20.1	0.0	28.5
Incr Delay (d2), s/veh	0.0	1.7	0.0	0.0	0.7	0.0				0.1	0.0	13.8
Initial Q Delay(d3),s/veh	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	9.3	0.0	0.0	0.2	0.0				3.6	0.0	14.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	20.6	0.0	0.0	0.7	0.0				20.2	0.0	42.3
LnGrp LOS	A	C		A	A					C	A	D
Approach Vol, veh/h		1076			751						1005	
Approach Delay, s/veh		20.6			0.7						32.3	
Approach LOS		C			A						C	
Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		56.7		48.3		56.7						
Change Period (Y+Rc), s		5.0		4.0		5.0						
Max Green Setting (Gmax), s		42.0		54.0		42.0						
Max Q Clear Time (g_c+I1), s		25.5		39.9		2.0						
Green Ext Time (p_c), s		5.1		4.4		3.9						

## Intersection Summary

HCM 6th Ctrl Delay	19.5
HCM 6th LOS	B

## Notes

User approved volume balancing among the lanes for turning movement.

User approved changes to right turn type.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary 2: I-5 NB Ramp & Elligsen Rd

WV Frog Pond East & South Master Plan  
Existing 2022

Item A.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑		↑↑	↑	↑↑		↑			
Traffic Volume (veh/h)	0	748	638	0	735	577	312	0	224	0	0	0
Future Volume (veh/h)	0	748	638	0	735	577	312	0	224	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	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			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	0	1870	1826	0	1870	1870	1826	0	1856			
Adj Flow Rate, veh/h	0	779	0	0	766	0	325	0	0			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	0	2	5	0	2	2	5	0	3			
Cap, veh/h	0	2800		0	2800		426	0				
Arrive On Green	0.00	1.00	0.00	0.00	1.00	0.00	0.13	0.00	0.00			
Sat Flow, veh/h	0	3647	1547	0	3647	1585	3374	0	1572			
Grp Volume(v), veh/h	0	779	0	0	766	0	325	0	0			
Grp Sat Flow(s),veh/h/ln	0	1777	1547	0	1777	1585	1687	0	1572			
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	9.8	0.0	0.0			
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	9.8	0.0	0.0			
Prop In Lane	0.00		1.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2800		0	2800		426	0				
V/C Ratio(X)	0.00	0.28		0.00	0.27		0.76	0.00				
Avail Cap(c_a), veh/h	0	2800		0	2800		1253	0				
HCM Platoon Ratio	1.00	2.00	2.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	0.78	0.00	0.00	0.89	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	44.3	0.0	0.0			
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.0	0.2	0.0	2.9	0.0	0.0			
Initial Q Delay(d3),s/veh	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	0.1	0.0	0.0	0.1	0.0	4.2	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.2	0.0	0.0	0.2	0.0	47.2	0.0	0.0			
LnGrp LOS	A	A		A	A		D	A				
Approach Vol, veh/h	779			766			325					
Approach Delay, s/veh	0.2			0.2			47.2					
Approach LOS	A			A			D					
Timer - Assigned Phs	2			6			8					
Phs Duration (G+Y+Rc), s	87.7			87.7			17.3					
Change Period (Y+Rc), s	5.0			5.0			4.0					
Max Green Setting (Gmax), s	57.0			57.0			39.0					
Max Q Clear Time (g_c+I1), s	2.0			2.0			11.8					
Green Ext Time (p_c), s	4.1			4.0			1.5					

## Intersection Summary

HCM 6th Ctrl Delay	8.4
HCM 6th LOS	A

## Notes

Unsignalized Delay for [NBR, EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary 3: Parkway Ave & Elligsen Rd

WV Frog Pond East & South Master Plan

Item A.

Existing 2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	473	450	47	693	36	456	28	50	54	18	163
Future Volume (veh/h)	49	473	450	47	693	36	456	28	50	54	18	163
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
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	1870	1826	1900	1900	1856	1900	1870	1900	1900	1678	1411	1841
Adj Flow Rate, veh/h	54	520	306	52	762	35	523	0	8	59	20	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	5	0	0	3	0	2	0	0	15	33	4
Cap, veh/h	70	1894	1168	68	2702	124	640	0	289	82	68	3
Arrive On Green	0.07	0.91	0.91	0.07	1.00	1.00	0.18	0.00	0.18	0.05	0.05	0.05
Sat Flow, veh/h	1781	3469	1609	1810	4964	227	3563	0	1610	1598	1332	67
Grp Volume(v), veh/h	54	520	306	52	518	279	523	0	8	59	0	21
Grp Sat Flow(s), veh/h/ln	1781	1735	1609	1810	1689	1814	1781	0	1610	1598	0	1399
Q Serve(g_s), s	3.1	1.9	1.6	3.0	0.0	0.0	14.8	0.0	0.4	3.8	0.0	1.5
Cycle Q Clear(g_c), s	3.1	1.9	1.6	3.0	0.0	0.0	14.8	0.0	0.4	3.8	0.0	1.5
Prop In Lane	1.00		1.00	1.00		0.13	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	70	1894	1168	68	1838	988	640	0	289	82	0	72
V/C Ratio(X)	0.78	0.27	0.26	0.77	0.28	0.28	0.82	0.00	0.03	0.72	0.00	0.29
Avail Cap(c_a), veh/h	161	1894	1168	267	1838	988	950	0	429	228	0	200
HCM Platoon Ratio	1.67	1.67	1.67	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.94	0.94	0.94	0.90	0.90	0.90	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	48.6	2.2	0.8	48.1	0.0	0.0	41.4	0.0	35.5	49.1	0.0	48.0
Incr Delay (d2), s/veh	15.8	0.3	0.5	15.0	0.3	0.6	3.5	0.0	0.0	11.3	0.0	2.2
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	1.7	0.6	0.8	1.6	0.1	0.2	6.8	0.0	0.2	1.8	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.4	2.5	1.3	63.1	0.3	0.6	44.9	0.0	35.5	60.4	0.0	50.2
LnGrp LOS	E	A	A	E	A	A	D	A	D	E	A	D
Approach Vol, veh/h	880			849			531			80		
Approach Delay, s/veh	5.9			4.3			44.8			57.7		
Approach LOS	A			A			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.4	62.3		10.4	8.6	62.2		23.9				
Change Period (Y+Rc), s	4.5	5.0		5.0	4.5	5.0		5.0				
Max Green Setting (Gmax), s	15.5	27.0		15.0	9.5	33.0		28.0				
Max Q Clear Time (g_c+I), s	15.0	3.9		5.8	5.1	2.0		16.8				
Green Ext Time (p_c), s	0.1	3.9		0.1	0.0	3.7		2.1				

## Intersection Summary

HCM 6th Ctrl Delay	15.9
HCM 6th LOS	B

## Notes

User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary 4: Parkway Center Dr & Elligsen Rd

WV Frog Pond East & South Master Plan  
Existing 2022

Item A.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	331	221	67	412	5	352	3	53	2	5	12
Future Volume (veh/h)	15	331	221	67	412	5	352	3	53	2	5	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
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	1900	1900	1870	1856	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	16	356	171	72	443	5	378	3	4	2	5	0
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, %	0	0	2	3	0	0	0	0	0	0	0	0
Cap, veh/h	706	1158	1182	733	2396	27	480	101	134	13	33	0
Arrive On Green	0.06	1.00	1.00	0.08	0.66	0.66	0.14	0.14	0.14	0.01	0.02	0.00
Sat Flow, veh/h	1810	1900	1584	1767	3656	41	3510	737	982	535	1338	0
Grp Volume(v), veh/h	16	356	171	72	219	229	378	0	7	7	0	0
Grp Sat Flow(s), veh/h/ln	1810	1900	1584	1767	1805	1893	1755	0	1719	1873	0	0
Q Serve(g_s), s	0.3	0.0	0.0	1.3	5.0	5.0	10.9	0.0	0.4	0.4	0.0	0.0
Cycle Q Clear(g_c), s	0.3	0.0	0.0	1.3	5.0	5.0	10.9	0.0	0.4	0.4	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.02	1.00		0.57	0.29		0.00
Lane Grp Cap(c), veh/h	706	1158	1182	733	1183	1240	480	0	235	47	0	0
V/C Ratio(X)	0.02	0.31	0.14	0.10	0.18	0.19	0.79	0.00	0.03	0.15	0.00	0.00
Avail Cap(c_a), veh/h	805	1158	1182	783	1183	1240	970	0	475	143	0	0
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.95	0.95	0.95	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	6.6	0.0	0.0	4.8	7.1	7.1	43.8	0.0	39.3	50.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.7	0.2	0.0	0.3	0.3	1.1	0.0	0.0	0.5	0.0	0.0
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	0.2	0.1	0.4	1.8	1.9	4.7	0.0	0.2	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.6	0.7	0.2	4.8	7.4	7.4	45.0	0.0	39.3	50.9	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	A
Approach Vol, veh/h	543			520			385			7		
Approach Delay, s/veh	0.7			7.1			44.8			50.9		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	2.0	68.0		6.6	7.2	72.8		18.4				
Change Period (Y+Rc), s	5.0	5.0		5.5	5.0	5.0		5.0				
Max Green Setting (Gmax), s	40.0			6.5	8.0	42.0		28.0				
Max Q Clear Time (g_c+I), s	2.0			2.4	2.3	7.0		12.9				
Green Ext Time (p_c), s	0.0	0.5		0.0	0.0	0.3		0.3				

## Intersection Summary

HCM 6th Ctrl Delay	14.9
HCM 6th LOS	B

HCM 6th TWSC  
5: Stafford Rd & 65th Ave

WV Frog Pond East & South Master Plan  
Existing 2022

Item A.

Intersection						
Int Delay, s/veh	59.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	RT		LT	LT	RT	RT
Traffic Vol, veh/h	140	211	91	298	541	390
Future Vol, veh/h	140	211	91	298	541	390
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	175	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	3	2	4	2	3	2
Mvmt Flow	147	222	96	314	569	411

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1281	775	980
Stage 1	775	-	-
Stage 2	506	-	-
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	182	398	696
Stage 1	453	-	-
Stage 2	603	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	157	398	696
Mov Cap-2 Maneuver	157	-	-
Stage 1	390	-	-
Stage 2	603	-	-

Approach	EB	NB	SB
HCM Control Delay, s	280.3	2.6	0
HCM LOS	F		









Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	696	-	247	-	-
HCM Lane V/C Ratio	0.138	-	1.496	-	-
HCM Control Delay (s)	11	-	280.3	-	-
HCM Lane LOS	B	-	F	-	-
HCM 95th %tile Q(veh)	0.5	-	21.7	-	-

# HCM 6th Signalized Intersection Summary 6: Parkway Ave & Boeckman Rd

WV Frog Pond East & South Master Plan  
Existing 2022

Item A.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	86	267	204	62	246	21	143	161	64	31	334	205
Future Volume (veh/h)	86	267	204	62	246	21	143	161	64	31	334	205
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.97	1.00		0.99
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	1900	1900	1900	1900	1870	1900	1900	1885	1900	1900	1900	1900
Adj Flow Rate, veh/h	91	281	183	65	259	18	151	169	51	33	352	191
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	2	0	0	1	0	0	0	0
Cap, veh/h	372	321	209	215	499	35	299	562	170	522	415	225
Arrive On Green	0.05	0.30	0.30	0.04	0.29	0.28	0.08	0.41	0.40	0.03	0.36	0.35
Sat Flow, veh/h	1810	1061	691	1810	1724	120	1810	1381	417	1810	1156	627
Grp Volume(v), veh/h	91	0	464	65	0	277	151	0	220	33	0	543
Grp Sat Flow(s),veh/h/ln	1810	0	1751	1810	0	1844	1810	0	1797	1810	0	1783
Q Serve(g_s), s	2.5	0.0	18.0	1.8	0.0	9.0	3.6	0.0	5.9	0.8	0.0	20.2
Cycle Q Clear(g_c), s	2.5	0.0	18.0	1.8	0.0	9.0	3.6	0.0	5.9	0.8	0.0	20.2
Prop In Lane	1.00		0.39	1.00		0.06	1.00		0.23	1.00		0.35
Lane Grp Cap(c), veh/h	372	0	529	215	0	534	299	0	732	522	0	640
V/C Ratio(X)	0.24	0.00	0.88	0.30	0.00	0.52	0.51	0.00	0.30	0.06	0.00	0.85
Avail Cap(c_a), veh/h	477	0	635	343	0	669	364	0	802	675	0	796
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(l)	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	17.3	0.0	23.8	19.2	0.0	21.3	15.9	0.0	14.4	14.1	0.0	21.3
Incr Delay (d2), s/veh	0.3	0.0	11.0	0.6	0.0	0.6	1.0	0.0	0.3	0.0	0.0	7.9
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	1.0	0.0	8.3	0.7	0.0	3.6	1.3	0.0	2.2	0.3	0.0	8.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.5	0.0	34.9	19.8	0.0	21.9	16.9	0.0	14.7	14.2	0.0	29.2
LnGrp LOS	B	A	C	B	A	C	B	A	B	B	A	C
Approach Vol, veh/h	555		342			371			576			
Approach Delay, s/veh	32.0		21.5			15.6			28.3			
Approach LOS	C		C			B			C			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.4	29.7	6.9	25.7	5.9	33.2	7.8	24.8				
Change Period (Y+Rc), s	4.0	4.5	4.0	4.5	4.0	4.5	4.0	4.5				
Max Green Setting (Gmax), s	8.0	31.5	8.0	25.5	8.0	31.5	8.0	25.5				
Max Q Clear Time (g_c+I1), s	5.6	22.2	3.8	20.0	2.8	7.9	4.5	11.0				
Green Ext Time (p_c), s	0.1	3.1	0.0	1.1	0.0	1.7	0.0	1.0				

## Intersection Summary









HCM 6th Ctrl Delay	25.6
HCM 6th LOS	C



Intersection

Intersection Delay, s/veh 20.3

Intersection LOS C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	53	250	45	63	255	57	29	92	71	102	155	71
Future Vol, veh/h	53	250	45	63	255	57	29	92	71	102	155	71
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	0	2	2	2	3	5	0	3	0	0	1	0
Mvmt Flow	59	278	50	70	283	63	32	102	79	113	172	79
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	22.5	23.8	15.2	17
HCM LOS	C	C	C	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	56%	0%	85%	0%	82%	0%	69%
Vol Right, %	0%	44%	0%	15%	0%	18%	0%	31%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	29	163	53	295	63	312	102	226
LT Vol	29	0	53	0	63	0	102	0
Through Vol	0	92	0	250	0	255	0	155
RT Vol	0	71	0	45	0	57	0	71
Lane Flow Rate	32	181	59	328	70	347	113	251
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.077	0.395	0.131	0.675	0.155	0.708	0.26	0.525
Departure Headway (Hd)	8.627	7.847	8.004	7.415	7.982	7.355	8.257	7.533
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	414	456	446	485	448	489	434	477
Service Time	6.414	5.634	5.782	5.192	5.759	5.131	6.037	5.313
HCM Lane V/C Ratio	0.077	0.397	0.132	0.676	0.156	0.71	0.26	0.526
HCM Control Delay	12.1	15.7	12	24.4	12.2	26.2	13.9	18.4
HCM Lane LOS	B	C	B	C	B	D	B	C
HCM 95th-tile Q	0.2	1.9	0.4	5	0.5	5.5	1	3

# HCM 6th Signalized Intersection Summary













WV Frog Pond East & South Master Plan

Item A.

## 8: Wilsonville Rd/Stafford Rd & Boeckman Rd/Advance Rd




Existing 2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	186	65	111	57	43	14	71	204	53	20	438	234
Future Volume (veh/h)	186	65	111	57	43	14	71	204	53	20	438	234
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.93		0.90	0.90		0.88	1.00		0.97	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	1885	1870	1885	1826	1900	1900	1885	1885	1870	1826	1885	1856
Adj Flow Rate, veh/h	188	66	18	58	43	1	72	206	45	20	442	216
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	2	1	5	0	0	1	1	2	5	1	3
Cap, veh/h	483	384	297	362	246	6	271	681	149	551	512	250
Arrive On Green	0.12	0.21	0.21	0.05	0.13	0.13	0.05	0.46	0.45	0.02	0.43	0.42
Sat Flow, veh/h	1795	1870	1445	1739	1842	43	1795	1491	326	1739	1195	584
Grp Volume(v), veh/h	188	66	18	58	0	44	72	0	251	20	0	658
Grp Sat Flow(s),veh/h/ln	1795	1870	1445	1739	0	1885	1795	0	1817	1739	0	1778
Q Serve(g_s), s	4.9	1.7	0.6	1.7	0.0	1.2	1.3	0.0	5.2	0.4	0.0	20.0
Cycle Q Clear(g_c), s	4.9	1.7	0.6	1.7	0.0	1.2	1.3	0.0	5.2	0.4	0.0	20.0
Prop In Lane	1.00		1.00	1.00		0.02	1.00		0.18	1.00		0.33
Lane Grp Cap(c), veh/h	483	384	297	362	0	252	271	0	829	551	0	762
V/C Ratio(X)	0.39	0.17	0.06	0.16	0.00	0.17	0.27	0.00	0.30	0.04	0.00	0.86
Avail Cap(c_a), veh/h	555	743	574	409	0	590	308	0	1277	635	0	1251
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(l)	1.00	1.00	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	16.9	19.4	19.0	20.5	0.0	22.8	12.5	0.0	10.2	9.6	0.0	15.5
Incr Delay (d2), s/veh	0.4	0.2	0.1	0.2	0.0	0.2	0.4	0.0	0.2	0.0	0.0	3.6
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	1.9	0.7	0.2	0.6	0.0	0.5	0.5	0.0	1.8	0.1	0.0	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.3	19.6	19.1	20.6	0.0	23.1	12.9	0.0	10.4	9.6	0.0	19.1
LnGrp LOS	B	B	B	C	A	C	B	A	B	A	A	B
Approach Vol, veh/h	272			102			323			678		
Approach Delay, s/veh	17.9			21.7			11.0			18.8		
Approach LOS	B			C			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.8	29.5	11.2	11.9	5.1	31.1	7.0	16.2				
Change Period (Y+Rc), s	4.0	4.5	4.5	4.5	4.0	4.5	4.5	4.5				
Max Green Setting (Gmax), s	4.0	41.3	9.1	18.1	4.0	41.3	4.1	23.1				
Max Q Clear Time (g_c+I), s	13.3	22.0	6.9	3.2	2.4	7.2	3.7	3.7				
Green Ext Time (p_c), s	0.0	3.0	0.1	0.1	0.0	1.0	0.0	0.2				

### Intersection Summary

HCM 6th Ctrl Delay	17.0
HCM 6th LOS	B

Intersection						
Int Delay, s/veh	0.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	84	16	2	85	15	2
Future Vol, veh/h	84	16	2	85	15	2
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	81	81	81	81	81	81
Heavy Vehicles, %	1	12	0	1	7	0
Mvmt Flow	104	20	2	105	19	2

Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	124	0	223	114
Stage 1	-	-	-	-	114	-
Stage 2	-	-	-	-	109	-
Critical Hdwy	-	-	4.1	-	6.47	6.2
Critical Hdwy Stg 1	-	-	-	-	5.47	-
Critical Hdwy Stg 2	-	-	-	-	5.47	-
Follow-up Hdwy	-	-	2.2	-	3.563	3.3
Pot Cap-1 Maneuver	-	-	1475	-	754	944
Stage 1	-	-	-	-	899	-
Stage 2	-	-	-	-	903	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1475	-	753	944
Mov Cap-2 Maneuver	-	-	-	-	753	-
Stage 1	-	-	-	-	899	-
Stage 2	-	-	-	-	902	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	771	-	-	1475	-
HCM Lane V/C Ratio	0.027	-	-	0.002	-
HCM Control Delay (s)	9.8	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Vol, veh/h	12	6	4	400	686	11
Future Vol, veh/h	12	6	4	400	686	11
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	92	92	92	92	92	92
Heavy Vehicles, %	0	0	25	0	2	0
Mvmt Flow	13	7	4	435	746	12

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1197	754	760	0	-	0
Stage 1	754	-	-	-	-	-
Stage 2	443	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.35	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.425	-	-	-
Pot Cap-1 Maneuver	207	412	757	-	-	-
Stage 1	468	-	-	-	-	-
Stage 2	651	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	205	411	756	-	-	-
Mov Cap-2 Maneuver	205	-	-	-	-	-
Stage 1	464	-	-	-	-	-
Stage 2	650	-	-	-	-	-




Approach	EB	NB	SB
HCM Control Delay, s	20.9	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	756	-	246	-	-
HCM Lane V/C Ratio	0.006	-	0.08	-	-
HCM Control Delay (s)	9.8	0	20.9	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

HCM 6th TWSC  
11: Stafford Rd & Frog Pond Ln

WV Frog Pond East & South Master Plan  
Existing 2022

Item A.

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	4	2	410	693	2
Future Vol, veh/h	1	4	2	410	693	2
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	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	2	50
Mvmt Flow	1	4	2	446	753	2

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1206	756	757	0	-	0
Stage 1	756	-	-	-	-	-
Stage 2	450	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	205	411	863	-	-	-
Stage 1	467	-	-	-	-	-
Stage 2	647	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	204	410	862	-	-	-
Mov Cap-2 Maneuver	204	-	-	-	-	-
Stage 1	465	-	-	-	-	-
Stage 2	646	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.7	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	862	-	341	-	-
HCM Lane V/C Ratio	0.003	-	0.016	-	-
HCM Control Delay (s)	9.2	0	15.7	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-




HCM 6th TWSC  
12: Stafford Rd & Kahle Rd

WV Frog Pond East & South Master Plan  
Existing 2022

Item A.

Intersection

Int Delay, s/veh 0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	2	409	2	2	693
Future Vol, veh/h	2	2	409	2	2	693
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	0	0	2	0	0	2
Mvmt Flow	2	2	445	2	2	753

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1203	446	0
Stage 1	446	-	-
Stage 2	757	-	-
Critical Hdwy	6.4	6.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	206	617	-
Stage 1	649	-	-
Stage 2	467	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	205	617	-
Mov Cap-2 Maneuver	205	-	-
Stage 1	649	-	-
Stage 2	466	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.9	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	308	1124
HCM Lane V/C Ratio	-	-	0.014	0.002
HCM Control Delay (s)	-	-	16.9	8.2
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0	0

# HCM 6th Signalized Intersection Summary 13: I-5 SB Ramp & Wilsonville Rd

WV Frog Pond East & South Master Plan Item A.

Existing 2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑↑
Traffic Volume (veh/h)	0	780	597	503	829	0	0	0	0	74	2	91
Future Volume (veh/h)	0	780	597	503	829	0	0	0	0	74	2	91
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.97
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	0	1870	1856	1870	1856	0				1856	1900	1856
Adj Flow Rate, veh/h	0	830	0	535	882	0				80	0	9
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				0.94	0.94	0.94
Percent Heavy Veh, %	0	2	3	2	3	0				3	0	3
Cap, veh/h	0	3357		631	3089	0				180	0	155
Arrive On Green	0.00	0.66	0.00	0.12	0.59	0.00				0.05	0.00	0.05
Sat Flow, veh/h	0	5274	1572	3456	3618	0				3534	0	3039
Grp Volume(v), veh/h	0	830	0	535	882	0				80	0	9
Grp Sat Flow(s),veh/h/ln	0	1702	1572	1728	1763	0				1767	0	1520
Q Serve(g_s), s	0.0	7.3	0.0	16.7	13.6	0.0				2.4	0.0	0.3
Cycle Q Clear(g_c), s	0.0	7.3	0.0	16.7	13.6	0.0				2.4	0.0	0.3
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	3357		631	3089	0				180	0	155
V/C Ratio(X)	0.00	0.25		0.85	0.29	0.00				0.44	0.00	0.06
Avail Cap(c_a), veh/h	0	3357		785	3089	0				610	0	525
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.93	0.93	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	7.7	0.0	46.8	5.6	0.0				50.7	0.0	49.7
Incr Delay (d2), s/veh	0.0	0.2	0.0	6.8	0.2	0.0				1.7	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.5	0.0	8.0	5.7	0.0				1.1	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	7.9	0.0	53.5	5.8	0.0				52.4	0.0	49.8
LnGrp LOS	A	A		D	A	A				D	A	D
Approach Vol, veh/h		830			1417						89	
Approach Delay, s/veh		7.9			23.9						52.1	
Approach LOS		A			C						D	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	24.1	76.3		9.6		100.4						
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0						
Max Green Setting (Gmax), s	25.0	54.0		19.0		75.0						
Max Q Clear Time (g_c+I1), s	18.7	9.3		4.4		15.6						
Green Ext Time (p_c), s	1.4	4.4		0.2		4.8						

## Intersection Summary

HCM 6th Ctrl Delay	19.3
HCM 6th LOS	B

## Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary 14: I-5 NB Ramp & Wilsonville Rd

WV Frog Pond East & South Master Plan

Existing 2022

Item A.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑			↑↑↑	↔	↔	↔	↔↔			
Traffic Volume (veh/h)	321	533	0	0	989	311	343	2	445	0	0	0
Future Volume (veh/h)	321	533	0	0	989	311	343	2	445	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97			
Parking Bus, Adj	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					
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1885	1826	1900	1870			
Adj Flow Rate, veh/h	334	555	0	0	1030	0	358	0	180			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0	0	2	1	5	0	2			
Cap, veh/h	407	2822	0	0	3268		463	0	412			
Arrive On Green	0.24	1.00	0.00	0.00	1.00	0.00	0.13	0.00	0.13			
Sat Flow, veh/h	3456	3647	0	0	5274	1598	3478	0	3089			
Grp Volume(v), veh/h	334	555	0	0	1030	0	358	0	180			
Grp Sat Flow(s),veh/h/ln	1728	1777	0	0	1702	1598	1739	0	1545			
Q Serve(g_s), s	10.1	0.0	0.0	0.0	0.0	0.0	10.9	0.0	5.9			
Cycle Q Clear(g_c), s	10.1	0.0	0.0	0.0	0.0	0.0	10.9	0.0	5.9			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	407	2822	0	0	3268		463	0	412			
V/C Ratio(X)	0.82	0.20	0.00	0.00	0.32		0.77	0.00	0.44			
Avail Cap(c_a), veh/h	785	2822	0	0	3268		949	0	842			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(l)	0.97	0.97	0.00	0.00	0.73	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	41.0	0.0	0.0	0.0	0.0	0.0	46.1	0.0	43.9			
Incr Delay (d2), s/veh	2.5	0.2	0.0	0.0	0.2	0.0	1.7	0.0	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			
%ile BackOfQ(50%),veh/ln	8.9	0.1	0.0	0.0	0.1	0.0	4.8	0.0	2.3			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.5	0.2	0.0	0.0	0.2	0.0	47.8	0.0	44.3			
LnGrp LOS	D	A	A	A	A		D	A	D			
Approach Vol, veh/h	889			1030			538					
Approach Delay, s/veh	16.4			0.2			46.6					
Approach LOS	B			A			D					
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	91.3			16.9			74.4			18.7		
Change Period (Y+Rc), s	4.0			4.0			4.0			4.0		
Max Green Setting (Gmax), s	53.0			25.0			43.0			30.0		
Max Q Clear Time (g_c+I1), s	2.0			12.1			2.0			12.9		
Green Ext Time (p_c), s	6.1			0.9			12.8			1.7		

## Intersection Summary

HCM 6th Ctrl Delay	16.2
HCM 6th LOS	B

## Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.



# HCM 6th Signalized Intersection Summary 15: Town Center Lp West & Wilsonville Rd

WV Frog Pond East & South Master Plan  
Existing 2022

Item A.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↱		↰↱	↱		↰↱	↱		↰↱	↱	↰↱
Traffic Volume (veh/h)	365	504	54	43	564	47	188	54	40	48	66	548
Future Volume (veh/h)	365	504	54	43	564	47	188	54	40	48	66	548
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.95	1.00		0.92
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	1870	1870	1870	1826	1885	1900	1885	1900	1900	1900	1900	1870
Adj Flow Rate, veh/h	384	531	51	45	594	44	198	57	16	51	139	116
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	5	1	0	1	0	0	0	0	2
Cap, veh/h	445	1912	183	57	1648	122	462	181	51	189	199	153
Arrive On Green	0.26	1.00	1.00	0.03	0.49	0.48	0.13	0.13	0.13	0.10	0.10	0.10
Sat Flow, veh/h	3456	3275	314	1739	3377	250	3591	1408	395	1810	1900	1465
Grp Volume(v), veh/h	384	287	295	45	315	323	198	0	73	51	139	116
Grp Sat Flow(s), veh/h/ln	1728	1777	1812	1739	1791	1835	1795	0	1804	1810	1900	1465
Q Serve(g_s), s	11.7	0.0	0.0	2.8	12.0	12.1	5.6	0.0	4.0	2.9	7.8	8.5
Cycle Q Clear(g_c), s	11.7	0.0	0.0	2.8	12.0	12.1	5.6	0.0	4.0	2.9	7.8	8.5
Prop In Lane	1.00		0.17	1.00		0.14	1.00		0.22	1.00		1.00
Lane Grp Cap(c), veh/h	445	1037	1058	57	874	896	462	0	232	189	199	153
V/C Ratio(X)	0.86	0.28	0.28	0.79	0.36	0.36	0.43	0.00	0.31	0.27	0.70	0.76
Avail Cap(c_a), veh/h	534	1037	1058	111	874	896	914	0	459	296	311	240
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.96	0.96	0.96	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.9	0.0	0.0	52.8	17.5	17.5	44.2	0.0	43.5	45.4	47.6	47.9
Incr Delay (d2), s/veh	11.0	0.6	0.6	16.0	1.2	1.1	0.5	0.0	0.6	0.6	3.3	5.6
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	4.9	0.2	0.2	1.5	5.1	5.2	2.5	0.0	1.9	1.3	3.8	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.0	0.6	0.6	68.9	18.6	18.7	44.7	0.0	44.1	45.9	50.9	53.4
LnGrp LOS	D	A	A	E	B	B	D	A	D	D	D	D
Approach Vol, veh/h	966			683			271			306		
Approach Delay, s/veh	20.6			22.0			44.5			51.0		
Approach LOS	C			C			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.6	68.2		15.5	18.1	57.7		18.7				
Change Period (Y+Rc), s	4.0	4.5		4.5	4.0	4.5		4.5				
Max Green Setting (Gmax), s	40.0			17.5	17.0	30.0		28.0				
Max Q Clear Time (g_c+I), s	14.8	2.0		10.5	13.7	14.1		7.6				
Green Ext Time (p_c), s	0.0	3.9		0.5	0.5	3.5		0.9				

## Intersection Summary

HCM 6th Ctrl Delay	28.1
HCM 6th LOS	C

## Notes

User approved volume balancing among the lanes for turning movement.

ID	Software/Method	Intersection	Control Type	LOS	Delay	V/C Ratio
1	Synchro HCM 6th Signal	I-5 SB Ramp & Elligsen Rd	Signal	B	19.5	0.74
2	Synchro HCM 6th Signal	I-5 NB Ramp & Elligsen Rd	Signal	A	8.4	0.34
3	Synchro HCM 6th Signal	Parkway Ave & Elligsen Rd	Signal	B	15.9	0.32
4	Synchro HCM 6th Signal	Parkway Center Dr & Elligsen Rd	Signal	B	14.9	0.40
6	Synchro HCM 6th Signal	Parkway Ave & Boeckman Rd	Signal	C	25.6	0.84
8	Synchro HCM 6th Signal	Wilsonville Rd/Stafford Rd & Boeckman Rd/	Signal	B	17.0	0.65
13	Synchro HCM 6th Signal	I-5 SB Ramp & Wilsonville Rd	Signal	B	19.3	0.38
14	Synchro HCM 6th Signal	I-5 NB Ramp & Wilsonville Rd	Signal	B	16.2	0.44
15	Synchro HCM 6th Signal	Town Center Lp West & Wilsonville Rd	Signal	C	28.1	0.38

## FUTURE BASELINE 2040 HCM REPORTS

---



# HCM 6th Signalized Intersection Summary 1: I-5 SB Ramp & Elligsen Rd

WV Frog Pond East & South Master Plan  
Future 2040 Build

Item A.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑		↑↑	↑				↑	↑	↑↑
Traffic Volume (veh/h)	0	1315	1105	0	1030	370	0	0	0	480	70	830
Future Volume (veh/h)	0	1315	1105	0	1030	370	0	0	0	480	70	830
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.98
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	0	1826	1856	0	1826	1900				1856	1870	1678
Adj Flow Rate, veh/h	0	1384	0	0	1084	0				558	0	798
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	5	3	0	5	0				3	2	15
Cap, veh/h	0	2019		0	2019					1208	0	951
Arrive On Green	0.00	0.58	0.00	0.00	1.00	0.00				0.34	0.00	0.34
Sat Flow, veh/h	0	3561	1572	0	3561	1610				3534	0	2784
Grp Volume(v), veh/h	0	1384	0	0	1084	0				558	0	798
Grp Sat Flow(s),veh/h/ln	0	1735	1572	0	1735	1610				1767	0	1392
Q Serve(g_s), s	0.0	29.1	0.0	0.0	0.0	0.0				13.0	0.0	27.8
Cycle Q Clear(g_c), s	0.0	29.1	0.0	0.0	0.0	0.0				13.0	0.0	27.8
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2019		0	2019					1208	0	951
V/C Ratio(X)	0.00	0.69		0.00	0.54					0.46	0.00	0.84
Avail Cap(c_a), veh/h	0	2019		0	2019					1447	0	1140
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	0.86	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	15.3	0.0	0.0	0.0	0.0				27.0	0.0	31.9
Incr Delay (d2), s/veh	0.0	1.9	0.0	0.0	0.9	0.0				0.3	0.0	4.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	11.0	0.0	0.0	0.2	0.0				5.4	0.0	9.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	17.2	0.0	0.0	0.9	0.0				27.3	0.0	36.8
LnGrp LOS	A	B		A	A					C	A	D
Approach Vol, veh/h		1384			1084						1356	
Approach Delay, s/veh		17.2			0.9						32.9	
Approach LOS		B			A						C	
Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		65.1		39.9		65.1						
Change Period (Y+Rc), s		5.0		4.0		5.0						
Max Green Setting (Gmax), s		53.0		43.0		53.0						
Max Q Clear Time (g_c+I1), s		31.1		29.8		2.0						
Green Ext Time (p_c), s		7.8		6.1		6.4						

## Intersection Summary

HCM 6th Ctrl Delay	18.1
HCM 6th LOS	B

## Notes

User approved volume balancing among the lanes for turning movement.

User approved changes to right turn type.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary 2: I-5 NB Ramp & Elligsen Rd

WV Frog Pond East & South Master Plan  
Future 2040 Build

Item A.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑		↑↑	↑	↑↑		↑			
Traffic Volume (veh/h)	0	905	890	0	920	535	480	0	270	0	0	0
Future Volume (veh/h)	0	905	890	0	920	535	480	0	270	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	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			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	0	1870	1826	0	1870	1870	1826	0	1856			
Adj Flow Rate, veh/h	0	943	0	0	958	0	500	0	0			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	0	2	5	0	2	2	5	0	3			
Cap, veh/h	0	2598		0	2598		618	0				
Arrive On Green	0.00	1.00	0.00	0.00	1.00	0.00	0.18	0.00	0.00			
Sat Flow, veh/h	0	3647	1547	0	3647	1585	3374	0	1572			
Grp Volume(v), veh/h	0	943	0	0	958	0	500	0	0			
Grp Sat Flow(s),veh/h/ln	0	1777	1547	0	1777	1585	1687	0	1572			
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	14.9	0.0	0.0			
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	14.9	0.0	0.0			
Prop In Lane	0.00		1.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2598		0	2598		618	0				
V/C Ratio(X)	0.00	0.36		0.00	0.37		0.81	0.00				
Avail Cap(c_a), veh/h	0	2598		0	2598		1253	0				
HCM Platoon Ratio	1.00	2.00	2.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	0.67	0.00	0.00	0.86	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	41.1	0.0	0.0			
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.0	0.3	0.0	2.6	0.0	0.0			
Initial Q Delay(d3),s/veh	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	0.1	0.0	0.0	0.1	0.0	6.3	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.3	0.0	0.0	0.3	0.0	43.7	0.0	0.0			
LnGrp LOS	A	A		A	A		D	A				
Approach Vol, veh/h	943			958			500					
Approach Delay, s/veh	0.3			0.3			43.7					
Approach LOS	A			A			D					
Timer - Assigned Phs	2			6			8					
Phs Duration (G+Y+Rc), s	81.8			81.8			23.2					
Change Period (Y+Rc), s	5.0			5.0			4.0					
Max Green Setting (Gmax), s	57.0			57.0			39.0					
Max Q Clear Time (g_c+I1), s	2.0			2.0			16.9					
Green Ext Time (p_c), s	5.2			5.3			2.3					

## Intersection Summary

HCM 6th Ctrl Delay	9.3
HCM 6th LOS	A

## Notes

Unsignalized Delay for [NBR, EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary 3: Parkway Ave & Elligsen Rd

WV Frog Pond East & South Master Plan  
Future 2040 Build

Item A.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	625	470	50	795	45	460	30	55	70	20	200
Future Volume (veh/h)	80	625	470	50	795	45	460	30	55	70	20	200
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
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	1870	1826	1900	1900	1856	1900	1870	1900	1900	1678	1411	1841
Adj Flow Rate, veh/h	88	687	314	55	874	44	529	0	8	77	22	2
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	5	0	0	3	0	2	0	0	15	33	4
Cap, veh/h	111	1839	1142	72	2507	126	640	0	289	103	82	7
Arrive On Green	0.13	1.00	1.00	0.01	0.17	0.17	0.18	0.00	0.18	0.06	0.06	0.06
Sat Flow, veh/h	1781	3469	1609	1810	4940	248	3563	0	1610	1598	1274	116
Grp Volume(v), veh/h	88	687	314	55	597	321	529	0	8	77	0	24
Grp Sat Flow(s), veh/h/ln	1781	1735	1609	1810	1689	1811	1781	0	1610	1598	0	1390
Q Serve(g_s), s	5.0	0.0	0.0	3.2	16.4	16.5	15.0	0.0	0.4	5.0	0.0	1.7
Cycle Q Clear(g_c), s	5.0	0.0	0.0	3.2	16.4	16.5	15.0	0.0	0.4	5.0	0.0	1.7
Prop In Lane	1.00		1.00	1.00		0.14	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	111	1839	1142	72	1714	919	640	0	289	103	0	90
V/C Ratio(X)	0.79	0.37	0.27	0.76	0.35	0.35	0.83	0.00	0.03	0.75	0.00	0.27
Avail Cap(c_a), veh/h	198	1839	1142	267	1714	919	882	0	399	228	0	199
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.90	0.87	0.87	0.87	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	45.3	0.0	0.0	51.3	28.4	28.4	41.5	0.0	35.5	48.3	0.0	46.8
Incr Delay (d2), s/veh	10.6	0.5	0.5	13.2	0.5	0.9	4.7	0.0	0.0	10.3	0.0	1.6
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	2.4	0.1	0.2	1.7	7.5	8.2	7.0	0.0	0.2	2.3	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.8	0.5	0.5	64.5	28.8	29.3	46.2	0.0	35.5	58.6	0.0	48.3
LnGrp LOS	E	A	A	E	C	C	D	A	D	E	A	D
Approach Vol, veh/h	1089			973			537			101		
Approach Delay, s/veh	5.0			31.0			46.0			56.2		
Approach LOS	A			C			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.7	60.7		11.8	11.1	58.3		23.9				
Change Period (Y+Rc), s	4.5	5.0		5.0	4.5	5.0		5.0				
Max Green Setting (Gmax), s	15.5	29.0		15.0	11.7	32.8		26.0				
Max Q Clear Time (g_c+I), s	15.2	2.0		7.0	7.0	18.5		17.0				
Green Ext Time (p_c), s	0.1	5.1		0.2	0.1	3.6		1.8				

## Intersection Summary

HCM 6th Ctrl Delay 24.4

HCM 6th LOS C

## Notes









User approved volume balancing among the lanes for turning movement.

