

TUALATIN CITY PLANNING COMMISSION MEETING

WEDNESDAY, JULY 17, 2024 TUALATIN CITY SERVICES BUILDING 10699 SW HERMAN RD TUALATIN, OR 97062

Join Zoom Meeting:

https://us02web.zoom.us/j/86029812078?pwd=5OHcM3nFrhY1f2m3A0JrGTXXoIHYin.

L Meeting ID: 860 2981 2078 Passcode: 468623

Bill Beers, Chair Janelle Thompson, Vice Chair, Ursula Kuhn, Randall Hledik, Brittany Valli, Zach Wimer

CALL TO ORDER & ROLL CALL

ANNOUNCEMENTS & PLANNING COMMISSION COMMUNICATION

1. Recognition of Daniel Bachhuber for dedication and exemplary service to the Tualatin Planning Commission.

APPROVAL OF MINUTES

1. Review or meeting minutes from April 17, 2024 and May 15, 2024

COMMUNICATION FROM THE PUBLIC (NOT ON THE AGENDA)

Limited to 3 minutes

ACTION ITEMS

- The applicant, Miller Nash LLP, is requesting approval of a zoning map adjustment from Light Manufacturing (ML) to Medium-Low Density Residential (RML) of approximately 3,681 square-foot portion of land that has been historically occupied by the Willow Glen Mobile Home Park. Plan Map Amendment (PMA24-0001).
- 2. The Tualatin Planning Commission is asked to provide a recommendation to the City Council on adoption of the Stormwater Master Plan, the Basalt Creek Parks and Recreation Plan, and corresponding amendments to relevant Comprehensive Plan policies and Development Code references (Plan Text and Plan Map Amendments PTA/PMA 24-0003).

COMMUNICATION FROM CITY STAFF

FUTURE ACTION ITEMS

ADJOURNMENT

Tualatin Planning Commission

MINUTES OF APRIL 17, 2024 (NOT ADOPTED)

TPC MEMBERS PRESENT:	STAFF PRESENT:
William Beers, Chair	Steve Koper, Assistant Community Director
Zach Wimer, Commissioner	Erin Engman, Senior Planner
Brittany Valli, Commissioner	Keith Leonard, Associate Planner
Ursula Kuhn, Commissioner	Lindsey Hagerman, Office Coordinator

TPC MEMBERS ABSENT:

Janelle Thompson, Vice Chair Daniel Bachhuber, Commissioner Randall Hledik, Commissioner

CALL TO ORDER AND ROLL CALL

The meeting was called to order at 6:40 p.m. and roll call was taken.

ACTION ITEMS

 Consideration of a Conditional Use Permit (CUP24-0001) for "Vehicle Repair" limited to vehicle battery service/replacement for only AAA members on a 1.87 acres site in the Light-Manufacturing (ML) zone within a building located at 18155 SW Teton Avenue, (Tax Lot: 2S123BB 00701).

Chair Beers declared that he is an AAA member and drove by the site. He stated he is not biased and will be participating.

Keith Leonard, Associate Planner, presented an overview of the project this included Site background, Applicable Criteria, and recommendation. He explained a brief overview of the site background and what is the purpose of a Conditional Use Permit.

Mr. Leonard recapped the review process and dates of the application. He noted the use category would be limited to only vehicle battery service and replacement and only AAA members would be allowed to use the service. He shared because this is a commercial use on industrially zoned property and therefore the use has limitations. He noted the property is located within the Industrial Area design type boundary and commercial uses are limited.

Mr. Leonard explained AAA is the sole tenant in the building, and this will be the only commercial use on the site. The proposed use cannot exceed 5,000 square feet. The applicant is proposing approximately 2,315 square feet for the use, which is under the maximum of 5,000

square feet. He shared an illustration of how the proposed use will function on the site. He noted the approval criteria which included objectives and policies of the Tualatin Comprehensive Plan that are applicable to the proposed use.

Mr. Leonard stated the Conditional Use Permit Criteria listed in Section 33.040 (5) of the Tualatin Development Code. He noted the applicant has demonstrated through their application submittal that they meet approval criteria "A" through "E," as described in the "Findings and Analysis."

Mr. Leonard spoke about Comprehensive Goals and Policies related to community involvement, economy and transportation and how the City continues to support local employment and businesses. He noted that the goals and policies were designed to limit impacts to abutting properties and residential areas.

Mr. Leonard highlighted an additional requirement from TDC 60.210(7) that prohibits Conditional Uses from locating closer than 300 feet to residentially zoned property. He explained the adjacent properties to the north are zoned Low-Density Residential. The proposed use will be located more than 300 feet from the residential uses with the centerline of Tualatin Road being about 330 feet.

Mr. Leonard went through the five Conditions of Approval, CUP-1 though CUP-5, explaining how they will ensure the proposed use will not impact other properties in the area. He then concluded that through the Findings and Analysis and evaluation of the CUP, the proposed use meets the approval criteria, and respectfully recommended approval of CUP 24-0001 with CoA CUP-1 through CUP-5.

The applicant Scott Thompson from AAA and Willis DeWitt from Woofer Bloch Architects introduced themselves and provided a brief history of this project.

Commissioner Valli asked what kind of vehicles would be serviced. The applicant answered there would be limits on vehicle size to passenger vehicles and light duty trucks.

Chair Beers asked what kind of battery. The applicant answered a normal car battery.

Commissioner Wimer asked if they manage any service points like this in the area. The applicant answered this is the first one in the country.

Commissioner Wimer asked what outreach and compliance they have done with Clean Water Services or other organizations for compliance and TDC Chapter 63 for storage and disposal of batteries. The applicant answered that all the batteries are stored in self-contained pallets. They will have spill kits on hand if any spill does occur.

Mr. Leonard let the commissioners know he has spoken with Clean Water Services, and they are coordinating with the applicant and a condition of approval was included for this reason.

Commissioner Wimer made a motion to approve CUP24-0001. Commissioner Valli seconded the motion and passed unanimously (4-0).

2. The Planning Commission is asked to provide a recommendation to the City Council on a city-initiated amendment proposal to comply with state-mandated rulemaking known as Climate Friendly and Equitable Communities (CFEC) Parking Reform (PTA 24-0002)

Erin Engman, Senior Planner, introduced the project and shared the presentation agenda. She noted that Climate Friendly and Equitable Communities (CFEC) is a direct response from Governor Browns Executive Order No. 20-04. She noted the rules require updates to land use regulations and transportation plans to encourage a reduction in greenhouse gases. She noted CFEC is implemented through Oregon Administrative Rules and Department of Land Conservation and Development (DLCD) Ms. Engman noted that while CFEC also requires broad updates to our land use regulation and transportation system plan, tonight's conversation centers around parking regulations.

Ms. Engman noted that CFEC is applicable to eight metropolitan regions throughout Oregon.

Ms. Engman explained a brief history of minimum parking requirements and some of the regulatory parking barriers for businesses trying to relocate in our community. She went on to explain the CFEC requires Tualatin to remove minimum parking requirements, to apply standards for pedestrian connectivity, tree canopy, and electric vehicle charging conduit, and to apply parking maximums downtown and along frequent transit routes.

Ms. Engman shared that some phases of the mandate have already taken effect. She noted that while our code has not yet been amended to comply with the various components of CFEC, our practice is to apply the applicable Oregon Administrative Rules to development applications submitted after the effective dates. She noted this update will provide greater transparency of the state requirements for developers.

Ms. Engman provided an overview of the proposed code amendments and affected development code chapters.

Ms. Engman highlighted electric vehicle readiness standards that require electric conduit to service Type 2 EV chargers at commercial and multi-family developments.

Ms. Engman presented parking lot coverage standards to make efficient use of urban land. She explained that parking lots cannot exceed the proposed floor area of development for buildings that have a floor area of more than 65,000 square feet.

Ms. Engman shared the state now requires tree canopy standards for parking lots under a halfacre to have tree canopy coverage of 40% or greater and for larger parking lots, trees along driveway entrances, in addition to providing some form of climate mitigation. The tree canopy is calculated using the expected tree crown, 15 years after planting.

CFEC also requires parking maximums. She highlighted parking maximums are presently included in our development and are broken down between Zones A and B. Zone A includes the town center (also referred to as our downtown) and in corridors along frequent transit routes, which is defined as 20-minute service during peak hours. Zone B is our remaining land. CFEC goes one step further to establish parking maximum thresholds for multifamily development and most commercial/retail development in Zone A. Ms. Engman also noted that the new threshold for retail uses is not a substantial change to what is currently in the code.

Ms. Engman noted that staff provided a Findings and Analysis included as Attachment A that found the project will maintain consistency with the applicable state, regional, and local regulations.

The presentation concluded and the Tualatin Planning Commission was asked to forward a recommendation of approval to the City Council for the proposed CFEC Parking Reform amendments under File No. PTA24-0002.

Chair Beers asked if staff would be making recommendations to developers for parking. Ms. Engman noted that developers typically engage consultants to conduct market analysis for parking needs. Mr. Koper noted that developers arrive at parking recommendations through data extrapolated from the level of vehicle traffic generated by a specific use.

Commissioner Kuhn asked if the rules apply to the current tenant or tax lot. Ms. Engman shared the rules apply to new development and re-development applications.

Chair Beers noted the library has an abundance of compact stalls and asked if they could restripe the parking lot under the new rules. Mr. Koper answered there is a 35% maximum cap on how many stalls can be compact.

Commissioner Wimer asked if CFEC holds any mandatory burden on existing parking lots. Ms. Engman stated that it does not.

Chair Beers asked about electric requirement if it's conduit only. Ms. Engman answered that Chair Beers is correct.

Commissioner Wimer asked about the 40% tree canopy and solar power requirements. Ms. Engman clarified there is a menu of options for parking areas over a half-acre, where a developer may choose one or multiple climate mitigation strategies.

Commissioner Wimer asked for clarification as to whether the overall building footprint or interior space of the structure was included in the greater than 65,000 square foot maximum code language. Ms. Engman answered it is the total gross floor area of 65,000.

Chair Beers asked if there is a distinction between deciduous and evergreen trees. Mr. Koper noted the intent for it to be at maturity and deciduous would likely be easier to meet standard.

Commissioner Valli asked about how 40% is determined in 15 years if someone comes out to measure the standard. Ms. Engman answered the applicant would be required to demonstrate the standard will be met with their development application.

Commissioner Wimer asked about permeability parking lot standards. Ms. Engman stated she is not aware of any. Mr. Koper noted that pervious surface can sometimes be used to meet storm water requirements with development but there is no mandate as part of these amendments.

Chair Beers asked about redevelopment versus new development and if up zoning apartments would trigger the need to add electrical service for the re-development. Ms. Engman noted potentially if they made improvements to the parking lot. Mr. Koper confirmed it's possible and could affect re-development.

Commissioner Valli asked what would happen if we didn't adopt this. Mr. Koper replied that the deadline had already passed and the City asked for an extension from the State. He explained starting on July 1 parking minimums would just go away due to the state mandate and we would not be able to apply our local rules.

Chair Beers moved to make a motion to send a recommendation for approval of PTA 24-0002 to the City Council for the proposed CFEC Parking Reform amendments. Commissioner Wimer seconded this motion. The motion was passed unanimously (4-0).

COMMUNICATION FROM STAFF

Mr. Koper briefly spoke about the potential agenda for May 15th meeting.

ADJOURNMENT

A motion to adjourn was made by Commissioner Valli. The motion was seconded by Chair Beers. The Planning Commissioners unanimously voted to adjourn the meeting at 7:37p.m.

Tualatin Planning Commission

MINUTES OF May 15, 2024 (NOT ADOPTED)

TPC MEMBERS PRESENT:

STAFF PRESENT:

William Beers, Chair Zach Wimer, Commissioner Janelle Thompson, Vice Chair Brittany Valli, Commissioner Randall Hledik, Commissioner Steve Koper, Assistant Community Director Lindsey Hagerman, Office Coordinator

TPC MEMBERS ABSENT:

Ursula Kuhn, Commissioner

CALL TO ORDER AND ROLL CALL

The meeting was called to order at 6:30 p.m. and roll call was taken.

APPROVAL OF MINUTES

Commissioners unanimously voted to approve the March 27, 2024 minutes.

ACTION ITEMS

1. TriMet will provide an informational presentation on its Forward Together ridership and equity-focused system redesign

Grant O'Connell from TriMet started his presentation and shared background of the project. He explained there are two different phases of Forward Together. He shared this is part of TriMet's post-pandemic service concept to guide restoration and growth with community engagement. He noted the pandemic really changed and shaped these goals. He showed a graph of how the bus system has changed during and after the pandemic.

Mr. O'Connell illustrated the profound shifts brought about by the pandemic. He highlighted how certain bus lines maintained their ridership, catering to areas with in-person work and lowincome communities. Conversely, he noted that other lines experienced a decline in ridership, particularly those service areas where hybrid and remote work have become prevalent, such as higher-income communities.

Mr. O'Connell discussed the public outreach initiatives undertaken to inform their service recovery plan. He highlighted a survey aimed at determining TriMet's priorities for restoring service, which had 5,400 individuals participating. Among the top responses were calls to prioritize the restoration of ridership, alleviate congestion, and enhance services for lower-income individuals.

Mr. O'Connell presented a changed model for accessing communities. He emphasized that the median number of jobs reachable by residents within a 45-minute service area would increase by 45%, indicating significant overall improvements in job accessibility.

Commissioner Hledik asked clarification on the color of the map and how they pick points. Mr. O'Connell answered they run different models through the data base and it comes down to professional judgement. He explained the software they use is the basis for decision-making. He noted they did this project with all 26 jurisdictions for transportation service input.

Commissioner Hledik asked who in Tualatin helps identify transportation service needs. Mr. O'Connell answered Mike McCarthy and Cody Field.

Mr. O'Connell shared where the ideas came from, including TriMet's Service Enhancement Plans, the Forward Together plan, and municipal staff workshops. He shared they plan on expansion of frequent network, more local services, expand weekend service and hybrid/return to work schedules.

Mr. O'Connell explained how they do long-range planning. He explained their plan overall to get back the 22% level lost during the pandemic. He shared they would like to not only restore but also grow back, in a conservative way. He shared their plan to expand their frequent service network. He shared specific lines that run through Tualatin.

Commissioner Hledik asked clarification on the chart if it was growth over the last year. Mr. O'Connell answered it was total of percent growth.

Mr. O'Connell shared specific Tualatin Service Lines and how TriMet is extending these lines and adding different weekend services.

Chair Beers asked where in Lake Oswego Line 97 would go. Mr. O'Connell answered that it would go downtown.

Commissioner Hledik asked how often the lines runs. Mr. O'Connell answered Line 94 runs every 20 minutes, Line 76 runs every 15 minutes, and Line 96 and Line 97 run every 30 minutes.

Mr. O'Connell explained the implementation steps including outreach and operator hiring. The latter being TriMet's biggest challenge due to labor shortages. He noted that system growth of 38% would require 500 more operators to be employed. He shared a graph of weekly vehicle hour growth.

Commissioner Hledik asked clarification on the graph if it was growth since last year. Mr. O'Connell explained the percentage is different year to year.

Mr. O'Connell switched gears to speak about Forward Together 2.0. He shared this is ann aspirational vision for TriMet service growth in response to community desires and support.

Vice Chair Thompson asked how they advertise the new lines. Mr. O'Connell shared planning process people are engaged and mailings near the route. He also shared they might do a community event in celebration of a new line.

Mr. O'Connell noted that revisions for long range goals included a 12.2% transit mode share of total trips.

Commissioner Hledik asked why 12.2%. Mr. O'Connell answered that the goals were set to reduce greenhouse gas reductions and Metro was ultimately responsible for the specifics of the goals.

Mr. O'Connell shared the next steps TriMet plans on doing with Forward Together 1.0 and 2.0.

Vice Chair Thompson asked if TriMet is able to capture the new developments for their planning. Mr. O'Connell answered yes, and shared they met with City of Tualatin. He spoke about ridership modeling technology and how they work together with different modeling projections.

Assistant Community Development Director, Steve Koper, asked where people can find information on upcoming events. Mr. O'Connell answered people can sign up on their website for updates.

Commissioner Hledik asked if the City can rely on TriMet to work on lines in the new development. Mr. Koper answered yes, we are working with them.

2. Ride Connection will provide an informational presentation on its service and operations

Tangerine Behere and her colleagues from Ride Connection introduced themselves. She shared an overview and brief history of Ride Connections. Ms. Behere elaborated on the various connections the organization facilitates, providing insights into each: community connectors, demand response, volunteer driver program, ride together, shared vehicle agreements, ride wise, travel options counseling, and mobility for health.

Commissioner Hledik said it sounded like they are Uber/Lfyt and asked how one could use their services to go to a to a doctor's appointment. Ms. Behere answered they need to call the service center and give three to five business days' notice before an appointment. Debbie Waalkes noted they determine if they can do a ride based on staff or volunteer availability.

Commissioner Hledik asked if the service is free. Ms. Waalkes and Ms. Behere answered it is free to the user and funded by donations.

Commissioner Hledik asked what the qualifications are for a ride. Miranda Seekins answered that the recipient must be 60 or older and/or have a disability. Ms. Waalkes noted this includes temporary disabilities such as cancer treatment or broken leg.

Vice Chair Thompson asked if Ride Connection was the same thing as the Tualatin Shuttle. Ms. Behere responded, stating that the name is tailored to the location of the connecting ride; in this case, Tualatin.

Commissioner Hledik asked if the shuttle makes regular runs to the high school. Ms. Seekins shared they have a map of the shuttle on the slides to share.

Ms. Behere shared a map of the shuttle's green, blue and red lines.

Commissioner Hledik asked how someone would use the shuttle from park and ride. Ms. Waalkes explained they are considered first mile and last mile service for many.

Commissioner Wimer shared he uses the shuttle.

Commissioner Valli asked if the shuttle is free. Ms. Behere answered that yes, it is.

Ms. Seekins shared the bus route schedule and times. She noted live stops are option and schedule deviation half a mile off the route.

Ms. Behere discussed the impact, value, and benefits of Ride Connection. She emphasized how the routes foster community connections, improve livability, stimulate economic vitality, and mitigate greenhouse gas emissions. She emphasized that these initiatives receive support through regional transit plans, serving as a model for the wider region.

Ms. Behere shared rider survey for the Tualatin Shuttle and dip in services. Ms. Waalkes spoke about increase services to Rolling Hills Church Monday and Wednesday.

Ms. Seekins talked about a new route they will be launching late summer early fall 2024.

Vice Chair Thompson asked the frequency of the new bus route. Ms. Seekins answered it depends on the time of day and driver breaks but it's roughly once an hour.

Vice Chair Thompson asked if all the routes typically have one driver. Ms. Waalkes answered there is one driver in the morning and one in the afternoon.

COMMUNICATION FROM STAFF

Mr. Koper spoke about the upcoming agenda items for future meetings.

COMMUNICATION WITH COMMISSIONERS

Susan Noack from the Tualatin Chamber of Commerce shared her opinions on the significance of the bus system for Tualatin and shared some history on importance for the community. She also spoke about the Aging Task Force and the need and desire for long-range planning for the aging community.

Chair Beers invited Ms. Noack to come to a future planning commission meeting to share her knowledge from the Tualatin Chamber of Commerce on the ageing community.

ADJOURNMENT

A motion to adjourn was made by Commissioner Valli. The motion was seconded by Chair Beers. The Commissioners voted unanimously to adjourn the meeting at 7:45 p.m.

Willow Glen Plan Zoning Map Adjustment (PMA 24-0001)

> Tualatin Planning Commission July 17, 2024



PROJECT DESCRIPTION

Miller Nash LLP is requesting approval of a zoning map adjustment from Light Manufacturing (ML) to Medium-Low Density Residential (RML) of approximately 3,681 square-foot portion of land that has been historically occupied by the Willow Glen Mobile Home Park (tax lot 3200). The request is being processed as a Plan Map Amendment (PMA)



PROPOSAL

The requested Plan Map Amendment (PMA) would:

- Change the existing zoning from Light Manufacturing (ML) to Medium-Low Density Residential (RML).
- Not create additional dwelling units or developable land; the adjustment is intended to better reflect "on the ground" conditions.
- Change industrial zoning to residential zoning on an approximately 9' x 405' or 3,681 sq. ft. area of land to match the current residential use.
- Eliminate what is currently a nonconforming use of industrial land for residential use.



PMA SUBJECT AREA & EXISTING USE





PMA CURRENT ZONING





SURVEY





APPLICABLE CRITERIA

- The Amendment is consistent with applicable Oregon Statewide Planning Goals and Administrative Rules.
- The Amendment is consistent with applicable Metro Chapter 70 Urban Growth Management Functional Plan
- The Amendment Conforms with Tualatin's Comprehensive Plan
- No conflicts with the Tualatin Development Code.
 - The Recommendation meets applicable approval criteria found in TDC 33.070 (5)



OREGON STATEWIDE PLANNING GOALS & ADMINISTRATIVE RULES

- State Planning Goals The proposed PMA is in compliance with applicable goals
- State Administrative Rules No conflicts with State Administrative Rules were identified and due to the limited scope of the PMA a Transportation Impact Analysis is not warranted.