# HCM 6th Signalized Intersection Summary 4: Parkway Center Dr & Elligsen Rd

WV Frog Pond East & South Master Plan  
Future 2040 Build

Item A.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	455	265	120	460	5	415	5	115	5	5	15
Future Volume (veh/h)	30	455	265	120	460	5	415	5	115	5	5	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
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	1900	1900	1870	1856	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	32	489	190	129	495	5	446	5	13	5	5	0
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, %	0	0	2	3	0	0	0	0	0	0	0	0
Cap, veh/h	659	1101	1164	586	2267	23	546	72	188	27	27	0
Arrive On Green	0.06	0.77	0.77	0.08	0.62	0.62	0.16	0.16	0.16	0.01	0.03	0.00
Sat Flow, veh/h	1810	1900	1584	1767	3661	37	3510	466	1211	927	927	0
Grp Volume(v), veh/h	32	489	190	129	244	256	446	0	18	10	0	0
Grp Sat Flow(s),veh/h/ln	1810	1900	1584	1767	1805	1893	1755	0	1677	1854	0	0
Q Serve(g_s), s	0.7	9.4	2.2	2.6	6.2	6.3	12.9	0.0	1.0	0.6	0.0	0.0
Cycle Q Clear(g_c), s	0.7	9.4	2.2	2.6	6.2	6.3	12.9	0.0	1.0	0.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.02	1.00		0.72	0.50		0.00
Lane Grp Cap(c), veh/h	659	1101	1164	586	1118	1172	546	0	261	53	0	0
V/C Ratio(X)	0.05	0.44	0.16	0.22	0.22	0.22	0.82	0.00	0.07	0.19	0.00	0.00
Avail Cap(c_a), veh/h	734	1101	1164	590	1118	1172	903	0	431	141	0	0
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.90	0.90	0.90	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.5	6.1	2.2	6.5	8.8	8.8	42.9	0.0	37.8	50.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.2	0.3	0.1	0.4	0.4	1.2	0.0	0.0	0.6	0.0	0.0
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	3.2	1.1	0.9	2.4	2.5	5.6	0.0	0.4	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.5	7.3	2.4	6.5	9.3	9.2	44.0	0.0	37.9	50.8	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	A
Approach Vol, veh/h	711		629			464			10			
Approach Delay, s/veh	6.0		8.7			43.8			50.8			
Approach LOS	A		A			D			D			
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	2.8	64.8	7.0		8.6	69.0	20.3					
Change Period (Y+Rc), s	5.0	5.0	5.5		5.0	5.0	5.0					
Max Green Setting (Gmax), s	44.0	44.0	6.5		8.0	44.0	26.0					
Max Q Clear Time (g_c+I), s	11.4	11.4	2.6		2.7	8.3	14.9					
Green Ext Time (p_c), s	0.0	0.6	0.0		0.0	0.4	0.3					

## Intersection Summary

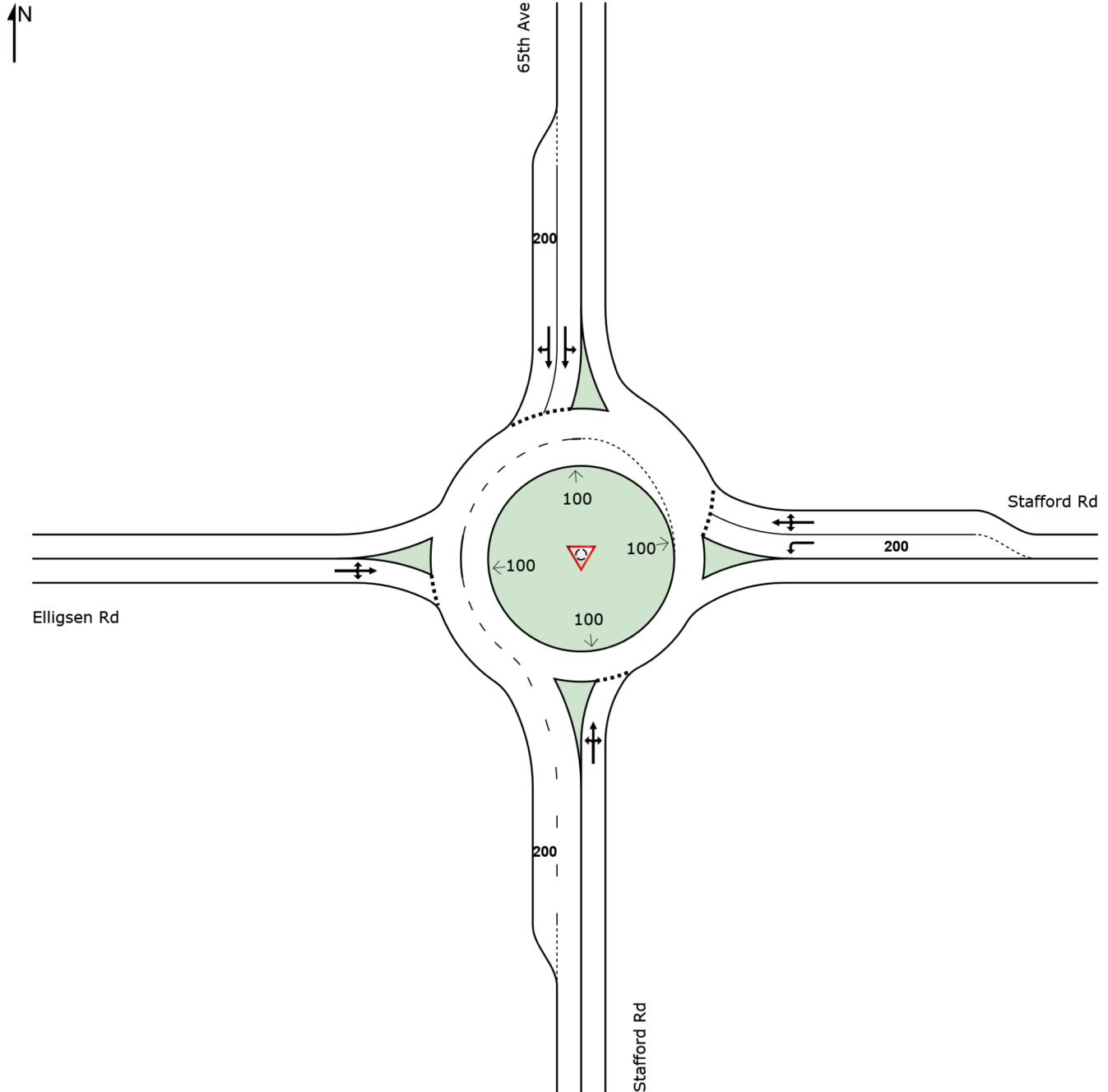
HCM 6th Ctrl Delay	16.9
HCM 6th LOS	B

## SITE LAYOUT

 Site: [Stafford Rd/65th Ave - Baseline (Site Folder: Stafford Rd/65th Ave)]

Site Category: -  
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.





## MOVEMENT SUMMARY

 Site: [Stafford Rd/65th Ave - Baseline (Site Folder: Stafford Rd/65th Ave)]

Site Category: -  
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] ft				
South: Stafford Rd														
3	L2	25	2.0	26	2.0	0.584	12.0	LOS B	5.7	144.1	0.71	0.78	1.02	31.6
8	T1	165	2.0	174	2.0	0.584	12.0	LOS B	5.7	144.1	0.71	0.78	1.02	31.6
18	R2	330	2.0	347	2.0	0.584	12.0	LOS B	5.7	144.1	0.71	0.78	1.02	30.7
Approach		520	2.0	547	2.0	0.584	12.0	LOS B	5.7	144.1	0.71	0.78	1.02	31.0
East: Stafford Rd														
1	L2	610	2.0	642	2.0	0.618	12.0	LOS B	6.7	169.4	0.68	0.73	0.99	29.6
6	T1	395	2.0	416	2.0	0.502	9.4	LOS A	3.3	82.6	0.59	0.52	0.65	33.0
16	R2	100	2.0	105	2.0	0.502	9.4	LOS A	3.3	82.6	0.59	0.52	0.65	32.0
Approach		1105	2.0	1163	2.0	0.618	10.8	LOS B	6.7	169.4	0.64	0.64	0.84	30.9
North: 65th Ave														
7	L2	35	2.0	37	2.0	0.707	24.6	LOS C	5.1	128.3	0.84	1.10	1.76	27.0
4	T1	420	2.0	442	2.0	0.707	23.3	LOS C	5.1	128.3	0.81	1.03	1.57	27.7
14	R2	65	2.0	68	2.0	0.340	13.1	LOS B	1.4	34.8	0.73	0.78	0.91	30.4
Approach		520	2.0	547	2.0	0.707	22.1	LOS C	5.1	128.3	0.80	1.00	1.50	28.0
West: Elligsen Rd														
5	L2	105	2.0	111	2.0	0.839	37.2	LOS D	8.1	206.5	0.90	1.36	2.49	23.2
2	T1	195	2.0	205	2.0	0.839	37.2	LOS D	8.1	206.5	0.90	1.36	2.49	23.2
12	R2	120	2.0	126	2.0	0.839	42.9	LOS D	8.1	206.5	0.90	1.36	2.49	22.7
Approach		420	2.0	442	2.0	0.839	38.8	LOS D	8.1	206.5	0.90	1.36	2.49	23.0
All Vehicles		2565	2.0	2700	2.0	0.839	17.9	LOS B	8.1	206.5	0.73	0.86	1.28	28.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

**SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com**

Organisation: DKS ASSOCIATES | Licence: PLUS / Enterprise | Processed: Tuesday, August 23, 2022 1:25:55 PM









Project: S:\Projects\2021\21108-000 (Wilsonville Frog Pond East & South Master Plan)\03\_Analysis\Synchro\Wilsonville Frog Pond East & South Master Plan - Future 2040.sip9

# HCM 6th Signalized Intersection Summary 6: Parkway Ave & Boeckman Rd

WV Frog Pond East & South Master Plan  
Future 2040 Build

Item A.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	305	315	75	340	30	200	220	65	35	385	260
Future Volume (veh/h)	145	305	315	75	340	30	200	220	65	35	385	260
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	0.99		0.96	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	1900	1900	1900	1900	1870	1900	1900	1885	1900	1900	1900	1900
Adj Flow Rate, veh/h	153	321	105	79	358	24	211	232	57	37	405	247
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	2	0	0	1	0	0	0	0
Cap, veh/h	330	554	177	282	563	38	330	706	173	575	468	286
Arrive On Green	0.09	0.21	0.20	0.05	0.17	0.16	0.09	0.48	0.48	0.03	0.42	0.42
Sat Flow, veh/h	1810	2664	853	1810	3371	225	1810	1457	358	1810	1104	673
Grp Volume(v), veh/h	153	215	211	79	188	194	211	0	289	37	0	652
Grp Sat Flow(s),veh/h/ln	1810	1805	1712	1810	1777	1819	1810	0	1814	1810	0	1777
Q Serve(g_s), s	4.8	7.5	7.8	2.5	6.9	7.0	4.3	0.0	6.9	0.8	0.0	23.5
Cycle Q Clear(g_c), s	4.8	7.5	7.8	2.5	6.9	7.0	4.3	0.0	6.9	0.8	0.0	23.5
Prop In Lane	1.00		0.50	1.00		0.12	1.00		0.20	1.00		0.38
Lane Grp Cap(c), veh/h	330	375	356	282	297	304	330	0	879	575	0	754
V/C Ratio(X)	0.46	0.57	0.59	0.28	0.63	0.64	0.64	0.00	0.33	0.06	0.00	0.87
Avail Cap(c_a), veh/h	369	580	550	395	571	584	374	0	913	727	0	894
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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.3	25.1	25.3	23.1	27.3	27.4	14.7	0.0	11.2	11.1	0.0	18.5
Incr Delay (d2), s/veh	0.8	1.0	1.2	0.4	1.7	1.7	2.6	0.0	0.3	0.0	0.0	8.4
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	1.9	3.1	3.0	1.0	2.9	3.0	1.6	0.0	2.4	0.3	0.0	10.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.1	26.1	26.5	23.5	29.0	29.0	17.2	0.0	11.5	11.1	0.0	26.9
LnGrp LOS	C	C	C	C	C	C	B	A	B	B	A	C
Approach Vol, veh/h	579			461			500			689		
Approach Delay, s/veh	25.2			28.1			13.9			26.1		
Approach LOS	C			C			B			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	30.3	33.9	7.6	18.6	6.1	38.1	10.5	15.8				
Change Period (Y+Rc), s	4.0	4.5	4.0	4.5	4.0	4.5	4.0	4.5				
Max Green Setting (Gmax), s	34.9	34.9	8.0	22.1	8.0	34.9	8.0	22.1				
Max Q Clear Time (g_c+I), s	10.3	25.5	4.5	9.8	2.8	8.9	6.8	9.0				
Green Ext Time (p_c), s	0.1	3.8	0.0	1.5	0.0	2.4	0.0	1.4				

## Intersection Summary









HCM 6th Ctrl Delay	23.5
HCM 6th LOS	C

# HCM 6th Signalized Intersection Summary 7: Canyon Creek Rd & Boeckman Rd

WV Frog Pond East & South Master Plan  
Future 2040 Build

Item A.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	265	45	85	330	70	40	120	105	115	165	75
Future Volume (veh/h)	55	265	45	85	330	70	40	120	105	115	165	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.99	0.99		0.97
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	1900	1870	1870	1870	1856	1826	1900	1856	1900	1900	1885	1900
Adj Flow Rate, veh/h	61	294	42	94	367	69	44	133	76	128	183	63
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	2	2	2	3	5	0	3	0	0	1	0
Cap, veh/h	335	481	69	414	478	90	345	205	117	390	307	106
Arrive On Green	0.05	0.30	0.29	0.06	0.32	0.30	0.04	0.19	0.17	0.08	0.23	0.22
Sat Flow, veh/h	1810	1600	229	1781	1518	285	1810	1103	630	1810	1328	457
Grp Volume(v), veh/h	61	0	336	94	0	436	44	0	209	128	0	246
Grp Sat Flow(s),veh/h/ln	1810	0	1828	1781	0	1803	1810	0	1733	1810	0	1786
Q Serve(g_s), s	1.0	0.0	6.9	1.6	0.0	9.5	0.9	0.0	4.9	2.5	0.0	5.4
Cycle Q Clear(g_c), s	1.0	0.0	6.9	1.6	0.0	9.5	0.9	0.0	4.9	2.5	0.0	5.4
Prop In Lane	1.00		0.13	1.00		0.16	1.00		0.36	1.00		0.26
Lane Grp Cap(c), veh/h	335	0	550	414	0	568	345	0	323	390	0	412
V/C Ratio(X)	0.18	0.00	0.61	0.23	0.00	0.77	0.13	0.00	0.65	0.33	0.00	0.60
Avail Cap(c_a), veh/h	581	0	1388	631	0	1369	609	0	997	573	0	1027
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	10.9	0.0	13.1	10.2	0.0	13.5	14.0	0.0	16.5	13.2	0.0	15.0
Incr Delay (d2), s/veh	0.3	0.0	1.1	0.3	0.0	2.2	0.2	0.0	2.2	0.5	0.0	1.4
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	2.3	0.5	0.0	3.2	0.3	0.0	1.9	0.9	0.0	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.1	0.0	14.2	10.5	0.0	15.7	14.1	0.0	18.6	13.7	0.0	16.4
LnGrp LOS	B	A	B	B	A	B	B	A	B	B	A	B
Approach Vol, veh/h	397		530			253			374			
Approach Delay, s/veh	13.7		14.8			17.9			15.4			
Approach LOS	B		B			B			B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.6	12.1	6.7	17.1	5.6	14.0	6.1	17.7				
Change Period (Y+Rc), s	4.0	4.5	4.0	4.5	4.0	4.5	4.0	4.5				
Max Green Setting (Gmax), s	30.0	24.5	8.0	32.5	8.0	24.5	8.0	32.5				
Max Q Clear Time (g_c+I), s	14.5	6.9	3.6	8.9	2.9	7.4	3.0	11.5				
Green Ext Time (p_c), s	0.1	0.7	0.1	1.3	0.0	0.8	0.0	1.7				
Intersection Summary												
HCM 6th Ctrl Delay	15.2											
HCM 6th LOS	B											

# HCM 6th Signalized Intersection Summary













WV Frog Pond East & South Master Plan

Item A.

## 8: Wilsonville Rd/Stafford Rd & Boeckman Rd/Advance Rd





Future 2040 Build



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	205	70	115	60	60	30	100	225	65	45	465	330
Future Volume (veh/h)	205	70	115	60	60	30	100	225	65	45	465	330
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.92		0.90	0.87		0.85	1.00		0.98	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	1885	1870	1885	1826	1900	1900	1885	1885	1870	1826	1885	1856
Adj Flow Rate, veh/h	207	71	20	61	61	8	101	227	56	45	470	308
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	2	1	5	0	0	1	1	2	5	1	3
Cap, veh/h	427	358	275	307	175	23	238	728	180	589	516	338
Arrive On Green	0.13	0.19	0.19	0.05	0.11	0.10	0.05	0.50	0.49	0.03	0.49	0.48
Sat Flow, veh/h	1795	1870	1436	1739	1607	211	1795	1452	358	1739	1062	696
Grp Volume(v), veh/h	207	71	20	61	0	69	101	0	283	45	0	778
Grp Sat Flow(s),veh/h/ln	1795	1870	1436	1739	0	1817	1795	0	1810	1739	0	1758
Q Serve(g_s), s	6.8	2.3	0.8	2.2	0.0	2.5	2.0	0.0	6.6	0.9	0.0	28.9
Cycle Q Clear(g_c), s	6.8	2.3	0.8	2.2	0.0	2.5	2.0	0.0	6.6	0.9	0.0	28.9
Prop In Lane	1.00		1.00	1.00		0.12	1.00		0.20	1.00		0.40
Lane Grp Cap(c), veh/h	427	358	275	307	0	198	238	0	907	589	0	854
V/C Ratio(X)	0.48	0.20	0.07	0.20	0.00	0.35	0.42	0.00	0.31	0.08	0.00	0.91
Avail Cap(c_a), veh/h	490	624	479	336	0	424	252	0	1069	629	0	1038
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	1.00	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	21.6	24.1	23.5	26.1	0.0	29.2	15.3	0.0	10.5	8.9	0.0	16.9
Incr Delay (d2), s/veh	0.6	0.2	0.1	0.2	0.0	0.8	0.9	0.0	0.2	0.0	0.0	10.4
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	2.7	1.0	0.3	0.9	0.0	1.1	0.7	0.0	2.3	0.3	0.0	12.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.3	24.3	23.6	26.3	0.0	30.0	16.2	0.0	10.7	8.9	0.0	27.3
LnGrp LOS	C	C	C	C	A	C	B	A	B	A	A	C
Approach Vol, veh/h	298			130			384			823		
Approach Delay, s/veh	22.8			28.3			12.1			26.3		
Approach LOS	C			C			B			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.5	38.4	13.2	11.7	6.3	39.5	7.4	17.5				
Change Period (Y+Rc), s	4.0	4.5	4.5	4.5	4.0	4.5	4.5	4.5				
Max Green Setting (Gmax), s	4.0	41.3	11.2	16.0	4.0	41.3	4.1	23.1				
Max Q Clear Time (g_c+I), s	4.0	30.9	8.8	4.5	2.9	8.6	4.2	4.3				
Green Ext Time (p_c), s	0.0	3.0	0.1	0.1	0.0	1.1	0.0	0.2				

### Intersection Summary

HCM 6th Ctrl Delay	22.5
HCM 6th LOS	C

Intersection												
Int Delay, s/veh	4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	100	25	5	95	25	30	30	5	30	30	5
Future Vol, veh/h	5	100	25	5	95	25	30	30	5	30	30	5
Conflicting Peds, #/hr	0	0	0	0	0	0	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	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	1	12	0	1	0	7	0	0	0	0	0
Mvmt Flow	6	111	28	6	106	28	33	33	6	33	33	6
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	134	0	0	139	0	0	289	283	125	289	283	120
Stage 1	-	-	-	-	-	-	137	137	-	132	132	-
Stage 2	-	-	-	-	-	-	152	146	-	157	151	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.17	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.17	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.17	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.563	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1463	-	-	1457	-	-	653	629	931	667	629	937
Stage 1	-	-	-	-	-	-	854	787	-	876	791	-
Stage 2	-	-	-	-	-	-	839	780	-	850	776	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1463	-	-	1457	-	-	619	624	931	632	624	937
Mov Cap-2 Maneuver	-	-	-	-	-	-	619	624	-	632	624	-
Stage 1	-	-	-	-	-	-	851	784	-	872	788	-
Stage 2	-	-	-	-	-	-	796	777	-	806	773	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			0.3			11.4			11.3		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	638	1463	-	-	1457	-	-	644				
HCM Lane V/C Ratio	0.113	0.004	-	-	0.004	-	-	0.112				
HCM Control Delay (s)	11.4	7.5	0	-	7.5	0	-	11.3				
HCM Lane LOS	B	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	0.4				

Intersection												
Int Delay, s/veh	4.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	25	5	15	20	10	20	15	400	45	70	805	45
Future Vol, veh/h	25	5	15	20	10	20	15	400	45	70	805	45
Conflicting Peds, #/hr	0	0	0	0	0	0	2	0	0	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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, %	0	0	0	0	0	0	10	0	0	0	2	0
Mvmt Flow	27	5	16	22	11	22	16	435	49	76	875	49
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1562	1570	902	1554	1570	460	926	0	0	484	0	0
Stage 1	1054	1054	-	492	492	-	-	-	-	-	-	-
Stage 2	508	516	-	1062	1078	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.2	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.29	-	-	2.2	-	-
Pot Cap-1 Maneuver	92	112	339	93	112	605	706	-	-	1089	-	-
Stage 1	276	305	-	562	551	-	-	-	-	-	-	-
Stage 2	551	538	-	273	297	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	70	93	338	74	93	605	705	-	-	1089	-	-
Mov Cap-2 Maneuver	70	93	-	74	93	-	-	-	-	-	-	-
Stage 1	267	260	-	545	534	-	-	-	-	-	-	-
Stage 2	504	521	-	218	253	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	72.6		56.3		0.3		0.7					
HCM LOS	F		F									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	705	-	-	99	122	1089	-	-				
HCM Lane V/C Ratio	0.023	-	-	0.494	0.445	0.07	-	-				
HCM Control Delay (s)	10.2	0	-	72.6	56.3	8.6	0	-				
HCM Lane LOS	B	A	-	F	F	A	A	-				
HCM 95th %tile Q(veh)	0.1	-	-	2.2	2	0.2	-	-				

Intersection												
Int Delay, s/veh	36.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	75	10	10	10	10	50	5	420	20	85	900	100
Future Vol, veh/h	75	10	10	10	10	50	5	420	20	85	900	100
Conflicting Peds, #/hr	0	0	0	0	0	0	2	0	0	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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, %	0	0	0	0	0	0	0	0	0	0	2	10
Mvmt Flow	82	11	11	11	11	54	5	457	22	92	978	109

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1730	1708	1035	1706	1751	468	1089	0	0	479	0	0
Stage 1	1219	1219	-	478	478	-	-	-	-	-	-	-
Stage 2	511	489	-	1228	1273	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	~ 70	92	284	73	87	599	648	-	-	1094	-	-
Stage 1	223	255	-	572	559	-	-	-	-	-	-	-
Stage 2	549	553	-	220	241	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 46	71	284	51	67	599	647	-	-	1094	-	-
Mov Cap-2 Maneuver	~ 46	71	-	51	67	-	-	-	-	-	-	-
Stage 1	220	199	-	566	553	-	-	-	-	-	-	-
Stage 2	484	547	-	156	188	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	610.5	45.1	0.1	0.7
HCM LOS	F	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	647	-	-	53	163	1094	-	-
HCM Lane V/C Ratio	0.008	-	-	1.948	0.467	0.084	-	-
HCM Control Delay (s)	10.6	0	-	610.5	45.1	8.6	0	-
HCM Lane LOS	B	A	-	F	E	A	A	-
HCM 95th %tile Q(veh)	0	-	-	10.1	2.2	0.3	-	-

Notes												
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined						*: All major volume in platoon				

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	5	5	5	5	10	5	535	5	10	1075	10
Future Vol, veh/h	10	5	5	5	5	10	5	535	5	10	1075	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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, %	0	0	0	0	0	0	0	2	0	0	2	0
Mvmt Flow	11	5	5	5	5	11	5	582	5	11	1168	11

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1799	1793	1174	1796	1796	585	1179	0	0	587	0	0
Stage 1	1196	1196	-	595	595	-	-	-	-	-	-	-
Stage 2	603	597	-	1201	1201	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	63	82	236	63	81	515	600	-	-	998	-	-
Stage 1	229	262	-	494	496	-	-	-	-	-	-	-
Stage 2	489	495	-	228	260	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	56	78	236	56	77	515	600	-	-	998	-	-
Mov Cap-2 Maneuver	56	78	-	56	77	-	-	-	-	-	-	-
Stage 1	226	254	-	488	490	-	-	-	-	-	-	-
Stage 2	468	489	-	211	252	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	70.3		43.5		0.1		0.1	
HCM LOS	F		E					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	600	-	-	76	115	998	-
HCM Lane V/C Ratio	0.009	-	-	0.286	0.189	0.011	-
HCM Control Delay (s)	11.1	0	-	70.3	43.5	8.6	0
HCM Lane LOS	B	A	-	F	E	A	A
HCM 95th %tile Q(veh)	0	-	-	1	0.7	0	-



# HCM 6th Signalized Intersection Summary 13: I-5 SB Ramp & Wilsonville Rd

WV Frog Pond East & South Master Plan

Future 2040 Build

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑↑
Traffic Volume (veh/h)	0	820	655	540	1015	0	0	0	0	80	5	115
Future Volume (veh/h)	0	820	655	540	1015	0	0	0	0	80	5	115
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.97
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	0	1870	1856	1870	1856	0				1856	1900	1856
Adj Flow Rate, veh/h	0	863	0	568	1068	0				88	0	13
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	3	2	3	0				3	0	3
Cap, veh/h	0	3331		644	3086	0				184	0	158
Arrive On Green	0.00	0.65	0.00	0.37	1.00	0.00				0.05	0.00	0.05
Sat Flow, veh/h	0	5274	1572	3456	3618	0				3534	0	3039
Grp Volume(v), veh/h	0	863	0	568	1068	0				88	0	13
Grp Sat Flow(s),veh/h/ln	0	1702	1572	1728	1763	0				1767	0	1520
Q Serve(g_s), s	0.0	7.8	0.0	16.9	0.0	0.0				2.7	0.0	0.4
Cycle Q Clear(g_c), s	0.0	7.8	0.0	16.9	0.0	0.0				2.7	0.0	0.4
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	3331		644	3086	0				184	0	158
V/C Ratio(X)	0.00	0.26		0.88	0.35	0.00				0.48	0.00	0.08
Avail Cap(c_a), veh/h	0	3331		817	3086	0				610	0	525
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.88	0.88	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	8.0	0.0	33.4	0.0	0.0				50.7	0.0	49.6
Incr Delay (d2), s/veh	0.0	0.2	0.0	8.3	0.3	0.0				1.9	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.7	0.0	6.2	0.1	0.0				1.2	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	8.2	0.0	41.6	0.3	0.0				52.6	0.0	49.9
LnGrp LOS	A	A		D	A	A				D	A	D
Approach Vol, veh/h		863			1636						101	
Approach Delay, s/veh		8.2			14.6						52.3	
Approach LOS		A			B						D	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	24.5	75.8		9.7		100.3						
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0						
Max Green Setting (Gmax), s	26.0	53.0		19.0		75.0						
Max Q Clear Time (g_c+I1), s	18.9	9.8		4.7		2.0						
Green Ext Time (p_c), s	1.6	4.6		0.3		6.3						

## Intersection Summary

HCM 6th Ctrl Delay	14.0
HCM 6th LOS	B

## Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary 14: I-5 NB Ramp & Wilsonville Rd

WV Frog Pond East & South Master Plan

Future 2040 Build

Item A.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑			↑↑↑	↔	↔	↔	↔↔			
Traffic Volume (veh/h)	360	540	0	0	1100	335	455	10	505	0	0	0
Future Volume (veh/h)	360	540	0	0	1100	335	455	10	505	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99			
Parking Bus, Adj	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					
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1885	1826	1900	1870			
Adj Flow Rate, veh/h	375	562	0	0	1146	0	481	0	264			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0	0	2	1	5	0	2			
Cap, veh/h	446	2680	0	0	3006		602	0	541			
Arrive On Green	0.26	1.00	0.00	0.00	0.59	0.00	0.17	0.00	0.17			
Sat Flow, veh/h	3456	3647	0	0	5274	1598	3478	0	3124			
Grp Volume(v), veh/h	375	562	0	0	1146	0	481	0	264			
Grp Sat Flow(s),veh/h/ln	1728	1777	0	0	1702	1598	1739	0	1562			
Q Serve(g_s), s	11.3	0.0	0.0	0.0	13.1	0.0	14.6	0.0	8.4			
Cycle Q Clear(g_c), s	11.3	0.0	0.0	0.0	13.1	0.0	14.6	0.0	8.4			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	446	2680	0	0	3006		602	0	541			
V/C Ratio(X)	0.84	0.21	0.00	0.00	0.38		0.80	0.00	0.49			
Avail Cap(c_a), veh/h	723	2680	0	0	3006		1043	0	937			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.97	0.97	0.00	0.00	0.23	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	39.7	0.0	0.0	0.0	12.0	0.0	43.6	0.0	41.1			
Incr Delay (d2), s/veh	3.3	0.2	0.0	0.0	0.1	0.0	1.5	0.0	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			
%ile BackOfQ(50%),veh/ln	4.3	0.1	0.0	0.0	4.7	0.0	6.3	0.0	3.2			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.0	0.2	0.0	0.0	12.1	0.0	45.2	0.0	41.5			
LnGrp LOS	D	A	A	A	B		D	A	D			
Approach Vol, veh/h	937			1146			745					
Approach Delay, s/veh	17.3			12.1			43.9					
Approach LOS	B			B			D					
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	87.0			18.2			68.8			23.0		
Change Period (Y+Rc), s	4.0			4.0			4.0			4.0		
Max Green Setting (Gmax), s	52.0			23.0			42.0			33.0		
Max Q Clear Time (g_c+I1), s	2.0			13.3			15.1			16.6		
Green Ext Time (p_c), s	6.1			0.9			12.3			2.4		

## Intersection Summary

HCM 6th Ctrl Delay	22.2
HCM 6th LOS	C

## Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary 15: Town Center Lp West & Wilsonville Rd

WV Frog Pond East & South Master Plan  
Future 2040 Build

Item A.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑↑			↑↑			↑	↑		↑	↑	
Traffic Volume (veh/h)	0	930	115	0	865	50	195	25	90	65	125	375
Future Volume (veh/h)	0	930	115	0	865	50	195	25	90	65	125	375
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	1.00		0.99	1.00		0.97
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	0	1870	1870	0	1885	1900	1885	1900	1900	1900	1900	1870
Adj Flow Rate, veh/h	0	979	106	0	911	49	205	26	39	68	132	353
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	0	1	0	1	0	0	0	0	2
Cap, veh/h	0	1396	151	0	1031	55	237	370	555	96	208	557
Arrive On Green	0.00	0.10	0.10	0.00	0.30	0.29	0.13	0.54	0.54	0.05	0.46	0.46
Sat Flow, veh/h	0	4841	505	0	3545	186	1795	681	1021	1810	448	1198
Grp Volume(v), veh/h	0	713	372	0	473	487	205	0	65	68	0	485
Grp Sat Flow(s),veh/h/ln	0	1702	1773	0	1791	1845	1795	0	1701	1810	0	1646
Q Serve(g_s), s	0.0	22.3	22.4	0.0	27.7	27.7	12.3	0.0	2.0	4.1	0.0	24.6
Cycle Q Clear(g_c), s	0.0	22.3	22.4	0.0	27.7	27.7	12.3	0.0	2.0	4.1	0.0	24.6
Prop In Lane	0.00		0.28	0.00		0.10	1.00		0.60	1.00		0.73
Lane Grp Cap(c), veh/h	0	1017	530	0	535	551	237	0	925	96	0	765
V/C Ratio(X)	0.00	0.70	0.70	0.00	0.88	0.88	0.87	0.00	0.07	0.71	0.00	0.63
Avail Cap(c_a), veh/h	0	1331	693	0	700	721	237	0	925	156	0	765
HCM Platoon Ratio	1.00	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.95	0.95	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	44.8	44.9	0.0	36.7	36.8	46.8	0.0	12.0	51.2	0.0	22.3
Incr Delay (d2), s/veh	0.0	0.9	1.7	0.0	9.8	9.5	26.9	0.0	0.1	9.2	0.0	4.0
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	10.3	10.9	0.0	13.2	13.6	7.3	0.0	0.8	2.1	0.0	10.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	45.7	46.5	0.0	46.5	46.3	73.7	0.0	12.1	60.4	0.0	26.3
LnGrp LOS	A	D	D	A	D	D	E	A	B	E	A	C
Approach Vol, veh/h	1085			960			270			553		
Approach Delay, s/veh	46.0			46.4			58.9			30.5		
Approach LOS	D			D			E			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.3	63.8		36.9	18.0	55.1		36.9				
Change Period (Y+Rc), s	4.0	4.5		4.5	4.0	4.5		4.5				
Max Green Setting (Gmax), s	4.0	45.5		42.5	14.0	40.5		42.5				
Max Q Clear Time (g_c+I), s	4.0	4.0		24.4	14.3	26.6		29.7				
Green Ext Time (p_c), s	0.0	0.2		3.8	0.0	1.5		2.7				

## Intersection Summary

HCM 6th Ctrl Delay	44.3
HCM 6th LOS	D

ID	Software/Method	Intersection	Control Type	LOS	Delay	V/C Ratio
1	Synchro HCM 6th Signal	I-5 SB Ramp & Elligsen Rd	Signal	B	18.1	0.73
2	Synchro HCM 6th Signal	I-5 NB Ramp & Elligsen Rd	Signal	A	9.3	0.45
3	Synchro HCM 6th Signal	Parkway Ave & Elligsen Rd	Signal	C	24.4	0.52
4	Synchro HCM 6th Signal	Parkway Center Dr & Elligsen Rd	Signal	B	16.9	0.55
6	Synchro HCM 6th Signal	Parkway Ave & Boeckman Rd	Signal	C	23.5	0.82
7	Synchro HCM 6th Signal	Canyon Creek Rd & Boeckman Rd	Signal	B	15.2	0.57
8	Synchro HCM 6th Signal	Wilsonville Rd/Stafford Rd & Boeckman Rd/	Signal	C	22.5	0.79
13	Synchro HCM 6th Signal	I-5 SB Ramp & Wilsonville Rd	Signal	B	14.0	0.40
14	Synchro HCM 6th Signal	I-5 NB Ramp & Wilsonville Rd	Signal	C	22.2	0.52
15	Synchro HCM 6th Signal	Town Center Lp West & Wilsonville Rd	Signal	D	44.3	0.82

## ANTICIPATED BUILD 2040 HCM REPORTS

---



# HCM 6th Signalized Intersection Summary 1: I-5 SB Ramp & Elligsen Rd

WV Frog Pond East & South Master Plan  
Future 2040 Build

Item A.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑		↑↑	↑				↑	↑	↑↑
Traffic Volume (veh/h)	0	1325	1105	0	1030	370	0	0	0	480	70	830
Future Volume (veh/h)	0	1325	1105	0	1030	370	0	0	0	480	70	830
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.98
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	0	1826	1856	0	1826	1900				1856	1870	1678
Adj Flow Rate, veh/h	0	1395	0	0	1084	0				558	0	798
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	5	3	0	5	0				3	2	15
Cap, veh/h	0	2019		0	2019					1208	0	951
Arrive On Green	0.00	0.58	0.00	0.00	1.00	0.00				0.34	0.00	0.34
Sat Flow, veh/h	0	3561	1572	0	3561	1610				3534	0	2784
Grp Volume(v), veh/h	0	1395	0	0	1084	0				558	0	798
Grp Sat Flow(s),veh/h/ln	0	1735	1572	0	1735	1610				1767	0	1392
Q Serve(g_s), s	0.0	29.5	0.0	0.0	0.0	0.0				13.0	0.0	27.8
Cycle Q Clear(g_c), s	0.0	29.5	0.0	0.0	0.0	0.0				13.0	0.0	27.8
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2019		0	2019					1208	0	951
V/C Ratio(X)	0.00	0.69		0.00	0.54					0.46	0.00	0.84
Avail Cap(c_a), veh/h	0	2019		0	2019					1447	0	1140
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	0.86	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	15.3	0.0	0.0	0.0	0.0				27.0	0.0	31.9
Incr Delay (d2), s/veh	0.0	2.0	0.0	0.0	0.9	0.0				0.3	0.0	4.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	11.1	0.0	0.0	0.2	0.0				5.4	0.0	9.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	17.3	0.0	0.0	0.9	0.0				27.3	0.0	36.8
LnGrp LOS	A	B		A	A					C	A	D
Approach Vol, veh/h		1395			1084						1356	
Approach Delay, s/veh		17.3			0.9						32.9	
Approach LOS		B			A						C	
Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		65.1		39.9		65.1						
Change Period (Y+Rc), s		5.0		4.0		5.0						
Max Green Setting (Gmax), s		53.0		43.0		53.0						
Max Q Clear Time (g_c+I1), s		31.5		29.8		2.0						
Green Ext Time (p_c), s		7.8		6.1		6.4						

## Intersection Summary

HCM 6th Ctrl Delay	18.2
HCM 6th LOS	B

## Notes

User approved volume balancing among the lanes for turning movement.