AMENDMENT CONFORMS TO THE TUALATIN COMPREHENSIVE PLAN

Comprehensive Plan goals and policies serve as the adopted expression of the public interest. The applicant has provided evidence that the proposed **Map Amendment** would satisfy the following Plan goal and policies:

- GOAL 1.1 COMMUNITY INVOLVEMENT. Implement community involvement practices in line with Statewide Planning Goal 1.
- POLICY 1.1.1 Support community advisory committees to provide recommendations on planning matters.
- POLICY 1.1.3. Conduct the planning process with adequate input and feedback from citizens in each affected neighborhood
- Due to the limited scope of the proposed zoning map adjustment, lack of new residential development capacity, there are few goals and policies from the Comprehensive Plan that apply to this proposal.



METRO CHAPTER 3.07 URBAN GROWTH MANAGEMENT FUNCTIONAL PLAN

- No conflicts with approval of this PMA and Metro Chapter 3.07 were identified.
- Due to the limited scope of the PMA, 3,861 sqft, no noticeable impact is expected to industrial land.



TUALATIN DEVELOPMENT CODE (TDC)

- TDC 33.070 (5) Plan Amendment Criteria
 - No conflict with the PMA criteria identified.
 - No conflict with Table 41-3 Development Standards in the RML Zone.
 - Proposal will actually eliminate the nonconforming use of industrially zoned land being used for residential use.
 - The public interest is best protected by granting the amendment at this time.



TPC ACTION

The Planning Commission is asked to make a recommendation to City Council on PMA 24-0001. The TPC may recommend to the council:

- Approval either as proposed or with modifications;
- Denial; or
- Neither approval nor denial (i.e a "neutral" recommendation).





CITY OF TUALATIN Staff Report

TO:	Tualatin Planning Commissioners
SUBJECT:	Willow Glen Zoning Map Adjustment (PMA24-0001)
THROUGH:	Steve Koper, Assistant Community Development Director
FROM:	Keith Leonard, Associate Planner
DATE:	July 17, 2024

SUBJECT:

The applicant, Miller Nash LLP, is requesting approval of a zoning map adjustment from Light Manufacturing (ML) to Medium-Low Density Residential (RML) of approximately 3,681 square-foot portion of land that has been historically occupied by the Willow Glen Mobile Home Park. Plan Map Amendment (PMA24-0001).

EXECUTIVE SUMMARY:

The proposal was submitted by Miller Nash LLP on behalf of the property owners, Life Front 2 LLC and LU QBF II LLC, requesting a zoning map adjustment for an approximately 3,681 square-foot portion of land that has been historically occupied by the Willow Glen Mobile Home Park. This subject property will be deeded from the property owner to Willow Glen Mobile Home Park through property line adjustment (PLA24-0001). The Willow Glen Mobile Home Park, located at 9700 SW Tualatin Road (Tax Map/Lot 2S123BA03200) is zoned Medium Low Density Residential (RML). The proposed zoning map adjustment (Plan Map Amendment (PMA)) will rezone the 3,681 square foot portion of property located at 9975 SW Herman Road (Tax Map/Lot 2S123BA03200) and 9905 SW Herman Road (Tax Map/Lot 2S123BA03100) from Light Manufacturing (ML) to RML, consistent with its historical use as part of the Mobile Home Park. No additional dwelling units will result in approval of this PMA. The three tax lots consists of a total of 12.87 acres. Tax Lot 2900 consists of approximately 6.6 acres before the adjustment and 6.5 acres after the adjustment. Tax Lot 3100 consists of approximately 1.87 acres before the adjustment and 4.4 acres after the adjustment.

The applicant's Narrative (Exhibit A) addresses the applicable criteria to the proposal for Plan Map Amendment (PMA).

The Findings and Analysis include a review of the proposal and application materials against the applicable criteria and standards, which include: Statewide Planning Goals, Oregon Administrative Rules, Metro Code, and the Tualatin Comprehensive Plan and Development Code. The specific approval criteria for a Plan Amendment are found at Tualatin Development Code (TDC) Section 33.070(5), and include other applicable criteria and standards that must be met.

RECOMMENDATION TO CITY COUNCIL:

The Planning Commission will be asked to vote on a recommendation on the proposed PMA that will be presented to the City Council. This recommendation may be in favor, against, or neutral.

OUTCOMES OF RECOMMENDATION:

The Planning Commission's recommendation will be presented to the City Council Public Hearing meeting on Monday, August 12, 2024. If Council approves the PMA the subject property would be rezoned to Medium-Low Density Residential (RML) from Light Manufacturing (ML), which eliminates the nonconforming use of industrial land for residential purposes. If the Council does not approve the PMA then the existing zoning would continue to apply and what is now a nonconforming residential use of industrially zoned land would also continue.

ATTACHMENTS:

- Attachment 1: Presentation
- Attachment 2: Analysis and Findings
- Exhibit A: Narrative
- Exhibit B: Site Plan
- Exhibit C: Survey
- Exhibit D: Supporting Documents
- Exhibit E: Public Noticing



Analysis and Findings for Willow Glen Plan Map Amendment or Adjustment

Case #:	PMA 24-0001
Project:	Willow Glen Zoning Map Adjustment
Owner:	Life Front 2 LLC (Tax Lot 3200) and LU QBF II LLC (Tax Lots 3100 and 2900)
Applicant:	Blakely Vogel, Attorney, Miller Nash LLP

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EXHIBITS

Exhibit A: Narrative Exhibit B: Site Plan Exhibit C: Survey Exhibit D: Supporting Documents Exhibit E: Public Noticing

I. INTRODUCTION

A. Applicable Criteria

Tualatin Development Code (TDC) Chapters 32 and 33; Tualatin Comprehensive Plan; Applicable Oregon Statewide Planning Goals; Applicable Oregon Administrative Rules including compliance with the Transportation Planning Rule; and Metropolitan Service District's Urban Growth Management Functional Plan.

B. Project Description

Miller Nash LLP on behalf of the property owners, Life Front 2 LLC and LU QBF II LLC, is requesting a zoning map adjustment for an approximately 3,681 square-foot portion of land that has been historically occupied by the Willow Glen Mobile Home Park (Figure 1). This subject property will be deeded from the property owner to Willow Glen Mobile Home Park through property line adjustment. The Willow Glen Mobile Home Park through property line adjustment. The Willow Glen Mobile Home Park, located at 9700 SW Tualatin Road (Tax Map/Lot 2S123BA03200) is zoned Medium Low Density Residential (RML). The proposed zoning map adjustment (Plan Map Amendment (PMA)) will rezone the 3,681 square foot portion of property located at 9975 SW Herman Road (Tax Map/Lot 2S123BA002900) and 9905 SW Herman Road (Tax Map/Lot 2S123BA03100) from Light Manufacturing (ML) to RML, consistent with its historical use as part of the Mobile Home Park. No additional dwelling units will result in approval of this PMA. The three tax lots consists of a total of 12.87 acres. Tax Lot 2900 consists of approximately 6.6 acres before the adjustment and 6.5 acres after the adjustment. Tax Lot 3100 consists of approximately 1.87 acres before the adjustment and 4.4 acres after the adjustment.



Figure 1: Land (Adjusted Lot Area) that is currently being utilized by Willow Glen Mobile Home Park and is the subject of this Plan Map Amendment (PMA).

C. Site Description and Surrounding Zoning



Figure 2: Surrounding Zoning and Land Use

Tax Lots 2900 and 3100 are zoned Light Manufacturing (ML) and take access from SW Herman Road with two recently constructed industrial buildings, associated landscaping and parking as approved by Architectural Review AR 22-0002 on these lots. Willow Glen Mobile Home Park is located on Tax Lot 3200, zoned Medium-Low Density Residential (RML) and has access to both SW Herman Road (secondary entrance) and SW Tualatin Road (main entrance). The surrounding zoning includes ML and Medium-High Density Residential (RMH) to the north, Office Commercial (CO) to the east, General Manufacturing (MG) to the south and ML zoned property to the west (see Section E., below).

D. Previous Land Use Actions

Tax Lots 2900 and 3100

- PLA24-0001 Adjusted the property lines transferring the subject property of this PMA to Tax Lot 3200.
- AR 22-0002 Approved the construction of two industrial buildings, parking and landscaping.
- PLA 20-0002 Property Line Adjustment
- AR 81-04 Westway Manufacturing Company (Adjacent lot under common ownership, PLA 20-0002 adjusted this lot to accommodate Lots 2900 and 3100.)
- AR 79-05 Westway Gear (Adjacent lot under common ownership, PLA 20-0002 adjusted this lot to accommodate Lots 2900 and 3100.)
- ANN 77-07 Annexation

Tax Lot 3200

• PLA24-0001 – Adjusted the property lines transferring the subject property of this PMA to Tax Lot

3200.

- AR 89-01 Willow Glen Mobile Home Court Expansion
- AR 88-03 Willow Glen Mobile Home Expansion
- AR 87-34 Willow Glen Mobile Home Expansion
- ANN 77-07 Annexation

E. Surrounding Uses

Surrounding uses include:

North: Medium-High Density Residential (RMH) District

• Multi-Family Residential

South: General Manufacturing (MG) District

- SW Herman Road
- Industrial
- Railroad Tracks

West: Light Manufacturing (ML) District

 Industrial (two buildings and associated improvements recently constructed on tax lots 2900 and 3100)

East: Office Commercial (CO) and Low-Density Residential (RL) Districts

- SW Tualatin Road
- Stormwater Facility (swale)
- Duplex Residential Development (zoned RL, located east of SW Tualatin Road)

II. FINDINGS

A: Oregon Statewide Planning Goals

Goal 1 – Citizen Involvement

To develop a citizen involvement program that insures the opportunity for citizens to be involved in all phases of the planning process.

Finding:

The Planning Commission will review the proposed Plan Map Amendment (PMA) at a public meeting on July 17, 2024. The Planning Commission is the City's acknowledged Committee for Citizen Involvement (CCI), in compliance with Goal 1.

In addition, the City has followed its acknowledged public notice procedures for quasi-judicial Plan Map Amendments, found in TDC 32.240. The procedures include mailed notice of the City Council hearing to surrounding property owners, publishing notice of the City Council hearing in the Tualatin Times, notice of the hearing to the Department of Land Conservation and Development (Exhibit E) at least 35 days prior to the first hearing, notice to affected government entities, and publicly posting notice of the hearing. Postcard land use application notices were sent to property owners on June 11, 2024 (Exhibit E). The Tualatin Times published the City Council public hearing notice on June 20, 2024 (Exhibit E). The proposed amendment will be considered at a City Council Public Hearing on August 12, 2024.

Goal 2 – Land Use Planning

To establish a land use planning process and policy framework as a basis for all decision and actions related to use of land and to assure an adequate factual base for such decisions and actions.

Finding:

The City of Tualatin's Comprehensive Plan and Development Code provide an acknowledged and established land use planning process and policy framework which serve as the basis for all decisions and actions related to use of land, including requirements to assure that an adequate factual basis is provided for those decisions and actions. The proposed amendment has been processed in accordance with these procedures.

Goal 5 – Open Spaces, Scenic and Historic Area, and Natural Resource

Goal 5 establishes a process for each resource to be inventoried and evaluated. OAR 660-015-0000(5) and OAR 660.023 (Procedures and Requirements for Complying with Goal 5)

Finding:

The proposed amendment does not modify the City's existing open space and natural resources requirements or include any text amendment to the regulations for those Goal 5 resources regulated by Tualatin Development Code Chapter 71 (Wetlands Protection District) and Tualatin Development Code Chapter 72 (Natural Resource Protection Overlay District). All development would be reviewed under the Architectural Review (AR) process to ensure that new construction will be reviewed consistent with these requirements.

Goal 6 – Air, Water and Land Resources Quality

Finding:

The Oregon Department of Environmental Quality (DEQ) regulates air, water and land with Clean Water Act (CWA) Section 401 Water Quality, Water Quality Certificate, State 303(d) listed waters, Hazardous Wastes, Clean Air Act (CAA), and Section 402 NPDES Construction and Stormwater Permits. The Oregon Department of State Lands and the U.S. Army Corps of Engineers regulate jurisdictional wetlands and CWA Section 404 water of the state and the country respectively. Clean Water Services (CWS) coordinates stormwater management, water quality and stream enhancement projects throughout the City. Future development would need to comply with national, state and regional regulations and protections for air, water and land resources. Tualatin has an acknowledged Comprehensive Plan that complies with this goal. All future development will be required to be reviewed consistent with these requirements.

Goal 7 – Areas Subject to Natural Disasters and Hazards

Finding:

Tualatin has an acknowledged Comprehensive Plan that complies with this goal. The proposed amendment does not modify the City's natural hazards requirements or existing goals and policies associated with Goal 7 established by the Comprehensive Plan. Future development would be required to be consistent with the applicable requirements of the Tualatin Development Code under Chapters 70 and 72.

Goal 8 – Recreation Needs

To satisfy the recreational needs of the citizens of the state and visitors and, where appropriate, to provide for the siting of necessary recreational facilities including destination resorts.

Finding:

The proposed amendment does not affect policies associated with recreational needs. Any change to the existing recreational facilities will be reviewed as part of an Architectural Review and compliance with the Tualatin Development Code recreational facilities requirements.

Goal 9 – Economy of the State

To provide adequate opportunities throughout the state for a variety of economic activities vital to the health, welfare, and prosperity of Oregon's citizens.

Finding:

The proposed amendment does not affect policies, lands, or opportunities associated with Goal 9 established by the Comprehensive Plan. There are no impacts on the inventory of commercial land. There would be a small reduction of industrial lands, 3,681 square-foot, with the approval of this amendment. This small strip of land has been utilized for residential use by the Willow Glen Mobile Home Park for decades and would not be developable for industrial use and did not impact the recent development of Tax Lots 2900 and 3100. The major employment areas of the City are protected.

Goal 10 – Housing

To provide for the housing needs of citizens of the state.

Finding:

The proposed plan map amendment would change the zoning designation of the subject site from Light

Manufacturing (ML) to Medium-Low Density Residential (RML). This is a small strip of land that is approximately 9 feet wide by 405 feet long or 3,681 square-feet so no additional dwelling units will result if this PMA is approved. Willow Glen's residents have been utilizing this strip of land for decades and the property owner of tax lots 3100 and 2900 is transferring the subject property to Willow Glen's property owner and rezoning it to RML.

The map amendment, as proposed, does not conflict with OAR 660-007 (the Metropolitan Housing Rule) which is used by cities such as Tualatin that are within the Portland Metropolitan UGB to demonstrate compliance with Goal 10. Additional findings addressing OAR 660-007 are found below.

Goal 11 – Public Facilities and Services

Finding:

Land within the City of Tualatin is adequately served by public facilities and services. No additional utility need will result from the approval of this PMA. The proposed amendment does not affect policies related to public facilities and services including water, sewer, and emergency services.

Goal 12 – Transportation

Finding:

The requirements of Goal 12 are addressed by compliance with Oregon Administrative Rule (OAR) Section 660-012-0060, also known as the Transportation Planning Rule or TPR. The proposed amendment did not trigger the need for a TPR analysis due to no additional trip generation as a result of the proposed amendment. TPRs are further addressed below under the applicable OAR Section.

Goal 13 – Energy

Findings:

The proposed amendment does not include any changes that are related to or intended to impact Tualatin's land use regulations pertaining to energy consumption.

Goal 14 – Urbanization

Finding:

The subject property is within the Urban Growth Boundary. The proposal does not contain any proposed modification to the Urban Growth Boundary or development outside of the Urban Growth Boundary.

B: Oregon Administrative Rules

OAR Chapter 660 Division 7 (Metropolitan Housing)

[...]

<u>660-007-0045</u>

Computation of Buildable Lands

(1) The local buildable lands inventory must document the amount of buildable land in each residential plan designation.

(2) The Buildable Land Inventory (BLI): The mix and density standards of OAR 660-007-0030, 660-007-0035 and 660-007-0037 apply to land in a buildable land inventory required by OAR 660-007-0010, as

modified herein. Except as provided below, the buildable land inventory at each jurisdiction's choice shall either be based on land in a residential plan/zone designation within the jurisdiction at the time of periodic review or based on the jurisdiction BLI at the time of acknowledgment as updated. Each jurisdiction must include in its computations all plan and/or zone changes involving residential land which that jurisdiction made since acknowledgment. A jurisdiction need not include plan and/or zone changes made by another jurisdiction before annexation to a city. The adjustment of the BLI at the time of acknowledgment shall:

(a) Include changes in zoning ordinances or zoning designations on residential planned land if allowed densities are changed;

(b) Include changes in planning or zoning designations either to or from residential use. A city shall include changes to annexed or incorporated land if the city changed type or density or the plan/zone designation after annexation or incorporation;

(c) The county and one or more cities affected by annexations or incorporations may consolidate buildable land inventories. A single calculation of mix and density may be prepared. Jurisdictions which consolidate their buildable lands inventories shall conduct their periodic review simultaneously;

(d) A new density standard shall be calculated when annexation, incorporation or consolidation results in mixing two or more density standards (OAR 660-007-0035). The calculation shall be made as follows:

(A)

(i) BLI Acres x 6 Units/Acre = Num. of Units;

(ii) BLI Acres x 8 Units/Acre = Num. of Units;

(iii) BLI Acres x 10 Units/Acre = Num. of Units;

(iv) Total Acres (TA) - Total Units (TU).

(B) Total units divided by Total Acres = New Density Standard;

(C) Example:

(i) Cities A and B have 100 acres and a 6-unit-per-acre standard: (100 x 6 = 600 units); City B has 300 acres and a 10-unit-per-acre standard: (300 x 10 = 3000 units); County has 200 acres and an 8-unit-per-acre standard: (200 x 08 = 1600 units); Total acres = 600 - Total Units = 5200.

(ii) 5200 units divided by 600 acres = 8.66 units per acre standard.

(3) Mix and Density Calculation: The housing units allowed by the plan/zone designations at periodic review, except as modified by section (2) of this rule, shall be used to calculate the mix and density. The number of units allowed by the plan/zone designations at the time of development shall be used for developed residential land.

660-007-0050

Regional Coordination

(1) At each periodic review of the Metro UGB, Metro shall review the findings for the UGB. They shall determine whether the buildable land within the UGB satisfies housing needs by type and density for the region's long-range population and housing projections.

(2) Metro shall ensure that needed housing is provided for on a regional basis through coordinated comprehensive plans.

660-007-0060

Applicability

(1) The new construction mix and minimum residential density standards of OAR 660-007-0030 through 660-007-0037 shall be applicable at each periodic review. During each periodic review local

government shall prepare findings regarding the cumulative effects of all plan and zone changes affecting residential use. The jurisdiction's buildable lands inventory (updated pursuant to OAR 660-007-0045) shall be a supporting document to the local jurisdiction's periodic review order.

(2) For plan and land use regulation amendments which are subject to OAR 660, Division 18, the local jurisdiction shall either:

(a) Demonstrate through findings that the mix and density standards in this Division are met by the amendment; or

(b) Make a commitment through the findings associated with the amendment that the jurisdiction will comply with provisions of this Division for mix or density through subsequent plan amendments.

Finding:

In 2019, the City of Tualatin completed a Housing Needs Analysis (HNA) which included a computation of the City's residential buildable lands inventory (BLI). The BLI analysis complied with statewide planning Goal 10 policies that govern planning for residential uses. Consistent with these sections, the detailed methodology used to complete the buildable lands inventory is presented in Appendix A of the HNA. As previously noted, no additional dwelling units or increase in density will result from the approval of this proposal.

OAR 660 Division 12 (Transportation Planning)

OAR 660-012-0060

Plan and Land Use Regulation Amendments

(1) If an amendment to a functional plan, an acknowledged comprehensive plan, or a land use regulation (including a zoning map) would significantly affect an existing or planned transportation facility, then the local government must put in place measures as provided in section (2) of this rule, unless the amendment is allowed under section (3), (9) or (10) of this rule. A plan or land use regulation amendment significantly affects a transportation facility if it would:

(a) Change the functional classification of an existing or planned transportation facility (exclusive of correction of map errors in an adopted plan);

(b) Change standards implementing a functional classification system; or

(c) Result in any of the effects listed in paragraphs (A) through (C) of this subsection based on projected conditions measured at the end of the planning period identified in the adopted TSP. As part of evaluating projected conditions, the amount of traffic projected to be generated within the area of the amendment may be reduced if the amendment includes an enforceable, ongoing requirement that would demonstrably limit traffic generation, including, but not limited to, transportation demand management. This reduction may diminish or completely eliminate the significant effect of the amendment.

(A) Types or levels of travel or access that are inconsistent with the functional classification of an existing or planned transportation facility;

(B) Degrade the performance of an existing or planned transportation facility such that it would not meet the performance standards identified in the TSP or comprehensive plan; or

(C) Degrade the performance of an existing or planned transportation facility that is otherwise projected to not meet the performance standards identified in the TSP or comprehensive plan.