User approved changes to right turn type.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary 2: I-5 NB Ramp & Elligsen Rd

WV Frog Pond East & South Master Plan  
Future 2040 Build

Item A.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑		↑↑	↑	↑↑		↑			
Traffic Volume (veh/h)	0	915	890	0	925	535	475	0	275	0	0	0
Future Volume (veh/h)	0	915	890	0	925	535	475	0	275	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	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			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	0	1870	1826	0	1870	1870	1826	0	1856			
Adj Flow Rate, veh/h	0	953	0	0	964	0	495	0	0			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	0	2	5	0	2	2	5	0	3			
Cap, veh/h	0	2603		0	2603		613	0				
Arrive On Green	0.00	1.00	0.00	0.00	1.00	0.00	0.18	0.00	0.00			
Sat Flow, veh/h	0	3647	1547	0	3647	1585	3374	0	1572			
Grp Volume(v), veh/h	0	953	0	0	964	0	495	0	0			
Grp Sat Flow(s),veh/h/ln	0	1777	1547	0	1777	1585	1687	0	1572			
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	14.8	0.0	0.0			
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	14.8	0.0	0.0			
Prop In Lane	0.00		1.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2603		0	2603		613	0				
V/C Ratio(X)	0.00	0.37		0.00	0.37		0.81	0.00				
Avail Cap(c_a), veh/h	0	2603		0	2603		1253	0				
HCM Platoon Ratio	1.00	2.00	2.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	0.67	0.00	0.00	0.85	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	41.2	0.0	0.0			
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.0	0.3	0.0	2.6	0.0	0.0			
Initial Q Delay(d3),s/veh	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	0.1	0.0	0.0	0.1	0.0	6.2	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.3	0.0	0.0	0.3	0.0	43.8	0.0	0.0			
LnGrp LOS	A	A		A	A		D	A				
Approach Vol, veh/h	953			964			495					
Approach Delay, s/veh	0.3			0.3			43.8					
Approach LOS	A			A			D					
Timer - Assigned Phs	2			6			8					
Phs Duration (G+Y+Rc), s	81.9			81.9			23.1					
Change Period (Y+Rc), s	5.0			5.0			4.0					
Max Green Setting (Gmax), s	57.0			57.0			39.0					
Max Q Clear Time (g_c+I1), s	2.0			2.0			16.8					
Green Ext Time (p_c), s	5.3			5.4			2.3					

## Intersection Summary

HCM 6th Ctrl Delay	9.2
HCM 6th LOS	A

## Notes

Unsignalized Delay for [NBR, EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary 3: Parkway Ave & Elligsen Rd

WV Frog Pond East & South Master Plan  
Future 2040 Build

Item A.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰↑↑	↑↑↑	↱	↰	↱	↱	↰	↱	↱
Traffic Volume (veh/h)	85	635	470	50	800	45	460	30	55	70	20	200
Future Volume (veh/h)	85	635	470	50	800	45	460	30	55	70	20	200
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
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	1870	1826	1900	1900	1856	1900	1870	1900	1900	1678	1411	1841
Adj Flow Rate, veh/h	93	698	314	55	879	44	529	0	8	77	22	2
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	5	0	0	3	0	2	0	0	15	33	4
Cap, veh/h	117	1839	1142	72	2492	124	640	0	289	103	82	7
Arrive On Green	0.13	1.00	1.00	0.01	0.17	0.17	0.18	0.00	0.18	0.06	0.06	0.06
Sat Flow, veh/h	1781	3469	1609	1810	4941	247	3563	0	1610	1598	1274	116
Grp Volume(v), veh/h	93	698	314	55	600	323	529	0	8	77	0	24
Grp Sat Flow(s),veh/h/ln	1781	1735	1609	1810	1689	1811	1781	0	1610	1598	0	1390
Q Serve(g_s), s	5.3	0.0	0.0	3.2	16.5	16.6	15.0	0.0	0.4	5.0	0.0	1.7
Cycle Q Clear(g_c), s	5.3	0.0	0.0	3.2	16.5	16.6	15.0	0.0	0.4	5.0	0.0	1.7
Prop In Lane	1.00		1.00	1.00		0.14	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	117	1839	1142	72	1703	913	640	0	289	103	0	90
V/C Ratio(X)	0.79	0.38	0.27	0.76	0.35	0.35	0.83	0.00	0.03	0.75	0.00	0.27
Avail Cap(c_a), veh/h	204	1839	1142	267	1703	913	882	0	399	228	0	199
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.89	0.89	0.89	0.87	0.87	0.87	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	44.9	0.0	0.0	51.3	28.6	28.6	41.5	0.0	35.5	48.3	0.0	46.8
Incr Delay (d2), s/veh	10.2	0.5	0.5	13.2	0.5	0.9	4.7	0.0	0.0	10.3	0.0	1.6
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	2.5	0.1	0.2	1.7	7.5	8.2	7.0	0.0	0.2	2.3	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.1	0.5	0.5	64.5	29.1	29.5	46.2	0.0	35.5	58.6	0.0	48.3
LnGrp LOS	E	A	A	E	C	C	D	A	D	E	A	D
Approach Vol, veh/h	1105			978			537			101		
Approach Delay, s/veh	5.1			31.2			46.0			56.2		
Approach LOS	A			C			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.7	60.7		11.8	11.4	58.0		23.9				
Change Period (Y+Rc), s	4.5	5.0		5.0	4.5	5.0		5.0				
Max Green Setting (Gmax), s	15.5	29.0		15.0	12.0	32.5		26.0				
Max Q Clear Time (g_c+I), s	15.2	2.0		7.0	7.3	18.6		17.0				
Green Ext Time (p_c), s	0.1	5.1		0.2	0.1	3.6		1.8				

## Intersection Summary

HCM 6th Ctrl Delay 24.5

HCM 6th LOS C

## Notes

User approved volume balancing among the lanes for turning movement.



# HCM 6th Signalized Intersection Summary 4: Parkway Center Dr & Elligsen Rd

WV Frog Pond East & South Master Plan  
Future 2040 Build

Item A.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	445	280	125	465	5	415	5	110	5	5	15
Future Volume (veh/h)	35	445	280	125	465	5	415	5	110	5	5	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
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	1900	1900	1870	1856	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	38	478	206	134	500	5	446	5	13	5	5	0
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, %	0	0	2	3	0	0	0	0	0	0	0	0
Cap, veh/h	659	1100	1164	587	2254	23	546	72	188	27	27	0
Arrive On Green	0.06	0.77	0.77	0.08	0.62	0.62	0.16	0.16	0.16	0.01	0.03	0.00
Sat Flow, veh/h	1810	1900	1584	1767	3662	37	3510	466	1211	927	927	0
Grp Volume(v), veh/h	38	478	206	134	246	259	446	0	18	10	0	0
Grp Sat Flow(s), veh/h/ln	1810	1900	1584	1767	1805	1893	1755	0	1677	1854	0	0
Q Serve(g_s), s	0.8	9.1	2.4	2.8	6.4	6.4	12.9	0.0	1.0	0.6	0.0	0.0
Cycle Q Clear(g_c), s	0.8	9.1	2.4	2.8	6.4	6.4	12.9	0.0	1.0	0.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.02	1.00		0.72	0.50		0.00
Lane Grp Cap(c), veh/h	659	1100	1164	587	1111	1165	546	0	261	53	0	0
V/C Ratio(X)	0.06	0.43	0.18	0.23	0.22	0.22	0.82	0.00	0.07	0.19	0.00	0.00
Avail Cap(c_a), veh/h	727	1100	1164	590	1111	1165	903	0	431	141	0	0
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.90	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.4	6.1	2.2	6.5	9.0	9.0	42.9	0.0	37.8	50.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.1	0.3	0.1	0.5	0.4	1.2	0.0	0.0	0.6	0.0	0.0
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	3.1	1.2	0.9	2.5	2.6	5.6	0.0	0.4	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.4	7.2	2.5	6.6	9.4	9.4	44.0	0.0	37.9	50.8	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	A
Approach Vol, veh/h	722			639			464			10		
Approach Delay, s/veh	5.9			8.8			43.8			50.8		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	2.8	64.8		7.0	9.0	68.6		20.3				
Change Period (Y+Rc), s	5.0	5.0		5.5	5.0	5.0		5.0				
Max Green Setting (Gmax), s	44.0			6.5	8.0	44.0		26.0				
Max Q Clear Time (g_c+I), s	11.1			2.6	2.8	8.4		14.9				
Green Ext Time (p_c), s	0.0	0.6		0.0	0.0	0.4		0.3				

## Intersection Summary

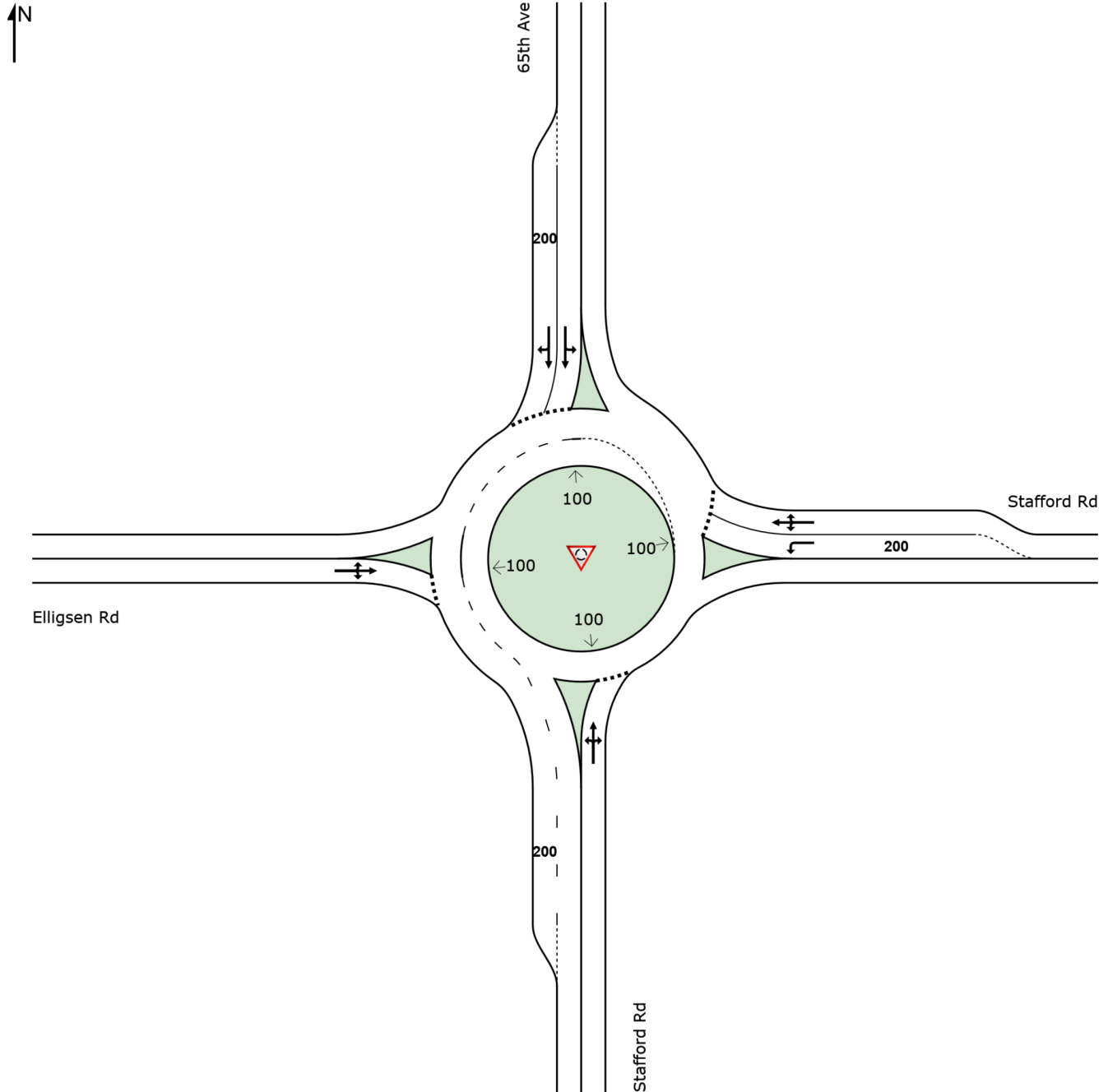
HCM 6th Ctrl Delay	16.8
HCM 6th LOS	B

## SITE LAYOUT

 Site: [Stafford Rd/65th Ave - Build (Site Folder: Stafford Rd/65th Ave)]

Site Category: -  
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



## MOVEMENT SUMMARY

 Site: [Stafford Rd/65th Ave - Build (Site Folder: Stafford Rd/65th Ave)]

Site Category: -  
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] %	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] ft				
South: Stafford Rd														
3	L2	35	2.0	37	2.0	0.648	13.8	LOS B	7.8	199.0	0.77	0.89	1.22	30.8
8	T1	215	2.0	226	2.0	0.648	13.8	LOS B	7.8	199.0	0.77	0.89	1.22	30.8
18	R2	330	2.0	347	2.0	0.648	13.8	LOS B	7.8	199.0	0.77	0.89	1.22	30.0
Approach		580	2.0	611	2.0	0.648	13.8	LOS B	7.8	199.0	0.77	0.89	1.22	30.3
East: Stafford Rd														
1	L2	585	2.0	616	2.0	0.628	12.8	LOS B	6.8	173.3	0.72	0.84	1.15	29.3
6	T1	425	2.0	447	2.0	0.575	11.4	LOS B	5.2	132.0	0.67	0.74	0.98	32.0
16	R2	110	2.0	116	2.0	0.575	11.4	LOS B	5.2	132.0	0.67	0.74	0.98	31.1
Approach		1120	2.0	1179	2.0	0.628	12.1	LOS B	6.8	173.3	0.70	0.79	1.06	30.5
North: 65th Ave														
7	L2	35	2.0	37	2.0	0.848	37.8	LOS D	8.6	218.1	0.90	1.38	2.56	23.3
4	T1	515	2.0	542	2.0	0.848	33.9	LOS C	8.6	218.1	0.87	1.26	2.21	24.6
14	R2	65	2.0	68	2.0	0.408	14.8	LOS B	1.8	45.4	0.75	0.83	1.04	29.7
Approach		615	2.0	647	2.0	0.848	32.1	LOS C	8.6	218.1	0.86	1.22	2.11	25.0
West: Elligsen Rd														
5	L2	105	2.0	111	2.0	0.831	38.0	LOS D	7.4	188.3	0.91	1.34	2.44	23.0
2	T1	190	2.0	200	2.0	0.831	38.0	LOS D	7.4	188.3	0.91	1.34	2.44	23.0
12	R2	95	2.0	100	2.0	0.831	43.8	LOS D	7.4	188.3	0.91	1.34	2.44	22.5
Approach		390	2.0	411	2.0	0.831	39.4	LOS D	7.4	188.3	0.91	1.34	2.44	22.9
All Vehicles		2705	2.0	2847	2.0	0.848	21.0	LOS C	8.6	218.1	0.78	0.99	1.53	27.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

**SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com**

Organisation: DKS ASSOCIATES | Licence: PLUS / Enterprise | Processed: Tuesday, August 23, 2022 1:24:47 PM









Project: S:\Projects\2021\21108-000 (Wilsonville Frog Pond East & South Master Plan)\03\_Analysis\Synchro\Wilsonville Frog Pond East & South Master Plan - Future 2040.sip9

# HCM 6th Signalized Intersection Summary 6: Parkway Ave & Boeckman Rd

WV Frog Pond East & South Master Plan  
Future 2040 Build

Item A.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	320	325	80	345	30	195	215	65	35	375	260
Future Volume (veh/h)	145	320	325	80	345	30	195	215	65	35	375	260
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.96	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	1900	1900	1900	1900	1870	1900	1900	1885	1900	1900	1900	1900
Adj Flow Rate, veh/h	153	337	119	84	363	24	205	226	56	37	395	246
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	2	0	0	1	0	0	0	0
Cap, veh/h	332	540	187	276	571	38	332	697	173	575	460	287
Arrive On Green	0.09	0.21	0.20	0.05	0.17	0.16	0.09	0.48	0.47	0.03	0.42	0.41
Sat Flow, veh/h	1810	2605	901	1810	3375	222	1810	1454	360	1810	1094	681
Grp Volume(v), veh/h	153	231	225	84	190	197	205	0	282	37	0	641
Grp Sat Flow(s),veh/h/ln	1810	1805	1701	1810	1777	1820	1810	0	1814	1810	0	1775
Q Serve(g_s), s	4.7	8.1	8.4	2.7	6.9	7.0	4.2	0.0	6.7	0.8	0.0	22.8
Cycle Q Clear(g_c), s	4.7	8.1	8.4	2.7	6.9	7.0	4.2	0.0	6.7	0.8	0.0	22.8
Prop In Lane	1.00		0.53	1.00		0.12	1.00		0.20	1.00		0.38
Lane Grp Cap(c), veh/h	332	374	352	276	300	308	332	0	870	575	0	747
V/C Ratio(X)	0.46	0.62	0.64	0.30	0.63	0.64	0.62	0.00	0.32	0.06	0.00	0.86
Avail Cap(c_a), veh/h	373	586	552	386	577	591	380	0	923	730	0	903
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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.1	25.1	25.3	22.7	26.9	27.0	14.5	0.0	11.2	11.1	0.0	18.4
Incr Delay (d2), s/veh	0.7	1.2	1.4	0.5	1.6	1.6	2.0	0.0	0.3	0.0	0.0	7.8
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	1.9	3.3	3.3	1.1	2.9	3.0	1.5	0.0	2.3	0.3	0.0	9.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.9	26.3	26.8	23.1	28.5	28.6	16.4	0.0	11.5	11.1	0.0	26.2
LnGrp LOS	C	C	C	C	C	C	B	A	B	B	A	C
Approach Vol, veh/h	609			471			487			678		
Approach Delay, s/veh	25.4			27.6			13.6			25.3		
Approach LOS	C			C			B			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	30.1	33.3	7.8	18.4	6.0	37.4	10.4	15.8				
Change Period (Y+Rc), s	4.0	4.5	4.0	4.5	4.0	4.5	4.0	4.5				
Max Green Setting (Gmax), s	34.9	34.9	8.0	22.1	8.0	34.9	8.0	22.1				
Max Q Clear Time (g_c+I), s	10.2	24.8	4.7	10.4	2.8	8.7	6.7	9.0				
Green Ext Time (p_c), s	0.1	4.0	0.0	1.6	0.0	2.3	0.0	1.4				

## Intersection Summary









HCM 6th Ctrl Delay	23.3
HCM 6th LOS	C

# HCM 6th Signalized Intersection Summary 7: Canyon Creek Rd & Boeckman Rd

WV Frog Pond East & South Master Plan  
Future 2040 Build

Item A.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	290	45	80	330	65	40	120	120	150	185	85
Future Volume (veh/h)	55	290	45	80	330	65	40	120	120	150	185	85
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.99	1.00		0.97
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	1900	1870	1870	1870	1856	1826	1900	1856	1900	1900	1885	1900
Adj Flow Rate, veh/h	61	322	42	89	367	63	44	133	87	167	206	74
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	2	2	2	3	5	0	3	0	0	1	0
Cap, veh/h	321	478	62	375	474	81	345	198	130	418	337	121
Arrive On Green	0.05	0.30	0.28	0.06	0.31	0.30	0.04	0.19	0.18	0.10	0.26	0.25
Sat Flow, veh/h	1810	1620	211	1781	1542	265	1810	1042	682	1810	1312	471
Grp Volume(v), veh/h	61	0	364	89	0	430	44	0	220	167	0	280
Grp Sat Flow(s),veh/h/ln	1810	0	1831	1781	0	1807	1810	0	1724	1810	0	1783
Q Serve(g_s), s	1.1	0.0	8.0	1.6	0.0	9.9	0.9	0.0	5.4	3.2	0.0	6.3
Cycle Q Clear(g_c), s	1.1	0.0	8.0	1.6	0.0	9.9	0.9	0.0	5.4	3.2	0.0	6.3
Prop In Lane	1.00		0.12	1.00		0.15	1.00		0.40	1.00		0.26
Lane Grp Cap(c), veh/h	321	0	541	375	0	555	345	0	328	418	0	458
V/C Ratio(X)	0.19	0.00	0.67	0.24	0.00	0.77	0.13	0.00	0.67	0.40	0.00	0.61
Avail Cap(c_a), veh/h	553	0	1286	582	0	1269	595	0	946	587	0	1018
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	11.6	0.0	14.2	11.1	0.0	14.4	14.4	0.0	17.2	12.6	0.0	15.0
Incr Delay (d2), s/veh	0.3	0.0	1.5	0.3	0.0	2.4	0.2	0.0	2.4	0.6	0.0	1.3
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	2.8	0.5	0.0	3.4	0.3	0.0	2.1	1.1	0.0	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.8	0.0	15.6	11.4	0.0	16.7	14.6	0.0	19.6	13.2	0.0	16.3
LnGrp LOS	B	A	B	B	A	B	B	A	B	B	A	B
Approach Vol, veh/h	425		519			264			447			
Approach Delay, s/veh	15.1		15.8			18.8			15.2			
Approach LOS	B		B			B			B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.7	12.7	6.7	17.4	5.7	15.7	6.2	18.0				
Change Period (Y+Rc), s	4.0	4.5	4.0	4.5	4.0	4.5	4.0	4.5				
Max Green Setting (Gmax), s	24.5	24.5	8.0	31.5	8.0	25.5	8.0	31.5				
Max Q Clear Time (g_c+I), s	7.4	7.4	3.6	10.0	2.9	8.3	3.1	11.9				
Green Ext Time (p_c), s	0.2	0.8	0.1	1.4	0.0	1.0	0.0	1.6				

## Intersection Summary

HCM 6th Ctrl Delay	15.9
HCM 6th LOS	B













# HCM 6th Signalized Intersection Summary

WV Frog Pond East & South Master Plan Item A.

## 8: Wilsonville Rd/Stafford Rd & Boeckman Rd/Advance Rd

Future 2040 Build



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	245	110	115	65	65	35	95	260	85	60	455	325
Future Volume (veh/h)	245	110	115	65	65	35	95	260	85	60	455	325
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.92		0.90	0.87		0.84	1.00		0.97	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	1885	1870	1885	1826	1900	1900	1885	1885	1870	1826	1885	1856
Adj Flow Rate, veh/h	247	111	24	66	66	12	96	263	74	61	460	301
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	2	1	5	0	0	1	1	2	5	1	3
Cap, veh/h	446	376	290	299	154	28	235	681	192	534	506	331
Arrive On Green	0.15	0.20	0.20	0.05	0.10	0.09	0.05	0.48	0.48	0.04	0.48	0.47
Sat Flow, veh/h	1795	1870	1442	1739	1512	275	1795	1406	396	1739	1063	695
Grp Volume(v), veh/h	247	111	24	66	0	78	96	0	337	61	0	761
Grp Sat Flow(s),veh/h/ln	1795	1870	1442	1739	0	1787	1795	0	1802	1739	0	1758
Q Serve(g_s), s	8.2	3.6	1.0	2.4	0.0	2.9	2.0	0.0	8.5	1.3	0.0	28.6
Cycle Q Clear(g_c), s	8.2	3.6	1.0	2.4	0.0	2.9	2.0	0.0	8.5	1.3	0.0	28.6
Prop In Lane	1.00		1.00	1.00		0.15	1.00		0.22	1.00		0.40
Lane Grp Cap(c), veh/h	446	376	290	299	0	181	235	0	873	534	0	837
V/C Ratio(X)	0.55	0.30	0.08	0.22	0.00	0.43	0.41	0.00	0.39	0.11	0.00	0.91
Avail Cap(c_a), veh/h	511	617	476	321	0	370	250	0	1053	563	0	1027
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(l)	1.00	1.00	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	21.7	24.3	23.2	26.7	0.0	30.2	15.5	0.0	11.7	9.4	0.0	17.4
Incr Delay (d2), s/veh	0.8	0.3	0.1	0.3	0.0	1.2	0.8	0.0	0.3	0.1	0.0	10.2
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	8.3	1.5	0.3	1.0	0.0	1.3	0.7	0.0	3.0	0.4	0.0	12.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.5	24.6	23.3	26.9	0.0	31.4	16.3	0.0	12.0	9.5	0.0	27.7
LnGrp LOS	C	C	C	C	A	C	B	A	B	A	A	C
Approach Vol, veh/h	382			144			433			822		
Approach Delay, s/veh	23.1			29.4			13.0			26.3		
Approach LOS	C			C			B			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.4	38.1	14.8	11.3	6.8	38.7	7.7	18.4				
Change Period (Y+Rc), s	4.0	4.5	4.5	4.5	4.0	4.5	4.5	4.5				
Max Green Setting (Gmax), s	4.0	41.3	12.9	14.3	4.0	41.3	4.1	23.1				
Max Q Clear Time (g_c+I), s	4.0	30.6	10.2	4.9	3.3	10.5	4.4	5.6				
Green Ext Time (p_c), s	0.0	2.9	0.2	0.1	0.0	1.4	0.0	0.3				

### Intersection Summary

HCM 6th Ctrl Delay	22.6
HCM 6th LOS	C

Intersection												
Int Delay, s/veh	5.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	110	80	5	95	30	45	50	5	30	70	10
Future Vol, veh/h	10	110	80	5	95	30	45	50	5	30	70	10
Conflicting Peds, #/hr	0	0	0	0	0	0	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	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	1	12	0	1	0	7	0	0	0	0	0
Mvmt Flow	11	122	89	6	106	33	50	56	6	33	78	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	139	0	0	211	0	0	368	340	167	355	368	123
Stage 1	-	-	-	-	-	-	189	189	-	135	135	-
Stage 2	-	-	-	-	-	-	179	151	-	220	233	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.17	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.17	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.17	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.563	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1457	-	-	1372	-	-	579	585	882	604	564	933
Stage 1	-	-	-	-	-	-	801	748	-	873	789	-
Stage 2	-	-	-	-	-	-	811	776	-	787	716	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1457	-	-	1372	-	-	505	577	882	550	556	933
Mov Cap-2 Maneuver	-	-	-	-	-	-	505	577	-	550	556	-
Stage 1	-	-	-	-	-	-	794	741	-	865	785	-
Stage 2	-	-	-	-	-	-	718	772	-	717	710	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.4			0.3			13.2			12.9		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	551	1457	-	-	1372	-	-	575
HCM Lane V/C Ratio	0.202	0.008	-	-	0.004	-	-	0.213
HCM Control Delay (s)	13.2	7.5	0	-	7.6	0	-	12.9
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.7	0	-	-	0	-	-	0.8

Intersection

Int Delay, s/veh 11.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	25	10	15	30	10	35	15	440	85	100	795	45
Future Vol, veh/h	25	10	15	30	10	35	15	440	85	100	795	45
Conflicting Peds, #/hr	0	0	0	0	0	0	2	0	0	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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, %	0	0	0	0	0	0	10	0	0	0	2	0
Mvmt Flow	27	11	16	33	11	38	16	478	92	109	864	49

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1690	1711	891	1676	1689	524	915	0	0	570	0	0
Stage 1	1109	1109	-	556	556	-	-	-	-	-	-	-
Stage 2	581	602	-	1120	1133	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.2	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.29	-	-	2.2	-	-
Pot Cap-1 Maneuver	75	92	344	76	94	557	713	-	-	1013	-	-
Stage 1	257	288	-	519	516	-	-	-	-	-	-	-
Stage 2	503	492	-	253	280	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	50	69	343	52	71	557	712	-	-	1013	-	-
Mov Cap-2 Maneuver	50	69	-	52	71	-	-	-	-	-	-	-
Stage 1	248	224	-	502	499	-	-	-	-	-	-	-
Stage 2	443	476	-	179	218	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	137.6		133		0.3		1	
HCM LOS	F		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	712	-	-	73 96	1013	-	-
HCM Lane V/C Ratio	0.023	-	-	0.744 0.849	0.107	-	-
HCM Control Delay (s)	10.2	0	-	137.6 133	9	0	-
HCM Lane LOS	B	A	-	F F	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	3.5 4.7	0.4	-	-



Intersection												
Int Delay, s/veh	121.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	75	10	10	20	10	80	5	450	45	165	910	100
Future Vol, veh/h	75	10	10	20	10	80	5	450	45	165	910	100
Conflicting Peds, #/hr	0	0	0	0	0	0	2	0	0	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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, %	0	0	0	0	0	0	0	0	0	0	2	10
Mvmt Flow	82	11	11	22	11	87	5	489	49	179	989	109

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1977	1952	1046	1937	1982	514	1100	0	0	538	0	0
Stage 1	1404	1404	-	524	524	-	-	-	-	-	-	-
Stage 2	573	548	-	1413	1458	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	~ 47	65	280	50	62	564	642	-	-	1040	-	-
Stage 1	175	208	-	540	533	-	-	-	-	-	-	-
Stage 2	508	520	-	173	196	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 19	35	280	24	33	564	641	-	-	1040	-	-
Mov Cap-2 Maneuver	~ 19	35	-	24	33	-	-	-	-	-	-	-
Stage 1	173	113	-	534	527	-	-	-	-	-	-	-
Stage 2	416	514	-	82	107	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, \$ 2017.7		\$ 318.8	0.1	1.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	641	-	-	22 86	1040	-	-
HCM Lane V/C Ratio	0.008	-	-	4.694 1.39	0.172	-	-
HCM Control Delay (s)	10.7	0	\$ 2017.7	\$ 318.8	9.2	0	-
HCM Lane LOS	B	A	-	F F	A A	-	-
HCM 95th %tile Q(veh)	0	-	-	13.1 9.1	0.6	-	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection												
Int Delay, s/veh	4.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	15	5	5	10	5	25	5	585	15	40	1160	35
Future Vol, veh/h	15	5	5	10	5	25	5	585	15	40	1160	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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, %	0	0	0	0	0	0	0	2	0	0	2	0
Mvmt Flow	16	5	5	11	5	27	5	636	16	43	1261	38

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2036	2028	1280	2025	2039	644	1299	0	0	652	0	0
Stage 1	1366	1366	-	654	654	-	-	-	-	-	-	-
Stage 2	670	662	-	1371	1385	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	43	58	204	43	57	476	540	-	-	944	-	-
Stage 1	184	217	-	459	466	-	-	-	-	-	-	-
Stage 2	450	462	-	182	213	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	32	48	204	33	47	476	540	-	-	944	-	-
Mov Cap-2 Maneuver	32	48	-	33	47	-	-	-	-	-	-	-
Stage 1	181	181	-	452	459	-	-	-	-	-	-	-
Stage 2	413	455	-	143	178	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	188.1		82.1		0.1		0.3	
HCM LOS	F		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	540	-	-	42 87	944	-	-
HCM Lane V/C Ratio	0.01	-	-	0.647 0.5	0.046	-	-
HCM Control Delay (s)	11.7	0	-	188.1 82.1	9	0	-
HCM Lane LOS	B	A	-	F F	A	A	-
HCM 95th %tile Q(veh)	0	-	-	2.4 2.1	0.1	-	-

# HCM 6th Signalized Intersection Summary 13: I-5 SB Ramp & Wilsonville Rd

WV Frog Pond East & South Master Plan  
Future 2040 Build

Item A.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑↑
Traffic Volume (veh/h)	0	825	660	545	1015	0	0	0	0	80	5	115
Future Volume (veh/h)	0	825	660	545	1015	0	0	0	0	80	5	115
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.97
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	0	1870	1856	1870	1856	0				1856	1900	1856
Adj Flow Rate, veh/h	0	868	0	574	1068	0				88	0	13
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	3	2	3	0				3	0	3
Cap, veh/h	0	3323		650	3086	0				184	0	158
Arrive On Green	0.00	0.65	0.00	0.38	1.00	0.00				0.05	0.00	0.05
Sat Flow, veh/h	0	5274	1572	3456	3618	0				3534	0	3039
Grp Volume(v), veh/h	0	868	0	574	1068	0				88	0	13
Grp Sat Flow(s),veh/h/ln	0	1702	1572	1728	1763	0				1767	0	1520
Q Serve(g_s), s	0.0	7.9	0.0	17.1	0.0	0.0				2.7	0.0	0.4
Cycle Q Clear(g_c), s	0.0	7.9	0.0	17.1	0.0	0.0				2.7	0.0	0.4
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	3323		650	3086	0				184	0	158
V/C Ratio(X)	0.00	0.26		0.88	0.35	0.00				0.48	0.00	0.08
Avail Cap(c_a), veh/h	0	3323		817	3086	0				610	0	525
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.88	0.88	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	8.1	0.0	33.2	0.0	0.0				50.7	0.0	49.6
Incr Delay (d2), s/veh	0.0	0.2	0.0	8.5	0.3	0.0				1.9	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.7	0.0	6.3	0.1	0.0				1.2	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	8.3	0.0	41.7	0.3	0.0				52.6	0.0	49.9
LnGrp LOS	A	A		D	A	A				D	A	D
Approach Vol, veh/h		868			1642						101	
Approach Delay, s/veh		8.3			14.7						52.3	
Approach LOS		A			B						D	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	24.7	75.6		9.7		100.3						
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0						
Max Green Setting (Gmax), s	26.0	53.0		19.0		75.0						
Max Q Clear Time (g_c+I1), s	19.1	9.9		4.7		2.0						
Green Ext Time (p_c), s	1.6	4.7		0.3		6.3						

## Intersection Summary

HCM 6th Ctrl Delay	14.0
HCM 6th LOS	B

## Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary 14: I-5 NB Ramp & Wilsonville Rd

WV Frog Pond East & South Master Plan  
Future 2040 Build

Item A.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑			↑↑↑	↔	↔	↔	↔↔			
Traffic Volume (veh/h)	355	550	0	0	1110	335	450	5	510	0	0	0
Future Volume (veh/h)	355	550	0	0	1110	335	450	5	510	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99			
Parking Bus, Adj	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					
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1885	1826	1900	1870			
Adj Flow Rate, veh/h	370	573	0	0	1156	0	473	0	287			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0	0	2	1	5	0	2			
Cap, veh/h	441	2686	0	0	3022		596	0	536			
Arrive On Green	0.26	1.00	0.00	0.00	0.59	0.00	0.17	0.00	0.17			
Sat Flow, veh/h	3456	3647	0	0	5274	1598	3478	0	3124			
Grp Volume(v), veh/h	370	573	0	0	1156	0	473	0	287			
Grp Sat Flow(s),veh/h/ln	1728	1777	0	0	1702	1598	1739	0	1562			
Q Serve(g_s), s	11.2	0.0	0.0	0.0	13.1	0.0	14.3	0.0	9.2			
Cycle Q Clear(g_c), s	11.2	0.0	0.0	0.0	13.1	0.0	14.3	0.0	9.2			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	441	2686	0	0	3022		596	0	536			
V/C Ratio(X)	0.84	0.21	0.00	0.00	0.38		0.79	0.00	0.54			
Avail Cap(c_a), veh/h	723	2686	0	0	3022		1043	0	937			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.97	0.97	0.00	0.00	0.26	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	39.9	0.0	0.0	0.0	11.8	0.0	43.7	0.0	41.6			
Incr Delay (d2), s/veh	3.0	0.2	0.0	0.0	0.1	0.0	1.5	0.0	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			
%ile BackOfQ(50%),veh/ln	4.3	0.1	0.0	0.0	4.7	0.0	6.2	0.0	3.5			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.9	0.2	0.0	0.0	11.9	0.0	45.2	0.0	42.1			
LnGrp LOS	D	A	A	A	B		D	A	D			
Approach Vol, veh/h	943			1156			760					
Approach Delay, s/veh	17.0			11.9			44.0					
Approach LOS	B			B			D					
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	87.1			18.0			69.1			22.9		
Change Period (Y+Rc), s	4.0			4.0			4.0			4.0		
Max Green Setting (Gmax), s	51.0			23.0			42.0			33.0		
Max Q Clear Time (g_c+I1), s	2.0			13.2			15.1			16.3		
Green Ext Time (p_c), s	6.3			0.9			12.5			2.5		

## Intersection Summary

HCM 6th Ctrl Delay	22.1
HCM 6th LOS	C

## Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary 15: Town Center Lp West & Wilsonville Rd

WV Frog Pond East & South Master Plan

Future 2040 Build

Item A.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑↑			↑↑			↑	↑		↑	↑	
Traffic Volume (veh/h)	0	945	115	0	870	50	200	25	90	65	125	375
Future Volume (veh/h)	0	945	115	0	870	50	200	25	90	65	125	375
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	1.00		0.99	1.00		0.97
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	0	1870	1870	0	1885	1900	1885	1900	1900	1900	1900	1870
Adj Flow Rate, veh/h	0	995	106	0	916	49	211	26	39	68	132	349
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	0	1	0	1	0	0	0	0	2
Cap, veh/h	0	1408	150	0	1038	56	247	369	553	96	207	546
Arrive On Green	0.00	0.10	0.10	0.00	0.30	0.30	0.14	0.54	0.54	0.05	0.46	0.46
Sat Flow, veh/h	0	4850	498	0	3546	185	1795	681	1021	1810	452	1195
Grp Volume(v), veh/h	0	723	378	0	475	490	211	0	65	68	0	481
Grp Sat Flow(s),veh/h/ln	0	1702	1775	0	1791	1845	1795	0	1701	1810	0	1646
Q Serve(g_s), s	0.0	22.6	22.7	0.0	27.8	27.8	12.6	0.0	2.0	4.1	0.0	24.6
Cycle Q Clear(g_c), s	0.0	22.6	22.7	0.0	27.8	27.8	12.6	0.0	2.0	4.1	0.0	24.6
Prop In Lane	0.00		0.28	0.00		0.10	1.00		0.60	1.00		0.73
Lane Grp Cap(c), veh/h	0	1024	534	0	538	555	247	0	922	96	0	753
V/C Ratio(X)	0.00	0.71	0.71	0.00	0.88	0.88	0.85	0.00	0.07	0.71	0.00	0.64
Avail Cap(c_a), veh/h	0	1362	710	0	716	738	253	0	922	156	0	753
HCM Platoon Ratio	1.00	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.94	0.94	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	44.8	44.9	0.0	36.6	36.6	46.3	0.0	12.1	51.2	0.0	22.9
Incr Delay (d2), s/veh	0.0	0.8	1.6	0.0	9.3	9.1	23.3	0.0	0.1	9.2	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	0.0	10.4	11.0	0.0	13.2	13.6	7.3	0.0	0.8	2.1	0.0	10.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	45.7	46.5	0.0	45.9	45.7	69.6	0.0	12.2	60.4	0.0	27.0
LnGrp LOS	A	D	D	A	D	D	E	A	B	E	A	C
Approach Vol, veh/h	1101			965			276			549		
Approach Delay, s/veh	46.0			45.8			56.1			31.2		
Approach LOS	D			D			E			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.3	63.6		37.1	18.6	54.3		37.1				
Change Period (Y+Rc), s	4.0	4.5		4.5	4.0	4.5		4.5				
Max Green Setting (Gmax), s	4.0	44.5		43.5	15.0	38.5		43.5				
Max Q Clear Time (g_c+I), s	4.0	4.0		24.7	14.6	26.6		29.8				
Green Ext Time (p_c), s	0.0	0.2		3.9	0.0	1.4		2.8				

## Intersection Summary

HCM 6th Ctrl Delay	44.1
HCM 6th LOS	D

ID	Software/Method	Intersection	Control Type	LOS	Delay	V/C Ratio
1	Synchro HCM 6th Signal	I-5 SB Ramp & Elligsen Rd	Signal	B	18.2	0.73
2	Synchro HCM 6th Signal	I-5 NB Ramp & Elligsen Rd	Signal	A	9.2	0.45
3	Synchro HCM 6th Signal	Parkway Ave & Elligsen Rd	Signal	C	24.5	0.53
4	Synchro HCM 6th Signal	Parkway Center Dr & Elligsen Rd	Signal	B	16.8	0.54
6	Synchro HCM 6th Signal	Parkway Ave & Boeckman Rd	Signal	C	23.3	0.81
7	Synchro HCM 6th Signal	Canyon Creek Rd & Boeckman Rd	Signal	B	15.9	0.60
8	Synchro HCM 6th Signal	Wilsonville Rd/Stafford Rd & Boeckman Rd/	Signal	C	22.6	0.81
13	Synchro HCM 6th Signal	I-5 SB Ramp & Wilsonville Rd	Signal	B	14.0	0.40
14	Synchro HCM 6th Signal	I-5 NB Ramp & Wilsonville Rd	Signal	C	22.1	0.52
15	Synchro HCM 6th Signal	Town Center Lp West & Wilsonville Rd	Signal	D	44.1	0.82