(2) If a local government determines that there would be a significant effect, then the local government must ensure that allowed land uses are consistent with the identified function, capacity, and performance standards of the facility measured at the end of the planning period identified in the adopted TSP through one or a combination of the remedies listed in (a) through (e) below, unless the

amendment meets the balancing test in subsection (2)(e) of this section or qualifies for partial mitigation in section (11) of this rule. A local government using subsection (2)(e), section (3), section (10) or section (11) to approve an amendment recognizes that additional motor vehicle traffic congestion may result and that other facility providers would not be expected to provide additional capacity for motor vehicles in response to this congestion.

(a) Adopting measures that demonstrate allowed land uses are consistent with the planned function, capacity, and performance standards of the transportation facility.

(b) Amending the TSP or comprehensive plan to provide transportation facilities, improvements or services adequate to support the proposed land uses consistent with the requirements of this division; such amendments shall include a funding plan or mechanism consistent with section (4) or include an amendment to the transportation finance plan so that the facility, improvement, or service will be provided by the end of the planning period.

(c) Amending the TSP to modify the planned function, capacity or performance standards of the transportation facility.

(d) Providing other measures as a condition of development or through a development agreement or similar funding method, including, but not limited to, transportation system management measures or minor transportation improvements. Local governments shall, as part of the amendment, specify when measures or improvements provided pursuant to this subsection will be provided.

(e) Providing improvements that would benefit modes other than the significantly affected mode, improvements to facilities other than the significantly affected facility, or improvements at other locations, if:

(A) The provider of the significantly affected facility provides a written statement that the system-wide benefits are sufficient to balance the significant effect, even though the improvements would not result in consistency for all performance standards;
(B) The providers of facilities being improved at other locations provide written

statements of approval; and

(C) The local jurisdictions where facilities are being improved provide written statements of approval.

(3) Notwithstanding sections (1) and (2) of this rule, a local government may approve an amendment that would significantly affect an existing transportation facility without assuring that the allowed land uses are consistent with the function, capacity and performance standards of the facility where:

(a) In the absence of the amendment, planned transportation facilities, improvements and services as set forth in section (4) of this rule would not be adequate to achieve consistency with the identified function, capacity or performance standard for that facility by the end of the planning period identified in the adopted TSP;

(b) Development resulting from the amendment will, at a minimum, mitigate the impacts of the amendment in a manner that avoids further degradation to the performance of the facility by the time of the development through one or a combination of transportation improvements or measures;

(4) Determinations under sections (1)–(3) of this rule shall be coordinated with affected transportation facility and service providers and other affected local governments.

(a) In determining whether an amendment has a significant effect on an existing or planned transportation facility under subsection (1)(c) of this rule, local governments shall rely on existing transportation facilities and services and on the planned transportation facilities, improvements and services set forth in subsections (b) and (c) below.

(b) Outside of interstate interchange areas, the following are considered planned facilities,

^[...]

improvements and services:

(A) Transportation facilities, improvements or services that are funded for construction or implementation in the Statewide Transportation Improvement Program or a locally or regionally adopted transportation improvement program or capital improvement plan or program of a transportation service provider.

(B) Transportation facilities, improvements or services that are authorized in a local transportation system plan and for which a funding plan or mechanism is in place or approved. These include, but are not limited to, transportation facilities, improvements or services for which: transportation systems development charge revenues are being collected; a local improvement district or reimbursement district has been established or will be established prior to development; a development agreement has been adopted; or conditions of approval to fund the improvement have been adopted.

(C) Transportation facilities, improvements or services in a metropolitan planning organization (MPO) area that are part of the area's federally-approved, financially constrained regional transportation system plan.

(D) Improvements to state highways that are included as planned improvements in a regional or local transportation system plan or comprehensive plan when ODOT provides a written statement that the improvements are reasonably likely to be provided by the end of the planning period.

(E) Improvements to regional and local roads, streets or other transportation facilities or services that are included as planned improvements in a regional or local transportation system plan or comprehensive plan when the local government(s) or transportation service provider(s) responsible for the facility, improvement or service provides a written statement that the facility, improvement or service is reasonably likely to be provided by the end of the planning period.

(c) Within interstate interchange areas, the improvements included in (b)(A)–(C) are considered planned facilities, improvements and services, except where:

(A) ODOT provides a written statement that the proposed funding and timing of mitigation measures are sufficient to avoid a significant adverse impact on the Interstate Highway system, then local governments may also rely on the improvements identified in paragraphs (b)(D) and (E) of this section; or

(B) There is an adopted interchange area management plan, then local governments may also rely on the improvements identified in that plan and which are also identified in paragraphs (b)(D) and (E) of this section.

(d) As used in this section and section (3):

(A) Planned interchange means new interchanges and relocation of existing interchanges that are authorized in an adopted transportation system plan or comprehensive plan;

(B) Interstate highway means Interstates 5, 82, 84, 105, 205 and 405; and

(C) Interstate interchange area means:

(i) Property within one-quarter mile of the ramp terminal intersection of an existing or planned interchange on an Interstate Highway; or

(ii) The interchange area as defined in the Interchange Area Management Plan adopted as an amendment to the Oregon Highway Plan.

(e) For purposes of this section, a written statement provided pursuant to paragraphs (b)(D), (b)(E) or (c)(A) provided by ODOT, a local government or transportation facility provider, as appropriate, shall be conclusive in determining whether a transportation facility, improvement or service is a planned transportation facility, improvement or service. In the absence of a written statement, a local government can only rely upon planned transportation facilities,
improvements and services identified in paragraphs (b)(A)–(C) to determine whether there is a significant effect that requires application of the remedies in section (2).

[...]

Finding:

The applicant proposed an amendment to the Comprehensive Plan and Zoning Map designation of the subject property as Tualatin is a single-map Comprehensive Plan/Zoning Map jurisdiction. The proposed amendment would not result in additional trip generation. The applicant has previously processed a Property Line Adjustment (PLA24-0001) that matches the area being rezoned from ML to RML. The proposed map amendment only amends the zoning to match the current use of the land by the Willow Glen Mobile Home Park. Therefore, a trip generation analysis is not warranted.

C: Metro Chapter 3.07, Urban Growth Management Functional Plan

The following Chapters and Titles of Metro Code are applicable to the proposed amendments: Chapter 3.07, Urban Growth Management Functional Plan

Finding:

Metro's Urban Growth Management Functional Plan is established in Metro Code as Section 3.07. The following Functional Plan sections are applicable to the proposed plan and map amendments:

Title 1 – Housing Capacity: requires a city or county to maintain or increase its housing capacity.

• The proposed map amendment would maintain Tualatin's housing capacity.

Title 2 – Regional Parking Policy: repealed.

Title 3 – Water Quality and Flood Management: protects Water Quality and Flood Management Areas.

• Water Quality and Flood Management are addressed in Tualatin Development Code Chapters 70, 71, and 74. No amendments are proposed to these chapters. No physical development is proposed with this application for the plan map amendment. The subject site would be further examined for natural resources with future development or redevelopment of the site through an Architectural Review. Future development of the site would need to comply with local, regional, state, and federal requirements for the protection of air, water, and land resources. Given that the Willow Glen Mobile Home Park is fully developed, no impact to Title 3 will occur if this PMA is approved.

Title 4 – Industrial and Other Employment Areas: promotes "clustering" of industries that operate more productively and efficiently when in proximity to each other.

• The lots are currently zoned to allow Medium Low Density Residential (RML) and Light Manufacturing (ML) uses. Tax lots 2900 and 3100 are located within the "Industrial Area" according to Metro's Title 4 Industrial and other Employment Areas Map. The proposed map amendment does not significantly diminish the industrial or commercial capacities of the City because the ML zoned lots are already fully developed and the small strip of land that is the subject of this PMA will be transferred to the Willow Glen and align with the subject properties current use for residential purposes. Industrial uses will remain clustered.

Title 5 - Neighbor Cities and Rural Reserves: repealed

Title 6 – Centers, Corridors, Station Communities and Main Streets: enhancements of these areas as principal centers of urban life via actions and investments.

• The land that is the subject of the PMA has not been identified as a Regional Center, Town Center, Station Community or Main Street.

Title 7 – Housing Choice: implements policies regarding establishment of voluntary affordable housing production goals to be adopted by local governments.

• The proposed plan map amendment will not create additional dwelling units. The proposed amendment is an adjustment of zoning to match the current use of the land by the residents of Willow Glen Mobile Home Park.

Title 8 – Compliance Procedures: ensures all cities & counties are equitably held to the same standards.

The City of Tualatin continues to partner with Metro to comply with the Functional Plan. The map amendment was initially shared and posted on the DLCD website on May 31, 2024 – 52 days before the scheduled hearing. The notice was updated with a new City Council Public Hearing date of August 12, 2024 and the updated notice posted on the DLCD website on June 7, 2024 – 45 days before the scheduled hearing. The need to update the DLCD notice was due to a lack of a Planning Commission quorum for the advisory meeting originally scheduled on June 26, 2024.

Title 9 – Performance Measures: repealed.

Title 10 – Functional Plan Definitions.

Title 11 – Planning for New Urban Areas: guides planning of areas brought into the UGB.

• All three tax lots are within the City of Tualatin City Limits, therefore the map amendment does not affect planning areas outside of the UGB.

Title 12 – Protection of Residential Neighborhoods: protects existing residential neighborhoods from pollution, noise, crime, and provides adequate levels of public services.

• The site of the proposed plan map amendment is adequately serviced by existing infrastructure and services. Infrastructure and public services will be discussed in greater detail in TDC 33.070(5)(i). No new dwelling units or developable land will result from approval of this PMA.

Title 13 – Nature in Neighborhoods: conserves, protects and restores a continuous ecologically viable streamside corridor system integrated with upland wildlife habitat and the urban landscape.

- Protection of natural resources are addressed in Chapter 72 of the Tualatin Development Code. In addition, sites are reviewed for the presence of natural resources and are reviewed by Clean Water Services at the time of development. No physical development is proposed with this application for this map amendment. Approval of this PMA will not affect Title 13 because there are no streamside corridor systems with upland wildlife habitat within or near the subject site.
- The subject site would be further examined for natural resources with future development of the site through an Architectural Review it they ever redeveloped. At this time all three lots are fully developed and no impact to surrounding natural resources or wildlife habitat would occur. Future development or redevelopment of the site would need to comply with local, regional, state, and federal requirements for the protection of air, water, and land resources. No amendments to this

Chapter 72 are proposed under this application.

Title 14 – Urban Growth Boundary: prescribes criteria and procedures for amendments to the UGB.

• No amendments are proposed to the UGB under this application.

D: Tualatin Comprehensive Plan

Chapter 1 – Community Involvement:

GOAL 1.1. Implement community involvement practices in line with Statewide Planning Goal 1.

POLICY 1.1.1. Support community advisory committees to provide recommendations on planning matters.

POLICY 1.1.3. Conduct the planning process with adequate input and feedback from citizens in each affected neighborhood.

Finding:

The applicant provided evidence that an in-person Neighborhood/Developer Meeting was held on July 12, 2023, that discussed the PMA (Exhibit D). The meeting was held and noticed in accordance with TDC 32.120. As a land use application requiring a Type IV-A procedure, an advisory recommendation will be sought before the Tualatin Planning Commission prior to the City Council meeting. City staff issued public notice and request for comment in accordance with the noticing procedures outlined in TDC 32.240 and included as Exhibit E. These policies are satisfied.

Chapter 10 – Land Use Designations and Zoning:

Planning District Objectives

RESIDENTIAL PLANNING DISTRICTS:

Medium Low Density Residential Planning District (RML)

This district supports household living uses with a variety of housing types at moderately low densities. This district is primarily oriented toward middle housing types including attached dwellings, multi-family development, and manufactured dwelling parks.

Light Manufacturing Planning District (ML)

Suitable for warehousing, wholesaling and light manufacturing processes that are not hazardous and that do not create undue amounts of noise, dust, odor, vibration, or smoke. Also suitable, with appropriate restrictions, are the retail sale of products not allowed for sale in General Commercial areas, subject to applicable zoning overlay standards. Also suitable are accessory commercial uses subject to area limitations for the sale of products manufactured, assembled, packaged or wholesaled on the site.

The purpose of this district is to provide sites for manufacturing uses that are more compatible with adjacent commercial and residential uses and would serve to buffer heavy manufacturing uses. The purpose is also to allow the retail sale of products manufactured, assembled, packaged or wholesaled on the site subject to area limitations. Certain heavier manufacturing uses may be allowed as conditional uses.

Finding:

The proposed amendment would adjust the zoning of small portion of the site from Light Manufacturing (ML) to Medium Low Density Residential (RML). The approximately 9' wide by 405' long strip (3,681 square feet) has been utilized by residents of the Willow Glen Mobile Home Park for decades. The owner of tax lots 2900 and 3100 (ML zoned) has applied to transfer this currently industrial zoned land to the residentially zoned property via a Property Line Adjustment PMA24-0001. With the Willow Glen residents utilizing the industrial land for residential purposes it creates a nonconforming use of land. Industrial land is used for industrial purposes like manufacturing while residential land is used for household living and not industrial use. This change would eliminate any nonconforming use of land by changing the ML zoned land to RML, matching the current residential use of this area of land.

E: Tualatin Development Code

Chapter 32: Procedures

TDC 32.010. - Purpose and Applicability.

[...]

(2) Applicability of Review Procedures. All land use and development permit applications and decisions, will be made by using the procedures contained in this Chapter. The procedure "type" assigned to each application governs the decision-making process for that permit or application. There are five types of permit/application procedures as described in subsections (a) through (e) below. Table 32-1 lists the City's land use and development applications and corresponding review procedure(s).

[...]

(d)*Type IV-A Procedure (Quasi-Judicial Review*—City Council Public Hearing). Type IV-A procedure is used when the standards and criteria require discretion, interpretation, or policy or legal judgment and is the procedure used for site-specific land use actions initiated by an applicant. Type IV-A decisions are made by the City Council and require public notice and a public hearing. Appeals of Type IV-A decisions are heard by the Land Use Board of Appeals (LUBA).

[...]

(3) *Determination of Review Type.* Unless specified in Table 32-1, the City Manager will determine whether a permit or application is processed as Type I, II, III, IV-A or IV-B based on the descriptions above. Questions regarding the appropriate procedure will be resolved in favor of the review type providing the widest notice and opportunity to participate. An applicant may choose to elevate a Type I or II application to a higher numbered review type, provided the applicant pays the appropriate fee for the selected review type.

Application/Action	Procedure Type	Decision Body*	Appeal Body*	Pre- Application Conference Required	Neighborhood/ Developer Mtg Required	Applicable Code Chapter
Plan Amendments						

 Table 32-1—Applications Types and Review Procedures

Application/Action	Procedure Type	Decision Body*	Appeal Body*	Pre- Application Conference Required	Neighborhood/ Developer Mtg Required	Applicable Code Chapter
 Map or Text Amendments for a specific property 	IV-A	сс	LUBA	Yes	Yes	TDC 33.070

* City Council (CC); Planning Commission (PC); Architectural Review Board (ARB); City Manager or designee (CM); Land Use Board of Appeals (LUBA).

Finding:

The proposed PMA application is subject to the Type IV-A procedures according to Table 32-1. This application has been processed according to the applicable code for Type IV-A procedures. Any future development or construction will be reviewed under a separate land use application.

TDC 32.030. - Time to Process Applications.

(1) *Time Limit—120-day Rule.* The City must take final action on all Type II, Type III, and Type IV-A land use applications, as provided by ORS 227.178, including resolution of all local appeals, within 120 days after the application has been deemed complete under TDC 32.160, unless the applicant provides written request or consent to an extension in compliance with ORS 227.178. (Note: The 120-day rule does not apply to Type IV-B (Legislative Land Use) decisions.)

[...]

(3) *Time Periods.* "Days" means calendar days unless otherwise specified. In computing time periods prescribed or allowed by this Chapter, the day of the act or event from which the designated period of time begins is not included. The last day of the period is included, unless it is a Saturday, Sunday, or a legal holiday, in which case the period runs until the end of the next day that is not on a weekend or City recognized legal holiday.

Finding:

The proposed PMA is an amendment to the City's Comprehensive Plan Map 10-1, the 120-day rule portion of ORS 227.178 is not applicable.

TDC 32.110. - Pre-Application Conference.

(1) *Purpose of Pre-Application Conferences.* Pre-application conferences are intended to familiarize applicants with the requirements of the TDC; to provide applicants with an opportunity discuss proposed projects in detail with City staff; and to identify approval criteria, standards, and procedures prior to filing a land use application. The pre-application conference is intended to be a tool to assist applicants in navigating the land use process, but is not intended to be an exhaustive review that identifies or resolves all potential issues, and does not bind or preclude the City from enforcing any applicable regulations or from applying regulations in a manner differently than may have been indicated at the time of the pre-application conference.

(2) *When Mandatory.* Pre-application conferences are mandatory for all land use actions identified as requiring a pre-application conference in Table 32-1. An applicant may voluntarily request a pre-application conference for any land use action even if it is not required.

(3) *Timing of Pre-Application Conference*. A pre-application conference must be held with City staff

before an applicant submits an application and before an applicant conducts a Neighborhood/Developer meeting.

(4) Application Requirements for Pre-Application Conference.

(a) Application Form. Pre-application conference requests must be made on forms provided by the City Manager.

[...]

Finding:

A pre-application meeting is mandatory for PMA applications. The applicant participated in a Pre-Application meeting on March 8, 2023 with a follow up meeting on February 28, 2024. The applicant submitted their application for completeness check on May 5, 2024, a little over 2-months after the follow up pre-application meeting.

TDC 32.120. - Neighborhood/Developer Meetings.

(1) Purpose. The purpose of this meeting is to provide a means for the applicant and surrounding property owners to meet to review a development proposal and identify issues regarding the proposal so they can be considered prior to the application submittal. The meeting is intended to allow the developer and neighbors to share information and concerns regarding the project. The applicant may consider whether to incorporate solutions to these issues prior to application submittal.

(2) When Mandatory. Neighborhood/developer meetings are mandatory for all land use actions identified in Table 32-1 as requiring a neighborhood/developer meeting. An applicant may voluntarily conduct a neighborhood/developer meeting even if it is not required and may conduct more than one neighborhood/developer meeting at their election.

(3) *Timing.* A neighborhood/developer meeting must be held after a pre-application meeting with City staff, but before submittal of an application.

(4) *Time and Location.* Required neighborhood/developer meetings must be held within the city limits of the City of Tualatin at the following times:

(a) If scheduled on a weekday, the meeting must begin no earlier than 6:00 p.m.

(b) If scheduled on a weekend, the meeting must begin between 10:00 a.m. and 6:00 p.m. *btice Requirements.*

(5) Notice Requirements.

(a) The applicant must provide notice of the meeting at least 14 calendar days and no more than 28 calendar days before the meeting. The notice must be by first class mail providing the date, time, and location of the meeting, as well as a brief description of the proposal and its location. The applicant must keep a copy of the notice to be submitted with their land use application.
(b) The applicant must mail notice of a neighborhood/developer meeting to the following persons:

(i) All property owners within 1,000 feet measured from the boundaries of the subject property;

(ii) All property owners within a platted residential subdivision that is located within 1,000 feet of the boundaries of the subject property. The notice area includes the entire subdivision and not just those lots within 1,000 feet. If the residential subdivision is one of two or more individually platted phases sharing a single subdivision name, the notice area need not include the additional phases; and

(iii) All designated representatives of recognized Citizen Involvement Organizations as established in TMC Chapter 11-9.

- (c) The City will provide the applicant with labels for mailing for a fee.
- (d) Failure of a property owner to receive notice does not invalidate the neighborhood/developer meeting proceedings.

(6) *Neighborhood/Developer Sign Posting Requirements*. The applicant must provide and post on the subject property, at least 14 calendar days before the meeting. The sign must conform to the design and placement standards established by the City for signs notifying the public of land use actions in TDC 32.150.

(7) Neighborhood/Developer Meeting Requirements. The applicant must have a sign-in sheet for all attendees to provide their name, address, telephone number, and email address and keep a copy of the sign-in sheet to provide with their land use application. The applicant must prepare meeting notes identifying the persons attending, those commenting and the substance of the comments expressed, and the major points that were discussed. The applicant must keep a copy of the meeting notes for submittal with their land use application.

Finding:

The applicant provided evidence that a Neighborhood/Developer Meeting was held on July 12, 2023 where the PMA and development of the industrial lots was discussed. The applicant provided documentation of sign posting and notification in compliance with Section 32.120 in Exhibit D.

Section 32.130 – Initiation of Applications.

(1) *Type I, Type II, Type III, and Type IV-A Applications.* Type I, Type II, Type III, and Type IV-A applications may be submitted by one or more of the following persons:

(a) The owner of the subject property;

(b) The contract purchaser of the subject property, when the application is accompanied by proof of the purchaser's status as such and by the seller's written consent;

(c) A lessee in possession of the property, when the application is accompanied by the owners' written consent; or

(d) The agent of any of the foregoing, when the application is duly authorized in writing by a person authorized to submit an application by paragraphs (a), (b) or (c) of this subsection, and accompanied by proof of the agent's authority.

[...]

Finding:

The applicant has provided a title report, included in Exhibit D, showing Life Front 2 LLC owning Tax Lot 3200 and LU QBF II LLC owning Tax Lots 3100 and 2900. The application has been submitted by a representative of the property owner's affected by the proposed PMA.

Section 32.140 – Application Submittal.

(1) *Submittal Requirements.* Land use applications must be submitted on forms provided by the City. A land use application may not be accepted in partial submittals. All information supplied on the application form and accompanying the application must be complete and correct as to the applicable facts. Unless otherwise specified, all of the following must be submitted to initiate completeness review under TDC 32.160:

(a) A completed application form. The application form must contain, at a minimum, the following information:

(i) The names and addresses of the applicant(s), the owner(s) of the subject property, and any authorized representative(s) thereof;

(ii) The address or location of the subject property and its assessor's map and tax lot number;

(iii) The size of the subject property;

(iv) The comprehensive plan designation and zoning of the subject property;

(v) The type of application(s);

(vi) A brief description of the proposal; and

(vii) Signatures of the applicant(s), owner(s) of the subject property, and/or the duly authorized representative(s) thereof authorizing the filing of the application(s).

(b) A written statement addressing each applicable approval criterion and standard;

(c) Any additional information required under the TDC for the specific land use action sought;

(d) Payment of the applicable application fee(s) pursuant to the most recently adopted fee schedule;

(e) Recorded deed/land sales contract with legal description.

(f) A preliminary title report or other proof of ownership.

(g) For those applications requiring a neighborhood/developer meeting:

(i) The mailing list for the notice;

(ii) A copy of the notice;

(iii) An affidavit of the mailing and posting;

(iv) The original sign-in sheet of participants; and

(v) The meeting notes described in TDC 32.120(7).

(h) A statement as to whether any City-recognized Citizen Involvement Organizations (CIOs) whose boundaries include, or are adjacent to, the subject property were contacted in advance of filing the application and, if so, a summary of the contact. The summary must include the date when contact was made, the form of the contact and who it was with (e.g. phone conversation with neighborhood association chairperson, meeting with land use committee, presentation at neighborhood association meeting), and the result;

(i) Any additional information, as determined by the City Manager, that may be required by another provision, or for any other permit elsewhere, in the TDC, and any other information that may be required to adequately review and analyze the proposed development plan as to its conformance to the applicable criteria;

(2) *Application Intake.* Each application, when received, must be date-stamped with the date the application was received by the City, and designated with a receipt number and a notation of the staff person who received the application.

(3) Administrative Standards for Applications. The City Manager is authorized to establish administrative standards for application forms and submittals, including but not limited to plan details, information detail and specificity, number of copies, scale, and the form of submittal

Finding:

The applicant submitted an application for PMA24-0001 on May 2, 2024. The application was deemed complete on May 15, 2024. The general land use submittal requirements were included with the application.

Section 32.150 - Sign Posting.

(1) When Signs Posted. Signs in conformance with these standards must be posted as follows:

(a) Signs providing notice of an upcoming neighborhood/developer meeting must be posted

prior to a required neighborhood/developer meeting in accordance with Section 32.120(6); and

(b) Signs providing notice of a pending land use application must be posted after land use application has been submitted for Type II, III and IV-A applications.

(2) *Sign Design Requirements.* The applicant must provide and post a sign(s) that conforms to the following standards:

(a) Waterproof sign materials;

(b) Sign face must be no less than eighteen (18) inches by twenty-four (24) inches (18" x 24"); and

(c) Sign text must be at least two (2) inch font.

(3) On-site Placement. The applicant must place one sign on their property along each public street frontage of the subject property. (Example: If a property adjoins four public streets, the applicant must place a sign at each of those public street frontages for a total of four signs). The applicant cannot place the sign within public right of way.

(4) *Removal.* If a sign providing notice of a pending land use application disappears prior to the final decision date of the subject land use application, the applicant must replace the sign within fortyeight (48) hours of discovery of the disappearance or of receipt of notice from the City of its disappearance, whichever occurs first. The applicant must remove the sign no later than fourteen (14) days after:

(a) The meeting date, in the case of signs providing notice of an upcoming

neighborhood/developer meeting; or

(b) The City makes a final decision on the subject land use application, in the case of signs providing notice of a pending land use application.

Finding:

The applicant provided certification, included as Exhibit D, that signs for the PMA application in conformance with Section 32.150 were properly posted.

Section 32.160 - Completeness Review.

(1) *Duration.* Except as otherwise provided under ORS 227.178, the City Manager must review an application for completeness within 30 days of its receipt.

(2) *Considerations.* Determination of completeness will be based upon receipt of the information required under TDC 32.140 and will not be based on opinions as to quality or accuracy. Applications that do not respond to relevant code requirements or standards can be deemed incomplete. A determination that an application is complete indicates only that the application is ready for review on its merits, not that the City will make a favorable decision on the application.

(3) *Complete Applications.* If an application is determined to be complete, review of the application will commence.

(4) *Incomplete Applications.* If an application is determined to be incomplete, the City Manager must provide written notice to the applicant identifying the specific information that is missing and allowing the applicant the opportunity to submit the missing information. An application which has been determined to be incomplete must be deemed complete for purposes of this section upon receipt of:

(a) All of the missing information;

(b) Some of the missing information and written notice from the applicant that no other information will be provided; or

(c) Written notice from the applicant that none of the missing information will be provided. (5) *Vesting.* If an application was complete at the time it was first submitted, or if the applicant submits additional required information within 180 days of the date the application was first submitted, approval or denial of the application must be based upon the standards and criteria that were in effect at the time the application was first submitted.

(6) *Void Applications.* An application is void if the application has been on file with the City for more than 180 days and the applicant has not provided the missing information or otherwise responded, as provided in subsection (4) of this section.

Finding:

The applicant submitted an application for PMA24-0001 on May 2, 2024. The application was deemed complete on May 15, 2024, within the allotted 30-day review period.

TDC 32.240. - Type IV-A Procedure (Quasi-Judicial Review—City Council Public Hearing).

Type IV-A decisions are quasi-judicial decisions made by the City Council after a public hearing. A hearing under these procedures provides a forum to apply standards to a specific set of facts to determine whether the facts conform to the applicable criteria and the resulting determination will directly affect only a small number of identifiable persons. Except as otherwise provided, the procedures set out in this section must be followed when the subject matter of the evidentiary hearing would result in a quasi-judicial decision. City Council decisions may be appealed to the state Land Use Board of Appeals pursuant to ORS 197.805—197.860.

(1) *Submittal Requirements.* Type IV-A applications must include the submittal information required by TDC 32.140(1).

(2) *Determination of Completeness*. After receiving an application for filing, the City Manager will review the application will for completeness in accordance with TDC 32.160.

(3) Written Notice of Public Hearing—Type IV-A. Once the application has been deemed complete, the City must mail by regular first class mail Notice of a Public Hearing to the following individuals and agencies no fewer than 20 days before the hearing.

(a) Recipients:

(i) The applicant and, the owners of the subject property;

(ii) All property owners within 1,000 feet measured from the boundaries of the subject property;

(iii) All property owners within a platted residential subdivision that is located within 1,000 feet of the boundaries of the subject property. The notice area includes the entire subdivision and not just those lots within 1,000 feet. If the residential subdivision is one of two or more individually platted phases sharing a single subdivision name, the notice area need not include the additional phases;

(iv) All recognized neighborhood associations within 1,000 feet from the boundaries of the subject property;

(v) All designated representatives of recognized Citizen Involvement Organizations as established in TMC Chapter 11-9;

(vi) Any person who submits a written request to receive a notice;

(vii) Any governmental agency that is entitled to notice under an intergovernmental agreement entered into with the City and any other affected agencies, including but not limited to: school districts; fire district; where the project either adjoins or directly affects a state highway, the Oregon Department of Transportation; and where the project site would access a County road or otherwise be subject to review by the County, then the County; and Clean Water Services; Tri Met; and, ODOT Rail Division and the railroad company if a railroad-highway grade crossing provides or will provide the only access to the subject property. The failure of another agency to respond with written comments on a pending application does not invalidate an action or permit approval made by the City under this Code;

(viii) Utility companies (as applicable); and,

(ix) Members of the City Council.

- (b) The Notice of a Public Hearing, at a minimum, must contain all of the following information:(i) The names of the applicant(s), any representative(s) thereof, and the owner(s) of the subject property;
 - (ii) The street address if assigned, if no street address has been assigned then Township,

Range, Section, Tax Lot or Tax Lot ID;

(iii) The type of application and a concise description of the nature of the land use action; (iv) A list of the approval criteria by TDC section for the decision and other ordinances or regulations that apply to the application at issue;

(v)Brief summary of the local decision making process for the land use decision being made and a general explanation of the requirements for submission of testimony and the procedure for conduct of hearings;

(vi) The date, time and location of the hearing;

(vii) Disclosure statement indicating that if any person fails to address the relevant approval criteria with enough detail, he or she may not be able to appeal to the Land Use Board of Appeals on that issue, and that only comments on the relevant approval criteria are considered relevant evidence;

(viii) The name of a City representative to contact and the telephone number where additional information may be obtained;

(ix) Statement that the application and all documents and evidence submitted to the City are in the public record and available for review, and that copies can be obtained at a reasonable cost from the City; and

(x) Statement that a copy of the staff report will be available for inspection at no cost at least seven days prior to the hearing and will be provided at reasonable cost.

(c) Failure of a person or agency to receive a notice, does not invalidate any proceeding in connection with the application, provided the City can demonstrate by affidavit that required notice was given.

(4) Additional Notice Requirements for Certain Type IV-A Application Types. The following additional notice requirements apply to Type IV-A Hearings where the City Council will be considering the application or removal of a Historic Landmark Designation or a Plan Text or Map Amendment for a particular property or discrete set of properties.

(a) The City Manager will notify in writing the Oregon Department of Land Conservation and Development (DLCD) in accordance with the minimum number of days required by ORS Chapter 197.

(b) At least 14 calendar days before the scheduled City Council public hearing date, public notice must be provided by publication in a newspaper of general circulation in the City.

(c) At least 14 calendar days before the scheduled City Council public hearing date, public notice must be posted in two public and conspicuous places within the City.

Finding:

The first evidentiary public hearing before the City Council will be held on August 12, 2024 and will follow the Quasi-Judicial review process. After submittal and completeness review, as required by this section, a notice of public hearing for Type IV-A application for PMA24-0001 was mailed by city staff on June 11, 2024. The mailed notice contained the information required by this section, as attached in Exhibit E. The Oregon Department of Land Conservation and Development (DLCD) was first notified prior to the 35-day notice period on May 31, 2024 and updated on July 7, 2024, attached in Exhibit E. The DLCD notice was updated with a new hearing date after we learned that there would not be a Planning Commission quorum for the advisory meeting originally scheduled for June 26th. This also pushed out the City Council first evidentiary hearing to August 12, 2024 which required updating the DLCD notice. Public notice has been published in the Tualatin Times during the week of June 20, 2024, attached in Exhibit E. No public notice was posted in two public places within the City on June 11, 2024, attached as Exhibit E. No public comments have been received. (5) Conduct of the Hearing—Type IV-A. The Mayor (or Mayor Pro Tem) must follow the order of proceedings set forth below. These procedures are intended to provide all interested persons a reasonable opportunity to participate in the hearing process and to provide for a full and impartial hearing on the application before the body. Questions concerning the propriety or the conduct of a hearing will be addressed to the chair with a request for a ruling. Rulings from the Mayor must, to the extent possible, carry out the stated intention of these procedures. A ruling given by the Mayor on such question may be modified or reversed by a majority of those members of the decision body present and eligible to vote on the application before the body. The procedures to be followed by the Mayor in the conduct of the hearing are as follows:

(a) At the commencement of the hearing, the Mayor (or designee) must state to those in attendance all of the following information and instructions:

(i) The applicable approval criteria by Code Chapter that apply to the application;
(ii) Testimony and evidence must concern the approval criteria described in the staff report, or other criteria in the comprehensive plan or land use regulations that the person testifying believes to apply to the decision;

(iii) Failure to raise an issue with sufficient detail to give the City Council and the parties an opportunity to respond to the issue, may preclude appeal to the state Land Use Board of Appeals on that issue;

(iv) At the conclusion of the initial evidentiary hearing, the City Council must deliberate and make a decision based on the facts and arguments in the public record; and (v) Any participant may ask the City Council for an opportunity to present additional relevant evidence or testimony that is within the scope of the hearing; if the City Council grants the request, it will schedule a date to continue the hearing as provided in TDC 32.240(5)(e), or leave the record open for additional written evidence or testimony as provided TDC 32.240(5)(f).

(b) The public is entitled to an impartial decision body as free from potential conflicts of interest and pre-hearing ex parte (outside the hearing) contacts as reasonably possible. Where questions related to ex parte contact are concerned, members of the City Council must follow the guidance for disclosure of ex parte contacts contained in ORS 227.180. Where a real conflict of interest arises, that member or members of the City Council must not participate in the hearing, except where state law provides otherwise. Where the appearance of a conflict of interest is likely, that member or members of the City Council must individually disclose their relationship to the applicant in the public hearing and state whether they are capable of rendering a fair and impartial decision. If they are unable to render a fair and impartial decision, they must be excused from the proceedings.

(c) Presenting and receiving evidence.

(i) The City Council may set reasonable time limits for oral presentations and may limit or exclude cumulative, repetitious, irrelevant, or personally derogatory testimony or evidence;

(ii) No oral testimony will be accepted after the close of the public hearing. Written testimony may be received after the close of the public hearing only as provided by this section; and

(iii) Members of the City Council may visit the property and the surrounding area, and may use information obtained during the site visit to support their decision, if the information relied upon is disclosed at the beginning of the hearing and an opportunity is provided to dispute the evidence.

(d) The City Council, in making its decision, must consider only facts and arguments in the public hearing record; except that it may take notice of facts not in the hearing record (e.g.,

local, state, or federal regulations; previous City decisions; case law; staff reports). Upon announcing its intention to take notice of such facts in its deliberations, it must allow persons who previously participated in the hearing to request the hearing record be reopened, as necessary, to present evidence concerning the newly presented facts.

(e) If the City Council decides to continue the hearing, the hearing must be continued to a date that is at least seven days after the date of the first evidentiary hearing (e.g., next regularly scheduled meeting). An opportunity must be provided at the continued hearing for persons to present and respond to new written evidence and oral testimony. If new written evidence is submitted at the continued hearing, any person may request, before the conclusion of the hearing, that the record be left open for at least seven days, so that he or she can submit additional written evidence or arguments in response to the new written evidence. In the interest of time, after the close of the hearing, the decision body may limit additional testimony to arguments and not accept additional evidence.

(f) If the City Council leaves the record open for additional written testimony, the record must be left open for at least seven days after the hearing. Any participant may ask the decision body in writing for an opportunity to respond to new evidence (i.e., information not disclosed during the public hearing) submitted when the record was left open. If such a request is filed, the decision body must reopen the record, as follows:

(i) When the record is reopened to admit new evidence or arguments (testimony), any person may raise new issues that relate to that new evidence or testimony;
(ii) An extension of the hearing or record granted pursuant to this section is subject to the limitations of TDC 32.030(1) (ORS 227.178—120-day rule), unless the applicant waives his or her right to a final decision being made within 120 days of filing a complete application; and

(iii) If requested by the applicant, the City Council must grant the applicant at least seven days after the record is closed to all other persons to submit final written arguments, but not evidence, provided the applicant may expressly waive this right.

(6) Notice of Adoption of a Type IV-A Decision. Notice of Adoption must be provided to the property owner, applicant, and any person who provided testimony at the hearing or in writing. The Type IV-A Notice of Adoption must contain all of the following information:

(a) A description of the applicant's proposal and the City's decision on the proposal, which may be a summary, provided it references the specifics of the proposal and conditions of approval in the public record;

(b) The address or other geographic description of the property proposed for development, including a map of the property in relation to the surrounding area;

(c) A statement a statement that a copy of the decision and complete case file, including findings, conclusions, and conditions of approval, if any, is available for review and how copies can be obtained;

(d) The date the decision becomes final; and

(e)The notice must include an explanation of rights to appeal a City Council decisions to the state Land Use Board of Appeals pursuant to ORS 197.805—197.860.

(7) Effective Date of a Type IV-A Decision.

(a) The written order is the final decision on the application.

(b) The date of the order is the date it is mailed by the Mayor (or designee) certifying its approval by the decision body.

(c) Appeal of a IV-A City Council decision is to the State Land Use Board of Appeals pursuant to ORS 197.805—197.860.

Finding:

The City Council public hearing will be conducted according to these requirements. Notice of Adoption of a Type IV-A Decision and any appeal will follow the requirements of this section.

Chapter 33: Applications and Approval Criteria

Section 33.070 Plan Amendments

(1) Purpose. To provide processes for the review of proposed amendments to the Zone Standards of the Tualatin Development Code and to the Text or the Plan Map of the Tualatin Comprehensive Plan.
 (2) Applicability. Quasi-judicial amendments may be initiated by the City Council, the City staff, or by a property owner or person authorized in writing by the property owner. Legislative amendments may only be initiated by the City Council.

(3) Procedure Type.

(a) Map or text amendment applications which are quasi-judicial in nature (e.g. for a specific property or a limited number of properties) is subject to Type IV-A Review in accordance with TDC Chapter 32

(b) Map or text amendment applications which are legislative in nature are subject to Type IV-B Review in accordance with TDC Chapter 32.

(4) *Specific Submittal Requirements.* An application for a plan map or text amendment must comply with the general submittal requirements in TDC 32.140 (Application Submittal).

Finding:

The proposed PMA is quasi-judicial in nature and has been processed according to the Type IV-A procedures discussed above.

(5) Approval Criteria.

(a) Granting the amendment is in the public interest.

Finding:

The applicant's narrative stated "amending the plan map as proposed will provide the public with an accurate depiction of property lines as they currently exist between the above-stated tax lots. Additionally, it will provide any prospective purchasers of any of the properties adjacent to the property line in question with an accurate understanding of the true extent of the property or properties in question. Amending the map as proposed will provide accurate information about the affected properties and protect the public interest." No public comments have been received. By approving this PMA what is a nonconformity, industrially zoned land being used for residential use, would be negated and bring the Willow Glen property more into compliance with the TDC.

Comprehensive Plan goals and policies serve as the adopted expression of the public interest. As identified in Section D, above, and with the applicant stating "the impact of this proposed map amendment is extremely limited in scope and matches existing use of the affected properties. None of the policies in the Tualatin Comprehensive Plan are implicated by this project" the public interest will be protected. City staff have determined that the proposed map amendment would satisfy Comprehensive Plan Goal 1 Public Involvement, Goal 1.1 and Policies 1.1.1 and 1.1.3, and therefore the change would be in the public interest. Because of the limited scope of the PMA, a non-developable strip of land, other Comprehensive Plan policies, goals and objective would not be affected or applicable.

(b) The public interest is best protected by granting the amendment at this time.

Finding:

The applicant's narrative states "amending the map as proposed will provide accurate information about the affected properties and protect the public interest". Tax Lots 2900 and 3100 are both zoned ML and should be utilized by uses listed in Table 60-1 Use Categories. The ML Zone only allows household living as a conditional use limited to caretaker residence, accessory to a permitted industrial use. Tax Lot 3200 is zoned RML and no industrial uses are permitted in this residential planning district. The 3,681 square feet strip of land is currently utilized by the Willow Glen Mobile Home Park for residential household living use which creates a non-conformity in terms of use. A Property Line Adjustment, PLA24-0001, was approved on June 17, 2024, which aligned the property line with the current uses. The ML zoning still remains for the strip of land that was the subject of PLA24-0001. The proposed PMA will rezone the strip of land to RML and then the nonconforming use of industrial zoned land for residential use will be negated.

(c) The proposed amendment is in conformity with the applicable goals and policies of the Tualatin Comprehensive Plan.

Finding:

As discussed above in Section D, the PMA will bring the Willow Glen Mobile Home Park into compliance with the TDC and consistent with several existing goals and policies of the Comprehensive Plan.