## RECOMMENDED IMPROVEMENTS HCM REPORTS

---

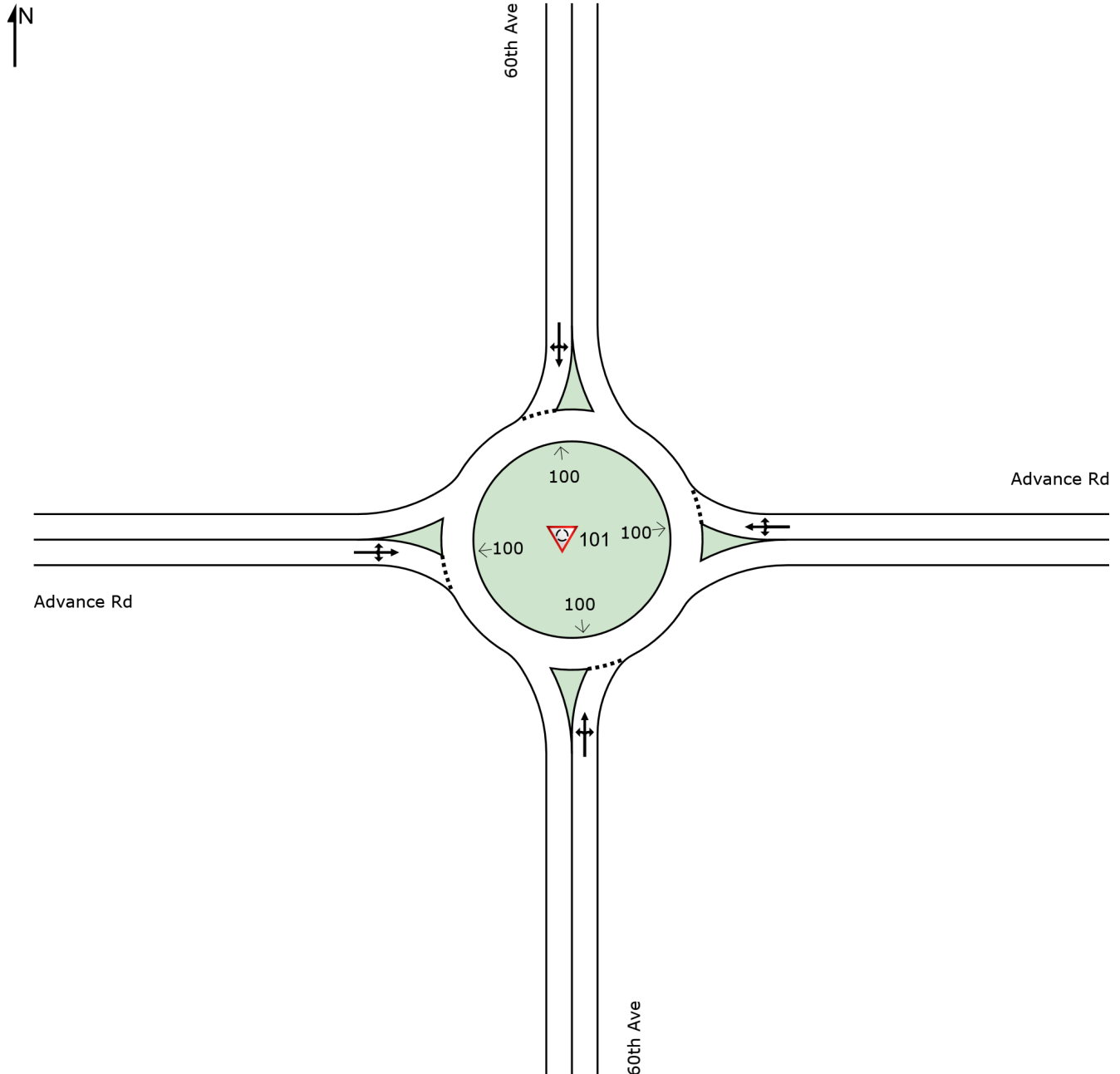


## SITE LAYOUT

 Site: 101 [Advance Rd/60th Ave (Site Folder: East & South Master Plan - Future 2040 Mitigation)]

Site Category: (None)  
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | [sidrasolutions.com](http://sidrasolutions.com)

Organisation: DKS ASSOCIATES | Licence: PLUS / Enterprise | Created: Tuesday, August 23, 2022 12:43:05 PM

Project: S:\Projects\2021\21108-000 (Wilsonville Frog Pond East & South Master Plan)\03\_Analysis\Mitigation\Final\_WV FP East & South - Final Roundabout Alternatives.sip9



## MOVEMENT SUMMARY

 **Site: 101 [Advance Rd/60th Ave (Site Folder: East & South Master Plan - Future 2040 Mitigation)]**

Site Category: (None)  
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] %	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] ft				
South: 60th Ave														
3	L2	45	7.0	50	7.0	0.099	4.2	LOS A	0.4	10.9	0.32	0.18	0.32	34.4
8	T1	50	0.0	56	0.0	0.099	3.9	LOS A	0.4	10.9	0.32	0.18	0.32	37.1
18	R2	5	0.0	6	0.0	0.099	3.9	LOS A	0.4	10.9	0.32	0.18	0.32	37.8
Approach		100	3.2	111	3.2	0.099	4.0	LOS A	0.4	10.9	0.32	0.18	0.32	35.9
East: Advance Rd														
1	L2	5	0.0	6	0.0	0.119	4.0	LOS A	0.5	13.7	0.27	0.14	0.27	40.8
6	T1	95	1.0	106	1.0	0.119	4.0	LOS A	0.5	13.7	0.27	0.14	0.27	37.2
16	R2	30	0.0	33	0.0	0.119	4.0	LOS A	0.5	13.7	0.27	0.14	0.27	39.4
Approach		130	0.7	144	0.7	0.119	4.0	LOS A	0.5	13.7	0.27	0.14	0.27	37.8
North: 60th Ave														
7	L2	30	0.0	33	0.0	0.105	4.0	LOS A	0.5	11.8	0.32	0.18	0.32	39.4
4	T1	70	0.0	78	0.0	0.105	4.0	LOS A	0.5	11.8	0.32	0.18	0.32	37.7
14	R2	10	0.0	11	0.0	0.105	4.0	LOS A	0.5	11.8	0.32	0.18	0.32	33.6
Approach		110	0.0	122	0.0	0.105	4.0	LOS A	0.5	11.8	0.32	0.18	0.32	37.7
West: Advance Rd														
5	L2	10	0.0	11	0.0	0.191	4.6	LOS A	0.9	23.3	0.28	0.15	0.28	34.8
2	T1	110	1.0	122	1.0	0.191	4.7	LOS A	0.9	23.3	0.28	0.15	0.28	36.2
12	R2	80	12.0	89	12.0	0.191	5.0	LOS A	0.9	23.3	0.28	0.15	0.28	32.3
Approach		200	5.4	222	5.4	0.191	4.8	LOS A	0.9	23.3	0.28	0.15	0.28	34.5
All Vehicles		540	2.7	600	2.7	0.191	4.3	LOS A	0.9	23.3	0.29	0.16	0.29	36.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

**SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com**

Organisation: DKS ASSOCIATES | Licence: PLUS / Enterprise | Processed: Tuesday, August 23, 2022 12:30:07 PM

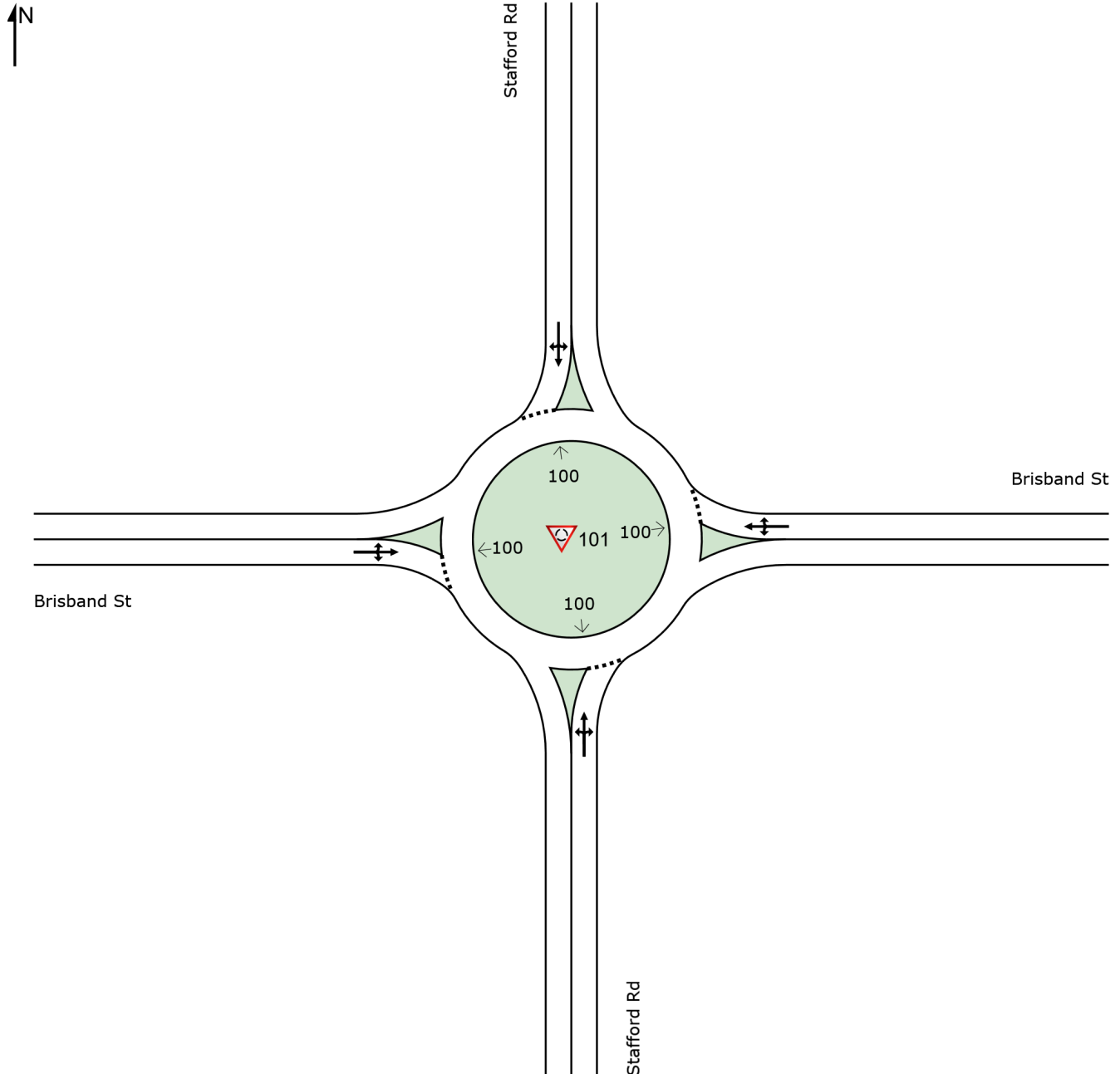
Project: S:\Projects\2021\21108-000 (Wilsonville Frog Pond East & South Master Plan)\03\_Analysis\Mitigation\Final\_WV FP East & South - Final Roundabout Alternatives.sip9

## SITE LAYOUT

 **Site: 101 [Stafford Rd/Brisband St (Site Folder: East & South Master Plan - Future 2040 Mitigation)]**

Site Category: (None)  
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



## MOVEMENT SUMMARY

 **Site: 101 [Stafford Rd/Brisband St (Site Folder: East & South Master Plan - Future 2040 Mitigation)]**

Site Category: (None)  
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] %	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] ft				
South: Stafford Rd														
3	L2	15	10.0	16	10.0	0.494	8.9	LOS A	3.4	85.7	0.51	0.35	0.51	33.2
8	T1	440	0.0	463	0.0	0.494	8.6	LOS A	3.4	85.7	0.51	0.35	0.51	35.8
18	R2	85	0.0	89	0.0	0.494	8.6	LOS A	3.4	85.7	0.51	0.35	0.51	36.5
Approach		540	0.3	568	0.3	0.494	8.6	LOS A	3.4	85.7	0.51	0.35	0.51	35.8
East: Brisband St														
1	L2	45	0.0	47	0.0	0.125	5.8	LOS A	0.5	13.0	0.55	0.49	0.55	38.0
6	T1	15	0.0	16	0.0	0.125	5.8	LOS A	0.5	13.0	0.55	0.49	0.55	34.9
16	R2	35	0.0	37	0.0	0.125	5.8	LOS A	0.5	13.0	0.55	0.49	0.55	36.8
Approach		95	0.0	100	0.0	0.125	5.8	LOS A	0.5	13.0	0.55	0.49	0.55	37.1
North: Stafford Rd														
7	L2	100	0.0	105	0.0	0.780	16.1	LOS C	10.8	273.4	0.66	0.35	0.66	33.1
4	T1	780	2.0	821	2.0	0.780	16.1	LOS C	10.8	273.4	0.66	0.35	0.66	31.6
14	R2	45	0.0	47	0.0	0.780	16.1	LOS C	10.8	273.4	0.66	0.35	0.66	28.8
Approach		925	1.7	974	1.7	0.780	16.1	LOS C	10.8	273.4	0.66	0.35	0.66	31.6
West: Brisband St														
5	L2	50	0.0	53	0.0	0.168	9.4	LOS A	0.6	16.0	0.68	0.68	0.68	31.1
2	T1	15	0.0	16	0.0	0.168	9.4	LOS A	0.6	16.0	0.68	0.68	0.68	32.3
12	R2	15	0.0	16	0.0	0.168	9.4	LOS A	0.6	16.0	0.68	0.68	0.68	30.3
Approach		80	0.0	84	0.0	0.168	9.4	LOS A	0.6	16.0	0.68	0.68	0.68	31.2
All Vehicles		1640	1.0	1726	1.0	0.780	12.7	LOS B	10.8	273.4	0.60	0.37	0.60	33.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

**SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com**

Organisation: DKS ASSOCIATES | Licence: PLUS / Enterprise | Processed: Tuesday, August 23, 2022 12:28:40 PM

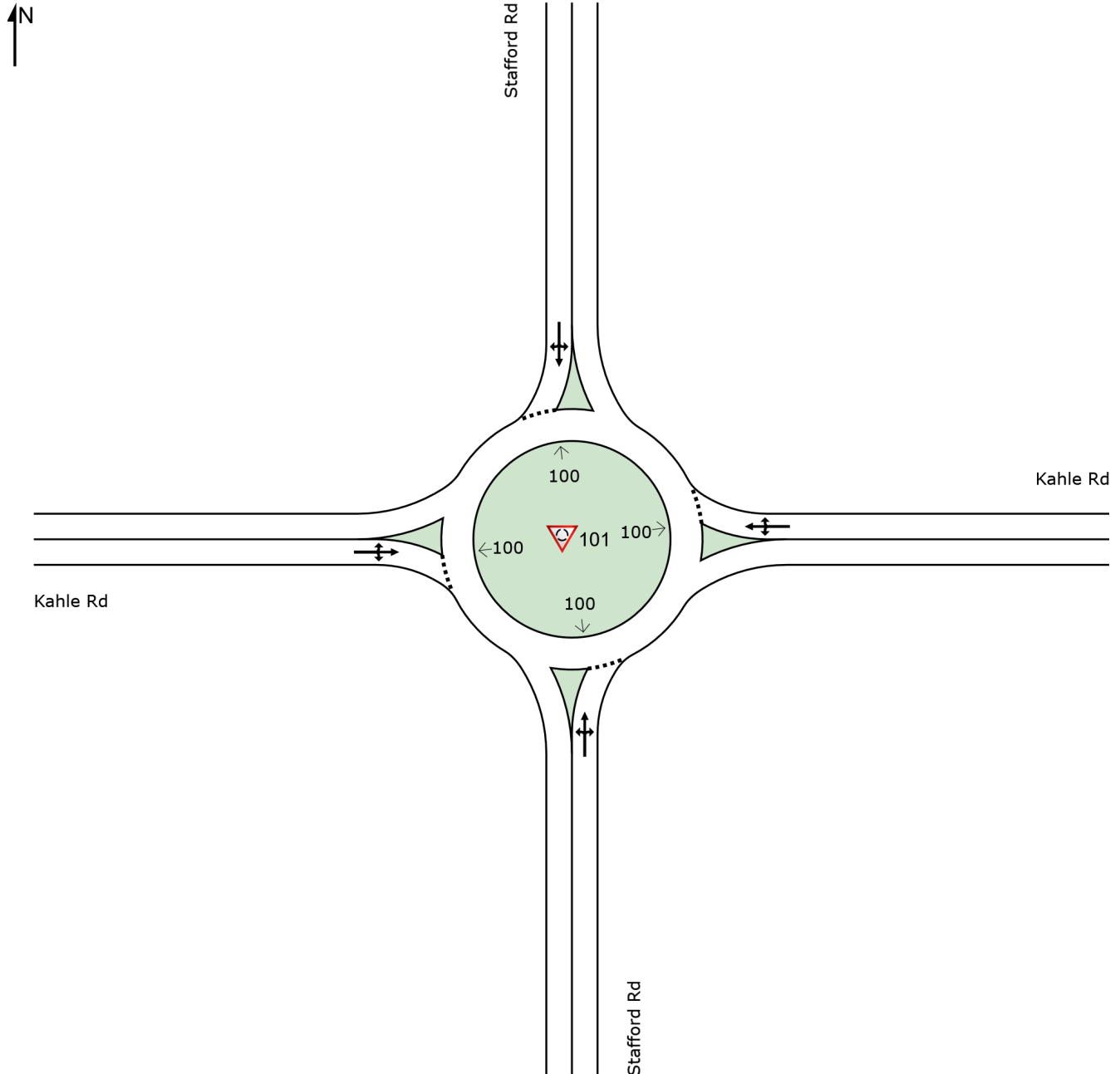
Project: S:\Projects\2021\21108-000 (Wilsonville Frog Pond East & South Master Plan)\03\_Analysis\Mitigation\_Final\_WV FP East & South - Final Roundabout Alternatives.sip9

## SITE LAYOUT

 Site: 101 [Stafford Rd/Kahle Rd (Site Folder: East & South Master Plan - Future 2040 Mitigation)]

Site Category: (None)  
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | [sidrasolutions.com](http://sidrasolutions.com)

Organisation: DKS ASSOCIATES | Licence: PLUS / Enterprise | Created: Tuesday, August 23, 2022 12:43:03 PM

Project: S:\Projects\2021\21108-000 (Wilsonville Frog Pond East & South Master Plan)\03\_Analysis\Mitigation\Final\_WV FP East & South - Final Roundabout Alternatives.sip9

## MOVEMENT SUMMARY

 **Site: 101 [Stafford Rd/Kahle Rd (Site Folder: East & South Master Plan - Future 2040 Mitigation)]**

Site Category: (None)  
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] %	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] ft				
South: Stafford Rd														
3	L2	5	0.0	5	0.0	0.489	8.2	LOS A	3.4	86.9	0.42	0.25	0.42	33.6
8	T1	535	2.0	563	2.0	0.489	8.3	LOS A	3.4	86.9	0.42	0.25	0.42	35.7
18	R2	15	0.0	16	0.0	0.489	8.2	LOS A	3.4	86.9	0.42	0.25	0.42	36.7
Approach		555	1.9	584	1.9	0.489	8.3	LOS A	3.4	86.9	0.42	0.25	0.42	35.7
East: Kahle Rd														
1	L2	15	0.0	16	0.0	0.074	5.8	LOS A	0.3	7.3	0.58	0.52	0.58	38.6
6	T1	10	0.0	11	0.0	0.074	5.8	LOS A	0.3	7.3	0.58	0.52	0.58	35.4
16	R2	25	0.0	26	0.0	0.074	5.8	LOS A	0.3	7.3	0.58	0.52	0.58	37.4
Approach		50	0.0	53	0.0	0.074	5.8	LOS A	0.3	7.3	0.58	0.52	0.58	37.3
North: Stafford Rd														
7	L2	40	0.0	42	0.0	0.993	41.1	LOS E	126.9	3219.2	1.00	0.58	1.33	24.4
4	T1	1160	2.0	1221	2.0	0.993	41.1	LOS E	126.9	3219.2	1.00	0.58	1.33	23.6
14	R2	35	0.0	37	0.0	0.993	41.1	LOS E	126.9	3219.2	1.00	0.58	1.33	22.0
Approach		1235	1.9	1300	1.9	0.993	41.1	LOS E	126.9	3219.2	1.00	0.58	1.33	23.6
West: Kahle Rd														
5	L2	65	0.0	68	0.0	0.231	13.9	LOS B	0.8	21.0	0.78	0.78	0.78	29.0
2	T1	10	0.0	11	0.0	0.231	13.9	LOS B	0.8	21.0	0.78	0.78	0.78	30.0
12	R2	5	0.0	5	0.0	0.231	13.9	LOS B	0.8	21.0	0.78	0.78	0.78	28.3
Approach		80	0.0	84	0.0	0.231	13.9	LOS B	0.8	21.0	0.78	0.78	0.78	29.1
All Vehicles		1920	1.8	2021	1.8	0.993	29.6	LOS D	126.9	3219.2	0.81	0.49	1.03	26.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

**SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com**

Organisation: DKS ASSOCIATES | Licence: PLUS / Enterprise | Processed: Tuesday, August 23, 2022 12:29:02 PM

Project: S:\Projects\2021\21108-000 (Wilsonville Frog Pond East & South Master Plan)\03\_Analysis\Mitigation\_Final\_WV FP East & South - Final Roundabout Alternatives.sip9

HCM 6th TWSC  
12: Stafford Rd & Frog Pond Ln

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗	↗	↗		↗	↗	
Traffic Vol, veh/h	0	0	10	0	0	80	5	475	45	165	915	100
Future Vol, veh/h	0	0	10	0	0	80	5	475	45	165	915	100
Conflicting Peds, #/hr	0	0	0	0	0	0	2	0	0	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	200	-	-	200	-	-
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, %	0	0	0	0	0	0	0	0	0	0	2	10
Mvmt Flow	0	0	11	0	0	87	5	516	49	179	995	109

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	1052	-	-	541	1106	0	0	565	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.2	-	-	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	-	-	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	278	0	0	545	639	-	-	1017	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	278	-	-	545	638	-	-	1017	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	18.5		12.9		0.1		1.3	
HCM LOS	C		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	638	-	-	278	545	1017	-
HCM Lane V/C Ratio	0.009	-	-	0.039	0.16	0.176	-
HCM Control Delay (s)	10.7	-	-	18.5	12.9	9.3	-
HCM Lane LOS	B	-	-	C	B	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.6	0.6	-

## Technical Memorandum

## Attachment 2

**Date:** September 6, 2022

**Project:** Wilsonville Frog Pond East and South Master Plan

**To:** Andrew Parish – APG/MIG  
Joe Dills – APG/MIG

**From:** Mike Carr, PE – Murraysmith  
Julia King, EIT – Murraysmith  
Joshua Owens, PE – Murraysmith

**Re:** Proposed Infrastructure Plans - Water, Wastewater, Stormwater Systems

---

### Introduction

This technical memorandum provides a summary of new water, wastewater, and stormwater infrastructure necessary for the development of Wilsonville Frog Pond East and South areas, to be documented in the area's Master Plan. Analyses were performed to estimate sizes and propose layouts of the proposed systems, using applicable City standards for the systems. The planned infrastructure will also be used for cost estimates and preparation of infrastructure funding strategies.

### Background

In 2015, the Frog Pond Area Plan (FPAP) was adopted by the City of Wilsonville. The Frog Pond area consists of three separate neighborhoods: West, East, and South. A master plan for Frog Pond West was developed in 2017 and development in Frog Pond West began soon after. Based on current information from the City, it is estimated that 80% of the parcels in Frog Pond West are currently, or soon to be, under development.

In 2018, the Frog Pond East and South areas were brought into the regional Urban Growth Boundary (UGB). The City initiated master planning in 2020. To date, the master plan process has prepared a draft preferred land use plan. The preferred alternative identifies residential uses of varied housing types, a neighborhood commercial area, streets and trails, and parks and open space. For the purpose of this infrastructure analysis, the plan is assumed to include 1,800 total housing units in the combined East and South neighborhoods. Infrastructure plans were developed for the preferred alternative and are further described in the individual sections below.

The City has also identified a higher-density scenario which calls for 2,384 total units (20 units per net residential acre) in the combined East and South neighborhoods. This scenario represents a very robust buildout of housing, especially middle housing. Infrastructure needs for the higher-

density alternative were estimated to determine the difference in needs between the two alternative plans. These are also described below.

## Proposed Water System

The water purveyor for the Frog Pond area is the City of Wilsonville. The City's *Water System Master Plan* (WSMP), adopted September 6, 2012, is the current basis for domestic water and fire system planning within the Frog Pond East and South. The recommendations provided in the 2015 FPAP for water system improvements still apply for the recommended development concepts for Frog Pond East and South. These areas will be extensions of water pressure Zone B which operates in an elevation range from 100 feet to 285 feet and has a hydraulic grade of 400 feet.

## Distribution System

**Figure 1** shows the proposed preliminary water system layout for the East and South neighborhoods, including off-site improvements needed to serve the area. The existing 12-inch waterline in Boeckman Road is the primary backbone connection for Frog Pond East and South to the City's water supply and storage system. A looped system consisting of 12-inch and 8-inch distribution mains is proposed for supply of domestic water to Frog Pond East and South. The 12-inch main network provides a redundant capacity of 1,500 gallons per minute (gpm) for fire flow to all areas. In accordance with City Public Works Standards, 12-inch mains are also required for the commercial main street area proposed along Brisband Road in Frog Pond East. For all residential zones, 8-inch mains are required, with all lines interconnected as a network to minimize dead ends.

The plan calls for new 12-inch waterlines extending north in Stafford Road and east in Advance Road to extend the distribution system into Frog Pond East and South, connecting to the existing 12-inch waterlines in Boeckman Road and Advance Road. Additional points of connection will also be made to proposed waterlines planned to be installed in Frog Pond Lane and Brisband Road as part of the Frog Pond West development.

The northernmost neighborhoods in Frog Pond East along SW Kahle Road need to be connected to the City's existing water system with a 12-inch loop that connects to the south side of the BPA easement in two locations, one being a connection at the intersection of Stafford Road and SW Kahle Roads, and the other to the 12-inch waterline in the commercial main street. The loop could be constructed across the BPA easement either in the proposed road extending northeast from Frog Pond Lane, or it could cross the BPA easement further to the east via the proposed pedestrian bridge over the main fork of the Newland Creek. The decision on where to route the loop will depend on what areas are developed first and whether the pedestrian bridge is built. In either scenario the 12-inch mainline along SW Stafford Road and SW Kahle Road will be required.

The WSMP recommended two additional connections to the existing distribution system to reliably serve Frog Pond East and South through buildout. The first is a 12-inch connection to the Canyon Creek Road waterline via a crossing of Boeckman Creek at the west end of Frog Pond Lane, for connection to the Stafford Road waterline in conjunction with development in Frog Pond East.



The second is a crossing of Meridian Creek with a 12-inch main, south of the Meridian Creek Middle School, installed in conjunction with development of Frog Pond South. Both creek crossings are assumed to be below grade directionally drilled pipelines; however, they may be installed on future pedestrian bridges where under consideration by the City.

## Storage System

The WSMP identified an overall water storage deficiency in the City which will be further increased by development in Frog Pond East and South. The WSMP proposed a 3.0-million-gallon West Side Tank and 24-inch transmission main project to provide sufficient storage for the City. The City has this project budgeted in the City's current 5-Year Capital Improvement Program, with design expected to begin in FY2022/23. The project is anticipated to be completed in 2025.

The extent of the storage deficiency and its impact on development of Frog Pond East and South is unknown at this time, since the WSMP is 10 years old and significant development has occurred in the City in that period. Additional analysis may be conducted to determine what, if any, impact any development in Frog Pond East and South prior to implementation of the new water tank would have on the existing water system and its customers.

The water system layout and sizing is primarily dependent on the street network to distribute fire flow to the designated land use types. Given the higher-density scenario using the same land use pattern and street plan, it is estimated that waterline sizes and costs would remain the same as with the preferred water system layout.

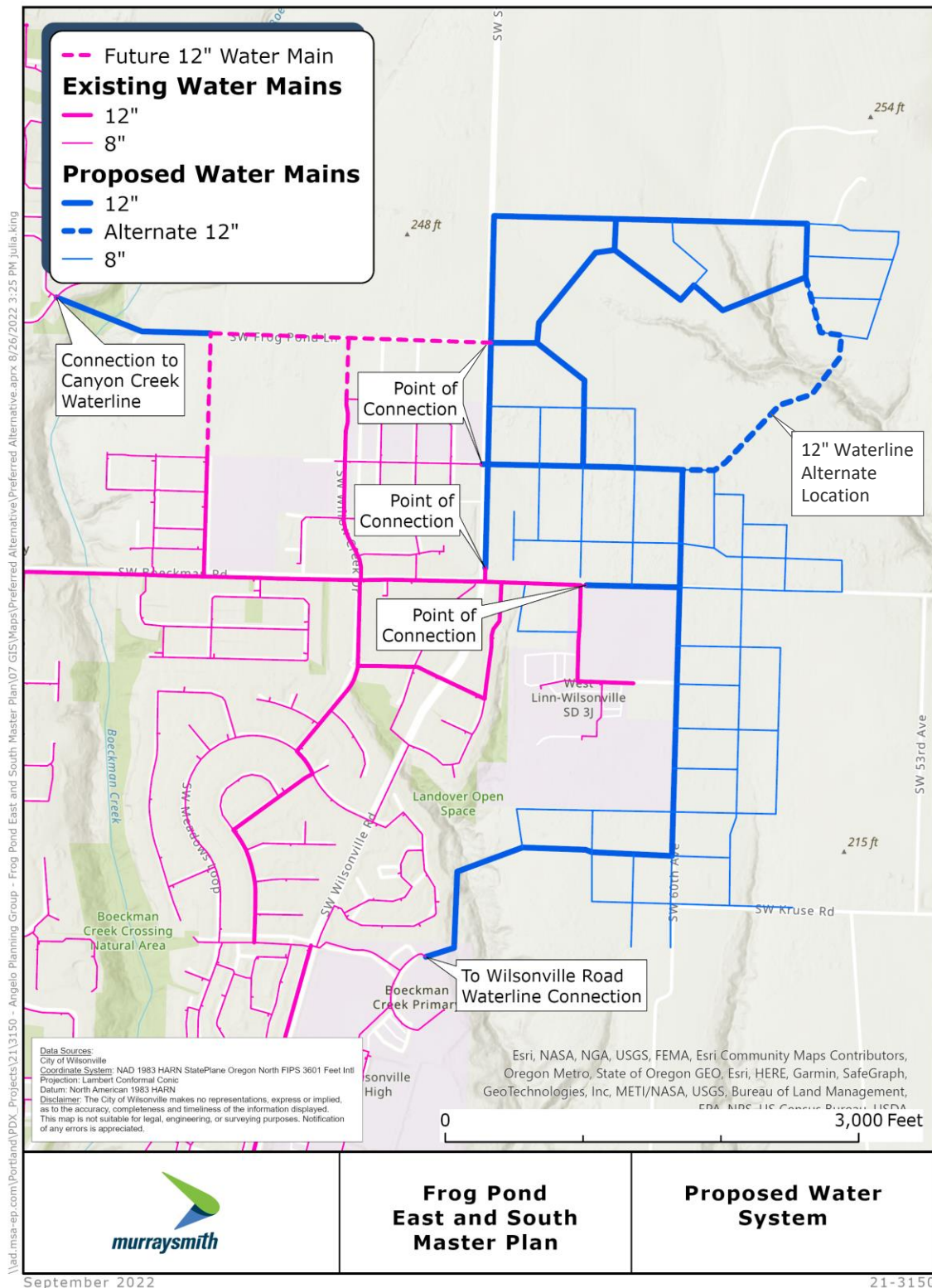
## Proposed Wastewater System

The City of Wilsonville will provide sanitary sewer service for the Frog Pond East and South area as an extension of the City's existing collection system. The City's *Wastewater Collection System Master Plan* (WCSMP), adopted in 2014, is the current basis for wastewater system planning within the City. The 2015 FPAP and subsequent studies provide the specific framework for wastewater system planning in the Frog Pond East and South area, along with design criteria from the 2017 Public Works Standards.

**Figure 2** shows the proposed preliminary wastewater system layout for the Frog Pond East and South neighborhoods.

The area was divided into five sewer basins, one for each of the four lift stations required and one that flows by gravity out of the Frog Pond area. Basin peak flows were calculated using preliminary land use data provided by MIG and unit flow values determined from the WCSMP. Residences were assumed to have 2.48 people per unit and an average sewer production rate of 67 gallons per person per day. Commercial sectors were assumed to generate 1,000 gallons per acre per day and schools were estimated to generate 25 gallons per day per person. Average dry weather flows were used with a peaking factor of 2 to estimate the peak dry weather flows. Wet weather flows were estimated to have an infiltration and inflow rate of 1,800 gallons per acre per day over the entire basin. Detailed calculations can be found in Appendix A.

Figure 1 – Preliminary Water System Layout



Each basin was analyzed for both the preferred housing scenario of 1,800 total units, and the higher-density scenario of 2,384 total units. The four lift station basins will each require an 8-inch gravity pipe to convey wastewater to the lift station at an assumed slope of 0.5%, and a 4-inch force main discharge to the downstream basin. These requirements are the same for both housing scenarios. **Table 1** shows the peak wet weather flow for each lift station basin and the required pipe sizes.

**Table 1 - Lift Station Basins**

Basin	Total Peak Flow for 1,800 Units (cfs)	Total Peak Flow for 1,800 Units (gpm)	Total Peak Flow for 2,384 Units (gpm)	Recommended Lift Station Design Capacity (gpm)	Force Main Size (in)	Gravity Sewer Size (in)
LS1	0.130	58	70	135	4	8
LS2	0.159	71	86	135	4	8
LS3	0.123	55	67	135	4	8
LS4	0.489	220	260	260	4	8

Table 1 shows that the recommended capacity for LS1, LS2 and LS3 lift stations is 135 gpm, which is the minimum size required to meet design criteria for 4-inch sewage force mains. This is the same for both housing scenarios. Capacity of LS4 would increase somewhat, from 220 gpm in the preferred scenario, to 260 gpm in the higher-density scenario. This change is estimated to be relatively insignificant in the overall cost of constructing the wastewater facilities for LS4 basin.

The main trunk traveling north to south on SW Stafford Road conveys sewage from both lift station 1 and 2 and a portion of the gravity basin. This pipe has the capacity to carry both housing density scenarios at an 8-inch size; however, this pipe is identified in the WCSMP as a 12-inch line for future extension to the north.

Extension of the Boeckman Road Trunk Sewer east on Advance Road is needed to convey sewage from both Lift Stations 3 and 4 and a portion of the gravity basin. A 10-inch size is required to provide capacity necessary for both housing density scenarios.

All wastewater from Frog Pond East and South is to be conveyed to the wastewater treatment plant through connection to the existing Boeckman Road Trunk Sewer, which flows west to the existing Boeckman Creek Interceptor Sewer and the Memorial Park Pump Station. The Boeckman Road Trunk Sewer is being upsized to 18-inch diameter as part of improvements to Boeckman Road, including Boeckman Dip Bridge, with completion anticipated for 2024.

The Boeckman Creek Interceptor Sewer is a 12-inch to 18-inch diameter pipe extending from Boeckman Road to the Memorial Park Pump Station. Capacity of the Boeckman Interceptor was determined to be sufficient for full buildout of Frog Pond West but will be insufficient to serve full build-out of Frog Pond East and South. The WCSMP recommends the Boeckman Creek Interceptor

Sewer be upsized for buildout of Frog Pond East and South. The City is currently planning to upsize the Boeckman Interceptor in conjunction with a regional trail in the creek corridor. Design of the project will begin in 2022, with construction anticipated to be completed in the fall of 2025.

Though the Boeckman Creek Interceptor will not have sufficient capacity for full buildout of Frog Pond East and South, there will be some capacity available for initial development in the area, depending on how much capacity has been taken up by Frog Pond West. A specific amount has not been calculated. With the Frog Pond West area nearing full development, it is recommended the City reevaluate the remaining capacity in the downstream Boeckman Creek system to estimate how many new dwelling units in Frog Pond East and South can be reliably connected before the planned interceptor improvements are complete.

The WCSMP estimated that the sewer line on SW Kahle Road would need to be a 10-inch pipeline; however based on updated loading conditions, calculations show an 8-inch pipe will be adequate to convey the flow from the areas tributary to the Kahle Road sewer line.

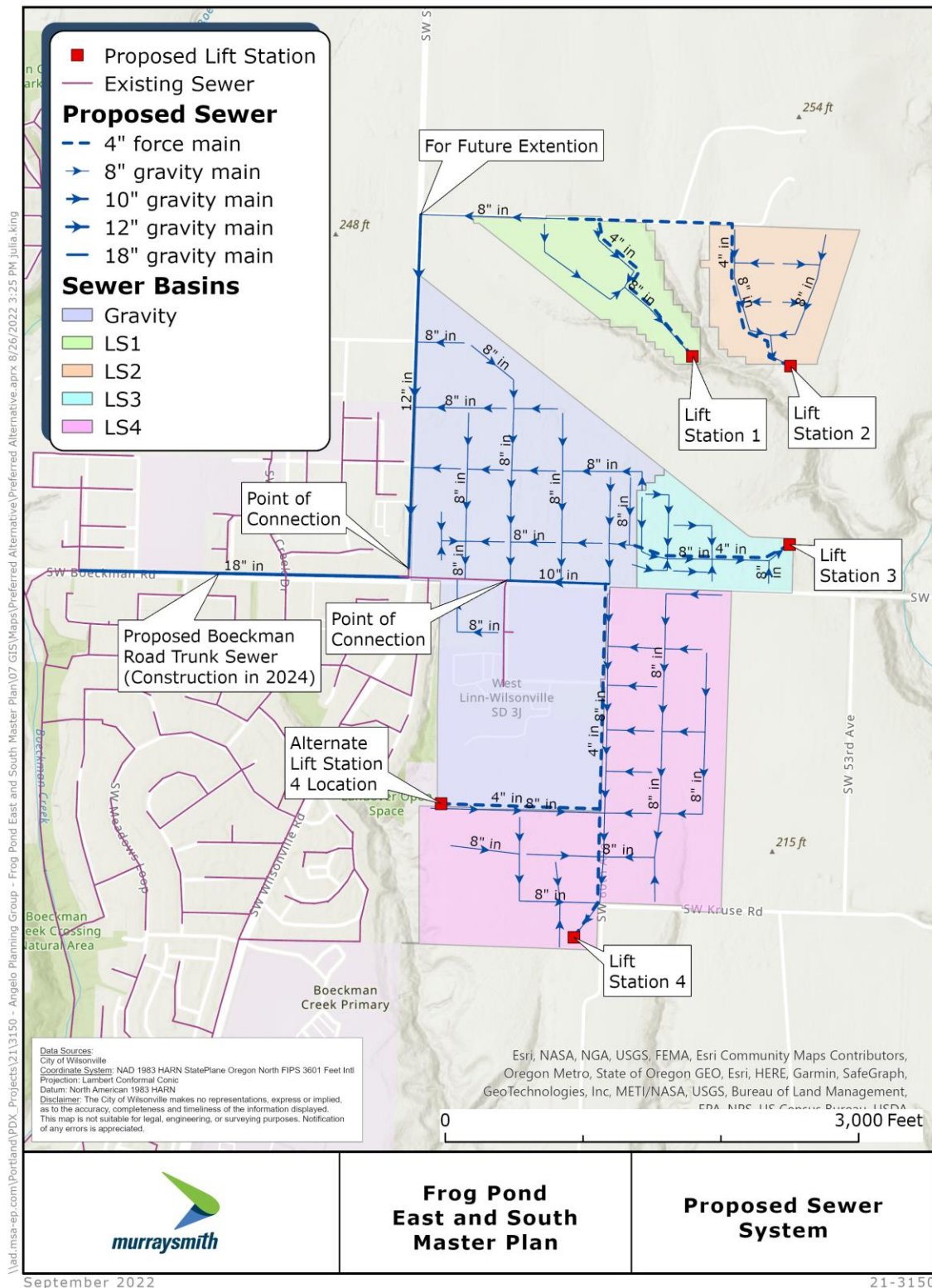
## Proposed Stormwater System

<<To Follow - Stormwater Infrastructure Plan is still in development as of September 6, 2022>>

## References

- Angelo Planning Group. (2015). *Frog Pond Area Plan*.
- City of Wilsonville. (2017). *Public Works Standards*.
- Keller Associates. (2012). *Water System Master Plan*.
- Murraysmith. (2014). *Wastewater Collection System Master Plan*.
- Murraysmith. (2021). *Findings of HB 2001 Sensitivity Analysis*.
- URS. (2012). *Stormwater Master Plan*.