- (d) The following factors were consciously considered:
 - (i) The various characteristics of the areas in the City;
 - (ii) The suitability of the areas for particular land uses and improvements in the areas;
 - (iii) Trends in land improvement and development;
 - (iv) Property values;

(v) The needs of economic enterprises and the future development of the area; needed rightof-way and access for and to particular sites in the area;

- (vi) Natural resources of the City and the protection and conservation of said resources;
- (vii) Prospective requirements for the development of natural resources in the City;
- (viii) The public need for healthful, safe, esthetic surroundings and conditions;

Finding:

The scope of this proposed PMA is extremely limited and will be more akin to correcting a mapping error than a rezone. The applicant's narrative states "the proposed Plan Map Amendment is intended to correct the current plan map to account for the actual property lines between the affected properties. As such, none of the above criteria will be affected by amending the map." Willow Glen Mobile Home Park has utilized the 3,681 square-feet of land for residential use for decades. The property owner of Tax Lots 2900 and 3100 has initiated this PMA through their representative and are transferring a portion of their property to the Willow Glen Mobile Home Park. It is worth noting that the above criteria calls for the various characteristics of the areas in the City to be "consciously considered" but does not provide a standard by which an amendment should be approved or denied. The above "factors" do not seem to apply to such a small PMA that will not increase dwelling units or have the potential of creating additional lots.

(ix) Proof of change in a neighborhood or area, or a mistake in the Plan Text or Plan Map for the property under consideration are additional factors to consider.

Finding:

The applicant's narrative states "the current Plan Map is inaccurate, as the property line between the affected properties is currently drawn roughly 9 feet to the east of the actual line, which impacts

the proper representation of the affected properties' zoning districts as shown on the City's Plan Map. The inaccuracy of the current Plan Map is a relevant factor to consider in amending the Plan Map as proposed." City Staff agree that the proposed PMA is adjusting the land use of the residential use of Willow Glen Mobile Home Park to match the property lines and proper use for RML zoned land.

(e) If the amendment involves residential uses, then the appropriate school district or districts must be able to reasonably accommodate additional residential capacity by means determined by any affected school district.

Finding:

Although Tax Lot 3200 is a residential use, there will be no new dwelling units created if this PMA is approved and therefore no impact to the Tigard Tualatin School District capacity to educate students will occur.

(f) Granting the amendment is consistent with the applicable State of Oregon Planning Goals and applicable Oregon Administrative Rules, including compliance with the Transportation Planning Rule TPR (OAR 660-012-0060).

Finding:

Because the purpose of this PMA is to change the ML zoning of the strip of industrially zoned land to RML in order to match the current residential land use by Willow Glen Mobile Home Park. No new dwelling units or developable land will result with the proposed PMA being approved. Oregon's Transportation Planning Rule (TPR) (OAR 660-012-0060) is not applicable and no Transportation Impact Analysis was required or conducted.

(g) Granting the amendment is consistent with the Metropolitan Service District's Urban Growth Management Functional Plan.

Finding:

The proposed amendment or adjustment would not adversely impact the City's compliance with Titles 1-14 of the Metro Chapter 3.07, Urban Growth Management Functional Plan due to the scope of this amendment being extremely limited.

(h) Granting the amendment is consistent with Level of Service F for the p.m. peak hour and E for the one-half hour before and after the p.m. peak hour for the Town Center 2040 Design Type (TDC Map 10-4), and E/E for the rest of the 2040 Design Types in the City's planning area.

Finding:

The criterion is not applicable due to no additional dwelling units being created as a result of this map amendment and therefore no impact to Tualatin transportation system will occur.

(i) Granting the amendment is consistent with the objectives and policies regarding potable water, sanitary sewer, and surface water management pursuant to TDC 12.020, water management issues are adequately addressed during development or redevelopment anticipated to follow the granting of a plan amendment.

[...]

Finding:

The proposed PMA will not impact public utilities because no additional dwelling units will be created and no additional utility service need will result if this amendment is approved.

Chapter 60: Light Manufacturing Zone (ML) <u>Section 60.100 Purpose.</u>

The purpose of this zone is to provide areas of the City that are suitable for industrial uses and compatible with adjacent commercial and residential uses. The zone serves to buffer heavy manufacturing uses from commercial and residential areas. Industrial uses that are environmentally adverse or pose a hazard to life and safety are prohibited. The zone is suitable for warehousing, wholesaling, and light manufacturing processes that are not hazardous and do not create undue amounts of noise, dust, odor, vibration, or smoke. The purpose is also to allow a limited amount of commercial uses and services and other support uses, including office uses in limited locations in close proximity to the Commercial Office (CO) district. Commercial uses are not permitted in the Limited Commercial Setback.

Finding:

The purpose statement of the Light Manufacturing (ML) zoning district pertains to industrial use and its compatibility of adjacent residential use and provide a general list of appropriate industrial uses and provide the appropriate location for commercial uses.

The proposed PMA would align property lines with appropriate land use. The small strip of ML zoned land is currently being utilized by residents of the Willow Glen Mobile Home Park. The abutting property owner has decided to transfer this small strip of ML zoned land to the RML zoned lot owner via PLA24-0001. If this PMA is approved the zoning of this strip of land will change from ML zoning to RML zoning thereby eliminating any nonconforming use of industrially zoned land.

Chapter 41: Medium Low Density Residential Zone (RML)

Section 41.100 Purpose

The purpose of this zone is to provide household living uses with a variety of housing types at moderately low densities. This district is primarily oriented toward middle housing types including attached dwellings, multi-family development, and manufactured dwelling parks.

Finding:

No additional dwelling units will result from approval of this PMA, therefore there will be no change to the density of Tax Lot 3200.

TDC 41.200. - Use Categories.

(1) Use Categories. Table 41-1 lists use categories Permitted Outright (P) or Conditionally Permitted (C) in the RML zone. Use categories may also be designated as Limited (L) and subject to the limitations listed in Table 41-1 and restrictions identified in TDC 41.210. Limitations may restrict the specific type of use, location, size, or other characteristics of the use category. Use categories which are not listed are prohibited within the zone, except for uses which are found by the City Manager or appointee to be of a similar character and to meet the purpose of this zone, as provided in TDC 31.070.

(2) *Overlay Zones.* Additional uses may be allowed in a particular overlay zone. See the overlay zone Chapters for additional uses.

Table 41-1 Use Categories in the RML Zone

USE CATEGORY	STATUS	LIMITATIONS AND CODE REFERENCES
RESIDENTIAL USE CATEGORIES		
Household Living	P/C	Permitted housing types subject to TDC 41.220.
Residential Accessory Uses	P (L)	Permitted uses limited to Family Child Care Home subject to ORS 329A.440.
[]		

TDC 41.220. - Housing Types.

Table 41-2 lists Housing Types permitted in the RML zone. Housing types may be Permitted Outright (P), Conditionally Permitted (C), or Not Permitted (N) in the RML zone.

Table 41-2	
Housing Types in the RML Z	one

	housing rypes in the time zone			
HOUSING TYPE	STATUS	LIMITATIONS AND CODE REFERENCES		
[]				
Manufactured Dwelling Park	Ρ	Limited to locations designated by the Tualatin Community Plan Map and subject to TDC 34.190.		
[]				

Section 41.300 Development Standards.

(1) Development standards in the RML zone are listed in Table 41-3. Additional standards may apply to some uses and situations, see TDC 41.310 and TDC 41.330. The standards in Table 41-3 may be modified for greenway and natural area dedications as provided in TDC 36.420. The standards for lot size, lot width, building coverage, and setbacks that apply to single-family dwellings in small lot subdivisions are provided in TDC 36.410(2)(b).

(2) *Exceptions.* Existing non-conforming situations may be developed according to the provisions of TDC Chapter 35.

STANDARD	REQUIREMENT	LIMITATIONS AND CODE REFERENCES
MAXIMUM DENSITY		
[]		
Manufactured Dwelling Parks	12 units per acre	Limited to single-wide dwelling parks or any part of a single-wide dwelling park.
[]		

Table 41-3 Development Standards in the RH-HR Zone

MINIMUM LOT SIZE				
All Other Permitted Uses	10,000 square feet			
Conditional Uses	20,000 square feet			
Infrastructure and Utilities	—	As determined through the Subdivision,		
Uses		Partition, or Lot Line Adjustment process.		
MINIMUM AVERAGE LOT WID	ТН			
[]				
All Other Permitted Uses	75 feet			
Conditional Uses	100 feet	Minimum lot width at street is 40 feet.		
Flag Lots	—	Must be sufficient to comply with minimum		
		access requirements of TDC 73C.		
MINIMUM SETBACKS				
[]				
Multi-family (5 or more				
units), Conditional Uses, and				
Other Permitted Uses Not				
Listed				
Front				
<12 feet	20 feet			
12—<25 feet	25 feet			
25—<30 feet	30 feet			
30+ feet	35 feet			
Side	5 feet			
Corner Lots	—	On corner lots, the setback is the same as the		
		front yard setback on any side facing a street		
		other than an alley except for duplexes,		
		triplexes, and quadplexes where the setback		
		is 10 feet.		
OTHER DEVELOPMENT TYPES				
Minimum Distance Between	10 feet			
Building within One				
Development	40.5	For Tourshaussen, data weiten data souch at a		
Parking and vehicle	10 feet	For Townhouses, determined through the		
		Architectural Review process		
	25 foot	If all sotbacks are equal to or greater than 11/		
All Uses	55 1661	times the height of the building the height		
		may be increased to a maximum of 50 feet		
		with a conditional use permit.		
MAXIMUM LOT COVERAGE				
[]				
All Other Permitted Uses	40%	1		
[]				
r1				

Finding:

The proposed PMA would not create any use or development standard nonconformities.

Plan Map Amendment Narrative

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I. Executive Summary

Life Front Communities and Lu Pacific are submitting this Plan Map Amendment application affecting the following properties:

- (1) Tax Lot ID: 2S123BA03200 (9700 SW Tualatin RD, Tualatin, OR 97062);
- (2) Tax Lot ID: 2S123BA02900 (9975 SW Herman Rd, Tualatin, 97062); and
- (3) Tax Lot ID: 2S123BA03100 (9905 SW Herman Rd, Tualatin, 97062).

The Plan Map Amendment is the second of two required applications to adjust a property line that also adjusts zoning district boundaries in the City of Tualatin (the "**City**"). The following is an outline of the anticipated applications:

<u>Property Line Adjustment</u>: The current property owners of the tax lots described above have mutually agreed to legally adjust their common property line(s) to match the existing common property lines established by use for several decades. A property line shared by all three properties, which runs approximately 405 feet north and south and is currently marked off by an existing fence, will shift approximately 9 feet west.

<u>Plan Map Amendment</u>: In conjunction with the Property Line Adjustment application, this Plan Map Amendment application is being submitted to adjust the zoning districts affected by the Property Line Adjustment. The Property Line Adjustment will proportionally extend Medium Low Density Residential (RML) and reduce Light Manufacturing (ML) zoning districts. The approximately 9-foot wide by 405-foot long strip of land, currently within the ML Zoning District will need to be recategorized as RML, to be consistent with its intended use, and the City's Plan Map must be amended accordingly.

Included in this Plan Map Amendment narrative are the following exhibits (each an "**Exhibit**"), attached to fulfill the application requirements under TDC 33.070, 32.140:

Exhibit A: Site Plan

Exhibit B: Record of Survey

Exhibit C: Title Report (Proof of Ownership)

Exhibit D: Service Provider Letters

Exhibit E: Neighborhood/Developer Meeting Documentation

Exhibit F: Pre-Application Meeting Summary

Exhibit G: Citizen Involvement Organization Contact Information

II. Site Description and Setting

Tax lot 3200, which is developed as a Manufactured Home Park, is within Zone RML (Medium Low Density Residential), whereas the westerly adjacent Tax lots 2900 and 3100 have been developed for commercial uses and are currently within Zone ML (Light Manufacturing).

Several decades ago, a fence was built to mark the boundary between tax lot 3200 and tax lots 2900 and 3100. However, this fence was placed roughly 9 feet west of the actual boundary. The properties have been used as if the fence line separated the RML and ML properties, and the owners of such properties now seek to formally adjust the shared property line between them to match the current position of the fence line, and to amend the City's plan map accordingly.

Upon approval of the above-described Property Line Adjustment, an approximately 9-foot wide by 405-foot long strip of land will become part of tax lot 3200 and will need to be recategorized as RML to be consistent with its intended use.

For a simple overview of the relationship and use of the affected properties, please see **Exhibits A** and **B**.

III. Applicable Review Criteria

A. <u>Chapter 32: Procedures</u>

TDC 32.010 Purpose and Applicability

...

....

••••

- (2) Applicability of Review Procedures. All land use and development permit applications and decisions, will be made by using the procedures contained in this Chapter. The procedure "type" assigned to each application governs the decision-making process for that permit or application. There are five types of permit/application procedures as described in subsections (a) through (e) below. Table 32-1 lists the City's land use and development applications and corresponding review procedure(s).
 - (a) Type I Procedure (Ministerial Staff Review). A Type I procedure is used in applying City standards and criteria that do not require the use of discretion, interpretation, or the exercise of policy or legal judgment (i.e., clear and objective standards). Type I decisions are made by the City Manager without public notice and without a public hearing. Appeals of Type I decisions are to Circuit Court under writ of review.
 - (d) Type IV-A Procedure (Quasi-Judicial Review—City Council Public Hearing). Type IV-A procedure is used when the standards and criteria require discretion, interpretation, or policy or legal judgment and is the procedure used for site-specific land use actions initiated by an applicant. Type IV-A decisions are made by the City Council and require public notice and a public hearing. Appeals of Type IV-A decisions are heard by the Land Use Board of Appeals (LUBA).
- (3) Determination of Review Type. Unless specified in Table 32-1, the City Manager will determine whether a permit or application is processed as Type I, II, III, IV-A or IV-B based on the descriptions above. Questions regarding the appropriate procedure will be resolved in favor of the review type providing the widest notice and opportunity to participate. An applicant may choose to elevate a Type I or II application to a higher numbered review type, provided the applicant pays the appropriate fee for the selected review type.

Excerpt of Table 32-1—Applicable Types and Review Procedures						
Application	Procedure Type	Decision Body	Appeal Body	Pre- Application Conference Required	Neighborhood & Developer Meeting Required	Applicable Code
Property Line Adjustment	I	СМ	Circuit Court	NO	NO	TDC 36
Plan Map Amendment IV-A CC LUBA YES YES TDC 33.070						
CC: City Council; CM: City Manager; LUBA: Land Use Board of Appeals.						

RESPONSE: As described in Table 32-1, a Plan Map Amendment application is subject to Type IV-A procedure and the City Council is the decision-making body. As discussed above in the Executive Summary, the Property Line Adjustment is being submitted concurrent with this Plan Map Amendment application and will be processed separately.

TDC 32.020 Procedures for Review of Multiple Applications.

Multiple applications processed individually require the filing of separate applications for each land use action. Each application will be separately reviewed according to the applicable procedure type and processed sequentially as follows:

- (1) Applications with the highest numbered procedure type must be processed first;
- (2) Applications specifically referenced elsewhere in the TDC as to the particular order must be processed in that order; and
- (3) Where one land use application is dependent on the approval of another land use application, the land use application upon which the other is dependent must be processed first (e.g., a conditional use permit is subject to prior approval before architectural review).

RESPONSE: The review procedure is understood.

TDC 32.110 Pre-Application Conference.

•••

- (2) When Mandatory. Pre-application conferences are mandatory for all land use actions identified as requiring a pre-application conference in Table 32-1. An applicant may voluntarily request a pre-application conference for any land use action even if it is not required.
- (3) Timing of Pre-Application Conference. A pre-application conference must be held with City staff before an applicant submits an application and before an applicant conducts a Neighborhood/Developer meeting.
- ••••
- (6) Validity Period for Mandatory Pre-Application Conferences; Follow-Up Conferences. A follow-up conference is required for those mandatory preapplication conferences that have previously been held when:
 - (a) An application relating to the proposed development that was the subject of the pre-application conference has not been submitted within six months of the pre-application conference;
 - ••••
- **RESPONSE:** A pre-application conference was held with City of Tualatin Planning Division on March 8, 2023, to discuss the proposed Property Line Adjustment and Plan Map Amendment. The follow-up conference requirement was fulfilled on February 28, 2024 via email by the City Planning Division. The pre-application conference and follow-up conference followed applicable procedures and is valid for six months, until August 28, 2024. See **Exhibit F** for details. The standards are met.

TDC 32.120 Neighborhood/Developer Meetings.

- •••
- (2) When Mandatory. Neighborhood/developer meetings are mandatory for all land use actions identified in Table 32-1 as requiring a neighborhood/developer meeting. An applicant may voluntarily conduct a neighborhood/developer meeting even if it is not required and may conduct more than one neighborhood/developer meeting at their election.
- (3) *Timing.* A neighborhood/developer meeting must be held after a preapplication meeting with City staff, but before submittal of an application.

- (4) *Time and Location.* Required neighborhood/developer meetings must be held within the city limits of the City of Tualatin at the following times:
 - (a) If scheduled on a weekday, the meeting must begin no earlier than 6:00 p.m.
 - (b) If scheduled on a weekend, the meeting must begin between 10:00 a.m. and 6:00 p.m.
- (5) Notice Requirements.
 - (a) The applicant must provide notice of the meeting at least <u>14</u> calendar days and no more than 28 calendar days before the meeting. The notice must be by first class mail providing the date, time, and location of the meeting, as well as a brief description of the proposal and its location. The applicant must keep a copy of the notice to be submitted with their land use application.
 - (b) The applicant must mail notice of a neighborhood/developer meeting to the following persons:
 - (i) All property owners within 1,000 feet measured from the boundaries of the subject property;
 - (ii) All property owners within a platted residential subdivision that is located within 1,000 feet of the boundaries of the subject property. The notice area includes the entire subdivision and not just those lots within 1,000 feet. If the residential subdivision is one of two or more individually platted phases sharing a single subdivision name, the notice area need not include the additional phases; and
 - (iii) All designated representatives of recognized Citizen Involvement Organizations as established in TMC Chapter 11-9.
 - (c) The City will provide the applicant with labels for mailing for a fee.
 - (d) Failure of a property owner to receive notice does not invalidate the neighborhood/developer meeting proceedings.
- (6) Neighborhood/Developer Sign Posting Requirements. The applicant must provide and post on the subject property, at least <u>14</u> calendar days before the meeting. The sign must conform to the design and placement standards established by the City for signs notifying the public of land use actions in TDC <u>32.150</u>.

- (7) Neighborhood/Developer Meeting Requirements. The applicant must have a sign-in sheet for all attendees to provide their name, address, telephone number, and email address and keep a copy of the sign-in sheet to provide with their land use application. The applicant must prepare meeting notes identifying the persons attending, those commenting and the substance of the comments expressed, and the major points that were discussed. The applicant must keep a copy of the meeting notes for submittal with their land use application.
- **RESPONSE** A Neighborhood/developer meeting is required for a Plan Map Amendment and it was held on July 12, 2023, from 6:30 pm to 7:30 pm at the Tualatin Library Community Room (18878 SW Martinazazzi Avenue, Tualatin, OR 97062). The neighborhood/developer meeting was arranged and held in accordance with TDC 32.120((3)-(7). All relevant documents pertaining to this meeting are attached in **Exhibit D**. The above standard is met.

TDC 32.130 Initiation of Application.

- (1) Type I, Type II, Type III, and Type IV-A Applications. Type I, Type II, Type III, and Type IV-A applications may be submitted by one or more of the following persons:
 - (a) The owner of the subject property;
- **RESPONSE:** This application has been submitted by the owners of the subject properties. The above standard is met.

TDC 32.140 Application Submittal.

- (1) Submittal Requirements. Land use applications must be submitted on forms provided by the City. A land use application may not be accepted in partial submittals. All information supplied on the application form and accompanying the application must be complete and correct as to the applicable facts. Unless otherwise specified, all of the following must be submitted to initiate completeness review under TDC 32.160:
 - (a) A completed application form. ...
 - (b) A written statement addressing each applicable approval criterion and standard;

- (c) Any additional information required under the TDC for the specific land use action sought;
- (d) Payment of the applicable application fee(s) pursuant to the most recently adopted fee schedule;
- (e) Recorded deed/land sales contract with legal description.
- (f) A preliminary title report or other proof of ownership.
- (g) For those applications requiring a neighborhood/developer meeting:
 - (i) The mailing list for the notice;
 - (ii) A copy of the notice;
 - (iii) An affidavit of the mailing and posting;
 - (iv) The original sign-in sheet of participants; and
 - (v) The meeting notes described in TDC 32.120(7).
- (h) A statement as to whether any City-recognized Citizen Involvement Organizations (CIOs) whose boundaries include, or are adjacent to, the subject property were contacted in advance of filing the application and, if so, a summary of the contact. The summary must include the date when contact was made, the form of the contact and who it was with (e.g. phone conversation with neighborhood association chairperson, meeting with land use committee, presentation at neighborhood association meeting), and the result;
- Any additional information, as determined by the City Manager, that may be required by another provision, or for any other permit elsewhere, in the TDC, and any other information that may be required to adequately review and analyze the proposed development plan as to its conformance to the applicable criteria;
- •••
- **RESPONSE:** This application submittal includes the applicable information required above, including the application form, fee, narrative, and property ownership information (*see* **Exhibit C**). An email was sent on May 9, 2023 to the River Park Community Involvement Organization's general email address (<u>riverparkcio@gmail.com</u>) describing the Property Line Adjustment and Plan Map Amendment projects (*see* **Exhibit G**). Additionally, a notice of public meeting was sent on June 15, 2023 to the River Park CIO and the general

Tualatin CIO (<u>Tualatincio@gmail.com</u>) describing the same projects and information related to the public meeting held to discuss them (*see* **Exhibit D**). Neither CIO has responded to these messages, nor did a representative of either CIO appear at the public meeting. The Above submittal requirements are met.

B. Chapter 33.070 Amendment to the Plan Map of the Tualatin Comprehensive Plan

TDC 33.070 Plan Amendments.

••••

- (5) Approval Criteria.
 - (a) Granting the amendment is in the public interest.
 - (b) The public interest is best protected by granting the amendment at this time.
- **RESPONSE:** Amending the plan map as proposed will provide the public with an accurate depiction of property lines as they currently exist between the above-stated tax lots. Additionally, it will provide any prospective purchasers of any of the properties adjacent to the property line in question with an accurate understanding of the true extent of the property or properties in question. Amending the map as proposed will provide accurate information about the affected properties and protect the public interest. The criteria are met.

TDC 33.070 Plan Amendments.

...

(5) Approval Criteria.

- (c) The proposed amendment is in conformity with the applicable goals and policies of the Tualatin Comprehensive Plan.
- **RESPONSE:** The impact of this proposed map amendment is extremely limited in scope and matches existing use of the affected properties. None of the policies in the Tualatin Comprehensive Plan are implicated by this project. The criterion is met.

TDC 33.070 Plan Amendments.

••••

(5) Approval Criteria.

- (d) The following factors were consciously considered:
 - (i) The various characteristics of the areas in the City;

- (ii) The suitability of the areas for particular land uses and improvements in the areas;
- (iii) Trends in land improvement and development;
- (iv) **Property values**;
- (v) The needs of economic enterprises and the future development of the area; needed right-of-way and access for and to particular sites in the area;
- (vi) Natural resources of the City and the protection and conservation of said resources;
- (vii) Prospective requirements for the development of natural resources in the City;
- (viii) The public need for healthful, safe, esthetic surroundings and conditions; and
- **RESPONSE:** The proposed Plan Map Amendment is intended to correct the current plan map to account for the actual property lines between the affected properties. As such, none of the above criteria will be affected by amending the map. The criteria are met.

TDC 33.070 Plan Amendments.

•••

(5) Approval Criteria.

(ix) Proof of change in a neighborhood or area, or a mistake in the Plan Text or Plan Map for the property under consideration are additional relevant factors to consider.

RESPONSE: The current Plan Map is inaccurate, as the property line between the affected properties is currently drawn roughly 9 feet to the east of the actual line, which impacts the proper representation of the affected properties' zoning districts as shown on the City's Plan Map. The inaccuracy of the current Plan Map is a relevant factor to consider in amending the Plan Map as proposed. The criterion is met.

TDC 33.070 Plan Amendments.

•••

(5) Approval Criteria.

- (e) If the amendment involves residential uses, then the appropriate school district or districts must be able to reasonably accommodate additional residential capacity by means determined by any affected school district.
- (f) Granting the amendment is consistent with the applicable State of Oregon Planning Goals and applicable Oregon Administrative Rules, including compliance with the Transportation Planning Rule TPR (OAR 660-012-0060).
- (g) Granting the amendment is consistent with the Metropolitan Service District's Urban Growth Management Functional Plan.
- (h) Granting the amendment is consistent with Level of Service F for the p.m. peak hour and E for the one-half hour before and after the p.m. peak hour for the Town Center 2040 Design Type (Comprehensive Plan Map 10-4), and E/E for the rest of the 2040 Design Types in the City's planning area.
- (i) Granting the amendment is consistent with the objectives and policies regarding potable water, sanitary sewer, and surface water management pursuant to applicable goals and policies in the Tualatin Comprehensive Plan, water management issues are adequately addressed during development or redevelopment anticipated to follow the granting of a plan amendment.

....

RESPONSE: The proposed Plan Map Amendment does involve residential use, but is only a correction of the Plan Map as currently drawn. Such Amendment will not impact school district capacities, Oregon Planning Goals, any Transportation Planning Rules, the Metropolitan Service District's Urban Growth Management Functional Plan, any of the City's Comprehensive Plan map requirements, or water, sanitary sewer, and surface water management goals in policies in the Tualatin Comprehensive Plan. As such, the above criteria are met.

C. Chapter 34.500: Manufactured Dwelling Park Development

TDC 34.500 Manufactured Dwelling Park Development Standards

- (2) Manufactured dwelling park developments and modifications to existing manufactured dwelling parks to which this section applies are reviewed through the Architectural Review Process for compliance with the Tualatin Development Code and any other applicable regulations and ordinances of the City. No person may establish, operate, rent, lease, or occupy a manufactured dwelling park or manufactured dwelling park space without first applying for and obtaining approval through the Architectural Review Process.
- (3) Only those manufactured homes and mobile homes, which have a Department of Housing and Urban Development (HUD) label certifying that the structure is constructed in accordance with federal law are permitted. Recreational vehicles and camping vehicles must not be used for residential purposes in manufactured dwelling parks and must not be rented a space or hooked up to sewer, water, or electrical facilities within a manufactured dwelling park.
- (4) The minimum gross acreage for a manufactured dwelling park is one acre.
- (5) The manufactured dwelling park street system must include at least one direct access to a public street, containing a right-of-way width of not less than 50 feet.
- (6) Each manufactured dwelling space must be designed to include at least two standard size automobile parking spaces, and may be designed either end-to-end or side-to-side. Such parking spaces must be paved in accordance with City standards for residential driveways.
- (7) Each manufactured dwelling must have its wheels, axles, tongue, and traveling lights removed.
- (8) Each manufactured dwelling must have a continuous and permanently affixed skirt installed. Such skirting must be composed of the same material and finish as the exterior of the manufactured dwelling or material with a brick-like finish or as otherwise approved through the Architectural Review Process.
- (9) No extension, accessory structure, or other out building may be attached to a manufactured dwelling, except for structures conforming to the definition contained in state law concerning accessory structures.
- (10) The distance between any two manufactured dwellings, including any approved accessory building, structure, awning, or tipout, must be ten feet or more on either side and either end.

- (11) The distance between a manufactured dwelling, including approved accessory buildings, structures, awnings, or tipouts, and the nearest manufactured dwelling park property line or other permanent park structure must be 15 feet or the setback requirement of the RML District, whichever is greater.
- (12) The distance between a manufactured dwelling and the nearest manufactured dwelling park street must be eight feet or more.
- (13) The distance between a manufactured dwelling and the nearest manufactured dwelling park sidewalk must be five feet or more.
- **RESPONSE:** The above standards are currently met and the Plan Map Amendment will not alter this.

D. Chapter 41: Medium Low Density Residential Zone (RML)

TDC 41.200 Use Categories

Residential Use Category	Status	Limitations and Code References
Household Living	P/C	Permitted housing types subject to TDC 41.220
P: Permitted Outright		C: Conditionally Permitted

TDC 41.222 Housing Types

Housing Type	Status	Limitations and Code References
Manufactured Dwelling Park	Permitted Outright	Limited to Locations Designated by the Tualatin Community Plan Map and Subject to TDC 34.190

RESPONSE: The existing manufactured dwelling park use is not planned to change with this Plan Map Amendment application.

TDC 41.300 Development Standards

Standard	Requirement	Limitations and Code References
Maximum Density	12 units per acre	Limited to single-wide dwelling parks or any part of single-wide dwelling parks
Minimum Setbacks		
Front		
<12 Feet	20 Feet	
12 – <25 Feet	25 Feet	
25 – <30 Feet	30 Feet	
30+ Feet	35 Feet	

Side	5 Feet	On corner lots, the setback is the same as the front yard setback on any side facing a street other than an alley except for duplexes, triplexes, and quadplexes where the setback is 10 feet.
Corner Lots	-	
Maximum Structure Height	35 Feet	
Maximum Lot Coverage	40%	

RESPONSE: As illustrated in the attached Site Plan attached as **Exhibit A**, the minimum lot size and width standards are met. No improvements are planned and the minimum setbacks and maximum structure height for the existing improvements continue to be met. The applicable standards are met.
E. Chapter 60: Light Manufacturing Zone (ML)

TDC 60.200 Use Categories

Use Category	Status	Limitations and Code References
Light Manufacturing	Permitted Outright Conditionally Permitted Limited	 Conditional uses limited to: Machine shop over 7,500 square feet; Building, heating, plumbing and electrical contractor's offices, with on-site storage of equipment or materials; Casting or fabrication of metals. All other uses permitted outright.

RESPONSE: The existing light manufacturing use is not planned to change with this Plan Map Amendment application.

TDC 60.300 Development Standards

Standard	Requirement	Limitations and Code References
Minimum Lot Size	20,000 Square Feet	_
Minimum Lot Width	100 Feet	When lot has frontage on public street, minimum lot width at the street is 100 feet.
		When lot has frontage on cul-de-sac street, minimum lot width at the street is 50 feet.
Infrastructure and Utilities Uses	_	As determined through the Subdivision, Partition, or Lot Line Adjustment process.
Flag Lots	_	Must be sufficient to comply with minimum access requirements of TDC 73C.
Minimum Setbacks		
Front	30 Feet	—

Front Setback Adjacent to Residential or Manufacturing Park District	50 Feet	
Side	0 — 50 Feet	Determined through Architectural Review Process. No minimum setback if adjacent to railroad right- of-way or spur track.
Side Setback Adjacent to Residential or Manufacturing Park District	50 Feet	_
Rear	0 — 50 Feet	Determined through Architectural Review Process. No minimum setback if adjacent to railroad right- of-way or spur track.
Rear Setback Adjacent to Residential or Manufacturing Park	50 Feet	_
Parking and Circulation Areas	5 Feet	No minimum setback required adjacent to joint access approach in accordance with TDC 73C.
Parking and Circulation Areas Setback Adjacent to Residential or Manufacturing Park	10 Feet	
Fences	10 Feet	From public right-of-way.
Structure Height	·	·
Maximum Height	50 Feet	May be increased to 85 feet if yards adjacent to structure are not less than a distance equal to one and one-half times the height of the structure.

		Measured at the 50-foot setback line, includes flagpoles. The building height may extend above 28 feet on a plane beginning at the 50-foot setback line at a slope of 45 degrees extending away from the 50-foot setback line. Flagpoles may extend to 100 feet.
Maximum Height Adjacent to Residential District	28 Feet	_

RESPONSE: As illustrated in the attached Site Plan attached as **Exhibit A**, the minimum lot size and width standards are met. No improvements are planned and the minimum setbacks and maximum structure height for the existing improvements continue to be met. The applicable standards are met.

IV. Conclusion

In summary, the proposal complies with the applicable approval criteria. The applicant requests that the City approve the Plan Map Amendment to amend the subject site's Plan Map designation to be entirely Medium Low Density Residential (RML) after the approved Property Line Adjustment.



L						
Γ	CURVE	RADIUS	ARC LENGTH	DELTA ANGLE	CHORD BEARING	CHORD LENGTH
I	C-1	2948.93'	81.71'	1'35'15.02"	S69 * 51'38"W	81.70 '
I	C-2	500.00'	142.82'	16'21'56.04"	N27°52'23"W	142.33'
I	C-3	500.00'	312.85'	35°51'01.92"	N18°18'01"W	307.78'
I	C-4	388.77'	191.08'	28'09'39.68"	S12°22'35"E	189.16'
l	C-5	2914.93'	188.66'	3•42'30.04"	N70 ° 55 ' 16 " E	188.63'

SITE PLAN PROPERTY LINE ADJUSTMENT IN THE NW 1/4 OF SECTION 23 TOWNSHIP 2 SOUTH, RANGE 1 WEST, W.M. CITY OF TUALATIN, WASHINGTON COUNTY, OREGON CASE FILE: XXXX





NOT TO SCALE

LEGEND



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		—E-		

CATCH BASIN CLEAN DUT COMMUNICATION VAULT ELECTRIC METER ELECTRIC RISER ELECTRIC VAULT ELECTRIC TRANSFORMER

FIRE HYDRANT

MANUFACTURED HOME PARK

POWER POLE WATER VALVE

BUILDING BUILDING OVERHANG FENCE GAS STORM DRAIN UNDERGROUND ELECTRIC WATER

CONCRETE



SCALE: 1'' = 60'DATE: MARCH 13, 2024

REGISTERED PROFESSIONAL LAND SURVEYOR Ann OREGON JULY 13, 2004 ANTHONY B. RYAN 58833 EXPIRES: DECEMBER 31, 2024

VEDDL SURVE Excellence is our benchmark. INC. 6950 SW HAMPTON ST., STE. 170, TIGARD, OR 97223 PH: (503) 595-8702 FAX: (503) 595-8705 www.weddlesurveying.net

JOB NO. 5679



WASHINGTON COUNTY SURVEYOR'S OFFICE ACCEPTED FOR FILING: _

PROPERTY OWNERS:

TRACT 1 AND TRACT 3 LU QBF II, LLC DOCUMENT NO. 2022-008851

TRACT 2 LIFE FRONT 2, LLC DOCUMENT NO. 2020-119069

NARRATIVE

BRASS SCREW

WITH 3/4" WASHER

MARKED "PLS

2692 CH2M HILL"

PER S.N. 28410

5/8" I.R. W/ Y.P.C.

MARKED "PLS

2692 CH2M HILL"

S.M

TUALATIN

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L=188.66

PER S.N. 28410

THE PURPOSE OF THIS SURVEY IS TO MONUMENT A PROPERTY LINE ADJUSTMENT BETWEEN THOSE TRACTS OF LAND DESCRIBED AS TRACT 1 AND TRACT 3 IN DOCUMENT NO. 2022-008851 AND THAT TRACT OF LAND DESCRIBED IN DOCUMENT NO. 2020-119069, WASHINGTON COUNTY DEED RECORDS, AS APPROVED BY THE CITY OF TUALATIN IN CASE FILE NO. PLA24-XXX.

BASIS OF BEARINGS

NORTH 67'34'48" EAST PER SURVEY NO. 34248, FOR THE NORTHERLY RIGHT-OF-WAY LINE OF SW HERMAN ROAD, BETWEEN A FOUND 5/8" IRON ROD WITH RED PLASTIC CAP BEING AT A 5.00-FOOT OFFSET TO THE SOUTHWEST CORNER OF THAT TRACT OF LAND DESCRIBED IN DOCUMENT NO. 2021-130476 AND A FOUND 5/8" IRON ROD WITH RED PLASTIC CAP AT THE SOUTHEAST CORNER OF TRACT 3, AS SHOWN HEREON.

PROCEDURE

- 1. THE PROPERTY LINES OF TRACT 1 AND TRACT 3 WERE ESTABLISHED BY HOLDING THE LOCATIONS OF MONUMENTS FOUND AT, OR WITH REFERENCE TO THE PROPERTY CORNERS OF SAID TRACTS, AS SHOWN HEREON, PER SAID SURVEY NO. 34248, ALSO MATCHING DATA SHOWN IN SAID DOCUMENT NO. 2022-008851
- THE NORTHERLY LINE OF TRACT 2 WAS ESTABLISHED BY HOLDING THE CALCULATED POSITION OF 2. THE NORTHEAST CORNER OF TRACT 3 (PER FALLINGS FROM AN ADJACENT FOUND IRON ROD, AS NOTED ON SAID SURVEY NO. 34248) AND A FOUND IRON ROD WITH YELLOW PLASTIC CAP MARKED "PLS 2692 CH2M HILL" (PER SURVEY NO. 28410) AT THE NORTHEAST CORNER OF SAID TRACT 2.
- THE EASTERLY AND SOUTHERLY LINES OF TRACT 2 WERE HELD TO BE THE WESTERLY 3. RIGHT-OF-WAY LINE OF SW TUALATIN ROAD AND THE NORTHERLY RIGHT-OF-WAY LINE OF SW HERMAN ROAD RESPECTIVELY, BOTH BEING ESTABLISHED BY HOLDING MONUMENTS MATCHING DESCRIPTIONS AND DATA SHOWN ON SAID SURVEY NO. 28410.
- MONUMENTS WERE SET TO MARK THE APPROVED, ADJUSTED PROPERTY LINES AT THE REQUEST OF THE PROPERTY OWNERS, AS SHOWN HEREON.

LEGEND

(NOTE: ALL MONUMENTS WERE HELD UNLESS OTHERWISE NOTED.)

- ♦ = FOUND MONUMENT AS NOTED
- ø = FOUND 5/8" IRON ROD WITH RED PLASTIC CAP STAMPED "WEDDLE SURVEYING" PER SN 34248, OR AS OTHERWISE NOTED
- ▲ = FOUND 5/8" IRON ROD WITH 1.5" ALUMINUM CAP STAMPED "PLS 2692 CH2M HILL" (OR AS OTHERWISE NOTED) PER SN 28410
- $O = 5/8" \times 30"$ IRON ROD WITH RED PLASTIC CAP STAMPED
- "WEDDLE SURVEYING", TO BE SET UPON CITY APPROVAL
-)S1 = DATA PER SURVEY NO. 34268, WASHINGTON COUNTY SURVEY RECORDS (
- DOC. NO. = DOCUMENT NUMBER, WASHINGTON COUNTY DEED RECORDS.
 - I.R. = IRON ROD
 - S.N. = SURVEY NUMBER, WASHINGTON COUNTY SURVEY RECORDS
- W/Y.P.C = WITH YELLOW PLASTIC CAP
- W/R.P.C = WITH RED PLASTIC CAP
- MEAS. = MEASURED



WASHINGTON COUNTY PLAT RECORDS: PARTITION PLAT 2002-005 "PACIFIC STATES INDUSTRIAL PARK" "SIJOTA INDUSTRIAL PARK" "TUALATIN INDUSTRIAL PARK"

IGTO	N CC	UNTY	DEED	RECORDS:
IENT	NO.	89-3	5206	
IENT	NO.	2004-	-0244	24
IENT	NO.	2005-	-0771	40
IENT	NO.	2006-	-1096	19
IENT	NO.	2012-	-0337	53
IENT	NO.	2020-	-1190	69
IENT	NO.	2021-	-1304	76
IENT	NO.	2022-	-0088	51





6950 SW HAMPTON ST., STE. 170, TIGARD, OR 97223 PH: (503) 595-8702 FAX: (503) 595-8705 www.weddlesurveying.net

312

8

April 30, 2024

City of Tualatin Planning Commission 18880 SW Martinazzi Ave, Tualatin, OR 97062

Subject: Property Owner Letter of Authorization

Dear Tualatin Planning Commission:

Life Front 2, LLC, an Oregon limited liability company ("Life Front"), owns the real property located at 9700 SW Tualatin Rd., Oregon 97062, and LU QBF II, LLC, an Oregon limited liability company ("Lu Pacific"), owns the real property located at 9975 and 9905 SW Herman Rd., Oregon 97062.

Life Front and Lu Pacific desire to effect a property line adjustment between the abovementioned properties that also requires a plan map amendment. Both Life Front and Lu Pacific authorize Miller Nash LLP to complete and submit a plan map amendment on their behalf.