Figure 2 – Preliminary Wastewater System Layout





## Appendix A

Project: 21-3150 Frog Pond Master Plan

Date: 8/26/2022

Author: JK

Decription: Frog Pond East and South sewer basin land use and flow calculations for 1,800 total residential units

Assumptions				Gravity Pipe Assumptions				Diameter		Max Flow in Pipe (cfs)	
Category	Average Sewer GPD			Slope							
Person	67	gallons/person/day		0.005				4		0.135	
Commercial	1000	gallons/acre/day		0.013				6		0.398	
School	25	gallons/person/day						8		0.857	
I&I	1800	gallons/acre/day						10		1.553	

Basin	Total Area (ac)	MF Units	SFA Units	SFD Units	Total Residental Units	Commeceial Area (ac)	School Area (ac)	School Students and Employees	Park/Street Area (ac)	Residenti al Area (ac)
Gravity	105.0	174	308	274	756	4.9	27.1	1305	27.9	45.0
LS1	18.1	0	63	93	155	0.0	0.0	0	0.4	17.7
LS2	20.7	0	86	111	197	0.0	0.0	0	1.0	19.7
LS3	15.4	0	72	84	156	0.0	0.0	0	1.4	14.0
LS4	76.7	48	212	276	536	0.0	0.0	0	25.1	51.6
Totals	235.9	222	740	837	1,800	4.9	27.1	1305	55.9	148.0

Basin	Average Dry Weather Flow (gpm)	Peak Average Dry Weather Flow (gpm)	Peak I&I Flow (gpm)	Total Peak Flow (gpm)	Total Peak Flow (cfs)	Force Main Size (in)	Force Main Velocity	Does Gravity Flow fit in 8in	Does Gravity Flow fit in 10 in
Gravity	96.6	193.3	131.3	324.5	0.723	N/A	N/A	Yes	Yes
LS1	17.9	35.9	22.6	58.5	0.130	4	1.49	Yes	Yes
LS2	22.7	45.4	25.8	71.2	0.159	4	1.82	Yes	Yes
LS3	18.0	36.0	19.2	55.2	0.123	4	1.41	Yes	Yes
LS4	61.8	123.6	95.9	219.5	0.489	4	5.61	Yes	Yes

Trunk		Total Peak Flow (cfs)	Does Gravity Flow fit in 8in	Does Gravity Flow fit in 10in
SW Stafford Road Trunk (cfs)		0.651	Yes	Yes
Boeckman Trunk Extension (cfs)		0.974	Pipe Overcapacity	Yes

Project: 21-3150 Frog Pond Master Plan  
 Date: 8/26/2022  
 Author: JK  
 Description: Frog Pond East and South sewer basin land use and flow calculations for 2,384 total residential units

Flow Assumptions		Pipe Assumptions		Diameter		Max Flow in Pipe (cfs)
Category	Average Sewer GPD					
Person	67	gallons/person/day	Slope		4	0.135
Commercial	1000	gallons/acre/day	Manning's n		6	0.398
School	25	gallons/person/day			8	0.857
I&I	1800	gallons/acre/day			10	1.553

Basin	Residential Units (32% increase)	Commercial Area	School Students and Employees
Gravity	1,001	4.9	1305
LS1	206	0.0	0
LS2	261	0.0	0
LS3	207	0.0	0
LS4	709	0.0	0
Total	2,384	4.9	1305

Basin	Average Dry Weather Flow (gpm)	Peak Average Dry Weather Flow (gpm)	Peak I&I Flow (gpm)	Total Peak Flow (gpm)	Total Peak Flow (cfs)	Force Main Size (in)	Force Main Velocity	Does Gravity Flow fit in 8in	Does Gravity Flow fit in 10in
Gravity	124.9	249.9	131.3	381.1	0.849	N/A	N/A	Yes	Yes
LS1	23.7	47.5	22.6	70.1	0.156	4	1.79	Yes	Yes
LS2	30.1	60.1	25.8	86.0	0.192	4	2.19	Yes	Yes
LS3	23.8	47.7	19.2	66.9	0.149	4	1.71	Yes	Yes
LS4	81.9	163.7	95.9	259.7	0.579	4	6.63	Yes	Yes

Trunk	Total Peak Flow (cfs)	Does Gravity Flow fit in 8in	Does Gravity Flow fit in 10in
SW Stafford Road Trunk (cfs)	0.772	Yes	Yes
Boeckman Trunk Extension (cfs)	1.152	Pipe Overcapacity	Yes





## CITY COUNCIL MEETING STAFF REPORT

<b>Meeting Date:</b> October 3, 2022	<b>Subject:</b> Review of the draft <i>Solid Waste Collection Rate Report, September 2022</i>  <b>Staff Member:</b> Mark Ottenad, Public/Government Affairs Director  <b>Department:</b> Administration	
<b>Action Required</b> <input type="checkbox"/> Motion <input type="checkbox"/> Public Hearing Date: <input type="checkbox"/> Ordinance 1 <sup>st</sup> Reading Date: <input type="checkbox"/> Ordinance 2 <sup>nd</sup> Reading Date: <input type="checkbox"/> Resolution <input checked="" type="checkbox"/> Information or Direction <input type="checkbox"/> Information Only <input type="checkbox"/> Council Direction <input type="checkbox"/> Consent Agenda	<b>Advisory Board/Commission Recommendation</b> <input type="checkbox"/> Approval <input type="checkbox"/> Denial <input type="checkbox"/> None Forwarded <input checked="" type="checkbox"/> Not Applicable  <b>Comments:</b> Prospective adoption on November 7, 2022, of Resolution No. 3004 has the effective of maintaining current solid waste collection and disposal rates for all classes of customers effective January 1, 2023.	
<b>Staff Recommendation:</b> N/A		
<b>Recommended Language for Motion:</b> N/A		
<b>Project / Issue Relates To:</b>		
<input type="checkbox"/> Council Goals/Priorities:	<input checked="" type="checkbox"/> Adopted Master Plan(s):	<input type="checkbox"/> Not Applicable

### ISSUE BEFORE COUNCIL:

Review of the draft *Solid Waste Collection Rate Report, September 2022* ("Report"), Attachment 1, in preparation for Council's prospective consideration on November 7, 2022, of Resolution No. 3004 to adopt the Findings and Recommendations of the 2022 Solid Waste Collection Rate Report and Rate Schedule.

The Report prospectively underpins Resolution No. 3004, which adopts the final *Solid Waste Collection Rate Report, September 2022*, and maintains the current "Republic Services Rate Schedule for Collection and Disposal of Solid Waste, Recyclables, Yard Debris, Organic Materials and Other Materials," effective January 1, 2022.

**EXECUTIVE SUMMARY:**

The Report finds that solid waste Franchisee Republic Services Rate of Return (“ROR”) adjusted for 2021 had a composite revenue of 16.1%, well in excess of the allowable range of 8% to 12%, with a target of 10% ROR; see Report page 1.

Composite revenue ROR is the combined ROR of Republic Services’ three lines or classes of business:

1. Roll Cart: Residential
2. Container: Commercial
3. Industrial: Drop Box

The Report finds projected 2022 financial performance with a composite net margin of 10.3%, which is on the mark for the target ROR of 10%; see Report page 2. While residential and commercial lines of business fall below the target ROR, the industrial category exceeds the allowable range, resulting in a composite ROR just over the 10% target.

Therefore, the Report recommends maintaining current rates for all three classes of solid-waste customers, including residential, commercial and industrial customers; see Report page 2. See Attachment 3 for current solid waste collection and disposal rates.

Last year in November 2021, City Council adoption of Resolution No. 2931 for the 2021 solid waste rate review process resulted in across-the-board rate reductions for all classes of customers, with Residential Roll Cart service rates decreased an average of 4.7%, Commercial Container service rates reduced an average of 7.6%, and Industrial Roll Off / Drop Box service rates lowered an average of 10.1%.

**EXPECTED RESULTS:**

Prospective adoption on November 7, 2022, of Resolution No. 3004 has the effect of maintaining current solid waste collection and disposal rates for all classes of customers for 2023.

**TIMELINE:**

- October 3, 2022: Council review of draft *Solid Waste Collection Rate Report, September 2022*
- November 7, 2022: Prospective Council adoption of Resolution No. 3004, which adopts the final *Solid Waste Collection Rate Report, September 2022*, and maintains the current “Republic Services Rate Schedule for Collection and Disposal of Solid Waste, Recyclables, Yard Debris, Organic Materials and Other Materials,” effective January 1, 2022.

**CURRENT YEAR BUDGET IMPACTS:**

The Report, Attachment B – Projected 2022, p. 4, projects City solid waste franchise-fee revenue of calendar year 2022 of \$394,096, a decrease of 14% or \$66,300 from solid waste franchise-fee revenue of \$460,424 for calendar year 2021. Declining franchisee ROR also reduces franchise fee revenue to City.

**COMMUNITY INVOLVEMENT PROCESS:**

Adoption of the Solid-Waste Franchise Ordinance No. 814 in 2018 followed standard City public outreach practices. The 2022 solid waste rate review is a by-product of the solid-waste franchise Ordinance No. 814.

Franchisee Republic Services was engaged in the rate-review process, although the CFO/controller position had become vacant prior to the review process. The General Manager submitted a number of questions that were responded to by the rate-review consultant and resulted in an adjustment to the initial draft rate report that was provided to Franchisee in advance; see Attachment 2.

**POTENTIAL IMPACTS OR BENEFIT TO THE COMMUNITY:**

The community benefits by continuing to receive Republic Services solid waste collection services at current rates during a time of high inflation.

**ALTERNATIVES:**

N/A

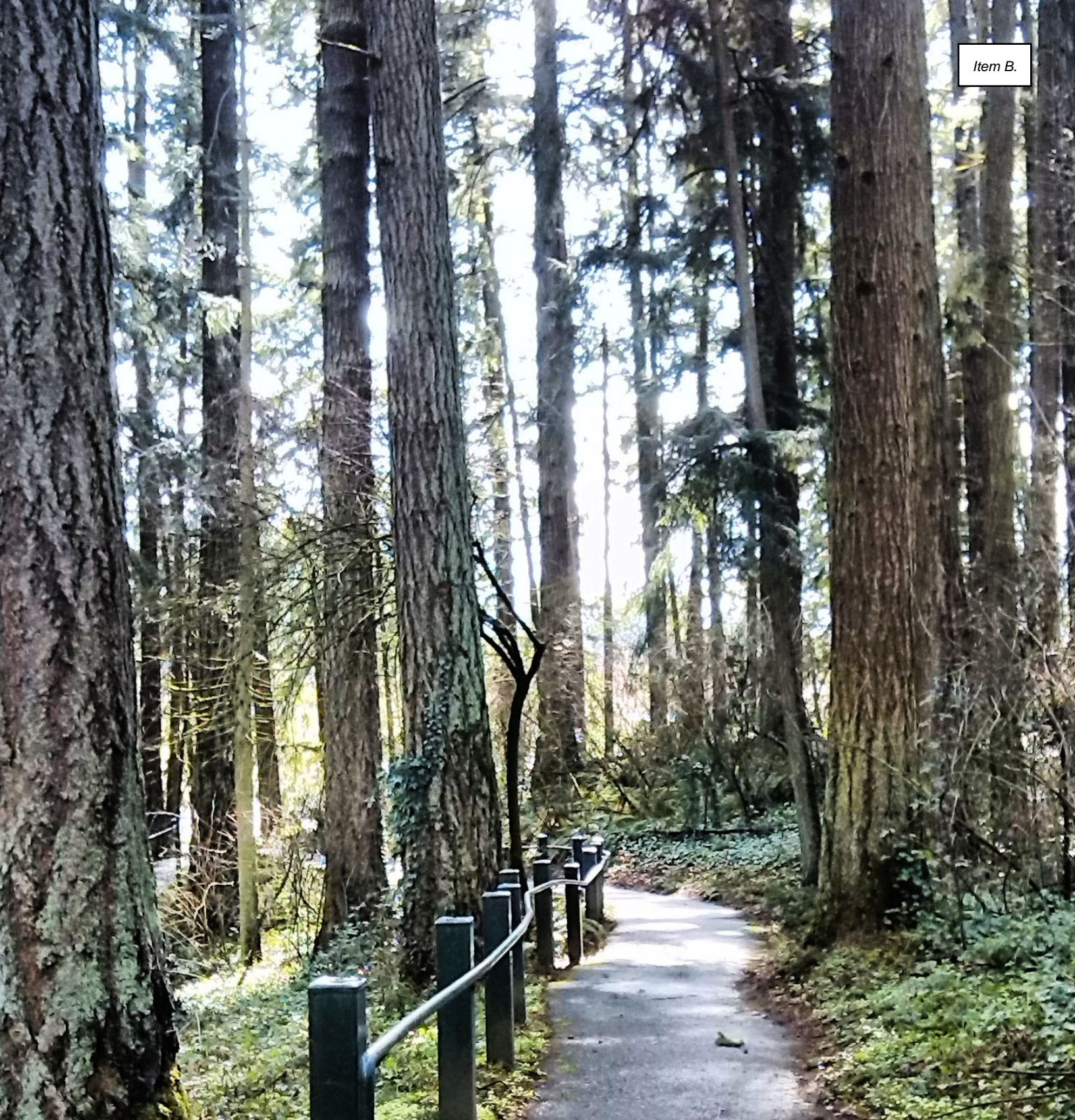
**CITY MANAGER COMMENT:**

N/A

**ATTACHMENTS:**

1. *Solid Waste Collection Rate Report, September 2022* (draft)
2. Memo from Bell & Associates, Inc., Solid Waste & Recycling Consultants, RE: 2022 Solid Waste Rate Review, responding to questions from Franchisee Republic Services
3. "Republic Services Rate Schedule for Collection and Disposal of Solid Waste, Recyclables, Yard Debris, Organic Materials and Other Materials, Effective January 1, 2022"
4. Republic Services October 3, 2022 Memo RE Rate Review





## City of Wilsonville

### Solid Waste Collection Rate Report

Bell & Associates / September 2022 - REVISED





# City of Wilsonville

## Solid Waste Collection Rate Report

September 2022 - REVISED

Bell & Associates

### Table of Contents

Background of Solid Waste Review.....	1
Annual Cost Report .....	1
Adjusted Report for 2021 .....	1
Projected Results for 2022 .....	2
Projected 2022 Expenses.....	2
Rate Recommendation .....	2
Attachment A – Adjusted 2021 Results .....	3
Attachment B – Projected 2022 .....	4

Chris Bell, CPA  
 Bell & Associates  
 1628 NW 33rd Way  
 Camas, WA 98607  
 360-210-4344  
[Chris@Bellassociatesinc.com](mailto:Chris@Bellassociatesinc.com)

## Background of Solid Waste Review

The City of Wilsonville (City) contracted with Bell & Associates, a consulting firm with expertise in solid waste collection operations, to provide the City with solid waste and recycling consulting services. In March 2022, solid waste franchisee Republic Services (Republic) submitted its annual detailed cost reports to the City for the calendar year 2021.

## Annual Cost Report

The collection of waste and recycling within Wilsonville is accomplished under an exclusive franchise agreement between Republic Services and the City. The annual report provides line-item costs and revenues associated with providing service within the City as well as combined line item totals for their non-Wilsonville operations. The format of the report provides the capacity to calculate the cost of service for each line of business (cart, container, and drop box). Cart collection is primarily for residential customers, whereas business customers are serviced with a container. Reported results were analyzed, and the following tasks were completed:

- Analyze reported route collection hours to the reported customer counts for each line of business.
- Using a predictive test of revenue for each line of business, ensure the reported revenues are reasonable for the number of reported customers.
- By thoroughly reviewing the reported direct cost line items, determine if the expense is reasonable in relation to the customer and operational data entered from the detailed cost report.
- Utilize a predictive test of disposal to determine if the reported disposal expense is reasonable.
- Using the reported administrative line items, determine if the expense is reasonable in relation to the operational data entered from the detailed cost report.
- Review the costs between the City and Republic's other franchised collection operations to determine if the allocations are reasonable.

Report adjustments were made to the submission by Republic from the application of the tasks above that reduced the reported costs and increased the profitability of services provided to Wilsonville customers.

## Adjusted Report for 2021

Table 1 details the return for each collection service provided within the Wilsonville franchise collection system.

**Table 1: Adjusted 2021 Wilsonville Results**

Description	Roll Cart	Container	Drop Box	Composite
Revenues	2,156,407	2,953,382	2,872,111	7,981,900
Allowable Costs for Rates	1,863,959	2,483,278	2,377,760	6,724,997
Franchise Income	292,448	470,104	494,351	1,256,903
<b>Margin (Income / Revenue)</b>	<b>13.6%</b>	<b>15.9%</b>	<b>17.2%</b>	<b>15.8%</b>

## Projected Results for 2022

Specific line item expenses from the adjusted 2021 report were escalated to project the results for 2022 using assumptions based on Metro's increased taxes and fees, contractual obligations such as the labor agreement between Republic and the union drivers, administrative wages, health insurance, recycling processing, fees, and estimated inflation. Table 2 summarizes the inflation assumptions.

The assumptions used for the 2022 projection include:

- January 1, 2022, rate decrease for cart, container, and drop box service.
- Processing costs for collected commingled have increased due to reduced values from the recovered materials.
- Driver wage increase is calculated on the hourly wage increase from the Teamster's contract, which increased from \$29.14 to \$29.99 for most drivers. The impact is an increase of 2.9%. Health insurance for union employees increased by 3.3% in 2022.
- Administrative labor costs are projected to increase by 5.0%
- Inflation increased by 6.58% from 2021 to August 2022.
- Republic's front-line collection trucks use natural gas, while the older trucks use diesel. The blended increase in fuel is 10% for the current year.
- The disposal fee increased in January 2022 due to contractual increases. Additionally, Metro assessed Regional System Fee (RSF) increased by \$2.72 per ton on July 1, 2022. Therefore, the total increase for disposal is calculated at 9.0% for 2022.

Expense	Change
Cart Revenue	-2.70%
Container Revenue	-4.70%
Drop Box Haul Fees	-7.50%
Recycling Processing	52.00%
Driver Wage	2.90%
Administrative Costs	5.00%
Inflation	6.58%
Fuel	10.00%
Solid Waste Disposal	9.00%

## Projected 2022 Expenses

The estimated increases noted above were applied to the 2021 expenses and summarized in Table 3.

**Table 3: Projected 2022 Financial Performance for Wilsonville**

Description	Roll Cart	Container	Drop Box	Composite
Revenues	2,099,199	2,814,099	2,941,741	7,855,039
Allowable Costs for Rates	1,966,248	2,602,150	2,517,723	7,086,121
Franchise Income	132,951	211,949	424,018	768,918
Margin (Income / Revenue)	6.3%	7.5%	14.4%	<b>9.8%</b>

## Rate Recommendation

The current rates, combined with the expected changes previously detailed, are expected to generate a rate of return within the 8% to 12% operating range; therefore, no change is recommended to the current collection rates.

## Attachment A – Adjusted 2021 Results

**Adjusted**  
**Return on Revenues**  
**City of Wilsonville January 1 to December 31, 2021**

	Solid Waste	Residential Service Recycling	Yard Debris	Solid Waste	Commercial Service Recycling	Drop Box	Grand Totals
<b>Collection &amp; Service Revenues</b>	<b>2,156,407</b>	<b>0</b>	<b>0</b>	<b>2,953,382</b>	<b>0</b>	<b>2,872,111</b>	<b>7,981,900</b>
<b>Direct Costs of Operations</b>	<b>877,783</b>	<b>378,092</b>	<b>314,881</b>	<b>1,667,944</b>	<b>413,768</b>	<b>2,278,156</b>	<b>5,930,624</b>
Disposal Expense	494,130	39,125	160,742	950,976	64,653	1,553,651	3,263,277
Labor Expense	176,777	227,534	103,467	308,969	208,558	331,600	1,356,905
Truck Expense	72,279	93,034	42,306	126,330	85,274	135,584	554,807
Equipment Expense	2,247	2,892	1,315	63,150	41,069	54,456	165,129
Franchise Fees	107,560	0	0	180,067	0	172,797	460,424
Other Direct Expense	24,790	15,507	7,051	38,452	14,214	30,068	130,082
<b>Indirect Costs of Operations</b>	<b>293,526</b>			<b>402,009</b>		<b>99,708</b>	<b>795,243</b>
Management Expense	35,583			48,734		12,093	96,410
Administrative Expense	29,424			40,300		10,000	79,724
Other Overhead Expenses	228,519			312,975		77,615	619,109
<b>Total Cost</b>	<b>1,864,282</b>			<b>2,483,721</b>		<b>2,377,864</b>	<b>6,725,867</b>
<b>Less Unallowable Costs</b>	<b>323</b>			<b>443</b>		<b>104</b>	<b>870</b>
<b>Allowable Costs</b>	<b>1,863,959</b>			<b>2,483,278</b>		<b>2,377,760</b>	<b>6,724,997</b>
<b>Franchise Income</b>	<b>292,448</b>			<b>470,104</b>		<b>494,351</b>	<b>1,256,903</b>
<b>Carts/ Yards/ Drop Box Pulls</b>	<b>5,754</b>		<b>4,223</b>	<b>140,192</b>	<b>128,180</b>	<b>5,826</b>	
<b>Revenues</b>	<b>2,156,407</b>			<b>2,953,382</b>		<b>2,872,111</b>	<b>7,981,900</b>
<b>Direct Costs of Operations</b>	<b>1,570,756</b>			<b>2,081,712</b>		<b>2,278,156</b>	<b>5,930,624</b>
<b>Indirect Costs of Operations</b>	<b>293,526</b>			<b>402,009</b>		<b>99,708</b>	<b>795,243</b>
<b>Total Cost</b>	<b>1,864,282</b>			<b>2,483,721</b>		<b>2,377,864</b>	<b>6,725,867</b>
<b>Less Unallowable Costs</b>	<b>323</b>			<b>443</b>		<b>104</b>	<b>870</b>
<b>Allowable Costs</b>	<b>1,863,959</b>			<b>2,483,278</b>		<b>2,377,760</b>	<b>6,724,997</b>
<b>Franchise Income</b>	<b>292,448</b>			<b>470,104</b>		<b>494,351</b>	<b>1,256,903</b>
<b>Return on revenues</b>	<b>13.56%</b>			<b>15.92%</b>		<b>17.21%</b>	<b>15.75%</b>



## Attachment B – Projected 2022

**Projected 2022 Results**  
**Return on Revenues**  
**City of Wilsonville**

	Solid Waste			Residential Service Recycling			Yard Debris			Commercial Service			Drop Box			Grand Totals		
		% ▲ from prior year			% ▲ from prior year			% ▲ from prior year			% ▲ from prior year		% ▲ from prior year					
Collection & Service Revenues	2,099,199	-2.7%		0			0			2,814,099	-4.7%		0			2,941,741	2.4%	7,855,039
Surcharge Overage																		
Direct Costs of Operations	928,648			410,012			325,772			1,730,101			458,688			2,415,192		6,268,413
Disposal / Processing Expense	538,602	9.0%		59,470	52.0%		166,368	3.5%		1,036,564	9.0%		98,273	52.0%		1,696,223	9.2%	3,595,500
Labor Expense	182,242	3.1%		234,568	3.1%		106,666	3.1%		318,518	3.1%		215,005	3.1%		341,850	3.1%	1,398,849
Truck Expense	75,604	4.6%		97,313	4.6%		44,252	4.6%		132,140	4.6%		89,196	4.6%		141,820	4.6%	580,325
Equipment Expense	2,247	0.0%		2,892	0.0%		1,315	0.0%		64,216	1.7%		41,760	1.7%		57,762	6.1%	170,192
Franchise Fees	104,960	-2.4%		0			0			139,855	-22.3%		0			147,087	-14.9%	391,902
Other Direct Expense	24,993	0.8%		15,769	1.7%		7,171	1.7%		38,808	0.9%		14,454	1.7%		30,450	1.3%	131,645
Indirect Costs of Operations	302,139	14%								413,804	15%					102,635	3%	818,578
Management Expense	35,583	0.0%								48,734	0.0%					12,093	0.0%	96,410
Administrative Expense	30,898	5.0%								42,319	5.0%					10,502	5.0%	83,719
Other Overhead Expenses	235,658	3.1%								322,751	3.1%					80,040	3.1%	638,449
Less Unallowable Costs	323									443						104		870
Revenues	2,099,199									2,814,099						2,941,741		7,855,039
		% ▲ from prior year									% ▲ from prior year							
Direct Costs of Operations	1,664,432	6.0%								2,188,789	5.1%					2,415,192		6,268,413
Indirect Costs of Operations	302,139	2.9%								413,804	2.9%					102,635		818,578
Total Cost	1,966,571	5.5%								2,602,593	4.8%					2,517,827		7,086,991
Less Unallowable Costs	323									443						104		870
Allowable Costs	1,966,248									2,602,150						2,517,723		7,086,121
Franchise Income	132,951									211,949						424,018		768,918
Projected Return on Revenues	6.33%									7.53%						14.41%		9.79%
2021 Return on Revenues	13.56%									15.92%						17.21%		15.75%



## Bell & Associates, Inc.

### Solid Waste & Recycling Consultants

## Memorandum

From: Chris Bell, Bell & Associates

To: Mark Ottenad, City of Wilsonville

CC: Amanda Guile-Hinman, City of Wilsonville

Subject: 2022 Solid Waste Rate Review

The following questions were raised by Jason Jordan, General Manager for Republic Services, regarding the proposed adjustments to the annual cost report submitted by Republic Services for the calendar year 2021.

### Waste Disposal Fee

Question 1a. Chris is making an assumption on what the disposal price “should” be vs. what the actual tip fee was for 2021, and

Question 2b. Tip fee assumption used was not correct to actual tip fee (Akimi explained this in prior communications)

### Answer

There has been a trend in the Metro where vertically integrated companies are setting disposal fees at their transfer stations higher than the current rates charged by Metro. The underlying question asked by jurisdictions impacted by the higher rates is whether the increased fees are defensible for the operation. Is the rate charged at WRI either a market rate or a regulated rate?

Inbound waste tons must be from various sources to be classified as a market rate. However, most of the approximately 80,000 tons delivered to WRI were from Republic Services. Therefore, the rate is not market driven.

The costs that comprise the disposal fees at WRI have not been reviewed by Metro (the regional regulator for transfer facilities) or the City of Wilsonville, so it's not a regulated rate.

Therefore, the disposal rates charged by WRI to Republic's affiliated hauling companies are best classified as internal rates. Previous rate reviews have adjusted the internal rate for waste disposal and recycling transfer. Last year, the reported tipping fee at WRI was revised down from the reported disposal cost. In other words, internal rates of affiliated companies are not conducted at an arm's-length transaction, in which two or more unrelated and unaffiliated parties agree to do business, acting independently and in their self-interest.

The underlying costs that comprise the tipping fees charged by Metro are available for review and can be supported. This is why the Metro disposal fee was Wilsonville's basis for disposal costs. The second reason is the Metro fee doesn't financially harm Republic's rate of return in Wilsonville. Metro's tonnage fee includes the costs of franchised haulers and self-haulers. Transfer station managers know that the cost of self-hauling customers is significantly higher than commercial operations. Metro completed a cost of service at the transfer stations in 2018, where the difference in costs between the franchised haulers and self-haulers was \$32.62 per ton. This is relevant because WRI doesn't have the volume of self-haulers; therefore, the transfer cost at WRI should be lower than at Metro. Additionally, the transport cost from Wilsonville to Coffin Butte Landfill is lower than Metro's transport cost to Arlington, Oregon. Finally, since Republic Services owns this landfill, WRI provides a financial benefit to Coffin Butte.

**Response:** Until the disposal fees charged by WRI are in parity with Metro or the rate is regulated, I will recommend using the Metro fee for the cost of waste disposal in Wilsonville.

### Commercial Waste Disposal Expense

Question 2a. Commercial Assumed lbs. /yard and tip fee

Chris's assumption the lbs. /yard were not updated to 112lb/yd. as he stated would be used. The calculations remained at 110lb/yd.

**Response:** The disposal expense was adjusted for the average of 112 pounds per yard. The following is the calculation of the adjustment:

Reported Annual SW Container Yards:	140,192	
Adjustment to Revenue:	14,458	<sup>1</sup>
Total Estimated Commercial Yards	154,650	
Average pounds per Yard	111.78	
Annual Collected Tons	8,643.28	$((154,650 \times 111.78) / 2,000)$
Cost per Ton (2021 Metro Average)	\$107.08	
Estimated Commercial Disposal Cost	\$925,523	$(8,643.28 \times \$107.08)$
Reported Commercial Disposal Cost	\$1,037,976	
Disposal Expense Adjustment	(\$110,000)	
Adjusted Commercial Disposal	\$927,976	

**Note 1:** Reported container yards were increased to match the reported revenue because the yards were from year-end, which didn't account for additional yards and seasonality.

## Yard Debris Disposal Expense

### 3. Yard Debris assumed weights and tip fee

- Weight assumption used 2019 data vs. the 2021 Clackamas County average lbs./yard/customer to include Wilsonville
- Tip fee assumption also not correct to actual tip fee (Akimi explained this in prior communications)

### Response

The initial calculation for the average Wilsonville weight per customer doesn't use the 2019 data; it was based on the 2021 composite data from four jurisdictions: Clackamas / Happy Valley, City of Tigard, City of Hillsboro, and the City of Beaverton, which has an average of 880 pounds per customer per year. The updated average weight included the reported 1,203 pounds from Wilsonville, which increased the average annual weight in Wilsonville to 945 pounds.

The disposal fee used to calculate the yard debris disposal cost is the reported cost per ton from the annual report, which was \$80.59 per ton.

The following calculation is the adjustment to the reported yard debris disposal expense.

	Wilsonville		
Landfilled	Tons	\$	Check
<b>Yard Debris + Food Scraps</b>			0
<i>Grimms</i>	0.822	\$90	\$109.38
<i>Willamette Resources</i>	2,539.856	\$204,652	\$80.58
<i>S&amp;H Logging</i>	0.000	0	0
<i>Metro South Transfer Station</i>	0.000	0	
<b>FoodTotal</b>	2,540.679	\$204,742	
<b>Check: \$/Ton</b>		<b>\$80.59</b>	

### Yard Debris Disposal Expense

Reported Yard Debris Customers	4,223
Average Weight per Customer	945 pounds per year
Annual Pounds	3,990,735 (4,223 x 945)
Annual Tons	1,995.36 (3,990,735 / 2,000 pounds per ton)
Reported Cost per Ton	\$80.59
Estimated Yard Debris Disposal	\$160,807 (1,995.36 x \$80.59)
Reported Yard Debris Disposal	\$204,742
Yard Debris Expense Adjustment	(\$44,000)
Adjusted Yard Debris Disposal	\$160,742

**Conclusion:** The proposed adjustment of \$50,000 will be amended to \$44,000



CITY OF WILSONVILLE, OREGON

**Republic Services Rate Schedule  
for Collection and Disposal of  
Solid Waste, Recyclables, Yard Debris,  
Organic Materials and Other Materials**

**Effective: January 1, 2022**

## ROLL CART SERVICE RATES

### (Residential Single-Family Dwellings and Multi-Family Communities)

<b>Residential Cart *</b>	<b>Rate</b>
20 gallon	\$21.32
35 gallon	\$27.95
60 gallon	\$36.30
90 gallon	\$41.00
<b>Charbonneau Cart * (yard debris exempt)</b>	<b>Rate</b>
20 gallon	\$18.57
35 gallon	\$21.90
60 gallon	\$30.75
<b>Commercial / Multi-Family Cart *</b>	<b>Rate</b>
35 gallon cart	\$21.20
60 gallon cart	\$32.70
90 gallon cart	\$41.00
On Call (per each pick-up/service)	\$12.26
Recycling Only (monthly fee)	\$10.98
Yard Debris Only (monthly fee)	\$8.11
Recycling & Yard Debris Only (monthly fee)	\$16.74

<b>Additional / Extra Service</b>	<b>Rate</b>
Lost or damaged garbage cart (new replacement)	\$69.08
Lost or damaged yard debris cart (new replacement)	\$72.39
Lost or damaged recycling cart (new replacement)	\$72.39
Lost or damaged recycling bin (new replacement)	\$11.73
Return trip fee outside of normally scheduled route	\$23.14
All occasional extras (box/bag/can)	\$6.40
Over-full can charge	\$6.40
Yard debris contaminated with garbage	\$13.86
Gate opening/roll out container (monthly)	\$17.27
Special container (medical waste)	\$17.27

<b>Temporary Clean Up Container: 3 Yards Maximum Volume for 4 Days</b>	<b>Rate</b>
Delivery & Removal of Container	\$126.97
Extra Dump	\$91.37
Daily Container Rental Charge Past 4 Days	\$6.18

\* indicates monthly rate for cart service

## COMMERCIAL CONTAINER RATES

### Commercial Services – Rate Per Month

Container Size	Rate - 1 stop per week	Rate - 2 stops per week	Rate - 3 stops per week	Rate - 4 stops per week	Rate - 5 stops per week	Rate - 6 stops per week
1 yard	\$108.96	\$212.10	\$306.73	N/A	N/A	N/A
1.5 yard	\$143.05	\$273.14	\$401.68	N/A	N/A	N/A
2 yard	\$184.59	\$352.95	\$520.96	\$698.73	\$874.84	\$1,053.91
3 yard	\$251.07	\$485.22	\$720.72	\$975.19	\$1,227.38	\$1,479.05
4 yard	\$323.43	\$633.19	\$942.18	\$1,276.47	\$1,607.67	\$1,938.17
5 yard	\$390.49	\$757.30	\$1,134.58	\$1,538.03	\$1,938.11	\$2,336.70
6 yard	\$446.77	\$871.60	\$1,314.31	\$1,782.90	\$2,247.06	\$2,710.41
8 yard	\$588.47	\$1,149.69	\$1,735.01	\$2,356.59	\$2,971.70	\$3,585.54

### Extra Commercial Pick-Up Rates

Container Size	Rate per Pick-up
1 yard	\$25.05
1.5 yard	\$35.07
2 yard	\$45.84
3 yard	\$66.52
4 yard	\$87.31
5 yard	\$108.10
6 yard	\$128.78
8 yard	\$169.19

Container Compactor rates is 2.2 times the regular rate.

Commercial extra container dumps (return trips) are charged at 33% of the monthly rate.

Extra material beyond the capacity of the container is charged \$26.85 per yard.

### Recycling Rates for Multi-Family Sites with Compactors or Train Systems

Number of Units	Rate per Month
1-99	\$139.22 (minimum)
100-199	\$2.34 per unit
200-299	\$1.92 per unit
300-399	\$1.69 per unit
400+	\$1.65 per unit

### Additional Recycling Services – Drop Box and Commercial Customers

Container Size	Rate
60 gallon	\$16.10 per cart (includes pick up)
90 gallon	\$19.50 per cart (includes pick up)
Metal Tote	\$25.27 monthly rent, plus hourly rate
Cardboard Container	\$25.27 per month for customers that have less than 4 cubic yards of flattened cardboard per month

### Miscellaneous Service Rates – Hourly Hauling Rate

Service	Rate Per Hour
1 truck + 1 driver	\$105.86
1 truck + 1 driver + 1 helper	\$133.69

## DROP BOX AND ROLL OFF COMPACTOR SERVICE RATES

### Drop Box / Compactor Rates Haul Rates

Container Size	Haul Rate
10-29 yard drop box	\$124.00
30 yard drop box	\$140.00
40 yard drop box	\$159.00
10-19 yard compactor	\$124.00
20-29 yard compactor	\$140.00
30-39 yard compactor	\$197.00
40+ yard compactor	\$264.00

### Additional Drop Box Fees

Service	Rate
Drop Box Delivery Fee	\$56.00
Fee for less than 1 haul per month	\$20.00
Round-trip box (per haul)	\$36.00

### Drop Box Rental Fees

Drop Box Size	Rate
10 yard - After 48 hours	\$9.00 / Per Day
20 yard - After 48 hours	\$9.00 / Per Day
30 yard - After 48 hours	\$10.00 / Per Day
40 yard - After 48 hours	\$12.00 / Per Day
10 yard - Monthly	\$85.00 / Per Month
20 yard - Monthly	\$85.00 / Per Month
30 yard - Monthly	\$90.00 / Per Month
40 yard - Monthly	\$95.00 / Per Month

Rent charged is the lesser of the daily or monthly rent total.



## SUPPLEMENTAL SERVICES RATES

Type of Service	Rate
<b>Special Services Not Listed:</b> Hauler will charge the reasonable cost of collection and disposal; charge to be related to a similar schedule fee where possible.	Cost of Collection/ Disposal
<b>Appliances:</b>	
Large appliances that contain Freon (accessible at curb)	\$50.10
Large appliances without Freon (accessible at curb, Freon removal certificate required for pick up)	\$28.78
<b>Bathtub / Sink / Toilet:</b>	
Fiberglass tub/shower	\$44.53
Sinks without cabinet	\$16.70
Toilet	\$22.26
<b>Carpets:</b>	
Rug	\$16.70
<b>E-Waste (Electronic Devices) Removal:</b>	
TV under 25", PC monitor, laptop	\$16.70
TV over 25"	\$33.40
TV console, TV projector, copiers	\$44.53
<b>Furniture:</b>	
Hide-a-bed	\$44.53
Large furniture – full sized couch, dining table, dresser, etc.	\$33.40
Small furniture – recliner chair, office chair, crib, coffee table, patio table, cabinets, etc.	\$22.26
<b>Mattresses:</b>	
Twin mattress/box spring (set)	\$22.26
Double/queen mattress/box spring (set)	\$33.40
King mattress/box spring (set)	\$38.97
<b>Miscellaneous / Other:</b>	
Basketball hoop	\$44.53
Bicycle	\$16.70
Christmas tree	\$10.67
Entertainment center	\$55.43
Hot tub cover	\$55.43
Hot water heater	\$44.53
Treadmill, door, furnace, barbeque, satellite dish, lawnmower	\$27.84
Waterbed bag	\$16.70
Windows	\$16.70
<b>Tires:</b>	
Tires with rims – Passenger or light truck	\$22.26
Tires without rims – Passenger or light truck	\$16.70
Tires – Heavy equipment, semi, etc. charged per ton at current disposal facility gate rate	Gate Rate
<b>Return Trip Fee:</b>	\$22.26
<b>Minimum Charge:</b>	\$16.70

## RECYCLING SURCHARGE

Temporary recycling surcharge for residential and commercial customers was eliminated effective January 1, 2022.

To: Mark Ottenad, Director of Government Affairs, City of Wilsonville  
From: Jason Jordan, General Manager, Republic Services  
Date: October 3, 2022  
*Sent via email*

Dear Mr. Ottenad:

As you are aware, the rate consultant on contract with the City (Chris Bell) and the Republic Services' Finance Manager (Akimi Murata-Chambers) have been working through the consultant's questions regarding expenses and operations. Mr. Bell, provided the City with a memo detailing his analysis, without fully working through details with Ms. Murata-Chambers. We have understanding that, as a result of this, the rate report has had to be updated several times.