Contact information for Miller Nash LLP is as follows:

Miller Nash LLP c/o Max Forer 1140 SW Washington St., Ste. 700 Portland, Oregon 97205 Telephone: (503) 224-5858 E-mail: max.forer@millernash.com

Sincerely,

LU QBF II, LLC

Name: __perer Lu

Title: _	Darner	
Date: _	5/2/24	

Life Front 2, LLC

Ken Kib

Name: Benjamin Kilo

Title: Owner

Date: 5/2/24

Exhibit C

Proof of Ownership – Title Report

Property Detail Report 9700 SW Tualatin Rd, Tualatin, OR 97062-9407

APN: R531552

Owner Information					
Owner Name:	Life Front 2 LLC				
Vesting: Mailing Address:	3015 NE 44th Ave, Portland,	, OR 97213-1112		Occupancy:	Absentee Owner
Location Information]				
Legal Description: APN: Munic / Twnshp: Subdivision: Neighborhood: Elementary School: Latitude:	Acres 4.39 R531552 Tualatin Elementar 45.38733	Alternate APN: Twnshp-Rng-Sec: Tract #: School District: Middle School: Longitude:	2S123BA03200 02S-01W-23 Tigard-Tualatin School Dis Hazelbrook Middle -122.77789	County: Census Tract / Block: Legal Lot / Block: Legal Book / Page: strict 23J High School:	Washington, OR 032001 / 2013 Tualatin High Scho
l ast Transfer / Conve	evance - Current Owner				
Transfer / Rec Date: Buyer Name:		Price: Seller Name:		Transfer Doc #: Deed Type:	
Last Market Sale					
Sale / Rec Date: Multi / Split Sale: 1st Mtg Amt / Type: 2nd Mtg Amt / Type: Seller Name:		Sale Price / Type: Price / Sq. Ft.: 1st Mtg Rate / Type: 2nd Mtg Rate / Type:		Deed Type: New Construction: 1st Mtg Doc #: Sale Doc #:	N/A N/A
Lender:				Litle Company:	
Prior Sale Informatio	n				
Sale / Rec Date: 1st Mtg Amt / Type: Prior Lender:		Sale Price / Type: 1st Mtg Rate / Type:		Prior Deed Type: Prior Sale Doc #:	N/A
Property Characteris	stics				
Gross Living Area: Living Area: Total Adj. Area: Above Grade: Basement Area: Style: Foundation: Quality: Condition:	400 Sq. Ft. 400 Sq. Ft. 400 Sq. Ft.	Total Rooms: Bedrooms: Baths (F / H): Pool: Fireplace: Cooling: Heating: Exterior Wall: Construction Type:	0	Year Built / Eff: Stories: Parking Type: Garage #: Garage Area: Porch Type: Patio Type: Roof Type: Roof Material:	
Site Information					
Land Use: State Use:	Mobile Home Park	Lot Area: Lot Width / Depth:	191,228 Sq. Ft.	Zoning: # of Buildings:	RML 1
County Use:	7070 - Manufactured Home Park	Usable Lot:		Res / Comm Units:	
Site Influence: Flood Zone Code: Community Name:	Ae City Of Tualatin	Acres: Flood Map #: Flood Panel #:	4.39 41067C0544E 0544E	Water / Sewer Type: Flood Map Date: Inside SFHA:	11/04/2016 True
Tax Information					
Assessed Year: Tax Year: Tax Area: Property Tax: Exemption:	2023 2022 023.76 \$25,359.25	Assessed Value: Land Value: Improvement Value: Improved %: Delinquent Year:	\$1,508,410 39.42%	Market Total Value: Market Land Value: Market Imprv Value: Market Imprv %:	\$4,638,160 \$2,809,660 \$1,828,500 39.42%



Disclaimer: This report is not an insured product or service or a representation of the condition of title to real property. It is not an abstract, legal opinion, opinion of title, title insurance, commitment or preliminary report, or any form of title insurance or guaranty. Estimated property values are: (i) based on available data; (ii) are not guaranteed or warranted; (iii) do not constitute an appraisal; and (iv) should not be relied upon in lieu of an appraisal. This report is issued exclusively for the benefit of the applicant therefor, and may not be used or relied upon by any other person. This report may not be reproduced in any manner without the issuing party's prior written consent. The issuing party does not represent or warrant that the information herein is complete or free from error, and the information herein is provided without any warranties of any kind, as-is, and with all faults. As a material part of the consideration given in exchange for the issuance of this report, recipient agrees that the issuing party's sole liability for any loss or damage caused by an error or omission due to inaccurate information or negligence in preparing this report shall be limited to the fee charged for the report. Recipient accepts this report with this limitation and agrees that the issuing party would not have issued this report but for the limitation of liability described above. The issuing party makes no representation or warranty as to the legality or propriety of recipient's use of the information herein.

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RECORDING REQUESTED BY:

hicago Litle

1211 SW Fifth Ave., Ste 2130 Portland, OR 97204

AFTER RECORDING RETURN TO:

Order No.: 472520007426-WG Life Front 2, LLC, an Oregon limited liability company 3015 NE 44th Avenue Portland, OR 97213

SEND TAX STATEMENTS TO:

Life Front 2, LLC, an Oregon limited liability company 3015 NE 44th Avenue Portland, OR 97213

APN: R531552 Map: 2S123BA03200

Washington County, Oregon 2020-119069 m-nw 11/23/2020 01:36:49 PM Stn=16 M LOPEZ \$3,996.00

\$20.00 \$11.00 \$5.00 \$60.00 \$3,900.00

I, Margaret Garza, Director of Assessment and Taxation and Ex-Officio County Clerk for Washington County, Oregon, do hereby certify that the within instrument of writing was received and recorded in the book of records of said county

> Margaret Garza, Director of Assessment and Taxation, Ex-Officio County Clerk

SPACE ABOVE THIS LINE FOR RECORDER'S USE

STATUTORY WARRANTY DEED

Willow Glen MHP, LLC, an Oregon limited liability company, Grantor, conveys and warrants to Life Front 2, LLC, an Oregon limited liability company, Grantee, the following described real property, free and clear of encumbrances except as specifically set forth below, situated in the County of Washington, State of Oregon:

SEE EXHIBIT "A" ATTACHED HERETO AND MADE A PART HEREOF

THE TRUE AND ACTUAL CONSIDERATION FOR THIS CONVEYANCE IS THREE MILLION NINE HUNDRED THOUSAND AND NO/100 DOLLARS (\$3,900,000.00). (See ORS 93.030).

Subject to:

SEE EXHIBIT "B" ATTACHED HERETO AND MADE A PART HEREOF

BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON TRANSFERRING FEE TITLE SHOULD INQUIRE ABOUT THE PERSON'S RIGHTS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009, AND SECTIONS 2 TO 7, CHAPTER 8, OREGON LAWS 2010. THIS INSTRUMENT DOES NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATION OF APPLICABLE LAND USE LAWS AND REGULATIONS. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON ACQUIRING FEE TITLE TO THE PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY THAT THE UNIT OF LAND BEING TRANSFERRED IS A LAWFULLY ESTABLISHED LOT OR PARCEL, AS DEFINED IN ORS 92.010 OR 215.010, TO VERIFY THE APPROVED USES OF THE LOT OR PARCEL, TO DETERMINE ANY LIMITS ON LAWSUITS AGAINST FARMING OR FOREST PRACTICES, AS DEFINED IN ORS 30.930, AND TO INQUIRE ABOUT THE RIGHTS OF NEIGHBORING PROPERTY OWNERS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009, AND SECTIONS 2 TO 7, CHAPTER 8, OREGON LAWS 2010.

Deed (Statutory Warranty) ORD1293.doc / Updated: 04.26.19

Page 1

STATUTORY WARRANTY DEED

(continued)

IN WITNESS WHEREOF, the undersigned have executed this document on the date(s) set forth below.

Dated: 101. 20. 2020

Willow Glen MHP LLC, an Oregon limited liability company

BY: Hung In, Member BY: Jung In, Member BY: Yvette kitt, Member

BY: <u>Geem</u> RC Guem Choi, Member

State of <u>0regon</u> County of <u>Multhom</u>

This instrument was acknowledged before me on <u>//- 20 - 20</u> by Guem Choi, as Member for Willow Glen MHP LLC, Hung In, as Member for Willow Glen MHP LLC, Jung In, as Member for Willow Glen MHP LLC, Yvette Kitt, as Member for Willow Glen MHP LLC.

Notary Public - State of Oregon

My Commission Expires: 8/30/22

OFFICIAL STAMP WENDY ALICE GEURIN NOTARY PUBLIC-OREGON COMMISSION NO. 978610 MY COMMISSION EXPIRES AUGUST 30, 2022

EXHIBIT "A"

Legal Description

A tract of land situated in Section 23, Township 2 South, Range 1 West, of the Willamette Meridian, in the City of Tualatin, County of Washington and State of Oregon, being more particularly described as follows:

Beginning at a point on the West line of that tract as described in Contract to Alex Freadman, et ux, recorded in Book 525, page 541, said point bears South 35° 50' West 993,07 feet from the one-quarter corner to Sections 14 and 23, Township 2 South, Range 1 West of the Willamette Meridian; thence South 2° 10' East along the West line of said Freadman tract, a distance of 186.16 feet; thence continuing along said West line South 17° 10' East 93.95 feet to the center of SW Herman Road (40 feet wide) County Road No. 489 formerly Cipole Road; thence Southwesterly along the center line of said road to a point on the East line of that tract conveyed to James A. Remillard, et ux, by Deed recorded in Book 216, page 69; thence North along the East line of said Remillard tract to the Southeast corner of Lot 3, SIJOTA INDUSTRIAL PARK, a duly recorded subdivision in Washington County; thence East along the South line of those tracts as described in Deeds recorded as Fee No. 85005768 and in Book 436, page 344, to a point on the West line of SW Tualatin Road (50 feet wide); thence Southeasterly along the West line of said road to the Northwest corner of the aforementioned Freadman tract; thence South 2° 10' East along the West line of said Freadman tract, a distance of 75.20 feet to the point of beginning.

EXCEPTING THEREFROM that portion lying within the boundaries of SW Herman Road.

FURTHER EXCEPTING THEREFROM the Southerly 14 feet dedicated for public right of way to the City of Tualatin by instrument recorded June 7, 1990, Recording No. 90-29548 and Recording No. 90-29549.

ALSO EXCEPTING THEREFROM that portion dedicated to the City of Tualatin by instrument recorded October 20, 1999 as Fee No. 99118702 and being more particularly described as follows:

A parcel of land in that tract of real property in Section 23, Township 2 South, Range 1 West, of the Willamette Meridian, in the City of Tualatin, County of Washington and State of Oregon and being a portion of that property described in a Deed to Kenneth W. Hick Revocable Trust, recorded in Document No. 88050765 of Washington County Book of Records; the said parcel being more particularly described as follows:

Beginning at a point at the intersection of the North line of that tract of real property described in a Deed to Kenneth W. Hick Revocable Trust, recorded in Document No. 88050765 of Washington County Book of Records, with the Southerly right of way of S.W. Tualatin Road; thence South 89° 52' 42" West along said North line a distance of 15.00 feet; thence South 25° 18' 41" East a distance of 69.78 feet; thence South 34° 42' 19" East a distance of 77.32 feet to the East line of said property; thence North 2° 10' 12" West along said East line a distance of 50.00 feet to the Southerly right of way of S.W. Tualatin Road; thence Northwesterly along said right of way along a 95.80 foot curve to the right having a radius of 383.10 feet through a central angle of 14° 19' 39", the long chord of which bears North 36° 35' 45" West a distance of 95.55 feet to the point of beginning.

Page 3

EXHIBIT "B"

Exceptions

Subject to:

Easement(s) for the purpose(s) shown below and rights incidental thereto, as granted in a document: Granted to: Columbia Cable of Oregon, an Oregon Corporation Purpose: Television cable and incidental purposes Recording Date: April 23, 1990 Recording No: 90019737





onehuncticd



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		Ν	Λ	A	P)	V	0		1

2S 1 23BA-S1

2S 1 23BA-S1



bespin



FOR OTHER USE Map areas delineated by either gray shading or a cross-hatched pattern are for reference only and may not indicate the most current property boundaries. Please consult the appropriate map for the most current information.

2S 1 23BA-S2



2S 1 23BA-S2

Property Detail Report

9905 SW Herman Rd, Tualatin, OR 97062-7911

APN: R531534

Owner Information					
Owner Name:	Lu Qbf II LLC				
Mailing Address:	Po Box 483, Tualatin, OR 97	062-0483		Occupancy:	Unknown
Location Information	1				
Legal Description: APN: Munic / Twnshp: Subdivision: Neighborhood: Elementary School: Latitude:	Acres 1.88 R531534 Tualatin Tualatin & Sherwood Schumacher Place Tualatin Elementar 45.38664	Alternate APN: Twnshp-Rng-Sec: Tract #: School District: Middle School: Longitude:	2S123BA03100 02S-01W-23 Tigard-Tualatin School Dis Hazelbrook Middle -122.7793	County: Census Tract / Block: Legal Lot / Block: Legal Book / Page: strict 23J High School:	Washington, OR 032001 / 2013 Tualatin High Scho
Last Transfer / Conve	eyance - Current Owner				
Transfer / Rec Date: Buyer Name:	12/27/2012 / 02/08/2013 Powin Qbf LLC	Price: Seller Name:	Lu Joseph & Mei Y	Transfer Doc #: Deed Type:	2013.12461 Special Warranty Deed
Last Market Sale					
Sale / Rec Date:	10/16/2009 / 11/03/2009	Sale Price / Type:	\$5,000,000 / Confirmed	Deed Type:	High Liability Loan
1st Mtg Amt / Type: 2nd Mtg Amt / Type:	\$3,500,000 / Conventional	1st Mtg Rate / Type: 2nd Mtg Rate / Type:	500.0 / Fixed	1st Mtg Doc #: Sale Doc #:	2009.96524 2009.96523
Lender:	Jiaren LLC			Title Company:	Lawyers Title
Prior Sale Informatio	n				
Sale / Rec Date: 1st Mtg Amt / Type: Prior Lender:		Sale Price / Type: 1st Mtg Rate / Type:		Prior Deed Type: Prior Sale Doc #:	N/A
Property Characteris	stics				
Gross Living Area: Living Area: Total Adj. Area: Above Grade: Basement Area: Style: Foundation: Quality: Condition:		Total Rooms: Bedrooms: Baths (F / H): Pool: Fireplace: Cooling: Heating: Exterior Wall: Construction Type:	0	Year Built / Eff: Stories: Parking Type: Garage #: Garage Area: Porch Type: Patio Type: Roof Type: Roof Material:	
Site Information					
Land Use: State Use:	Vacant Land- Industrial 2300 - 2300	Lot Area: Lot Width / Depth:	81,892 Sq. Ft.	Zoning: # of Buildings:	ML
County Use:	2300 - County Appraised Vacant Industrial Land	Usable Lot:		Res / Comm Units:	
Site Influence: Flood Zone Code: Community Name:	Ae City Of Tualatin	Acres: Flood Map #: Flood Panel #:	1.88 41067C0544E 0544E	Water / Sewer Type: Flood Map Date: Inside SFHA:	11/04/2016 True
Tax Information					
Assessed Year: Tax Year: Tax Area: Property Tax: Exemption:	2023 2022 023.76 \$5,637.45	Assessed Value: Land Value: Improvement Value: Improved %: Delinquent Year:	\$335,320	Market Total Value: Market Land Value: Market Imprv Value: Market Imprv %:	\$563,830 \$563,830



Disclaimer: This report is not an insured product or service or a representation of the condition of title to real property. It is not an abstract, legal opinion, opinion of title, title insurance, commitment or preliminary report, or any form of title insurance or guaranty. Estimated property values are: (i) based on available data; (ii) are not guaranteed or warranted; (iii) do not constitute an appraisal; and (iv) should not be relied upon in lieu of an appraisal. This report is issued exclusively for the benefit of the applicant therefor, and may not be used or relied upon by any other person. This report may not be reproduced in any manner without the issuing party's prior written consent. The issuing party does not represent or warrant that the information herein is complete or free from error, and the information herein is provided without any warranties of any kind, as-is, and with all faults. As a material part of the consideration given in exchange for the issuance of this report, recipient agrees that the issuing party's sole liability for any loss or damage caused by an error or omission due to inaccurate information or negligence in preparing this report shall be limited to the fee charged for the report. Recipient accepts this report with this limitation and agrees that the issuing party would not have issued this report but for the limitation of liability described above. The issuing party makes no representation or warranty as to the legality or propriety of recipient's use of the information herein.

School information is copyrighted and provided by GreatSchools.org.

After Recording, return to: Lu QBF II, LLC PO Box 483 Tualatin, OR 97062

Send Tax Statements to:

Lu QBF II, LLC PO Box 483 Tualatin, OR 97062



SPECIAL WARRANTY DEED

LU QBF, LLC, an Oregon Limited Liability Company, hereinafter called "Grantor", hereby conveys and specially warrants to LU QBF II, LLC, an Oregon Limited Liability Company, hereinafter called "Grantee", all of Grantor's interest in and to the following described real properties situated in the County of Washington and State of Oregon free from encumbrances or defects created or suffered by Grantor except as specifically set forth herein below, such properties being more particularly described as follows, to wit:

For legal description see Exhibit "A" attached hereto, incorporated by reference and made a part of this instrument.

TO HAVE AND TO HOLD the same unto said Grantee and Grantees' successors and assigns forever.

The true and actual consideration paid for this transfer, stated in terms of dollars, is \$-0-. However, the actual consideration consists of other property or value given or promised, which is the whole consideration.

This Conveyance is made solely as an adjustment of common boundary between adjoining properties (City of Tualatin Approval Case File No. PLA21-0001, 10005 SW HERMAN RD, Property Line Adjustment).

THE LIABILITY AND OBLIGATIONS OF THE GRANTOR(S) TO GRANTEE AND GRANTEE'S SUCCESSORS AND ASSIGNS UNDER THE WARRANTIES AND COVENANTS CONTAINED HEREIN OR PROVIDED BY LAW SHALL BE LIMITED TO THE EXTENT OF COVERAGE THAT WOULD BE AVAILABLE TO GRANTOR(S) UNDER A STANDARD POLICY OF TITLE INSURANCE CONTAINING EXCEPTIONS FOR MATTERS OF PUBLIC RECORD. THE LIMITATIONS CONTAINED HEREIN EXPRESSLY DO NOT RELIEVE GRANTOR(S) OF ANY LIABILITY OR OBLIGATIONS UNDER THIS INSTRUMENT, BUT MERELY DEFINE THE SCOPE, NATURE AND AMOUNT OF SUCH LIABILITY OR OBLIGATIONS.

BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON TRANSFERRING FEE TITLE SHOULD INQUIRE ABOUT THE PERSON'S RIGHTS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007 AND SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009. THIS INSTRUMENT DOES NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATON OF APPLICABLE LAND USE LAWS AND REGULATIONS. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON ACQUIRING FEE TITLE TO THE PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY THAT THE UNIT OF LAND BEING TRANSFERRED IS A LAWFULLY ESTABLISHED LOT OR PARCEL, AS DEFINED IN ORS 92.010 OR 215.010, TO VERIFY THE APPROVED USES OF THE LOT OR PARCEL, TO DETERMINE ANY LIMITS ON LAWSUITS AGAINST FARMING OR FOREST PRACTICES, AS DEFINED IN ORS 30.930, AND TO INQUIRE ABOUT THE RIGHTS OF NEIGHBORING PROPERTY OWNERS, IF ANY UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007 AND SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009, AND SECTIONS 2 TO 7, CHAPTER 8, OREGON LAWS 2010.

In construing this instrument, where the context so requires the singular includes the plural and all grammatical changes shall be made so that this instrument shall apply equally to business, other entities and to individuals.

IN WITNESS WHEREOF the undersigned have executed this instrument this $\frac{3\gamma_{c}}{2}$ day of February, 2022

GRANTOR:

Lu QBF, LLC, an Oregon Limited Liability Company By its member, Lu Pacific Properties, LLC, an Oregon Limited Liability Company

SS.

Peter Lu, Managing Member

Danny Lu, Managing Member

STATE OF OREGON

County of Washington

2022, personally appeared before me the above-named Peter Lu, as Managing On February Member of Lu Pacific Properties, LLC, an Oregon limited liability company, Member of Lu QBF, LLC, an Oregon limited liability company.

OFFICIAL STAMP Bradley C Holbrook NOTARY PUBLIC - OREGON COMMISSION NO. 1001750 STATE OF OREGON July 9, 2024 SS. County of Washington

Brally C. Hel m

On Fobrum 3²², 2022, personally appeared before me the above-named Danny Lu, as Managing Member of Lu Pacific Properties, LLC, an Oregon limited liability company, Member of Lu QBF, LLC, an Oregon limited liability company.

	the second s	ANALYSING NEW WORKS AND	_
	OFFICIA Bradley C	L STAMP Holbrook	
「代書部门	NOTARY PUB	LIC - OREGON	
	COMMISSIO	N NO. 1001750	
MY COMMIS	SION EXPIRES	July 9, 2024	
		NAMES OF TAXABLE PARTY OF TAXABLE PARTY.	-

Notary Public for Oregon

EXHIBIT A LEGAL DESCRIPTION

Tract 1

A tract of land for Property Line Adjustment purposes in the N.W. 1/4 of Section 23, Township 2 South, Range 1 West, W.M., Washington County, Oregon, described as follows:

Being a portion of Tracts 1, 2 and 3 of that tract of land described in Special Warranty Deed to Lu QBF, LLC, recorded January 8, 2021 as Document No. 2021-003040, Washington County Deed Records, more particularly described as follows:

Beginning at a 5/8" iron rod at the Southwest corner of said Tract 1, thence along the West line of said Lu QBF, LLC tract, North 00°15'00" East, 432.33 feet to a 5/8" iron rod at the Northwest corner of said Parcel 1;

Thence along the North line of said Tract 1, North 89°54'47" East, 697.62 feet to the Northeast corner of said Tract 1, from which point a 5/8" iron rod bears North 07°27'37" East, 0.98 feet;

Thence along the East line of said Lu QBF, LLC tract, South 00°15'00" West, 349.03 feet to a 5/8" iron rod with red plastic cap marked "Weddle Surveying";

Thence leaving said East line along the line common to said Tracts 1 and 3, North 89°45'00" West, 321.11 feet;

Thence South 00°00'00" East, 222.97

feet; Thence South 39°36'06" East,

95.93 feet;

Thence South 22°26'00" East, 10.66 feet to a point 43.50 feet, by perpendicular measure, from the centerline of S.W. Herman Road;

Thence parallel with said centerline, South 67°34'48" West, 74.57 feet;

Thence North 22°29'15" West, 110.56 feet;

Thence North 00°00'00" West, 147.73 feet;

Thence South 89°54'47" West, 330.87 feet to the Point of

Beginning. Containing therein 6.604 acres, more or less.