Several of the discrepancies identified by Republic Services have been corrected in the memo Mr. Bell has resubmitted this morning. However, we would like to detail them for the record:

**Labor Wages and Health Insurance:** In analyzing future anticipated labor costs/health insurance impacts, Mr. Bell initially used information from the wrong Collective Union Bargaining Agreement from Clackamas County. Mr. Bell assumed that Republic Services used the same CBA, which is incorrect. This information was provided for correction after this discrepancy was identified by our company upon the review of the submitted report.

**Commodity/Recycling Impacts:** The original submitted report stated a forecasted increase of recycling costs for 2022 at only 10%. This was incorrect and was again brought to Mr. Bell's attention after reviewing the report. Republic Services provided details and explanation that our current forecasted increase in recycling costs, mostly based on uncontrollable commodity market pricing impacts, should be around 60%. The response our company received was that Mr. Bell did not understand the information provided so changed the forecasted increase from his original 10% to 52% based on another city's assessment.

**Disposal:** These assessments made by Mr. Bell appear to be an attempt at regulating what the rates should be at a private transfer station. Mr. Bell, in his attempt at regulating the disposal rate at the private transfer station, omits important facts such as volume is crucial to offset or help maintain costs of operation. As an example, five years ago Willamette Resources Inc. (WRI) received approximately 75,000 tons of MSW. Due to Metro's tonnage allocation methodology, the allotted tonnage was reduced by 7% to approximately 70,000 tons. Therefore, less revenue is allowed from previous years, while fixed costs have remained the same or even increased as the world has experienced inflationary costs due to many factors. There was also an initial discrepancy with Mr. Bell's predictive modeling using outdated cart/container weights. This was found by our company and the request was made to adjust these weights to the latest data. From a contractual standpoint, the definition of Allowable Costs includes the costs of disposal, which we provided to Mr. Bell. The disposal cost at WRI meets all of the parameters



referenced in the introductory paragraph of Article IV Section2 and the Franchise Agreement does not contemplate a process of making adjustments to a provided disposal rate at a private transfer station through the use of various assumptions.

The points detailed above are not made by our company in an attempt to affect future rates, which the city should be proud are roughly lower than the average of the surrounding cities with comparable services. We believe we have continued to provide high-quality services at a responsible price for the citizens and businesses of Wilsonville. The purpose of this letter is to highlight the complex nature of our industry and that we seek better partnership with the city's hired consultant to ensure the information provided to Council and the community are accurate and properly vetted. Per the terms of the Franchise Agreement, we would ask that the City and Mr. Bell continue to work with us to resolve any discrepancies with respect to our expenses so that we can ensure that the final information provided to the city in the future is accurate and fair.

Sincerely,

Jason Jordan  
General Manager  
Republic Services

Cc: Brian Cosgrove, City Manager  
Amanda Guile-Hinman, City Attorney  
Julie Fitzgerald, Mayor  
Kristin Akervall, Council President  
Charlotte Lehan, City Councilor  
Ben West, City Councilor  
Dr. Joann Linville, City Councilor

**CITY COUNCIL ROLLING SCHEDULE**  
**Board and Commission Meetings**  
**Items known as of 08/26/22**

Item 4.

**October**

Date	Day	Time	Event	Location
10/4	Tuesday	5:00 pm	Municipal Traffic Court	City Hall
10/10	Monday	6:30 pm	DRB Panel A	Council Chambers
10/11	Tuesday	6:00 pm	DEI Committee	City Hall
10/12	Wednesday	6:00 pm	Planning Commission	City Hall
10/13	Thursday	6:00 pm	Parks and Recreation Advisory Board	Parks and Recreation Administration Building
10/17	Monday	7:00 pm	City Council Meeting	City Hall
10/17	Monday	7:00 pm	Urban Renewal Agency Meeting	City Hall
10/18	Tuesday	5:00 pm	Municipal Traffic Court	City Hall
10/19	Wednesday	5:00 pm	Arts, Culture, and Heritage Commission	Library
10/24	Monday	6:30 pm	DRB Panel B	Council Chambers
10/26	Wednesday	6:30 pm	Library Board Meeting	Library

**November**

Date	Day	Time	Event	Location
11/1	Tuesday	5:00 p.m.	Municipal Traffic Court	City Hall
11/7	Monday	7:00 p.m.	City Council Meeting	City Hall
11/8	Tuesday	6:00 pm	DEI Committee	City Hall
11/9	Wednesday	6:00 p.m.	Planning Commission	City Hall
11/14	Monday	6:30 p.m.	DRB Panel A	Council Chambers
11/15	Tuesday	5:00 pm	Municipal Traffic Court	City Hall
11/16	Wednesday	5:00 pm	Arts, Culture, and Heritage Commission	Library
11/21	Monday	7:00 p.m.	City Council Meeting	City Hall
11/23	Wednesday	6:30 p.m.	Library Board Meeting	Library
11/28	Monday	6:30 p.m.	DRB Panel B	Council Chambers

**Community Events:**

**10/4** Zumba Gold, 9:00 am, Community Center  
 Quilters, 9:00 am, Tauchman House  
 Ukulele Jam, 9:00 am, Parks & Rec Admin Bldg.

- ODHS Drop-In Assistance, 10:00 am, Public Library  
 Watercolor: Through Artist Eyes, 10:10 am, virtual  
 Toddler & Baby Time, 10:30 am & 11:15 am, Library  
 Beginning Tai Chi, 2:00 pm, Community Center  
 Oil Painting, 5:30 pm, Parks and Recreation Administration Building  
 Dance Fitness, 6:00 pm, Community Center  
 Gentle Flow Yoga, 7:15 pm, Community Center
- 10/5** Healthy Bones and Balance, 8:30 am, Community Center  
 Advanced Healthy Bones and Balance, 9:30 am, Community Center  
 Digital Photography, 10:00 am, Community Center  
 Family Storytime, 10:30 am, Library  
 Sit and Be Fit, 11:00 am, Community Center  
 PROFILES, 11:00 am, online  
 Lunch at the Community Center, 12:00 pm, Community Center  
 Pinochle/Cribbage, 1:00 pm, Community Center  
 Bingo, 1:00 pm, Community Center  
 Teen Drop-In Activities, 3:30 pm, Library  
 Tai Chi Chih Basics, 3:30 pm, Community Center  
 Creative Writing, 6:00 pm, Library  
 Zumba, 7:00 pm, Community Center
- 10/6** Family Storytime, 10:30 am, Library  
 Ladies Afternoon Out, 1:00 pm, Community Center  
 Beginning Tai Chi, 2:00 pm, Community Center  
 Restorative Yoga, 7:15 pm, Community Center
- 10/7** Healthy Bones and Balance, 8:30 am, Community Center  
 Advanced Healthy Bones and Balance, 9:30 am, Community Center  
 Sit and Be Fit, 11:00 am, Community Center  
 Lunch at the Community Center, 12:00 pm, Community Center  
 Mexican Train Dominoes, 1:00 pm, Community Center  
 First Friday Films, 6:00 pm, Library
- 10/8** Soccer Shots, 9:00 am, Memorial Park  
 Barre, 9:00 am, Community Center  
 Book Notes Concert, 2:00 pm, Library
- 10/10** Library Closed – Staff In-Service (All day)  
 Healthy Bones and Balance, 8:30 am, Community Center  
 Advanced Healthy Bones and Balance, 9:30 am, Community Center  
 Weight Loss Support Group, 12:30 pm, Community Center  
 Bridge Group, 1:00 pm, Community Center  
 Body Sculpt, 5:45 pm, Community Center
- 10/11** Zumba Gold, 9:00 am, Community Center  
 Quilters, 9:00 am, Tauchman House  
 Ukulele Jam, 9:00 am, Parks & Rec Admin Bldg.  
 ODHS Drop-In Assistance, 10:00 am, Public Library  
 Watercolor: Through Artist Eyes, 10:10 am, virtual  
 Toddler & Baby Time, 10:30 am & 11:15 am, Library  
 Medicare 101 – Extra Help, 10:30 am, Community Center  
 Beginning Tai Chi, 2:00 pm, Community Center  
 Dance Fitness, 6:00 pm, Community Center

Gentle Flow Yoga, 7:15 pm, Community Center

**10/12** Safe Routes to School (All day)

Healthy Bones and Balance, 8:30 am, Community Center

Advanced Healthy Bones and Balance, 9:30 am, Community Center

Digital Photography, 10:00 am, Community Center

Family Storytime, 10:30 am, Library

Sit and Be Fit, 11:00 am, Community Center

Lunch at the Community Center, 12:00 pm, Community Center

STEAM Stuff 1:00 pm, Library

Pinochle/Cribbage, 1:00 pm, Community Center

Bingo, 1:00 pm, Community Center

Teen Drop-In Activities, 3:30 pm, Library

Tai Chi Chih Basics, 3:30 pm, Community Center

Creative Writing, 6:00 pm, Library

Zumba, 7:00 pm, Community Center

**10/13** Family Storytime, 10:30 am, Library

Ladies Afternoon Out, 1:00 pm, Community Center

Beginning Tai Chi, 2:00 pm, Community Center

Restorative Yoga, 7:15 pm, Community Center

**10/14** Healthy Bones and Balance, 8:30 am, Community Center

Advanced Healthy Bones and Balance, 9:30 am, Community Center

Sit and Be Fit, 11:00 am, Community Center

Lunch at the Community Center, 12:00 pm, Community Center

Mexican Train Dominoes, 1:00 pm, Community Center

**10/15** Soccer Shots, 9:00 am, Memorial Park

Barre, 9:00 am, Community Center

Oil Painting, 10:00 am, Parks and Recreation Administration Building

**10/16** How to E-Book, 1:30 pm, Library

**10/17** Healthy Bones and Balance, 8:30 am, Community Center

Advanced Healthy Bones and Balance, 9:30 am, Community Center

Blood Drive, 5:45 pm, Library

Weight Loss Support Group, 12:30 pm, Community Center

Bridge Group, 1:00 pm, Community Center

Body Sculpt, 5:45 pm, Community Center

Genealogy Club, 1:00 pm, Library

Beginning Spanish Class, 6:00 pm, Library

**10/18** Zumba Gold, 9:00 am, Community Center

Quilters, 9:00 am, Tauchman House

Ukulele Jam, 9:00 am, Parks & Rec Admin Bldg.

ODHS Drop-In Assistance, 10:00 am, Public Library

Toddler & Baby Time, 10:30 am & 11:15 am, Library

Beginning Tai Chi, 2:00 pm, Community Center

Dance Fitness, 6:00 pm, Community Center

Gentle Flow Yoga, 7:15 pm, Community Center

**10/19** Healthy Bones and Balance, 8:30 am, Community Center

Advanced Healthy Bones and Balance, 9:30 am, Community Center

Digital Photography, 10:00 am, Community Center

Family Storytime, 10:30 am, Library



# City of Wilsonville Renewables Narrative

Lisa DiMartino, Senior Product Specialist

Tiffany Delgado, Senior Key Customer Manager

August 26, 2022



## Table of Contents

1. Wilsonville's Objective & Goals
2. U.S. Renewable Energy Market
3. City of Wilsonville and Renewable Energy
4. PGE & Clean Energy
5. City of Wilsonville and PGE Partnership
6. Appendix





# Wilsonville's Objective & Goals



## Objective & goals

### Objective:

Tell the story of how Wilsonville is increasing usage of renewables (2016-2021)

### Story goals:

1. Provide an overview of the city and community's increasing use of renewable power in the context of regional and US EPA national context
2. Present PGE's various renewable programs over time
3. Segment the market among residential and commercial/industrial customers
4. Include PGE customer contacts by customer segment





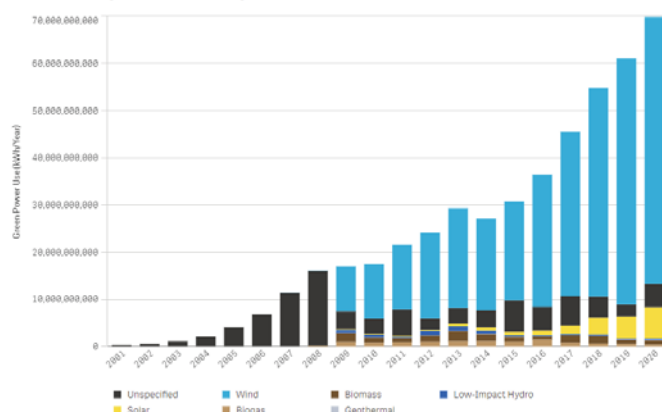
# U.S. Renewable Energy Market



## We're part of a national trend

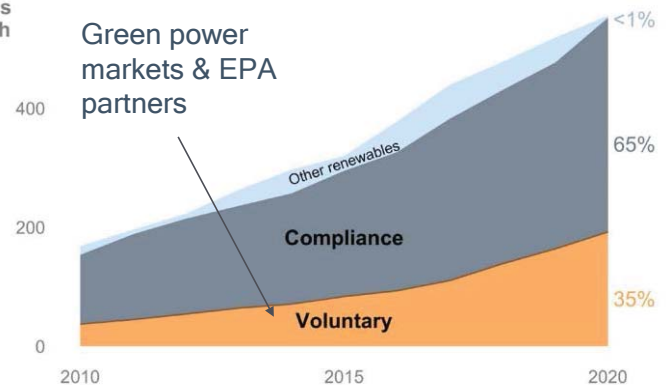
- 7.5 million customers procured 192 billion kWh of renewable energy through voluntary green power markets. (In 2020 U.S. electricity sales totaled 3.7 trillion kWh).
- 100s of EPA Green Power Partners together purchased a total of 44.76 billion kWh
- 11 EPA Green Power Communities (GPCs) in Oregon and 118 in the US purchased 7.46 billion kWh

Green Power Use by Renewable Resource by Collection Year



Sources: [Meet Our Partners | US EPA](#),  
[Program Data Viewer | US EPA](#), [Green Power Communities List | US EPA](#) (2020)

Millions of MWh



Source: [Status and Trends in the Voluntary Market \(2020 Data\) \(nrel.gov\)](#)



# City of Wilsonville & Renewable Energy



## Our renewables journey began in 2014

2014: Entered EPA Green Power challenge and joined PGE's Clean Wind<sup>1</sup> program

2015: Became an EPA Green Power Partner<sup>2</sup> & EPA Green Power Community<sup>3</sup>

2016: Enrolled City of Wilsonville SMART in PGE's Clean Wind<sup>1</sup> program at 100%

2019: Enrolled in PGE's bundled renewable energy program to bring Oregon's largest solar facility to Gilliam County

2020-2021: Increased annual participation in PGE Clean Wind<sup>1</sup> by over 300 MWh

2022: Committed to reaching 100% renewable energy matching with a purchase of renewable energy certificates through PGE's Green Future Enterprise (from 94,913 to 278,558 kWh).

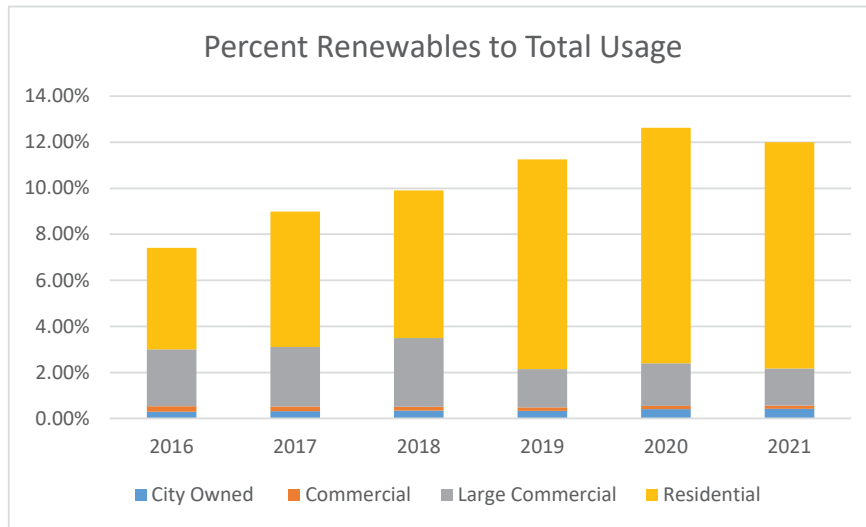
<sup>1</sup> PGE rebranded its Clean Wind program under the Green Future program umbrella. The program is now called Green Future Enterprise (GFE). GFE is a renewable energy certificate program. Renewable Energy Certificates (REC) do not contain electricity. A REC represents the environmental benefits of 1 megawatt hour (MWh) of renewable energy that can be paired with electricity. Green Future Enterprise is a Green-e® Energy certified REC product. PGE is also supplying your electricity. Green-e® Energy has only certified the RECs, which may be sourced from outside of your local electricity distribution area. For more information, see [www.green-e.org/rec](http://www.green-e.org/rec)

<sup>2</sup> EPA Green Power Partner requires 7% of total usage to be renewable energy purchases (over 100,000,001 kWh/year)

<sup>3</sup> EPA Green Power Community requires at least 5% of a community's total usage to be renewable energy purchases



## Increased renewable energy<sup>1</sup> purchases, as a percent of total usage, from 8% to 12% in 5 years

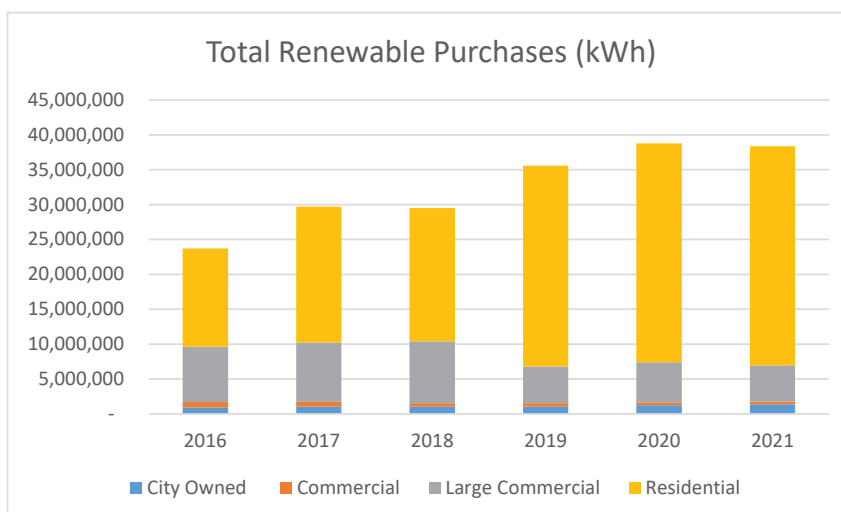


- Residential customers lead renewables growth from 4.5% to 9.8%
- City owned renewables purchases (blue bar) increased from 0.29% to 0.42%

Source: PGE EPA Reports 2016-2021. 2016 and 2017: Total commercial usage included large commercial usage. 2018 - 2021 Total commercial usage excluded large commercial usage.  
<sup>1</sup> GFE is a renewable energy certificate program. Renewable Energy Certificates (REC) do not contain electricity. A REC represents the environmental benefits of 1 megawatt hour (MWh) of renewable energy that can be paired with electricity. Green Future Enterprise is a Green-e® Energy certified REC product. PGE is also supplying your electricity. Green-e® Energy has only certified the RECs, which may be sourced from outside of your local electricity distribution area. For more information, see [www.green-e.org/rec](http://www.green-e.org/rec)



## The Wilsonville community increased renewable kWh<sup>1</sup> purchases by 62%

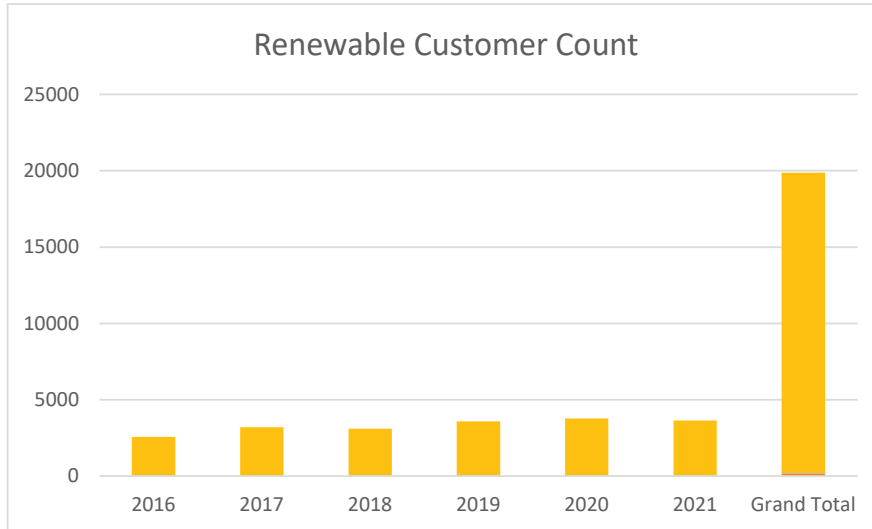


- Residential customers lead renewables growth from 14mm to 31mm kWh
- City owned renewables purchases (green bar) increased 45% - from 927k kWh to 1,347k kWh

Source: PGE EPA Reports 2016-2021. 2016 and 2017: Total commercial usage included large commercial usage. 2018 - 2021 Total commercial usage excluded large commercial usage.  
<sup>1</sup> GFE is a renewable energy certificate program. Renewable Energy Certificates (REC) do not contain electricity. A REC represents the environmental benefits of 1 megawatt hour (MWh) of renewable energy that can be paired with electricity. Green Future Enterprise is a Green-e® Energy certified REC product. PGE is also supplying your electricity. Green-e® Energy has only certified the RECs, which may be sourced from outside of your local electricity distribution area. For more information, see [www.green-e.org/rec](http://www.green-e.org/rec)



## Wilsonville increased the number of customers purchasing renewable energy<sup>1</sup> by 41% in 5 years



- The residential segment drove this trend increasing from 2,542 customers purchasing renewables in 2016 to 3,624 in 2021

Source: PGE EPA Reports 2016-2021. 2016 and 2017: Total commercial usage included large commercial usage. 2018 - 2021 Total commercial usage excluded large commercial usage. 2021 Customer Count: Residential: 3624, City Owned: 1, Commercial: 18, Large Commercial: 7

<sup>1</sup> GFE is a renewable energy certificate program. Renewable Energy Certificates (REC) do not contain electricity. A REC represents the environmental benefits of 1 megawatt hour (MWh) of renewable energy that can be paired with electricity. Green Future Enterprise is a Green-e® Energy certified REC product. PGE is also supplying your electricity. Green-e® Energy has only certified the RECs, which may be sourced from outside of your local electricity distribution area. For more information, see [www.green-e.org/rec](http://www.green-e.org/rec)



## Wilsonville's estimated annual generation from onsite solar is just under 2 m kWh per year

Customer Segment	Number of Customers	kW Installed Capacity	kWh Est. Annual Generation
Residential	155	1,069	1,218,000
Small Commercial	5	133	151,000
Large Commercial	8	528	602,000
<b>Total</b>	<b>168</b>	<b>1,729</b>	<b>1,971,000</b>

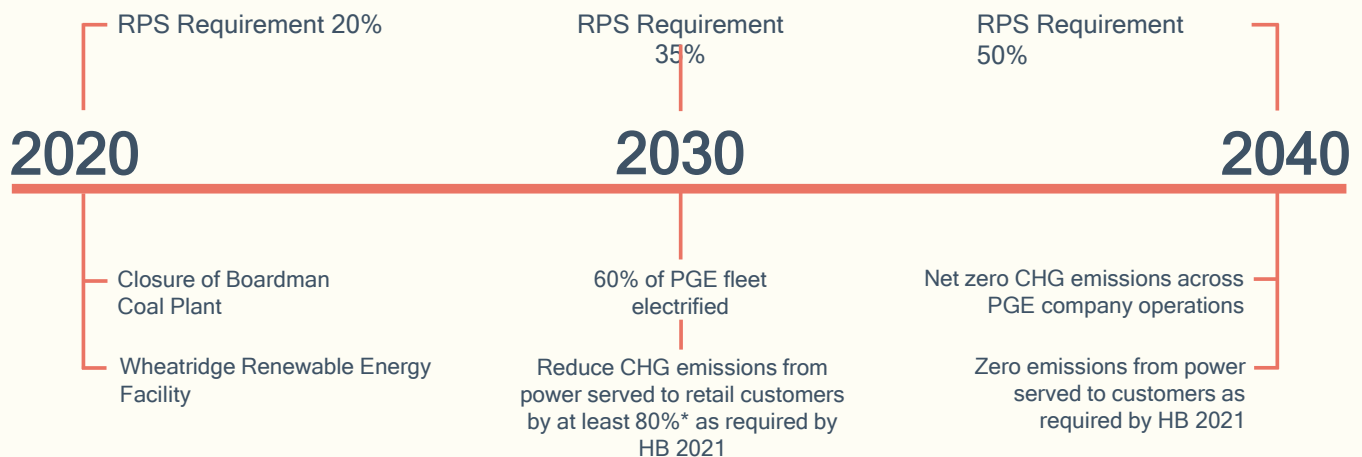
Installed capacity from PGE (PowerClerk). Estimated annual generation based on solar radiation data and average system assumptions from PVWatts. PGE does not report solar generation in the EPA annual reports



# PGE & Clean Energy



## PGE Milestones for a clean energy future



RPS=Renewable Portfolio Standard

\*Below baseline period, defined in HB 2021 as the average annual CHG emissions for 2010, 2011 and 2012 associated with the electricity sold to retail electricity customers as reported to DEQ.



# PGE's voluntary programs help customers achieve their clean energy goals faster

The City of Wilsonville is part of a community of more than 225,000 like-minded leaders, who've made PGE's Green Future the No. 1 renewable power program in America.<sup>1</sup>

Wilsonville's participation in PGE's Green Future programs supports renewable energy projects and jobs in Oregon.

Residents, businesses and the city lower the carbon footprint associated with their electricity use.



<sup>1</sup> According to National Renewable Energy Laboratory Top 10 rankings of Green Power Sales, Customers, Sales Rate, Participation Rate, [Top Ten Utility Green Pricing Programs \(2020 data\) \(nrel.gov\)](#)

## Recognition benefits offered through Green Future Enterprise

### Green Future<sup>™</sup> Enterprise Marketing toolkit

Clean energy. It's how you do business. By sharing your support of local, renewable energy, you just might inspire your customers, employees and community to do the same — creating an Oregon kind of energy. Here are some guidelines to help you promote your participation in Green Future Enterprise.

#### Marketing messages

You can use these play-and-learn messages to explain what your business is doing. Go ahead and put your own spin on them to fit your unique brand voice.

"Our company is proud to support a clean energy future for Oregon by choosing PGE's Green Future<sup>™</sup> Enterprise renewable option."

"By making a commitment to renewable energy, we are joining more than 225,000 households and businesses who are demonstrating their environmental stewardship."

"By choosing Green Future<sup>™</sup> Enterprise from PGE, we're helping drive the demand for new renewable energy sources."

These are great messages to include in materials about community events, sponsorships or Earth Day, to name a few. You can use them in employee communications, newsletters, blogs, social media and other channels.

#### Digital stickers

Live up your website while showing off your environmental stewardship with our Green Future digital stickers. Just make sure you link the graphic to [portlandgeneral.com/greenfuture](#).



#### Website

Spread the word of renewable energy for and with. All we ask is that you point your visitors to [portlandgeneral.com/greenfuture](#) so they can get the latest information about our renewable energy programs.

#### Window decal

Decorate any building or vehicle window while proudly promoting clean energy with these removable decals. Need more? Just let us know.



#### Social media

Help us get the word out. Follow us and tag us when you post about Green Future Enterprise.

Facebook: [@PortlandGeneralElectric](#)  
Twitter: [@PortlandGeneral](#)  
Instagram: [@PortlandGeneral](#)  
LinkedIn: [linkedin.com/company/portland-general-electric](#)  
YouTube: [PortlandGeneralElectric](#)

### Here's to the leaders in our community! Thank you for choosing Green Future<sup>™</sup> Enterprise.

26 TAYLOR BUILDING • A TO Z WINERIES • AJINOMOTO • ARCYLE WINERY  
ABB EVERGREEN DATA CENTER • BOEING • BREW DR. KOMBUCHA • BRUCE PAC  
BUNDLESVILLE • C&S EMMI • CASSADINE TRADING GROUP OREGON • CATELIN DANIEL  
CELLISTICA • CITY OF BEAVERTON • CITY OF CLATSOP • CITY OF HILLSBORO  
CITY OF LAKE OSWEGO • CITY OF PORTLAND BUREAU OF ENVIRONMENTAL SERVICES  
CITY OF SALEM • CITY OF WILSONVILLE • CLACKAMAS COUNTY  
COLLINS, ROBERT NORTHWEST • COLLINS ARBORWIDE • COMPUTER FORMS  
CROSBY HOP PADS • DAMLER TRUCK • DAVE'S KILLER BREAD • DESCHUTES BREWERY  
DIGIMARC CORPORATION • ECOTRUST BUILDING • ELEPHANT'S DELICATESSEN  
ERSON PORTLAND • ESCO • EVRAZ • FEL COMPANY • FORD'S BROOM DOG PARK  
GARMAN • GEMNETECH • GOSY WALNUT • GRAND CENTRAL BAKERY  
GREEN ZEBRA GROCERY • HAMPTON LUMBER-WILLAMINA • INTEL  
JIRIN SEMICONDUCTOR • JES MICRO • KANTO CORPORATION • KEEN FOOTWEAR  
LATTICE SEMICONDUCTOR • LEGACY HEALTH • LEOPOLD & STEVENS • LIGHTBOX JEWELRY  
LINDE GAS NORTH AMERICA • LKPF DISTRIBUTION • LUCKY LION • MEIER & FRANK DEPOT  
MERCY CORP • METRO • MICROCHIP TECHNOLOGY • MULTNOMAH ATHLETIC CLUB  
NATIONAL UNIVERSITY OF NATURAL MEDICINE • OAKS • OAKS • OAKS SEMICONDUCTOR  
OREGON STATE BAR • OREGON STATE LOTTERY • OREGON ZOO  
ORGANICALLY GROWN COMPANY • OUR LADY OF THE LAKE • OVHCLOUD  
PACIFIC FRONT FARMS • PCC SYLVANIA • PERLO CONSTRUCTION  
PORTLAND POWDER COATING • PORTLAND TIMBERS • PRATT • LARSON  
PROVIDENCE HEALTH & SERVICES • REGENTX • REPUBLIC SERVICES  
ROCK CREEK • ROSE WILLY • SALEM HEALTH • SCHMITZER STEEL PRODUCTS  
SHAWNEE REALTY & PAULUS • SHI TRADING CORPORATION • STAPLES  
STIMSON LUMBER • SUNSET ATHLETIC CLUB • SUPREME PERLITE  
SWIRE PACIFIC HOLDINGS • TEKTRONIX • THE ALBI TIKI ROOM  
THE ALI HORN INN & SPA • THE STANDARD • TOKYO ELECTRON U.S. HOLDINGS  
TOSHIBA QUARTZ • TOYOTA LOGISTICS SERVICES • TRIMET • TROQUET SEMICONDUCTOR  
TUALITY HEALTHCARE • TUALATIN HILLS PARK & RECREATION DISTRICT  
UNIVERSITY OF PORTLAND • U.S. BANK • US VETERANS HOSPITAL CENTER  
VERNER SOFTWARE & TECHNOLOGY • VIDOR • WIDENHEIMNEDY  
WILLAMETTE UNIVERSITY • WILLAMETTE VALLEY VINEYARDS  
XXIOX • YAKIMA PRODUCTS

Together, you're helping create a clean energy future for all of Oregon.



[portlandgeneral.com/greenfuture](#)

Help us get the word out. Follow us and tag us when you post about Green Future Enterprise.



# City of Wilsonville and PGE partnership



Thank you for  
your partnership!

- Electric Avenue
- EV charging
- Smart street lighting pilots
- Water meter readings
- Green Future Programs



Pachwaywit Fields



**Let's  
meet the  
future  
together.**



## Appendix





## PGE website links

[Home \(portlandgeneral.com\)](http://portlandgeneral.com)

[Clean Energy Choices \(portlandgeneral.com\)](http://portlandgeneral.com)

[Green Power | Green Future Choice Renewable Power | PGE \(portlandgeneral.com\)](http://portlandgeneral.com)

[Green Future Enterprise | PGE \(portlandgeneral.com\)](http://portlandgeneral.com)

[Green Future Impact for Business - PGE \(portlandgeneral.com\)](http://portlandgeneral.com)



## PGE contacts

Commercial and industrial renewable programs

[GreenFutureEnterprise@pgn.com](mailto:GreenFutureEnterprise@pgn.com)

[GreenFutureImpact@pgn.com](mailto:GreenFutureImpact@pgn.com)

[Lisa.DiMartino@pgn.com](mailto:Lisa.DiMartino@pgn.com)

[Tiffany.Delgado@pgn.com](mailto:Tiffany.Delgado@pgn.com)

1-800-542-8818

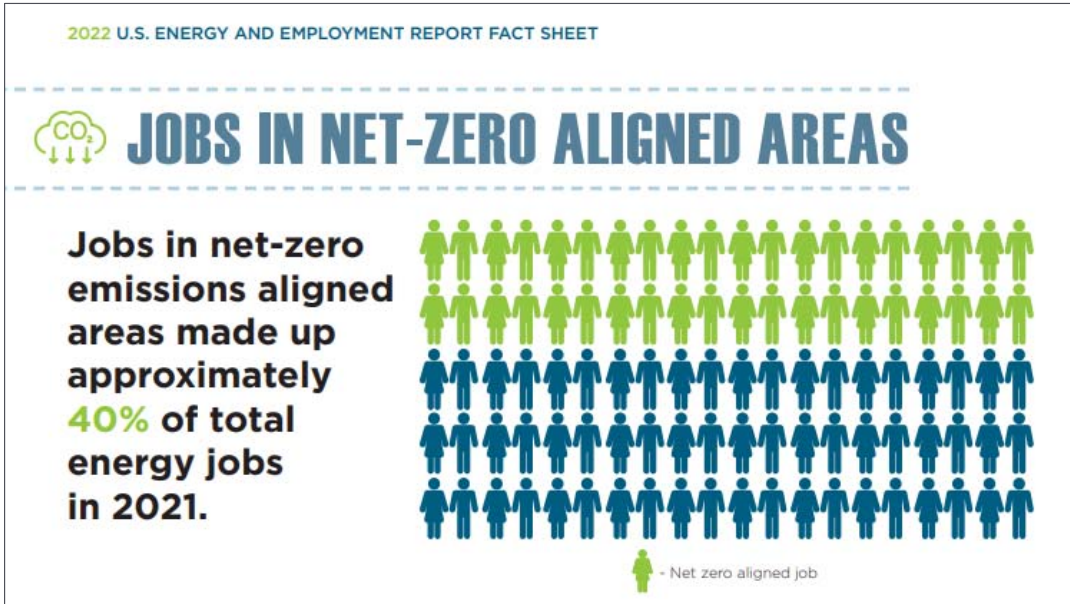
Residential renewable programs

[GreenFuture@pgn.com](mailto:GreenFuture@pgn.com)

1-800-542-8818



## Clean energy jobs are growing in the U.S. and globally



“The transition to clean energy is expected to generate 10.3 million net new jobs globally by 2030.

That will offset the 2.7 million jobs expected to be lost in fossil fuel sectors. “

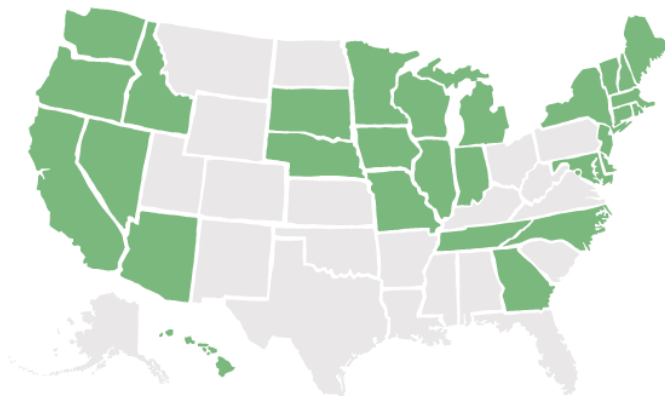
Source: [World Economic Forum \(weforum.org\)](https://www.weforum.org)

Source: [U.S. Energy & Employment Jobs Report \(USEER\) 2022 Fact Sheet](#)



## Oregon is leading the way in creating clean energy jobs

The 30 states in green show where wind and solar energy jobs outnumber coal and gas jobs.



**Solar jobs : 5,265**

**Coal jobs: 166**

Source: USEER 2022 National Report  
([energy.gov](https://energy.gov)) based on Union Data by State.

Source: [Environmental Defense Fund report January 2018](#)





## CITY COUNCIL MEETING STAFF REPORT

<b>Meeting Date:</b> October 3, 2022	<b>Subject: Resolution No. 2994</b> Establishing local discharge limitations to control conventional, non-conventional, and toxic pollutant discharges from non-domestic industrial users of the City of Wilsonville sanitary sewer system and repealing Resolution Nos. 1267, 1504 and 1888.  <b>Staff Member:</b> Steve Gering, Industrial Pretreatment Coordinator  <b>Department:</b> Public Works	
<b>Action Required</b>	<b>Advisory Board/Commission Recommendation</b>	
<input checked="" type="checkbox"/> Motion <input type="checkbox"/> Public Hearing Date: <input type="checkbox"/> Ordinance 1 <sup>st</sup> Reading Date: <input type="checkbox"/> Ordinance 2 <sup>nd</sup> Reading Date: <input checked="" type="checkbox"/> Resolution <input type="checkbox"/> Information or Direction <input type="checkbox"/> Information Only <input type="checkbox"/> Council Direction <input checked="" type="checkbox"/> Consent Agenda	<input type="checkbox"/> Approval <input type="checkbox"/> Denial <input type="checkbox"/> None Forwarded <input checked="" type="checkbox"/> Not Applicable  <b>Comments:</b> N/A	
<b>Staff Recommendation:</b> Staff recommends Council adopt Consent Agenda.		
<b>Recommended Language for Motion:</b> I move to adopt the Consent Agenda.		
<b>Project / Issue Relates To:</b>		
<input type="checkbox"/> Council Goals/Priorities:	<input type="checkbox"/> Adopted Master Plan(s):	<input checked="" type="checkbox"/> Not Applicable

### ISSUE BEFORE COUNCIL:

City of Wilsonville Resolution approving updated local discharge limits and repealing previous limits set in Resolution Nos. 1267, 1504, and 1888.

**EXECUTIVE SUMMARY:**

Local Limits regulate the type and quantity of pollutants, discharged to the wastewater treatment facility by non-domestic users that could cause pass-through, interference or sludge contamination. Pollutants incompatible with treatment works are a source of major disruptions to the collection system and treatment works as well as contributes to permit violations. Local Limits are part of the City Code Chapter 8—Environment.

A requirement of the City’s National Pollutant Discharge Elimination System (NPDES) permit is to perform a technical evaluation of the Local Limits and update the limits, if necessary.

Brown & Caldwell consulting firm in partnership with City staff and Jacobs, operators of the treatment plant, performed testing, calculations and analysis and presented its findings in a report named, “Technically Based Local Limits Development, June 21, 2021,” (Exhibit A).

The Local Limits development memorandum was submitted to the Oregon Department of Environmental Quality (DEQ) for review. DEQ found the report to be satisfactory and inclusive and gave conditional approval to adopt new local discharge limits contingent on public notice and City Council approval.

After completion of the public comment period and proof of approval by City Council, the Local Limits will be resubmitted to DEQ for final approval.

Local Limits have previously been establish through Resolution Nos. 1267, 1504, and 1888. To avoid confusion, each of these resolutions should be repealed and replaced by Resolution No. 2994.

**EXPECTED RESULTS:**

Adoption of the new Local Limits will ensure compliance with the City’s National Pollutant Discharge Elimination System (NPDES) permit.

**TIMELINE:**

Implementation of the new Local Limits will occur through the permitting process for the significant industrial users in the City.

**CURRENT YEAR BUDGET IMPACTS:**

No impact to budget.

**COMMUNITY INVOLVEMENT PROCESS:**

Because the proposed pollutant concentrations are less stringent than the previous limits, this constituted a Substantial Program Modification to the City’s Pretreatment Program, which requires a public notice of the intended revisions.

A public notice of request for approval of pretreatment program modifications was published in the Wilsonville Spokesman newspaper on August 11, 2022. The City did not received any written comments, which were due on September 15, 2022.

Additionally, the Industrial Pretreatment Coordinator personally met with each of the eight permitted wastewater dischargers that are subject to pretreatment regulations, including compliance with local limits to discuss the proposed revisions.

**POTENTIAL IMPACTS OR BENEFIT TO THE COMMUNITY:**

Implementation of the Local Limits will regulate the type and quantity of pollutants discharged to the wastewater treatment facility and in turn help keep the Willamette River clean.

**ALTERNATIVES:**

N/A

**CITY MANAGER COMMENT:**

N/A

**ATTACHMENTS:**

1. Resolution No. 2994
  - A. [Technically Based Local Limits Development Memorandum – June 21, 2022](#)

**RESOLUTION NO. 2994****A RESOLUTION OF THE CITY OF WILSONVILLE ESTABLISHING LOCAL DISCHARGE LIMITATIONS TO CONTROL CONVENTIONAL, NON-CONVENTIONAL, AND TOXIC POLLUTANT DISCHARGES FROM NON-DOMESTIC INDUSTRIAL USERS OF THE CITY OF WILSONVILLE SANITARY SEWER SYSTEM AND REPEALING RESOLUTION NOS. 1267, 1504 AND 1888.**

WHEREAS, the City's Environment Ordinance, commonly known as Wilsonville Code Chapter 8, establishes the legal authority for the enforcement of Department of Environmental Quality (DEQ) Pretreatment Regulations; and

WHEREAS, Wilsonville Code Section 8.001 authorizes the City's Public Works Director to develop and implement specific pollutant limitations and local limitations to control the discharge of wastewater containing restricted substances into the municipal sewer system; and

WHEREAS, the Oregon Department of Environmental Quality (DEQ) renewed the City of Wilsonville's National Pollutant Discharge Elimination Systems Wastewater Permit, #101888 effective September 1, 2020 ; and

WHEREAS, a condition of said permit is the City, in consultation with DEQ, must perform a technical evaluation of the local limits and update local limits, if necessary; and

WHEREAS, the City must submit those findings as a report to DEQ within 18 months after permit re-issuance unless DEQ authorizes or requires, in writing, an alternate time frame; and

WHEREAS, locally derived discharge limits must be defined as pretreatment standards under section 307(d) of the Act and must conform to 40 CFR 403.5(c) and 403.8(f)(4); and

WHEREAS, technically based local limits must be developed in accordance with the procedures established by DEQ and the Environmental Protection Agency's Local Limits Guidance; and

WHEREAS, the City's consultant completed a local limits reassessment and drafted a document entitled "Technically Based Local Limits Development Memorandum - June 21, 2022"; and

WHEREAS, DEQ has conducted a review of the City's local limits reassessment and determined the document meets EPA criteria and conditionally approved the proposed limits; and

WHEREAS, the proposed local limits include pollutants concentrations that are less stringent than the previous local limits and for this reason, the revision to the city's local limits is a Substantial Program Modification of the pretreatment program per 40 CFR Part 403.18(b)(2); and

WHEREAS, the City must conduct public notice of the local limits prior to adoption, consistent with 40 CFR part 403.11; and

WHEREAS, a public notice of request for approval of pretreatment program modifications was published in the Wilsonville Spokesman newspaper on August 11, 2022 instructing how to submit written comments and/or a request for a public hearing by September 15, 2022; and

WHEREAS, the public and impacted industries had the opportunity to review and comment on this evaluation with no objections being submitted; and

WHEREAS, Resolution No. 1267 adopted May 20, 1996, Resolution No. 1504 adopted September 21, 1998 and Resolution No. 1888 adopted July 19, 2004 previously established local discharge limitations pursuant to said authorizations; and

WHEREAS, Resolution Nos. 1267, 1504, and 1888 are no longer applicable and should be repealed.

NOW, THEREFORE, THE CITY OF WILSONVILLE RESOLVES AS FOLLOWS:

Section 1. Findings. The City Council incorporated and adopts the above recitals and staff report accompanying this Resolution as if fully set forth in its findings.

Section 2. The City Council hereby repeals Resolutions No. 1504, Resolution No. 1267 and Resolution No. 1888.

Section 2. The City Council hereby adopts the document, Technically Based Local Limits Development Memorandum, dated June 21, 2022.

Section 3. In order to the control conventional, non-conventional and toxic pollutant discharges from industrial users to the City's sanitary sewer system, the following local limits shall apply:

<u>Pollutant</u>	<u>Daily Maximum Concentration</u>
Arsenic	1.84 mg/L
Cadmium	1.11 mg/L
Chromium, total	205 mg/L
Copper	10.6 mg/L
Cyanide	6.97 mg/L
Lead	0.810 mg/L
Mercury	0.407 mg/L
Nickel	10.1 mg/L
Silver	2.30 mg/L
Zinc	3.85 mg/L
pH (SU)	5.5-10.0

mg/L = milligrams per liter

Section 4. Effective Date. This Resolution is effective upon adoption.

ADOPTED by the Wilsonville City Council at a regular meeting thereof this 3<sup>rd</sup> day of October, 2022 and filed with the Wilsonville City Recorder this date.

---

JULIE FITZGERALD, MAYOR

ATTEST:

---

Kimberly Veliz, City Recorder



SUMMARY OF VOTES:

Mayor Fitzgerald

Council President Akervall

Councilor Lehan

Councilor West

Councilor Linville

EXHIBIT:

- A. [Technically Based Local Limits Development Memorandum – June 21, 2022](#)



## CITY COUNCIL MINUTES

September 19, 2022 at 7:00 PM

Wilsonville City Hall & Remote Video Conferencing

---

### CALL TO ORDER

1. Roll Call
2. Pledge of Allegiance

A regular meeting of the Wilsonville City Council was held at the Wilsonville City Hall beginning at 7:00 p.m. on Monday, September 19, 2022. The Mayor called the meeting to order at 7:11 p.m., followed by roll call and the Pledge of Allegiance.

#### PRESENT:

Mayor Fitzgerald  
Council President Akervall  
Councilor Lehan  
Councilor West  
Councilor Linville

#### STAFF PRESENT:

Bryan Cosgrove, City Manager  
Kimberly Veliz, City Recorder  
Zoe Mombert, Assistant to the City Manager  
Ryan Adams, Assistant City Attorney  
Matt Lorenzen, Economic Development Manager  
Chris Neamtzu, Community Development Director  
Miranda Bateschell, Planning Director  
Mark Ottenad, Public/Government Affairs Director  
Georgia McAlister, Associate Planner  
Andrew Barrett, Capital Projects Engineering Manager  
Cindy Luxhoj, Associate Planner  
Dwight Brashear, Transit Director  
Zach Weigel, City Engineer

3. Motion to approve the following order of the agenda.

**Motion:** Moved to approve the order of the agenda.

Motion made by Council President Akervall, Seconded by Councilor Lehan.

**Voting Yea:**

Mayor Fitzgerald, Council President Akervall, Councilor Lehan, Councilor West, Councilor Linville

**Vote:** Motion carried 5-0.

## **MAYOR'S BUSINESS**

4. 2023 Legislative Concepts Request to Rep. Courtney Neron (HD-26)

The Mayor explained there was a special item on Mayor's Business for Council consideration. The Mayor recalled at Work Session, Council discussed potential legislative concepts for the 2023 session of the Oregon legislature.

The Mayor further explained if enacted, these legislative concepts would fulfill City Council Goals. Moreover, State Representative Courtney Neron of House District 26 whom represents the City of Wilsonville had indicated a willingness to consider introducing legislation on behalf of the City if asked.

The Mayor stated the legislative concepts from state legislators are due by September 23, 2022.

The Mayor briefly reviewed the four (4) legislative concepts that Council heard and discussed during Work Session:

- 1) Aurora State Airport coordinated intergovernmental planning; public utilities requirement for state airports of 150 acres, transportation facility does not provide land-use goal exception.
- 2) SMART service territory alignment with city boundaries; adjustment of TriMet district boundary.
- 3) ODOT Public Transportation Division study of WES North Willamette Valley Extension from Wilsonville to Salem, with stops in Woodburn and Keizer
- 4) Reauthorize and fund the Business Oregon Regionally Significant Industrial Sites (RSIS) Program

The Mayor requested a motion to advance a request to Representative Neron to consider submitting the City's legislative concepts, to the Legislative Council as potential bill drafts for the 2023 Legislative session.

**Motion:** Moved to advance the concepts in the manner described.

Motion made by Council President Akervall, Seconded by Councilor Lehan.

Discussion ensued.

**Voting Yea:**

Mayor Fitzgerald, Council President Akervall, Councilor Lehan, Councilor West, Councilor Linville

**Vote:** Motion carried 5-0.

## 5. Upcoming Meetings

The Mayor reported on the following events that occurred since the last Council meeting:

### Emergency Preparedness Fair

- City staff, police, fire and others had tables with information on how to prepare for emergencies.
- Community members were taught how to put together their emergency preparedness kits.

### Oregon Transportation Commission

- The Mayor testified and presented issues of concern by the City Council and constituents regarding the proposed Oregon Highway Plan Toll Amendment.
- The Mayor had recommended that a standard be implemented for meaningful community engagement with elected officials and community leaders.
- The Mayor recalled many of the points made were echoed in the letters submitted to the Oregon Transportation Committee by both Clackamas and Washington County Coordinating Committees.

The Mayor then announced the following upcoming events:

### Economic Development Conference

- The Mayor planned to attend the Economic Development Conference along with Matt Lorenzen, Economic Development Manager
- The conference would provide an opportunity to meet with regional business and government leaders. One leader in particular is the Mayor of Oakland, California, whom has helped to lead an economic revitalization of that city.

### Metro Workshop

- The Mayor shared she would also be attending the Metro workshop on the upcoming regional transportation.

### Tualatin Valley Fire and Rescue (TVF&R) Open House

- Reminded Council that on Saturday, October 1, 2022 they were all invited to an open house at the new Charbonneau Fire Station No 4.
- The station opened in September of 2021, COVID protocols delayed a grand opening.
- The new 2,600-square-foot station has a paramedic vehicle, sleeping quarters, a supply room, kitchen and exercise room.
- The new facility would provide TVF&R faster response times to medical emergencies and allow it to more easily assist Charbonneau in case of a natural disaster.

### City Council Meeting

- The next City Council meeting was scheduled for Monday, October 3, 2022 at 7:00 pm.

### **COMMUNICATIONS**

There was none.

### **CITIZEN INPUT AND COMMUNITY ANNOUNCEMENTS**

*This is an opportunity for visitors to address the City Council on items not on the agenda. It is also the time to address items that are on the agenda but not scheduled for a public hearing. Staff and the City Council will make every effort to respond to questions raised during citizen input before tonight's meeting ends or as quickly as possible thereafter. Please limit your comments to three minutes.*

Joseph Schaefer of the City of Aurora thanked City Council and staff for their work regarding the Aurora Airport.

Katelyn LeBlanc and Bianca Pinoli of the Wilsonville High School Robotics Team shared information about their team and invited Council to the Girls Generation competition.

Miles Pengilly, State Government Affairs Manager for TriMet spoke about the legislative concept regarding the SMART service territory alignment with city boundaries; adjustment of TriMet district boundary. Mr. Pengilly reported that TriMet supports the City's goal of coterminous boundaries. However, TriMet questions the need for new legislation to address this issue as existing state statute provides two paths for withdrawing from the transit district.

### **COUNCILOR COMMENTS, LIAISON REPORTS AND MEETING ANNOUNCEMENTS**

#### 6. Council President Akervall

Reported on the below meeting, she attended since the last City Council meeting:

- Washington County Coordinating Committee

Announced the following upcoming events:

- Bulky Waste Day
- Meeting at Wilsonville Library for potential host families for the exchange delegation from Japan

#### 7. Councilor Lehan

Provided the details of the upcoming Bulky Waste Day scheduled for Saturday, September 24, 2022.

Councilor Lehan shared her concern about the emerald ash borer, which is a bug. The emerald ash borer kills trees especially ash trees. She then asked staff to provide Council with a report on the City's response to this issue.

Lastly, Councilor Lehan reported that she attended Ruth Johnson's 100<sup>th</sup> birthday party. Councilor Lehan then read a poem for Council written by Ms. Johnson as a thank you for the Wilsonville swag.

8. Councilor West

No report.

9. Councilor Linville

Reported on the below meeting, she attended since the last City Council meeting:

- Clackamas County Coordinating Committee (C4) Metro Subcommittee

Announced the following upcoming event she planned to attend:

- Bulky Waste Day
- Clackamas Workforce Partnership Board Retreat

Councilor Linville reminded residents about the monthly City Manager Reports included in the Council packets. She then explained the reports included pages and pages of projects being worked on by City staff.

Lastly, Councilor Linville brought up concerns about Oregon Department of Transportation's strategies for meaningful public engagement.

## CONSENT AGENDA

The Assistant City Attorney read the titles of the Consent Agenda items into the record.

10. **Resolution No. 2985**

A Resolution Of The City Of Wilsonville Authorizing The City Manager To Execute A Professional Services Agreement Contract Amendment With Murraysmith, Inc. For Owner's Representative Services For The Boeckman Road Corridor Project (Capital Improvement Project # 2102, 4205, 4206, 4212, And 7067).

11. **Resolution No. 2996**

A Resolution Of The City Of Wilsonville Authorizing The City Manager To Enter Into A Development Agreement With BTC III Grahams Ferry IC, LLC For Construction Of Oversized Public Water Infrastructure Improvements.

12. **Resolution No. 3000**

A Resolution Of The City Of Wilsonville Authorizing The City Manager To Execute A Professional Services Agreement Contract Amendment With Murraysmith, Inc. To Provide Final Design And Construction Support Services For The Charbonneau Lift Station Rehabilitation Project (Capital Improvement Project #2106).

### 13. Minutes of the September 8, 2022 City Council Meeting.

**Motion:** Moved to adopt the Consent Agenda.

Motion made by Council President Akervall, Seconded by Councilor Linville.

**Voting Yea:**

Mayor Fitzgerald, Council President Akervall, Councilor Lehan, Councilor West, Councilor Linville

**Vote:** Motion carried 5-0.

### NEW BUSINESS

The Assistant City Attorney read the title of Resolution No. 2986 into the record.

#### 14. Resolution No. 2986

A Resolution Of The City Of Wilsonville Authorizing Acquisition Of Property And Property Interests Related To Construction Of The Willamette Water Supply Program Right-Of-Way Enhancement Projects.

Andrew Barrett, Capital Projects Engineering Manager provided the staff report and PowerPoint, which has been made a part of the record.

Clarifying questions followed the presentation.

**Motion:** Moved to adopt Resolution No. 2986.

Motion made by Councilor West, Seconded by Council President Akervall.

**Voting Yea:**

Mayor Fitzgerald, Council President Akervall, Councilor Lehan, Councilor West, Councilor Linville

**Vote:** Motion carried 5-0.

### CONTINUING BUSINESS

The Assistant City Attorney read the title of Ordinance Nos. 866 and 867 into the record on second reading.

The Mayor read the second reading script.

No Councilor declared a conflict of interest, bias, or conclusion from information gained outside the hearing. No member of the audience challenged any of the Councilor's participation.

Staff reported there was no further input.

The Mayor then called for the motion on Ordinance No. 866.

**15. Ordinance No. 866 - 2nd Reading (Quasi-Judicial)**

An Ordinance Of The City Of Wilsonville Annexing Approximately 11.17 Acres Of Property Located South Of SW Frog Pond Lane At 7480 And 7500 SW Frog Pond Lane For Development Of A 19-Lot Residential Subdivision.

**Motion:** Moved to adopt Ordinance No. 866 on second reading.

Motion made by Council President Akervall, Seconded by Councilor Linville.

**Voting Yea:**

Mayor Fitzgerald, Council President Akervall, Councilor Lehan, Councilor West, Councilor Linville

**Vote:** Motion carried 5-0.

The Mayor then announced those who desire to appeal this decision to the Oregon Land Use Board of Appeals; they must file a notice of intent to appeal, stating the grounds of the appeal, in the form and within the time prescribed by State law.

The Mayor then called for the motion on Ordinance No. 867.

**16. Ordinance No. 867 - 2nd Reading (Quasi-Judicial)**

An Ordinance Of The City Of Wilsonville Approving A Zone Map Amendment From The Clackamas County Rural Residential Farm Forest 5-Acre (RRFF-5) Zone To The Residential Neighborhood (RN) Zone On Approximately 10.94 Acres Located South Of SW Frog Pond Lane At 7480 And 7500 SW Frog Pond Lane For Development Of A 19-Lot Residential Subdivision.

**Motion:** Moved to adopt Ordinance No. 867 on second reading.

Motion made by Councilor Lehan, Seconded by Councilor West.

**Voting Yea:**

Mayor Fitzgerald, Council President Akervall, Councilor Lehan, Councilor West, Councilor Linville

**Vote:** Motion carried 5-0.

The Mayor then announced those who desire to appeal this decision to the Oregon Land Use Board of Appeals; they must file a notice of intent to appeal, stating the grounds of the appeal, in the form and within the time prescribed by State law.



## PUBLIC HEARING

The Assistant City Attorney read the title of Ordinance Nos. 868 and 869 into the record on first reading.

Georgia McAlister, Associate Planner provided the staff report and PowerPoint, which has been made a part of the record.

The Mayor provided the public hearing format and opened the public hearing at 8:15 p.m.

No Councilor declared a conflict of interest, bias, or conclusion from information gained outside the hearing. No member of the audience challenged any of the Councilor's participation.

The City Council then asked questions of staff.

Staff informed there was no applicant presentation.

The Mayor invited public testimony, seeing none the Mayor closed the public hearing on Ordinance Nos. 868 and 869 at 8:19 p.m.

The Mayor requested a motion on Ordinance No. 868.

### 17. Ordinance No. 868 - 1st Reading (Quasi-Judicial Hearing)

An Ordinance Of The City Of Wilsonville Annexing Approximately 4.92 Acres Of Property Located North Of SW Frog Pond Lane At 7315 SW Frog Pond Lane For Development Of A 12-Lot Residential Subdivision.

**Motion:** Moved to adopt Ordinance No. 868 on first reading.

Motion made by Council West, Seconded by Councilor Lehan.

### **Voting Yea:**

Mayor Fitzgerald, Council President Akervall, Councilor Lehan, Councilor West, Councilor Linville

**Vote:** Motion carried 5-0.

The Mayor requested a motion on Ordinance No. 869.

### 18. Ordinance No. 869 - 1st Reading (Quasi-Judicial Hearing)

An Ordinance Of The City Of Wilsonville Approving A Zone Map Amendment From The Clackamas County Rural Residential Farm Forest 5-Acre (RRFF-5) Zone To The Residential Neighborhood (RN) Zone On Approximately 4.07 Acres Located South Of SW Frog Pond Lane At 7314 SW Frog Pond Lane For Development Of A 12-Lot Residential Subdivision.

**Motion:** Moved to adopt Ordinance No. 869 on first reading.

Motion made by Councilor Linville, Seconded by Councilor Lehan.

**Voting Yea:**

Mayor Fitzgerald, Council President Akervall, Councilor Lehan, Councilor West, Councilor Linville

**Vote:** Motion carried 5-0.

**CITY MANAGER'S BUSINESS**

There was none.

**LEGAL BUSINESS**

There was none.

**ADJOURN**

The Mayor adjourned the meeting at 8:23 p.m.

Respectfully submitted,

---

Kimberly Veliz, City Recorder

ATTEST:

---

Julie Fitzgerald, Mayor



## CITY COUNCIL MEETING STAFF REPORT

<b>Meeting Date:</b> October 3, 2022		<b>Subject: Ordinance Nos. 868 and 869</b>	
		<b>Staff Member:</b> Georgia McAlister, Associate Planner	
		<b>Department:</b> Community Development	
<b>Action Required</b>		<b>Advisory Board/Commission Recommendation</b>	
<input checked="" type="checkbox"/> Motion <input checked="" type="checkbox"/> Public Hearing Date: September 19, 2022 <input checked="" type="checkbox"/> Ordinance 1 <sup>st</sup> Reading Date: September 19, 2022 <input checked="" type="checkbox"/> Ordinance 2 <sup>nd</sup> Reading Date: October 3, 2022 <input type="checkbox"/> Resolution <input type="checkbox"/> Information or Direction <input type="checkbox"/> Information Only <input type="checkbox"/> Council Direction <input type="checkbox"/> Consent Agenda		<input checked="" type="checkbox"/> Approval <input type="checkbox"/> Denial  <input type="checkbox"/> None Forwarded  <input type="checkbox"/> Not Applicable	
		<b>Comments:</b> During a public hearing on September 12, 2022, Development Review Board Panel 'A' reviewed and recommended adoption of the Annexation and Zone Map Amendment to City Council and approved the associated Frog Pond Overlook subdivision.	
<b>Staff Recommendation:</b> Staff recommends Council adopt Ordinance Nos. 868 and 869 on Second Reading.			
<b>Recommended Language for Motion:</b> Two separate motions: I move to adopt Ordinance No. 868 on Second Reading. I move to adopt Ordinance No. 869 on Second Reading.			
<b>Project / Issue Relates To:</b>			
<input type="checkbox"/> Council Goals/Priorities:	<input checked="" type="checkbox"/> Adopted Master Plan(s): Frog Pond West	<input type="checkbox"/> Not Applicable	

### ISSUE BEFORE COUNCIL:

Approve, modify, or deny Ordinance Nos. 868 and 869 to annex approximately 4.92 acres and rezone approximately 4.07 acres on the north side of SW Frog Pond Lane at 7315 SW Frog Pond Lane within the Frog Pond West Master Plan area, enabling development of a 12-lot residential subdivision called Frog Pond Overlook.

**EXECUTIVE SUMMARY:**

The proposed 12-lot subdivision is the tenth development proposal in Frog Pond West. The subdivision will connect via the Boeckman Creek Regional Trail to the concurrently proposed Frog Pond Terrace to the southwest, previously approved Frog Pond Vista subdivision to the northeast, and Morgan Farm subdivision to the south, blending together as one cohesive neighborhood consistent with the Frog Pond West Master Plan. Concurrent with the adoption of the Frog Pond West Maser Plan, the City added a new zoning district, Residential Neighborhood (RN), intended for application to the Master Plan area. The requested zone map amendment proposes applying the Residential Neighborhood (RN) Zone to the Frog Pond Overlook subdivision consistent with this intention.

**EXPECTED RESULTS:**

Adoption of Ordinance Nos. 868 and 869 will bring this portion of the Frog Pond West Master Plan area into the City and zone it for development consistent with the Master Plan.

**TIMELINE:**

The Annexation and Zone Map Amendment will be in effect 30 days after ordinance adoption on second reading and upon filing the annexation records with the Secretary of State as provided by ORS 222.180.

**CURRENT YEAR BUDGET IMPACTS:**

The project will result in income and expenditures consistent with the infrastructure financing plan of the Frog Pond West Master Plan.

**COMMUNITY INVOLVEMENT PROCESS:**

Staff sent the required public hearing notices. In addition, significant public involvement occurred during development and approval of the Frog Pond Area Plan and Frog Pond West Master Plan, with which the proposed actions are consistent.

**POTENTIAL IMPACTS OR BENEFIT TO THE COMMUNITY:**

Annexation and development of the subject land will provide additional housing choices and continued development of quality neighborhoods.

**ALTERNATIVES:**

The alternatives are to modify, approve, or deny the annexation and zone map amendment requests.

**CITY MANAGER COMMENT:**

N/A

**ATTACHMENTS:**

1. Ordinance No. 868
  - A. Legal Description and Sketch Depicting Land/Territory to be Annexed
  - B. Petition for Annexation
  - C. Annexation Findings
  - D. Development Review Board Panel A Resolution No. 407 Recommending Approval of Annexation
2. Ordinance No. 869
  - A. Zoning Order ZONE22-0002 Including Legal Description and Sketch Depicting Zone Map Amendment
  - B. Zone Map Amendment Findings
  - C. Development Review Board Panel A Resolution No. 407 Recommending Approval of Zone Map Amendment

**ORDINANCE NO. 868****AN ORDINANCE OF THE CITY OF WILSONVILLE ANNEXING APPROXIMATELY 4.92 ACRES OF PROPERTY LOCATED AT 7315 SW FROG POND LANE FOR DEVELOPMENT OF A 12-LOT RESIDENTIAL SUBDIVISION AT FROG POND OVERLOOK.**

WHEREAS, an application for the Frog Pond Overlook subdivision has been submitted by West Hills Land Development, LLC – Owner/Applicant, in accordance with the procedures set forth in Section 4.008 of the Wilsonville Code; and

WHEREAS, the subject site is located at 7315 SW Frog Pond Lane on Tax Lot 700, and a portion of SW Frog Pond Lane right-of-way, Section 12D, Township 3 South, Range 1 West, Willamette Meridian, Clackamas County, Oregon; and

WHEREAS, a petition (Exhibit B) submitted to the City requests annexation of certain real property legally described and depicted in Exhibit A; and

WHEREAS, Walter E. Remmers, an authorized signer for West Hills Land Development, LLC, representing 100 percent of the property ownership within the annexation area signed the petition; and

WHEREAS, there are no electors located within the annexation area; and

WHEREAS, ORS 227.125 authorizes the annexation of territory based on consent of all owners of land and a majority of electors within the territory and enables the City Council to dispense with submitting the questions of the proposed annexation to the electors of the City for their approval or rejection; and

WHEREAS, the land to be annexed is within the Urban Growth Boundary and has been master planned as part of the Frog Pond West Neighborhood; and

WHEREAS, the land to be annexed is contiguous to the City and can be served by City services; and

WHEREAS, Panel A of the Development Review Board considered the annexation and after a duly advertised public hearing held on September 12, 2022, adopted Resolution No. 407 (Exhibit D) recommending City Council approve the annexation; and

WHEREAS, on September 19, 2022, the City Council held a public hearing as required by Metro Code 3.09.050; and

WHEREAS, reports were prepared and considered as required by law; and because the annexation is not contested by any party, the City Council chooses not to submit the matter to the voters and does hereby favor the annexation of the subject tract of land based on findings, conclusions, and the Development Review Board's recommendation to City Council.

NOW, THEREFORE, THE CITY OF WILSONVILLE ORDAINS AS FOLLOWS:

- Section 1. Findings. The tract of land, described and depicted in Exhibit A, is declared annexed to the City of Wilsonville.
- Section 2. Determination. The findings and conclusions incorporated in Exhibit C are adopted. The City Recorder shall immediately file a certified copy of this ordinance with Metro and other agencies required by Metro Code Chapter 3.09.050(g) and ORS 222.005. The annexation shall become effective upon filing of the annexation records with the Secretary of State as provided by ORS 222.180.
- Section 3. Effective Date. This Ordinance shall be declared to be in full force and effect thirty (30) days from the date of final passage and approval.

SUBMITTED by the Wilsonville City Council at a regular meeting thereof this 19<sup>th</sup> day of September, 2022, and scheduled the second reading on the 3<sup>rd</sup> day of October, 2022, commencing at the hour of 7:00 p.m. at the Wilsonville City Hall, 29799 SW Town Center Loop East, Wilsonville, Oregon.

---

Kimberly Veliz, City Recorder

ENACTED by the City Council on the 3<sup>rd</sup> day of October, 2022, by the following votes:

Yes: \_\_\_\_\_ No: \_\_\_\_\_

---

Kimberly Veliz, City Recorder

DATED and signed by the Mayor this 3<sup>rd</sup> day of October, 2022.

---

JULIE FITZGERALD MAYOR

SUMMARY OF VOTES:

Mayor Fitzgerald

Council President Akervall

Councilor Lehan

Councilor West

Councilor Linville

EXHIBITS:

- A. Legal Description and Sketch Depicting Land/Territory to be Annexed
- B. Petition for Annexation
- C. Annexation Findings
- D. Development Review Board Panel A Resolution No. 407 Recommending Approval of Annexation



## **EXHIBIT A**

### **LEGAL DESCRIPTION for ANNEXATION**

May 17, 2022 (Otak #20015)

That property described in Statutory Warranty Deed to West Hills Land Development LLC recorded March 31, 2022 as Document No. 2022-019396, as adjusted by Property Line Adjustment Deed Document No. \_\_\_\_\_, both of Clackamas County Records, together with a portion of S.W. Frog Pond Lane, (County Road No. 2362), in the northwest quarter of the southeast quarter of Section 12, Township 3 South, Range 1 West, Willamette Meridian, Clackamas County, Oregon, the boundaries thereof described as follows:

BEGINNING at a 3/4 inch iron pipe (as shown on Clackamas County Survey No. 7853) which bears North 01°40'13" East along the east line of the southeast quarter of said section a distance of 1748.96 feet, and North 88°35'30" West along the north right of way line of 33.00 foot wide S.W. Frog Pond Lane (County Road No. 2362) a distance of 1908.13 feet from the southeast corner of said section, said POINT OF BEGINNING being the southeast corner of said West Hills Land Development LLC property;

thence along said north right of way line, South 88°35'30" East a distance of 564.59 feet to the northerly extension of the east line of that property described in Quitclaim Deed to Amy Thurmond recorded March 5, 1999 as Document No. 99-022102, Clackamas County Records;

thence along said northerly extension, South 01°39'15" West a distance of 33.00 feet to a point on the south right of way line of said S.W. Frog Pond Lane;

thence parallel with the south line of the southeast quarter of said Section 12 along said south right of way line, North 88°35'30" West a distance of 1119.31 feet;

thence North 01°24'30" East a distance of 33.00 feet to the southwest corner of said West Hills Land Development LLC property;

thence along the lines common to said West Hills Land Development LLC property and that property described in Statutory Warranty Deed to Derek Osterholme and Amber Osterholme recorded May 20, 2020 as Document No. 2020-036921, Clackamas County Records as adjusted by said Property Line Adjustment Deed, through the following four courses:

North 21°44'17" West a distance of 31.49 feet;

North 01°03'30" East a distance of 231.53 feet;

North 12°24'03" East a distance of 7.90 feet;

and North 82°39'16" East a distance of 575.72 feet to a 1 inch iron pipe (as shown on Clackamas County Survey No. 29676) found at the northeast corner of said West Hills Land Development LLC property, also being the most westerly northwest corner of that property described in Statutory Warranty Deed to Andy Finkbeiner and Tamara L.

Pittman recorded May 30, 2001 as Document No. 2001-040160 Clackamas County Records;

thence along the west line of said Finkbeiner and Pittman property,  
South 01°42'32" West a distance of 355.85 feet to the POINT OF BEGINNING.

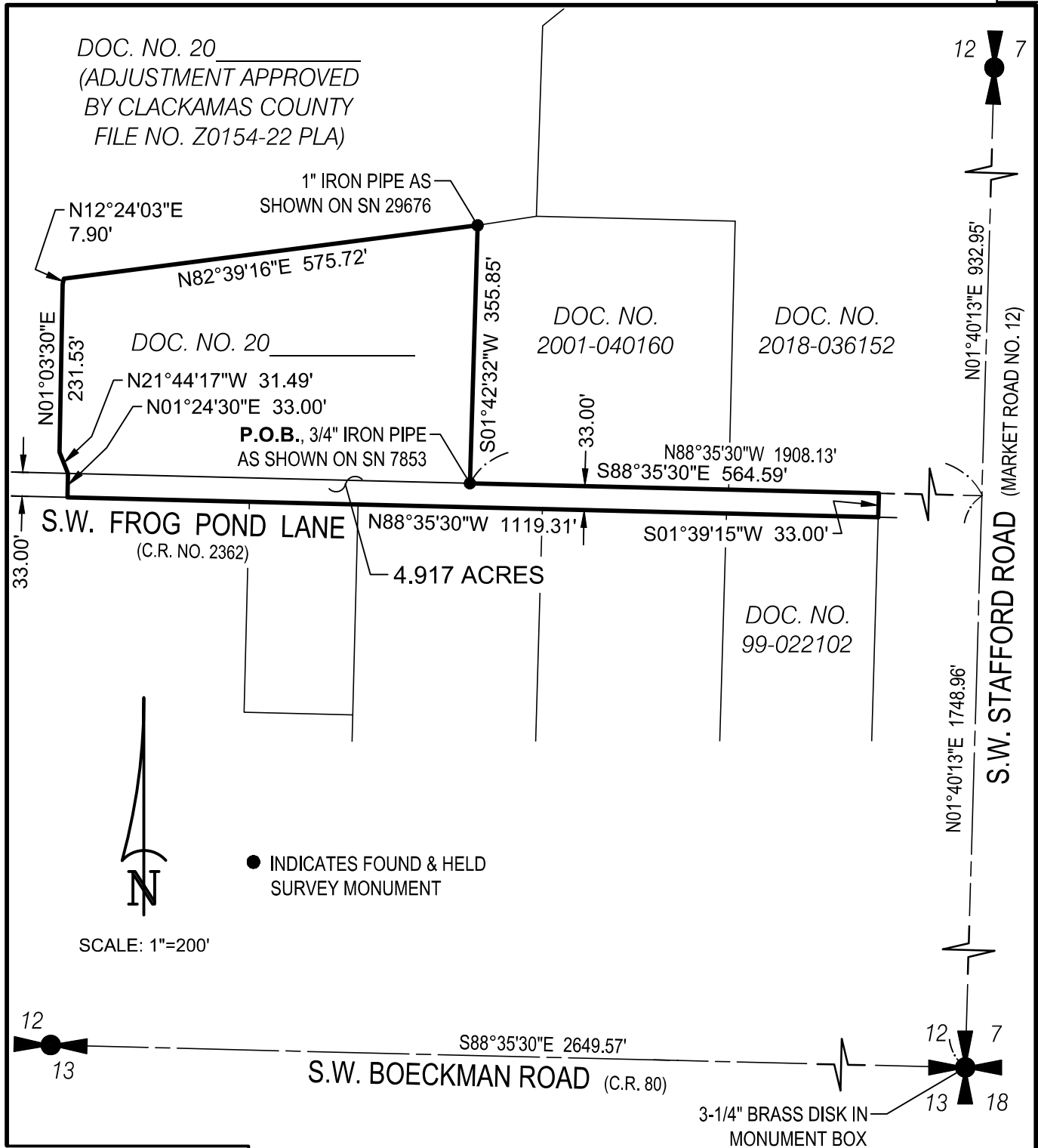
Contains 4.917 acres, more or less.

REGISTERED  
PROFESSIONAL  
LAND SURVEYOR

2022.05.17  
11:32:22-07'00'

OREGON  
NOVEMBER 12, 2013  
MICHAEL D. SPELTS  
87475PLS

RENEWES: JUNE 30, 2024



808 SW 3rd Ave., Ste. 800  
Portland, Oregon 97204  
Phone: (503) 287-6825  
www.otak.com  
project: 20015

## EXHIBIT B

ANNEXATION OF THE WEST HILLS LAND DEVELOPMENT LLC  
PROPERTY & A PORTION OF S.W. FROG POND LANE  
IN THE NW QUARTER OF THE SE QUARTER OF SECTION 12, TOWNSHIP 3 SOUTH,  
RANGE 1 WEST, WILLAMETTE MERIDIAN, CLACKAMAS COUNTY, OREGON

MAY 17, 2022

**CERTIFICATION OF PROPERTY OWNERSHIP OF  
100% OF LAND AREA**

I hereby certify that the attached petition contains the names of the owners<sup>1</sup> (as shown on the last available complete assessment roll) of 100% of the land area of the territory proposed for annexation as described in the attached petition.

NAME JOSHUA BOLL  
TITLE GIS CARTOGRAPHER II  
DEPARTMENT TAX & ASSESSMENT  
COUNTY OF CLACKAMAS  
DATE 8/31/22



<sup>1</sup> Owner means the legal owner of record or, where there is a recorded land contract which is in force, the purchaser thereunder. If a parcel of land has multiple owners, each consenting owner shall be counted as a percentage of their ownership interest in the land. That same percentage shall be applied to the parcel's land mass and assessed value for purposes of the consent petition. If a corporation owns land in territory proposed to be annexed, the corporation shall be considered the individual owner of that land.

Item 14.

**NOTE: This petition may be signed by qualified persons even though they may not know their property description or precinct number.**

[illegible]

\* PO =Property Owner  
RV =Registered Voter



Ordinance No. 868 Exhibit C  
Annexation Findings

Frog Pond Overlook 12-Lot Subdivision

City Council  
Quasi-Judicial Public Hearing

---

<b>Hearing Date:</b>	September 19, 2022
<b>Date of Report:</b>	September 6, 2022

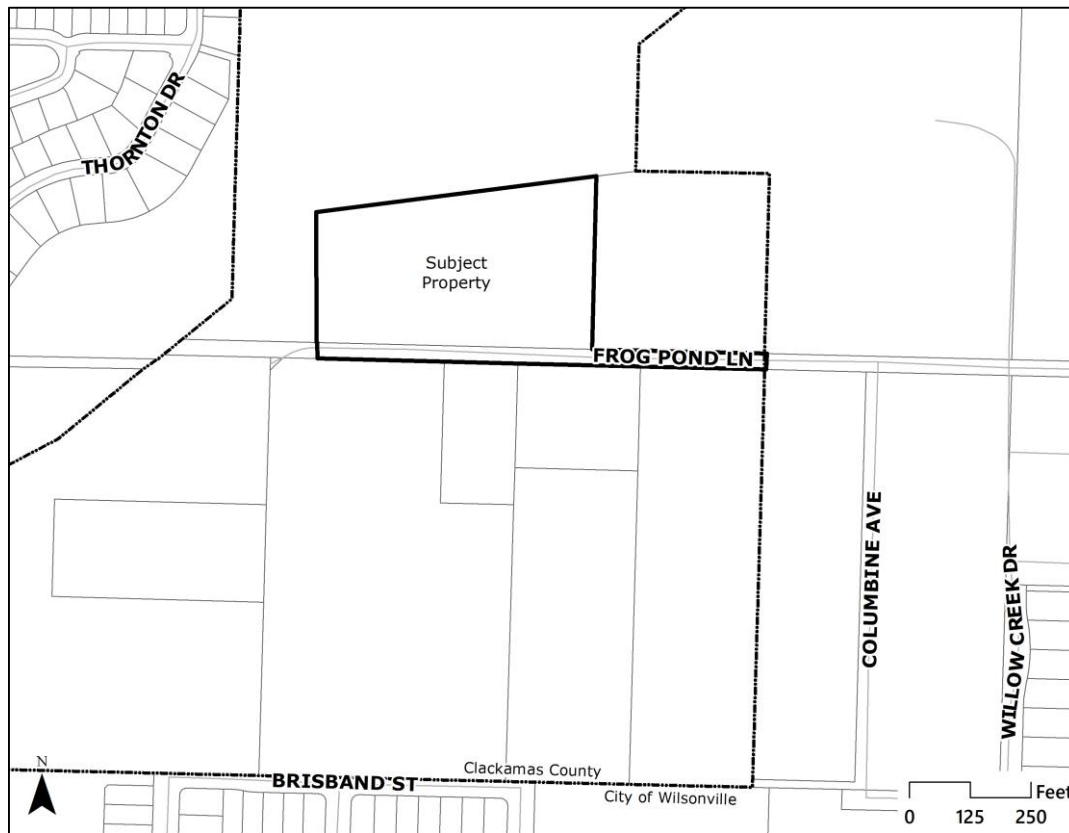
---

<b>Application No.:</b>	ANNX22-0001 Annexation
<b>Request/Summary:</b>	City Council approval of quasi-judicial annexation of approximately 4.92 acres for a 12-lot residential subdivision concurrently with proposed development consistent with the Frog Pond West Master Plan.
<b>Location:</b>	7315 SW Frog Pond Lane. The property is specifically known as TLID 700 and a portion of SW Frog Pond Lane right-of-way, Section 12D, Township 3 South, Range 1 West, Willamette Meridian, Clackamas County, Oregon.
<b>Owner/Applicant/ Petitioner:</b>	West Hills Land Development LLC (Contact: Dan Grimberg)
<b>Applicant's Rep.:</b>	OTAK, Inc. (Contact: Li Alligood AICP)
<b>Comprehensive Plan Designation:</b>	Residential Neighborhood
<b>Zone Map Classification (Current):</b>	Rural Residential Farm Forest 5-Acre (RRFF-5)
<b>Zone Map Classification (Proposed Concurrent with Annexation):</b>	Residential Neighborhood (RN)
<b>Staff Reviewer:</b>	Georgia McAlister, Associate Planner
<b>Staff/DRB Recommendation:</b>	<u>Approve</u> the requested annexation.

**Applicable Review Criteria:**

<b><u>Development Code:</u></b>	
Section 4.700	Annexation
<b><u>Comprehensive Plan and Sub-elements:</u></b>	
Citizen Involvement	
Urban Growth Management	
Land Use and Development	
Plan Map	
Area of Special Concern L	
Transportation Systems Plan	
Frog Pond West Master Plan	
<b><u>Regional and State Law and Planning Documents</u></b>	
Metro Code Chapter 3.09	Local Government Boundary Changes
ORS 222.111	Authority and Procedures for Annexation
ORS 222.125	Annexation by Consent of All Land Owners and Majority of Electors
ORS 222.170	Annexation by Consent Before Public Hearing or Order for Election
Statewide Planning Goals	

## Vicinity Map



## Background/Summary:

The subject property has long been rural/semi-rural, adjacent to the growing City of Wilsonville. Metro added the 181-acre area now known as Frog Pond West to the Urban Growth Boundary in 2002 to accommodate future residential growth. To guide development of the area and the urban reserve areas to the east and southeast, the City of Wilsonville adopted the Frog Pond Area Plan in November 2015. The Frog Pond Area Plan envisions that: "The Frog Pond Area in 2035 is an integral part of the Wilsonville community, with attractive and connected neighborhoods. The community's hallmarks are the variety of quality homes; open spaces for gathering; nearby services, shops and restaurants; excellent schools; and vibrant parks and trails. The Frog Pond Area is a convenient bike, walk, drive, or bus trip to all parts of Wilsonville."

As a follow up to the Area Plan and in anticipation of forthcoming development, in July 2017 the City of Wilsonville adopted the Frog Pond West Master Plan for the area within the UGB. To guide development and implement the vision of the Area Plan, the Master Plan includes details on land use (including residential types and unit count ranges), residential and community design, transportation, parks and open space, and community elements such as lighting, street trees, gateways, and signs. The Master Plan also lays out the infrastructure financing plan.



The proposed 12-lot subdivision is the tenth development proposal in Frog Pond West. The subdivision will connect to the concurrently proposed Frog Pond Terrace to the south, previously approved Frog Pond Vista subdivision to the northeast, and Morgan Farm subdivision to the south, blending together as one cohesive neighborhood consistent with the Frog Pond West Master Plan.

One nearby land use application has been submitted for a site near the subject property. Frog Pond Terrace (DB22-0003) is located southwest of Frog Pond Overlook and contains features such as street extensions, pedestrian connections, and street trees that will interface with this application. Staff have reviewed this application in the context of the property to ensure all shared components are consistently applied across both subdivisions.

All property owners in the annexation area have consented in writing to the annexation. No electors reside within the area proposed for annexation.

### **Conclusion and Conditions of Approval:**

Staff and the Development Review Board recommend the City Council annex the subject property with the following condition:

Request: Annexation (ANNX22-0001)

<b>PDA 1.</b>	<p><b><u>Prior to issuance of any Public Works permits by the City within the annexation area:</u></b> The developer shall be subject to a Development and Annexation Agreement with the City of Wilsonville as required by the Frog Pond West Master Plan. The developer shall enter into the Development and Annexation Agreement prior to issuance of any public works permits by the City within the annexation area.</p>
---------------	---

## Findings:

NOTE: Pursuant to Section 4.014 the burden of proving that the necessary findings of fact can be made for approval of any land use or development application rests with the applicant in the case.

### General Information

#### Application Procedures-In General Section 4.008

The City's processing of the application is in accordance with the applicable general procedures of this Section.

#### Initiating Application Section 4.009

The owners of all property included in the application signed the application forms. West Hills Land Development LLC initiated the application with their approval.

### Request: Annexation (ANNX22-0001)

As described in the Findings below, the request meets the applicable criteria or will by Conditions of Approval.

## Comprehensive Plan-Annexation and Boundary Changes

#### Consistent with Future Planned Public Services Implementation Measure 2.2.1.a.

- A1. The Frog Pond West Master Plan establishes the future planned public services and funding plan for the subject property. The development of public services and funding will be consistent with the Frog Pond West Master Plan thus allowing the annexation to proceed. West Hills Land Development LLC and the City will enter into a Development and Annexation Agreement detailing provision and development of public services as required by Conditions of Approval.

#### Demonstrated Need for Immediate Urban Growth Implementation Measure 2.2.1.a.

- A2. Metro brought the subject area into the Urban Growth Boundary (UGB) in 2002 to meet demonstrated regional housing needs. With adoption for the Frog Pond West Master Plan the subject area is now primed for development to help meet regional housing needs.

#### Adherence to State and Metro Annexation Laws and Standards Implementation Measure 2.2.1.e.

- A3. This review applies all applicable Metro and State rules, regulations, and statutes as seen in findings below.

## Orderly, Economic Provision of Public Facilities and Services

### Implementation Measure 2.2.1.e. 1.

- A4. The Frog Pond Area Plan includes implementation measures to ensure the orderly and economic provision of public facilities and services for the Frog Pond Area, including Frog Pond West. The applicant proposes site development with concurrent applications for Stage 1 and Stage 2 Planned Unit Development and Land Division, which proposes the extension of public facilities and services to the Frog Pond Overlook site. These proposed services are generally consistent with the Frog Pond Area Plan and Frog Pond West Master Plan, and the City's Finance Plan and Capital Improvements Plan.

## Availability of Sufficient Land for Uses to Insure Choices over 3-5 Years

### Implementation Measure 2.2.1.e. 2.

- A5. The inclusion of the Frog Pond area within the UGB and the adoption of the Frog Pond Area Plan demonstrate the need for residential development in the Frog Pond area. Annexation of the subject site will allow development of the uses envisioned by the adopted Frog Pond West Master Plan.

## Wilsonville Development Code-Annexation

### Authority to Review Quasi-Judicial Annexation Requests

Subsections 4.030 (.01) A. 11, 4.031 (.01) K, 4.033 (.01) F., and 4.700 (.02)

- A6. The review of the quasi-judicial annexation request by DRB and City Council is consistent with the authority established in the Development Code.

### Procedure for Review, Etc.

Subsections 4.700 (.01). and (.04)

- A7. The submission materials from the applicant include an annexation petition signed by the necessary parties, a legal description and map of the land to be annexed, and a narrative describing conformance with applicable criteria. City Council, upon recommendation from the DRB, will declare the subject property annexed.

### Adoption of Development Agreement with Annexation

Subsection 4.700 (.05)

- A8. Subject to requirements in this subsection and the Frog Pond West Master Plan, Conditions of Approval require the necessary parties enter into a Development and Annexation Agreement with the City covering the annexed land.

## **Metro Code**

### **Local Government Boundary Changes**

#### **Chapter 3.09**

- A9.** The request is within the UGB, meets the definition of a minor boundary change, satisfies the requirements for boundary change petitions, and is consistent with both the Comprehensive Plan and the Frog Pond West Master Plan.

## **Oregon Revised Statutes (ORS)**

### **Authority and Procedure for Annexation**

#### **ORS 222.111**

- A10.** The request meets the applicable requirements in State statute including the facts that the subject property is within the UGB and is contiguous to the City, the request has been initiated by the property owners of the land being annexed, and there are no electors residing within the area to be annexed.

### **Procedure Without Election by City Electors**

#### **ORS 222.120**

- A11.** The City charter does not require elections for annexation, the City is following a public hearing process defined in the Development Code, and the request meets the applicable requirements in State statute including the facts that all property owners within the annexed area consent in writing to the annexation. No electors reside within the territory proposed for annexation. Annexation of the subject property thus does not require an election.

### **Annexation by Consent of All Owners and Majority of Electors**

#### **ORS 222.125**

- A12.** All property owners within the annexed area have provided their consent in writing. No electors reside within the territory proposed for annexation. However, the City is following a public hearing process as prescribed in the City's Development Code concurrent with a Zone Map Amendment request and other quasi-judicial land use applications.

## **Oregon Statewide Planning Goals**

### **Planning Goals – Generally**

#### **Goals 1, 2, 5, 6, 8, 9, 11, 12, 13, 14**

- A13.** The area proposed for annexation will be developed consistent with the City's Comprehensive Plan and the Frog Pond West Master Plan, both of which have been found to meet the Statewide Planning Goals.

## Housing

### Goal 10

**A14.** The proposed Comprehensive Plan map amendments will continue to allow the City to meet its housing goals and obligations reflected in the Comprehensive Plan. Specifically:

- The City has an existing Housing Needs Analysis and Buildable Lands Inventory adopted in 2014 collectively known as the Wilsonville Residential Land Study. The key conclusions of this study are that Wilsonville: (1) may not have a 20-year supply of residential land and (2) the City's residential policies meet Statewide Planning Goal 10 requirements.
- Under the Metro forecast, Wilsonville is very close to having enough residential land to accommodate expected growth. Wilsonville could run out of residential land by 2032.
- If Wilsonville grows faster than the Metro forecast, based on historic City growth rates, the City will run out of residential land before 2030.
- Getting residential land ready for development is a complex process that involves decisions by Metro, City decision makers, landowners, the Wilsonville community, and others. The City has started the master planning process for Frog Pond East and South neighborhoods to ensure that additional residential land is available within the City. The City also adopted a new plan and development standards for more multi-family units in the Wilsonville Town Center. Finally, the City provides infill opportunities, allowing properties with existing development at more rural densities to be re-zoned for more housing, which this application falls under.
- Wilsonville is meeting Statewide Planning Goal 10 requirements to "provide the opportunity for at least 50 percent of new residential units to be attached single family housing or multiple family housing" and to "provide for an overall density of 8 or more dwelling units per net buildable acre."
- Wilsonville uses a two-map system, with a Comprehensive Plan Map designating a density for all residential land and Zone Map with zoning to implement the Comprehensive Plan designation. Rezoning the subject property to a higher density zone consistent with the Comprehensive Plan will ensure related Zone Map Amendment and development approvals support the Comprehensive Plan and Goal 10.
- The proposal increases density allowed and development capacity within the existing urban growth boundary and improving the capacity identified in the 2014 study. The type of housing is anticipated to be single-family; however, the approval will allow middle housing consistent with House Bill 2001 and newly implemented City code to allow middle housing types.

- The proposal directly impacts approximately 0.8% of the developable residential land identified in the 2014 Wilsonville Residential Land Study (approximately 4 of 477 acres).

**DEVELOPMENT REVIEW BOARD  
RESOLUTION NO. 407**

**A RESOLUTION ADOPTING FINDINGS RECOMMENDING APPROVAL TO CITY COUNCIL OF ANNEXATION OF APPROXIMATELY 4.92 ACRES AND ZONE MAP AMENDMENT FROM RURAL RESIDENTIAL FARM FOREST 5-ACRE (RRFF-5) TO RESIDENTIAL NEIGHBORHOOD (RN) OF APPROXIMATELY 4.07 ACRES, AND ADOPTING FINDINGS AND CONDITIONS APPROVING A STAGE 1 PRELIMINARY PLAN, STAGE 2 FINAL PLAN, SITE DESIGN REVIEW OF PARKS AND OPEN SPACE, TENTATIVE SUBDIVISION PLAT, TYPE C TREE PLAN, AND ABBREVIATED SROZ MAP VERIFICATION FOR A 12-LOT RESIDENTIAL SUBDIVISION.**

WHEREAS, an application, together with planning exhibits for the above-captioned development, has been submitted by Dan Grimberg, West Hills Land Development LLC – Applicant/Owner in accordance with the procedures set forth in Section 4.008 of the Wilsonville Code, and

WHEREAS, the subject site is located at 7315 SW Frog Pond Lane on Tax Lot 7700, and a portion of SW Frog Pond Lane right-of-way, Section 12D, Township 3 South, Range 1 West, Willamette Meridian, Clackamas County, Oregon, and

WHEREAS, the Planning Staff has prepared the staff report on the above-captioned subject dated September 1, 2022, and

WHEREAS, said planning exhibits and staff report were duly considered by the Development Review Board Panel A at a scheduled meeting conducted on September 12, 2022, at which time exhibits, together with findings and public testimony were entered into the public record, and

WHEREAS, the Development Review Board considered the subject and the recommendations contained in the staff report, and

WHEREAS, interested parties, if any, have had an opportunity to be heard on the subject.

NOW, THEREFORE, BE IT RESOLVED that the Development Review Board of the City of Wilsonville does hereby adopt the staff report dated September 1, 2022, attached hereto as Exhibit A1, with findings and recommendations contained therein, and authorizes the Planning Director to issue permits consistent with said recommendations subject to City Council approval of the Annexation and Zone Map Amendment Requests (ANNX22-0001 and ZONE22-0002) for:

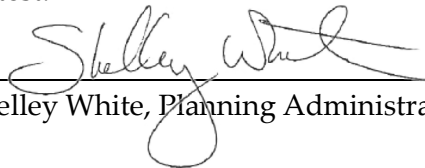
DB22-0002 Frog Pond Overlook: Stage 1 Preliminary Plan (STG122-0002), Stage 2 Final Plan (STG222-0002), Site Design Review of Parks and Open Space (SDR22-0002), Tentative Subdivision Plat (SUBD22-0001), Type C Tree Plan (TPLN22-0001), and Abbreviated SROZ Map Verification (SROZ22-0004).

ADOPTED by the Development Review Board of the City of Wilsonville at a regular meeting thereof this 12<sup>th</sup> day of September, 2022, and filed with the Planning Administrative Assistant on Sept. 13, 2022. This resolution is final on the 15<sup>th</sup> calendar day after the postmarked date of the

written notice of decision per WC Sec 4.022(.09) unless appealed per WC Sec 4.022(.02) or called up for review by the Council in accordance with WC Sec 4.022(.03).

  
\_\_\_\_\_  
Jean Svadlenka, Chair - Panel A  
Wilsonville Development Review Board

Attest:

  
\_\_\_\_\_  
Shelley White, Planning Administrative Assistant



**ORDINANCE NO. 869**

**AN ORDINANCE OF THE CITY OF WILSONVILLE APPROVING A ZONE MAP AMENDMENT FROM THE CLACKAMAS COUNTY RURAL RESIDENTIAL FARM FOREST 5-ACRE (RRFF-5) ZONE TO THE RESIDENTIAL NEIGHBORHOOD (RN) ZONE ON APPROXIMATELY 4.07 ACRES LOCATED NORTH OF SW FROG POND LANE AT 7314 SW FROG POND LANE FOR DEVELOPMENT OF A 12-LOT RESIDENTIAL SUBDIVISION AT FROG POND OVERLOOK.**

WHEREAS, an application has been submitted by West Hills Land Development, LLC – Owner/Applicant, in accordance with the procedures set forth in Section 4.008 of the Wilsonville Code; and

WHEREAS, the subject site is located at 7315 SW Frog Pond Lane on Tax Lot 700, Section 12D, Township 3 South, Range 1 West, Willamette Meridian, Clackamas County, Oregon; and

WHEREAS, certain real property within the Frog Pond West Master Plan is being annexed into the City; and

WHEREAS, the City of Wilsonville desires to have the properties zoned consistent with their Wilsonville Comprehensive Plan Map designation of “Residential Neighborhood” rather than maintain the current Clackamas County zoning designation; and

WHEREAS, concurrent with the adoption of the Frog Pond West Master Plan and designating the subject property as “Residential Neighborhood” on the Comprehensive Plan Map, the City added a new zoning district Residential Neighborhood (RN) intended for application to the Master Plan area; and

WHEREAS, the Zone Map Amendment is contingent upon annexation of the property to the City of Wilsonville, which annexation has been petitioned for concurrently with the Zone Map Amendment request; and

WHEREAS, the City of Wilsonville Planning Staff analyzed the Zone Map Amendment request and prepared a staff report for the Development Review Board, finding that the application met the requirements for a Zone Map Amendment and recommending approval of the Zone Map Amendment, which staff report was presented to the Development Review Board on September 12, 2022; and

WHEREAS, the Development Review Board Panel 'A' held a duly advertised public hearing on the application for a Zone Map Amendment on September 12, 2022, and after taking public testimony and giving full consideration to the matter, adopted Resolution No. 407 (Exhibit C) which recommends City Council approval of the Zone Map Amendment request (Case File No. ZONE22-0002; see DB22-0002), adopts the staff report with findings and recommendation, all as placed on the record at the hearing; and

WHEREAS, on September 19, 2022, the Wilsonville City Council held a public hearing regarding the above described matter, wherein the City Council considered the full public record made before the Development Review Board, including the Development Review Board and City Council staff reports; took public testimony; and, upon deliberation, concluded that the proposed Zone Map Amendment meets the applicable approval criteria under the City of Wilsonville Development Code.

**NOW, THEREFORE, THE CITY OF WILSONVILLE ORDAINS AS FOLLOWS:**

- Section 1. Findings. The City Council adopts, as findings and conclusions, the forgoing Recitals and the Zone Map Amendment Findings in Exhibit B, as if fully set forth herein.
- Section 2. Determination. The official City of Wilsonville Zone Map is hereby amended, upon finalization of the annexation of the property to the City, by Zoning Order ZONE22-0002, attached hereto as Exhibit A, from the Clackamas County Rural Residential Farm Forest - 5 (RRFF-5) Zone to the Residential Neighborhood (RN) Zone.
- Section 3. Effective Date. This Ordinance shall be declared to be in full force and effect thirty (30) days from the date of final passage and approval.

SUBMITTED by the Wilsonville City Council at a regular meeting thereof this 19<sup>th</sup> day of September, 2022, and scheduled the second reading on the 3<sup>rd</sup> day of October, 2022 commencing at the hour of 7:00 p.m. at the Wilsonville City Hall, 29799 SW Town Center Loop East, Wilsonville, Oregon.

---

Kimberly Veliz, City Recorder

ENACTED by the City Council on the 3<sup>rd</sup> day of October, 2022, by the following votes:

Yes: \_\_\_\_\_ No: \_\_\_\_\_

---

Kimberly Veliz, City Recorder

DATED and signed by the Mayor this 3<sup>rd</sup> day of October, 2022.

---

JULIE FITZGERALD MAYOR

SUMMARY OF VOTES:

Mayor Fitzgerald

Council President Akervall

Councilor Lehan

Councilor West

Councilor Linville

EXHIBITS:

- A. Zoning Order ZONE22-0002 Including Legal Description and Sketch Depicting Zone Map Amendment
- B. Zone Map Amendment Findings
- C. Development Review Board Panel A Resolution No. 407 Recommending Approval of Zone Map Amendment

**BEFORE THE CITY COUNCIL OF THE CITY  
OF WILSONVILLE, OREGON**

In the Matter of the Application of	)	
West Hills Land Development LLC	)	
for a Rezoning of Land and Amendment	)	<b>ZONING ORDER ZONE22-0002</b>
of the City of Wilsonville Zoning Map	)	
Incorporated in Section 4.102 of the	)	
Wilsonville Code.	)	

The above-entitled matter is before the Council to consider the application of ZONE22-0002, for a Zone Map Amendment and an Order, amending the official Zoning Map as incorporated in Section 4.102 of the Wilsonville Code.

The Council finds that the subject property ("Property"), legally described and shown on the attached legal description and sketch, has heretofore appeared on the Clackamas County zoning map Rural Residential Farm Forest 5-Acre (RRFF-5).

The Council having heard and considered all matters relevant to the application for a Zone Map Amendment, including the Development Review Board record and recommendation, finds that the application should be approved.

THEREFORE IT IS HEREBY ORDERED that the Property, consisting of approximately 4.07 acres located north of SW Frog Pond Lane at 7315 SW Frog Pond Lane comprising Tax Lot 700 of Section 12D, as more particularly shown and described in the attached legal description and sketch, is hereby rezoned to Residential Neighborhood (RN), subject to conditions detailed in this Order's adopting Ordinance. The foregoing rezoning is hereby declared an amendment to the Wilsonville Zoning Map (Section 4.102 WC) and shall appear as such from and after entry of this Order.

Dated: This 3<sup>rd</sup> day of October, 2022.

\_\_\_\_\_  
JULIE FITZGERALD, MAYOR

APPROVED AS TO FORM:

\_\_\_\_\_  
Amanda Guile-Hinman, City Attorney

ATTEST:

---

Kimberly Veliz, City Recorder

Attachment: Legal Description and Sketch Depicting Land/Territory to be Rezoned

# EXHIBIT A

## LEGAL DESCRIPTION for ZONE CHANGE

May 17, 2022 (Otak #20015)

That property described in Statutory Warranty Deed to West Hills Land Development LLC recorded March 31, 2022 as Document No. 2022-019396, as adjusted by Property Line Adjustment Deed Document No. \_\_\_\_\_, both of Clackamas County Records, in the northwest quarter of the southeast quarter of Section 12, Township 3 South, Range 1 West, Willamette Meridian, Clackamas County, Oregon, the boundaries thereof described as follows:

BEGINNING at a 3/4 inch iron pipe (as shown on Clackamas County Survey No. 7853) which bears North 01°40'13" East along the east line of the southeast quarter of said section a distance of 1748.96 feet, and North 88°35'30" West along the north right of way line of 33.00 foot wide S.W. Frog Pond Lane (County Road No. 2362) a distance of 1908.13 feet from the southeast corner of said section, said POINT OF BEGINNING being the southeast corner of said West Hills Land Development LLC property;

thence along said north right of way line, North 88°35'30" West a distance of 554.86 feet;

thence along the lines common to said West Hills Land Development LLC property and that property described in Statutory Warranty Deed to Derek Osterholme and Amber Osterholme recorded May 20, 2020 as Document No. 2020-036921, Clackamas County Records as adjusted by said Property Line Adjustment Deed, through the following four courses:

North 21°44'17" West a distance of 31.49 feet;

North 01°03'30" East a distance of 231.53 feet;

North 12°24'03" East a distance of 7.90 feet;

and North 82°39'16" East a distance of 575.72 feet to a 1 inch iron pipe (as shown on Clackamas County Survey No. 29676) found at the northeast corner of said West Hills Land Development LLC property, also being the most westerly northwest corner of that property described in Statutory Warranty Deed to Andy Finkbeiner and Tamara L. Pittman recorded May 30, 2001 as Document No. 2001-040160 Clackamas County Records;

thence along the west line of said Finkbeiner and Pittman property,  
South 01°42'32" West a distance of 355.85 feet to the POINT OF BEGINNING.

Contains 4.07 acres, more or less.

REGISTERED  
PROFESSIONAL  
LAND SURVEYOR

2022.05.17

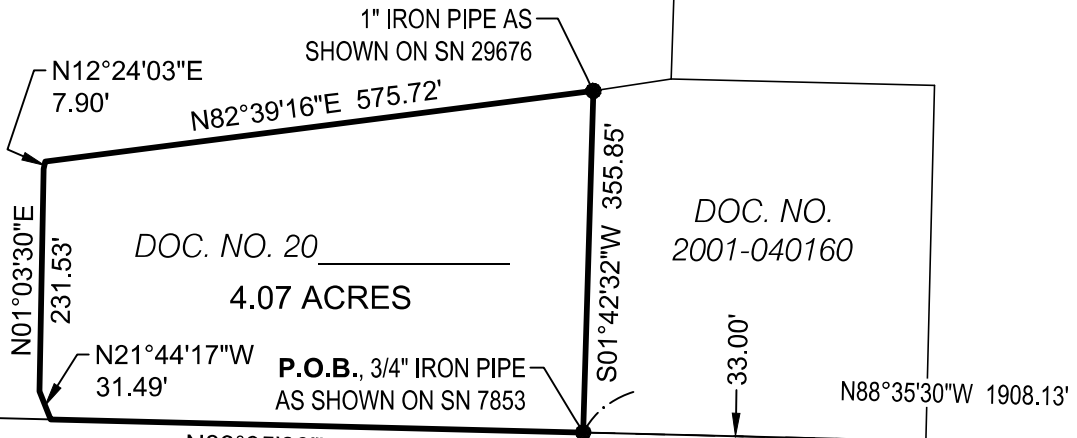
11:34:46-07'00'

OREGON  
NOVEMBER 12, 2013  
MICHAEL D. SPELTS  
87475PLS

RENEWS: JUNE 30, 2024

DOC. NO. 20 \_\_\_\_\_  
 (ADJUSTMENT APPROVED  
 BY CLACKAMAS COUNTY  
 FILE NO. Z0154-22 PLA)

12 7



33.00'



● INDICATES FOUND & HELD  
SURVEY MONUMENT

SCALE: 1"=200'

12 13

S88°35'30"E 2649.57'

S.W. BOECKMAN ROAD (C.R. 80)

12 7 13 18



808 SW 3rd Ave., Ste. 800  
 Portland, Oregon 97204  
 Phone: (503) 287-6825  
 www.otak.com  
 project: 20015

**EXHIBIT B**

ZONE CHANGE, WEST HILLS LAND DEVELOPMENT LLC PROPERTY  
 IN THE NW QUARTER OF THE SE QUARTER OF SECTION 12, TOWNSHIP 3 SOUTH,  
 RANGE 1 WEST, WILLAMETTE MERIDIAN, CLACKAMAS COUNTY, OREGON

MAY 17, 2022



Ordinance No. 869 Exhibit B  
Zone Map Amendment Findings

Frog Pond Overlook 12-Lot Subdivision

City Council  
Quasi-Judicial Public Hearing

---

<b>Hearing Date:</b>	September 19, 2022
<b>Date of Report:</b>	September 6, 2022

---

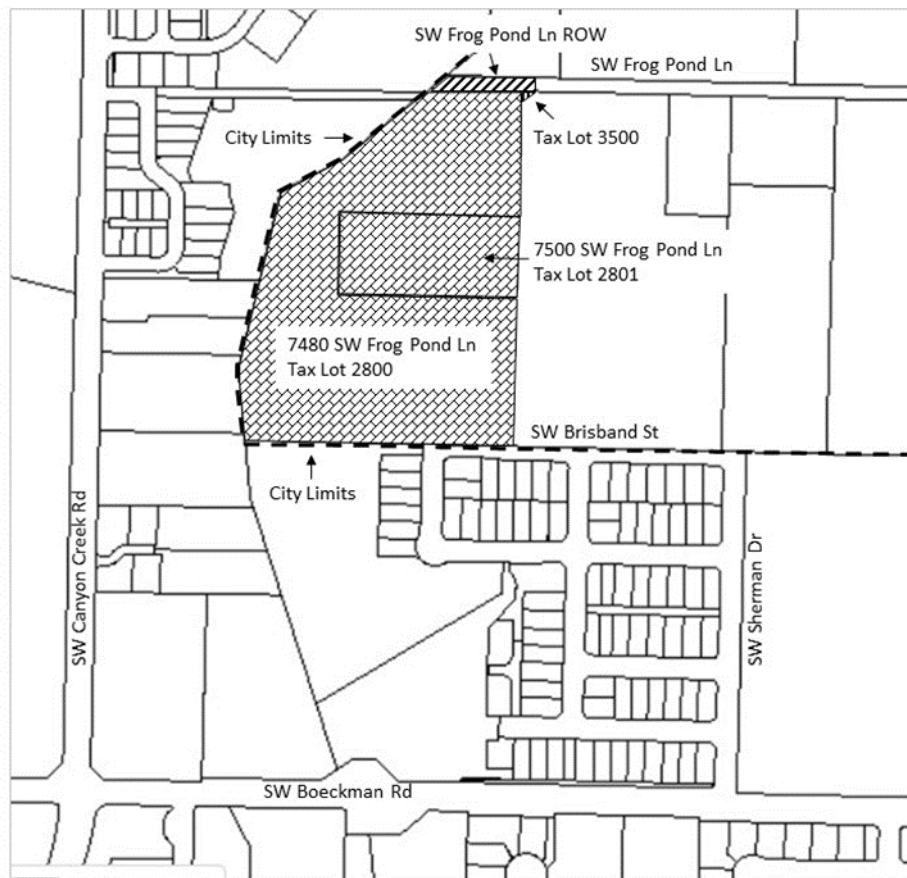
<b>Application No.:</b>	ZONE22-0002 Zone Map Amendment
<b>Request:</b>	The request before the City Council is a Zone Map Amendment for approximately 4.07 acres.
<b>Location:</b>	7315 SW Frog Pond Lane. The property is specifically known as TLID 700, Section 12D, Township 3 South, Range 1 West, Willamette Meridian, Clackamas County, Oregon.
<b>Owner/Applicant:</b>	West Hills Land Development LLC (Contact: Dan Grimberg)
<b>Applicant's Rep.:</b>	OTAK, Inc. (Contact: Li Alligood AICP)
<b>Comprehensive Plan Designation:</b>	Residential Neighborhood
<b>Zone Map Classification (Current):</b>	Rural Residential Farm Forest 5-Acre (RRFF-5)
<b>Zone Map Classification (Proposed Concurrent with Annexation):</b>	Residential Neighborhood (RN)
<b>Staff Reviewer:</b>	Georgia McAlister, Associate Planner
<b>Staff/DRB Recommendation:</b>	<u>Adopt</u> the requested Zone Map Amendment.



**Applicable Review Criteria:**

<b><u>Development Code:</u></b>	
Section 4.110	Zones
Section 4.127	Residential Neighborhood (RN) Zone
Section 4.197	Zone Changes
<b><u>Comprehensive Plan and Sub-elements:</u></b>	
Citizen Involvement	
Urban Growth Management	
Public Facilities and Services	
Land Use and Development	
Plan Map	
Area of Special Concern L	
Transportation Systems Plan	
Frog Pond West Master Plan	
<b><u>Regional and State Law and Planning Documents</u></b>	
Statewide Planning Goals	

## Vicinity Map



## Summary:

### Zone Map Amendment (ZONE22-0002)

Concurrent with the adoption of the Frog Pond West Master Plan, the City added a new zoning district, Residential Neighborhood (RN), intended for application to the Master Plan area. The applicant proposes applying the RN Zone to the annexed area consistent with this intention.

## Conclusion and Conditions of Approval:

Staff and the Development Review Board recommend the City Council approve the Zone Map Amendment with the following condition:

### Request: Zone Map Amendment (ZONE22-0002)

This action is contingent upon annexation of the subject properties to the City of Wilsonville (ANNX22-0001).

## Findings:

NOTE: Pursuant to Section 4.014 the burden of proving that the necessary findings of fact can be made for approval of any land use or development application rests with the applicant in the case.

### General Information

#### Application Procedures-In General Section 4.008

The City's processing of the application is in accordance with the applicable general procedures of this Section.

#### Initiating Application Section 4.009

The owners of all property included in the application signed the application forms. West Hills Land Development LLC initiated the application with their approval.

### Request: Zone Map Amendment (ZONE22-0002)

As described in the Findings below, the request meets the applicable criteria or will by Conditions of Approval.

### Comprehensive Plan

"Residential Neighborhood" on Comprehensive Plan Map, Purpose of "Residential Neighborhood" Designation  
Policy 4.1.7.a.

**B1.** The subject area has a Comprehensive Plan Map Designation of "Residential Neighborhood". The designation enables development of the site consistent with the purpose of this designation as set forth in the legislatively adopted Frog Pond West Master Plan, resulting in an attractive, cohesive and connected residential neighborhood with high quality architecture and community design, transportation choices, and preserved and enhanced natural resources.

"Residential Neighborhood" Zone Applied Consistent with Comprehensive Plan  
Implementation Measure 4.1.7.c.

**B2.** The applicant requests the subject area receive the zoning designation of Residential Neighborhood (RN) as required for areas with the Comprehensive Plan Map Designation of "Residential Neighborhood".

## Safe, Convenient, Healthful, and Attractive Places to Live

### Implementation Measure 4.1.4.c.

- B3.** The proposed RN zoning allows the use of planned developments consistent with the legislatively adopted Frog Pond West Master Plan, enabling development of safe, convenient, healthful, and attractive places to live.

## Residential Density

### Implementation Measure 4.1.4.u.

- B4.** The subject area will be zoned RN allowing application of the adopted residential densities of the Frog Pond West Master Plan. The sub-districts established in the Frog Pond West Master Plan govern the allowed residential densities.

## Development Code

### Zoning Consistent with Comprehensive Plan

#### Section 4.029

- B5.** The applicant requests a zone change concurrently with a Stage 1 Preliminary Plan, Stage 2 Final Plan, and other related development approvals. The proposed zoning designation of RN is consistent with the Comprehensive Plan “Residential Neighborhood” designation. See also Finding B2 above.

## Base Zones

### Subsection 4.110 (.01)

- B6.** The requested zoning designation of RN is among the base zones identified in this subsection.

## Residential Neighborhood (RN) Zone

### Purpose of the Residential Neighborhood (RN) Zone

#### Subsection 4.127 (.01)

- B7.** The request to apply the RN Zone on lands designated “Residential Neighborhood” on the Comprehensive Plan Map enables a planned development process implementing the “Residential Neighborhood” policies and implementation measures of the Comprehensive Plan and the Frog Pond West Master Plan.

### Permitted Uses in the Residential Neighborhood (RN) Zone

#### Subsection 4.127 (.02)

- B8.** Concurrent with the Zone Map Amendment request the applicant requests approval of a 12-lot residential subdivision. Single-family dwelling units, Duplex, Triplex, Quadplex, Cluster Housing, Cohousing, Cluster Housing (Frog Pond West Master Plan), open space, and public and private parks are among the permitted uses in the RN Zone.

**Residential Neighborhood (RN) Zone Sub-districts and Residential Density**  
 Subsection 4.127 (.05) and (.06)

- B9.** The proposed uses, number of lots, preservation of open space, and general block and street layout are generally consistent with the Frog Pond West Master Plan. Specifically in regards to residential land use lot count, the proposed Stage 1 area includes a portion of large lot Sub-district 8. The following table summarizes how the proposed residential lots in each Sub-district are consistent with the Master Plan recommendations. The applicant proposes 12 lots in Sub-district 8, which is one (1) lot greater than the maximum proportional density calculation for the site.

Subdistrict and Land Use Designation	Gross Site Area (ac)	Percent of Sub-district	Established lot range for Sub-district	Lot Range for Site	Proposed Lots	Total lots within Sub-district - Approved and Proposed
8 – R-10	3.96	20.7%	43-53	9-11	12	25 Approved 12 Proposed 37 Total

The proportional density allocation does not account for site-specific characteristics that influence the ability of a specific property to accommodate residential lots meeting minimum dimensional standards. The portion of the subject property within Sub-district 8 that is not dedicated as right-of-way (82.5%) is much greater than in other subareas. Minimal right-of-way dedication is required because the section of SW Frog Pond Lane adjacent to the site is a local street, which allows driveway access and the layout of Street A has been designed to accommodate the Boeckman Creek Trail on the western portion of the property resulting in the reduction of anticipated right-of-way dedication. As a result of the minimal right-of-way dedication it is possible to for the site to easily accommodate 12 lots, one (1) greater than the maximum density, while meeting minimum lot size standards. The configuration of lots as proposed will allow for buildout of the sub-district consistent with the Master Plan recommendations.

**DEVELOPMENT REVIEW BOARD  
RESOLUTION NO. 407**

**A RESOLUTION ADOPTING FINDINGS RECOMMENDING APPROVAL TO CITY COUNCIL OF ANNEXATION OF APPROXIMATELY 4.92 ACRES AND ZONE MAP AMENDMENT FROM RURAL RESIDENTIAL FARM FOREST 5-ACRE (RRFF-5) TO RESIDENTIAL NEIGHBORHOOD (RN) OF APPROXIMATELY 4.07 ACRES, AND ADOPTING FINDINGS AND CONDITIONS APPROVING A STAGE 1 PRELIMINARY PLAN, STAGE 2 FINAL PLAN, SITE DESIGN REVIEW OF PARKS AND OPEN SPACE, TENTATIVE SUBDIVISION PLAT, TYPE C TREE PLAN, AND ABBREVIATED SROZ MAP VERIFICATION FOR A 12-LOT RESIDENTIAL SUBDIVISION.**

WHEREAS, an application, together with planning exhibits for the above-captioned development, has been submitted by Dan Grimberg, West Hills Land Development LLC – Applicant/Owner in accordance with the procedures set forth in Section 4.008 of the Wilsonville Code, and

WHEREAS, the subject site is located at 7315 SW Frog Pond Lane on Tax Lot 7700, and a portion of SW Frog Pond Lane right-of-way, Section 12D, Township 3 South, Range 1 West, Willamette Meridian, Clackamas County, Oregon, and

WHEREAS, the Planning Staff has prepared the staff report on the above-captioned subject dated September 1, 2022, and

WHEREAS, said planning exhibits and staff report were duly considered by the Development Review Board Panel A at a scheduled meeting conducted on September 12, 2022, at which time exhibits, together with findings and public testimony were entered into the public record, and

WHEREAS, the Development Review Board considered the subject and the recommendations contained in the staff report, and

WHEREAS, interested parties, if any, have had an opportunity to be heard on the subject.

NOW, THEREFORE, BE IT RESOLVED that the Development Review Board of the City of Wilsonville does hereby adopt the staff report dated September 1, 2022, attached hereto as Exhibit A1, with findings and recommendations contained therein, and authorizes the Planning Director to issue permits consistent with said recommendations subject to City Council approval of the Annexation and Zone Map Amendment Requests (ANNX22-0001 and ZONE22-0002) for:

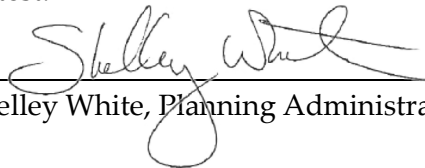
DB22-0002 Frog Pond Overlook: Stage 1 Preliminary Plan (STG122-0002), Stage 2 Final Plan (STG222-0002), Site Design Review of Parks and Open Space (SDR22-0002), Tentative Subdivision Plat (SUBD22-0001), Type C Tree Plan (TPLN22-0001), and Abbreviated SROZ Map Verification (SROZ22-0004).

ADOPTED by the Development Review Board of the City of Wilsonville at a regular meeting thereof this 12<sup>th</sup> day of September, 2022, and filed with the Planning Administrative Assistant on Sept. 13, 2022. This resolution is final on the 15<sup>th</sup> calendar day after the postmarked date of the

written notice of decision per WC Sec 4.022(.09) unless appealed per WC Sec 4.022(.02) or called up for review by the Council in accordance with WC Sec 4.022(.03).

  
\_\_\_\_\_  
Jean Svadlenka, Chair - Panel A  
Wilsonville Development Review Board

Attest:

  
\_\_\_\_\_  
Shelley White, Planning Administrative Assistant