The Basis of Bearing for this description is per Survey No. 34022, Washington County Survey Records.

Tract 3

A tract of land for Property Line Adjustment purposes in the N.W. 1/4 of Section 23, Township 2 South, Range 1 West, W.M., Washington County, Oregon, described as follows:

Being a portion of Tracts 1 and 3 of that tract of land described in Special Warranty Deed to Lu QBF, LLC, recorded January 8, 2021 as Document No. 2021-003040, Washington County Deed Records, more particularly described as follows:

Beginning at a 5/8" iron rod with red plastic cap marked "Weddle Surveying" at the Northeast corner of said Tract 3;

Thence along the North line of said Tract 3, North 89°45'00" West, 321.11 feet;

Thence leaving said North line, South 00°00'00" East, 222.97 feet;

Thence South 39°36'06" East, 95.93 feet;

Thence South 22°26'00" East, 10.66 feet to a point 43.50 feet, by perpendicular measure, from the centerline of S.W. Herman Road;

Thence parallel with said centerline, North 67°34'48" East, 275.87 feet to the East line of said Lu QBF, LLC tract;

Thence along said East line, North 00°15'00" East, 200.13 feet the Point of Beginning.

Containing therein 1.878 acres, more or less.

The Basis of Bearing for this description is per Survey No. 34022, Washington County Survey Records.



After Recording, return to:

Dianne L. Haugeberg, Attorney P.O. Box 480 McMinnville, OR 97128

Send Tax Statements to:

Joseph Lu Powin QBF, LLC 20550 S.W. 115th Avenue Tualatin, OR 97062

SPECIAL WARRANTY DEED

JOSEPH LU and MEI YI LU, husband and wife, "Grantors", hereby convey and specially warrant to POWIN QBF, LLC, an Oregon Limited Liability Company, "Grantee", all of Grantor's interest in and to the following described real property situate in the County of Washington, State of Oregon, free of encumbrances created or suffered by Grantor and except for matters of public record, to-wit:

See legal description attached hereto as Exhibit A and by this reference incorporated herein.

THE LIABILITY AND OBLIGATIONS OF THE GRANTOR(S) TO GRANTEE AND GRANTEE'S SUCCESSORS AND ASSIGNS UNDER THE WARRANTIES AND COVENANTS CONTAINED HEREIN OR PROVIDED BY LAW SHALL BE LIMITED TO THE EXTENT OF COVERAGE THAT WOULD BE AVAILABLE TO GRANTOR(S) UNDER A STANDARD POLICY OF TITLE INSURANCE CONTAINING EXCEPTIONS FOR MATTERS OF PUBLIC RECORD. THE LIMITATIONS CONTAINED HEREIN EXPRESSLY DO NOT RELIEVE GRANTOR(S) OF ANY LIABILITY OR OBLIGATIONS UNDER THIS INSTRUMENT, BUT MERELY DEFINE THE SCOPE, NATURE AND AMOUNT OF SUCH LIABILITY OR OBLIGATIONS.

The true and actual consideration paid for this transfer, stated in terms of dollars, is \$-0-. However, the actual consideration consists of or includes other property or value given or promised which is the whole consideration.

"BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON TRANSFERRING FEE TITLE SHOULD INQUIRE ABOUT THE PERSON'S RIGHTS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007 AND SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009. THIS INSTRUMENT DOES NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATON OF APPLICABLE LAND USE LAWS AND REGULATIONS. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON ACQUIRING FEE TITLE TO THE PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY THAT THE UNIT OF LAND BEING TRANSFERRED IS A LAWFULLY ESTABLISHED LOT OR PARCEL, AS DEFINED IN ORS 92.010 OR 215.010, TO VERIFY THE APPROVED USES OF THE LOT OR PARCEL, TO DETERMINE ANY LIMITS ON LAWSUITS AGAINST FARMING OR FOREST PRACTICES, AS DEFINED IN ORS 30.930, AND TO INQUIRE ABOUT THE RIGHTS OF NEIGHBORING PROPERTY OWNERS, IF ANY UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007 AND SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009, AND SECTIONS 2 TO 7, CHAPTER 8, OREGON LAWS 2010."

DATED this 27th day of Ver , 2012.

GRANTOR:

GRANTOR:

Joseph Lu

Mei Yi Lu

STATE OF OREGON)) ss. County of <u>Washington</u>)

On December <u>2</u>, 2012, personally appeared before me the above-named **JOSEPH LU and MEI YI Lu**, husband and wife, who acknowledged the within instrument as their true and voluntary act and deed.



Notary Public for Oregon F:\Law\EP\Lu Business Entities\Powin QBF LLC_Deed

Page 1 of 3 – SPECIAL WARRANTY DEED

EXHIBIT "A"

Parcel 1

A parcel of land in the Northwest one-quarter of Section 23, Township 2 South, Range 1 West, of the Willamette Meridian, in the County of Washington and State of Oregon, being a portion of those certain tracts of land conveyed to John Hiller as described in Book 216, Page 69 and in Book 319, Page 304 and a portion of that certain tract of land conveyed to David W. and Gail M. Shepherd in Book 1039, Page 632, Washington County Deed Records, Washington County, Oregon, being more particularly described as follows:

Beginning at a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc.", which is on the North line of said Hiller tract as described in said Book 319, page 304 which bears South 89° 54' 47" West, 348.81 feet along the North line of said Hiller tracts from a 5/8 inch iron rod marking the Northeast corner of said Book 216, Page 69; thence South 00° 15' 00" West, 397.08 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence South 23° 36' 48" East, 296.52 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc." on the North right-of-way line of Herman Road (County Road No. 469), a 40.00 foot wide road; thence South 67° 34' 00" West, 50.00 feet along said North right-of-way line to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence South 67° 34' 00" West, 309.83 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence South 89° 54' 47" West, 309.83 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence South 89° 54' 47" West, 309.83 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence South 89° 54' 47" West, 309.83 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence South 89° 54' 47" West, 309.83 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence South 89° 54' 47" West, 309.83 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc." in the West line of said Hiller tract as described in said Book 319, Page 304; thence along said West line North 00° 15' 00" West, 432.34 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "LS 510 JW CHASE" marking the Northwest corner of said Book 319, Page 304; thence along the North line of said Book 319, page 304, North 89° 54' 47" East, 348.81 feet to the point of beginning.

Parcel 2

A parcel of land in the Northwest one-quarter of Section 23, Township 2 South, Range 1 West, of the Willamette Meridian, in the County of Washington and State of Oregon, being a portion of those certain tracts of land conveyed to John Hiller as described in Book 216, Page 69 and in Book 319, Page 304 and a portion of that certain tract of land conveyed to David W. and Gail M. Shepherd in Book 1039, Page 632, Washington County Deed Records, Washington County, Oregon, being more particularly described as follows:

Beginning at a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc." on the West line of said Hiller tract as described in said Book 319, page 304 which bears South 00° 15' 00" West along the West line of said Hiller tract 432.34 feet from the Northwest corner of said tract; thence leaving said West line North 89° 54' 47" East, 309.83 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence South 23° 36' 48" East, 278.80 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc." in the North right-of-way line of Herman Road (County Road No. 419), a 40.00 foot wide road; thence along said North right-of-way line South 67° 34' 00" West, 458.06 feet to the Southwest corner of said Hiller tract; thence along the West line of said Hiller tract North 00° 15' 00" East, 429.79 feet to the point of beginning.

Parcel 3

A parcel of land in the Northwest one-quarter of Section 23, Township 2 South, Range 1 West, of the Willamette Meridian, in the County of Washington and State of Oregon, being a portion of those certain tracts of land conveyed to John Hiller as described in Book 216, page 69 and in Book 319, Page 304 and a portion of that certain tract of land conveyed to David W. and Gail M. Shepherd in Book 1039, Page 632, Washington County Deed Records, Washington County, Oregon, being more particularly described as follows:

Beginning at a 5/8 inch iron rod marking the Northeast corner of said Hiller tract as described in said Book 216, page 69; thence along the East line of said Hiller tract South 00° 15' 00" West, 425.00 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence South 89° 54' 47" West, 165.00 feet; thence South 00° 15' 00" West, 217.65 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc." on the Northerly right-of-way line of Herman Road (County Road No. 489), a 40.00 foot wide road; thence along said Northerly right-of-way line South 67° 34' 00" West, 69.20 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence leaving said Northerly right-of-way line North 23° 36' 48" West, 296.52 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence leaving said Northerly right-of-way line North 23° 36' 48" West, 296.52 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence North 00° 15' 00" East, 397.08 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence North 1ine of said Book 319, Page 304; thence along said North line and along the North line of Book 216, Page 69, North 89° 54' 47" East, 348.81 feet to the point of beginning.

Page 2 of 3 – SPECIAL WARRANTY DEED

Parcel 4

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Beginning 40 rods South and 60 rods West of the Northeast corner of the Northwest one-quarter of Section 23, Township 2 South, Range 1 West, of the Willamette Meridian, in the City of Tualatin, County of Washington and State of Oregon; thence 425 feet South to the true place of beginning; thence South 235 feet; thence West 165 feet; thence North 235 feet; thence East 165 feet to the place of beginning.

EXCEPTING THEREFROM any portion of said land lying within the Southern Pacific Railroad right-of-way.

(For informational purposes only, the above description covers: Tax Lot Account No. R2042036, Map: 2S123B-00901;Tax Lot Account No. R531525, Map: 2S123BA-02900; Tax Lot Account No. R531534, Map: 2S123BA-03100; and Tax Lot Account No. R531035, Map: 2S123B-00900.)

Page 3 of 3 – SPECIAL WARRANTY DEED



RECORDATION REQUESTED BY:

Sterling Savings Bank Peterkort Commercial Banking Center 9755 SW Barnes Rd Ste 105 Portland, OR 97225

WHEN RECORDED MAIL TO:

Sterling Savings Bank Loan Support PO Box 2131 Spokane, WA 99210

SEND TAX NOTICES TO:

JOSEPH LU MEI YI LU 13432 ROGERS ROAD LAKE OSWEGO, <u>OR 97035</u>



Richard Hobernicht, Director of Assessment and Taxation, Ex-Officio County Clerk

SPACE ABOVE THIS LINE IS FOR RECORDER'S USE ONLY

DEED OF TRUST

THIS DEED OF TRUST is dated June 3, 2011, among JOSEPH LU and MEI YI LU, AS TENANTS BY THE ENTIRETY ("Grantor"); Sterling Savings Bank, whose address is Peterkort Commercial Banking Center, 9755 SW Barnes Rd Ste 105, Portland, OR 97225 (referred to below sometimes as "Lender" and sometimes as "Beneficiary"); and BRAD WILLIAMS C/O UPF Washington Incorporated, whose address is 910 WEST BOONE AVE, SPOKANE, WA 99201 (referred to below as "Trustee").

CONVEYANCE AND GRANT. For valuable consideration, represented in the Note dated June 3, 2011, in the original principal amount of \$3,000,000.00, from Borrower to Lender, Grantor conveys to Trustee for the benefit of Lender as Beneficiary all of Grantor's right, title, and interest in and to the following described real property, together with all existing or subsequently erected or affixed buildings, improvements and fixtures; all easements, rights of way, and appurtenances; all water, water rights and ditch rights (including stock in utilities with ditch or irrigation rights); and all other rights, royalties, and profits relating to the real property, including without limitation all minerals, oil, gas, geothermal and similar matters, (the "Real Property") located in WASHINGTON County, State of Oregon:

See the exhibit or other description document which is attached to this Deed of Trust and made a part of this Deed of Trust as if fully set forth herein.

The Real Property or its address is commonly known as 10005 SW HERMAN RD, TUALATIN, OR 97062. The Real Property tax identification number is R531035; R2042036; R2167670; R531525; R531534.

CROSS-COLLATERALIZATION. In addition to the Note, this Deed of Trust secures all obligations, debts and liabilities, plus interest thereon, of either Grantor or Borrower to Lender, or any one or more of them, as well as all claims by Lender against Borrower and Grantor or any one or more of them, whether now existing or hereafter arising, whether related or unrelated to the purpose of the Note, whether voluntary or otherwise, whether due or not due, direct or indirect, determined or undetermined, absolute or contingent, liquidated or unliquidated, whether Borrower or Grantor may be liable individually or jointly with others, whether obligated as guarantor, surety, accommodation party or otherwise, and whether recovery upon such amounts may be or hereafter may become barred by any statute of limitations, and whether the obligation to repay such amounts may be or hereafter may become otherwise unenforceable.

Grantor presently assigns to Lender (also known as Beneficiary in this Deed of Trust) all of Grantor's right, title, and interest in and to all present and future leases of the Property and all Rents from the Property. In addition, Grantor grants to Lender a Uniform Commercial Code security interest in the Personal Property and Rents.

THIS DEED OF TRUST, INCLUDING THE ASSIGNMENT OF RENTS AND THE SECURITY INTEREST IN THE RENTS AND PERSONAL PROPERTY, IS GIVEN TO SECURE (A) PAYMENT OF THE INDEBTEDNESS AND (B) PERFORMANCE OF ANY AND ALL OBLIGATIONS UNDER THE NOTE, THE RELATED DOCUMENTS, AND THIS DEED OF TRUST. THIS DEED OF TRUST IS GIVEN AND ACCEPTED ON THE FOLLOWING TERMS:

GRANTOR'S REPRESENTATIONS AND WARRANTIES. Grantor warrants that: (a) this Deed of Trust is executed at Borrower's request and not at the request of Lender; (b) Grantor has the full power, right, and authority to enter into this Deed of Trust and to hypothecate the Property; (c) the provisions of this Deed of Trust do not conflict with, or result in a default under any agreement or other instrument binding upon Grantor and do not result in a violation of any law, regulation, court decree or order applicable to Grantor; (d) Grantor has established adequate means of obtaining from Borrower on a continuing basis information about Borrower's financial condition; and (e) Lender has made no representation to Grantor about Borrower (including without limitation the creditworthiness of Borrower).

GRANTOR'S WAIVERS. Grantor waives all rights or defenses arising by reason of any "one action" or "anti-deficiency" law, or any other law which may prevent Lender from bringing any action against Grantor, including a claim for deficiency to the extent Lender is otherwise entitled to a claim for deficiency, before or after Lender's commencement or completion of any foreclosure action, either judicially or by exercise of a power of sale.

PAYMENT AND PERFORMANCE. Except as otherwise provided in this Deed of Trust, Borrower and Grantor shall pay to Lender all Indebtedness secured by this Deed of Trust as it becomes due, and Borrower and Grantor shall strictly perform all their respective obligations under the Note, this Deed of Trust, and the Related Documents.

POSSESSION AND MAINTENANCE OF THE PROPERTY. Borrower and Grantor agree that Borrower's and Grantor's possession and use of the Property shall be governed by the following provisions:

Possession and Use. Until the occurrence of an Event of Default, Grantor may (1) remain in possession and control of the Property; (2) use, operate or manage the Property; and (3) collect the Rents from the Property. The following provisions relate to the use of the Property or to other limitations on the Property. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON TRANSFERRING FEE TITLE SHOULD INQUIRE ABOUT THE PERSON'S RIGHTS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, AND SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009. THIS INSTRUMENT DOES NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATION OF APPLICABLE LAND USE LAWS AND REGULATIONS. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON ACQUIRING FEE TITLE TO THE PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY THAT THE UNIT OF LAND BEING TRANSFERRED IS A LAWFULLY ESTABLISHED LOT OR PARCEL, AS DEFINED IN ORS 92.010 OR 215.010, TO VERIFY THE APPROVED USES OF THE LOT OR PARCEL, TO DETERMINE ANY LIMITS ON LAWSUITS AGAINST FARMING OR FOREST PRACTICES, AS DEFINED IN ORS 30.930, AND TO INQUIRE ABOUT THE RIGHTS OF NEIGHBORING PROPERTY OWNERS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, AND SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009.

Duty to Maintain. Grantor shall maintain the Property in tenantable condition and promptly perform all repairs, replacements, and maintenance necessary to preserve its value.

Nuisance, Waste. Grantor shall not cause, conduct or permit any nuisance nor commit, permit, or suffer any stripping of or waste on or to the Property or any portion of the Property. Without limiting the generality of the foregoing, Grantor will not remove, or grant to any other party the right to remove, any timber, minerals (including oil and gas), coal, clay, scoria, soil, gravel or rock products without Lender's prior written consent.

Removal of Improvements. Grantor shall not demolish or remove any Improvements from the Real Property without Lender's prior written consent. As a condition to the removal of any Improvements, Lender may require Grantor to make arrangements satisfactory to Lender to replace such Improvements with Improvements of at least equal value.

Lender's Right to Enter. Lender and Lender's agents and representatives may enter upon the Real Property at all reasonable times to attend to Lender's interests and to inspect the Real Property for purposes of Grantor's compliance with the terms and conditions of this Deed of

Page 2

Trust.

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Compliance with Governmental Requirements. Grantor shall promptly comply with all laws, ordinances, and regulations, now or hereafter in effect, of all governmental authorities applicable to the use or occupancy of the Property, including without limitation, the Americans With Disabilities Act. Grantor may contest in good faith any such law, ordinance, or regulation and withhold compliance during any proceeding, including appropriate appeals, so long as Grantor has notified Lender in writing prior to doing so and so long as, in Lender's sole opinion, Lender's interests in the Property are not jeopardized. Lender may require Grantor to post adequate security or a surety bond, reasonably satisfactory to Lender, to protect Lender's interest.

Duty to Protect. Grantor agrees neither to abandon or leave unattended the Property. Grantor shall do all other acts, in addition to those acts set forth above in this section, which from the character and use of the Property are reasonably necessary to protect and preserve the Property.

DUE ON SALE - CONSENT BY LENDER. Lender may, at Lender's option, declare immediately due and payable all sums secured by this Deed of Trust upon the sale or transfer, without Lender's prior written consent, of all or any part of the Real Property, or any interest in the Real Property. A "sale or transfer" means the conveyance of Real Property or any right, title or interest in the Real Property; whether legal, beneficial or equitable; whether voluntary or involuntary; whether by outright sale, deed, installment sale contract, land contract, contract for deed, leasehold interest with a term greater than three (3) years, lease-option contract, or by sale, assignment, or transfer of any beneficial interest in the Real Property. However, this option shall not be exercised by Lender if such exercise is prohibited by federal law or by Oregon law.

TAXES AND LIENS. The following provisions relating to the taxes and liens on the Property are part of this Deed of Trust:

Payment. Grantor shall pay when due (and in all events prior to delinquency) all taxes, special taxes, assessments, charges (including water and sewer), fines and impositions levied against or on account of the Property, and shall pay when due all claims for work done on or for services rendered or material furnished to the Property. Grantor shall maintain the Property free of all liens having priority over or equal to the interest of Lender under this Deed of Trust, except for the lien of taxes and assessments not due and except as otherwise provided in this Deed of Trust.

Right to Contest. Grantor may withhold payment of any tax, assessment, or claim in connection with a good faith dispute over the obligation to pay, so long as Lender's interest in the Property is not jeopardized. If a lien arises or is filed as a result of nonpayment, Grantor shall within fifteen (15) days after the lien arises or, if a lien is filed, within fifteen (15) days after Grantor has notice of the filing, secure the discharge of the lien, or if requested by Lender, deposit with Lender cash or a sufficient corporate surety bond or other security satisfactory to Lender in an amount sufficient to discharge the lien plus any costs and attorneys' fees, or other charges that could accrue as a result of a foreclosure or sale under the lien. In any contest, Grantor shall defend itself and Lender and shall satisfy any adverse judgment before enforcement against the Property. Grantor shall name Lender as an additional obligee under any surety bond furnished in the contest proceedings.

Evidence of Payment. Grantor shall upon demand furnish to Lender satisfactory evidence of payment of the taxes or assessments and shall authorize the appropriate governmental official to deliver to Lender at any time a written statement of the taxes and assessments against the Property.

Notice of Construction. Grantor shall notify Lender at least fifteen (15) days before any work is commenced, any services are furnished, or any materials are supplied to the Property, if any mechanic's lien, materialmen's lien, or other lien could be asserted on account of the work, services, or materials. Grantor will upon request of Lender furnish to Lender advance assurances satisfactory to Lender that Grantor can and will pay the cost of such improvements.

PROPERTY DAMAGE INSURANCE. The following provisions relating to insuring the Property are a part of this Deed of Trust.

Maintenance of Insurance. Grantor shall procure and maintain policies of fire insurance with standard extended coverage endorsements on a replacement basis for the full insurable value covering all Improvements on the Real Property in an amount sufficient to avoid application of any coinsurance clause, and with a standard mortgagee clause in favor of Lender. Grantor shall also procure and maintain comprehensive general liability insurance in such coverage amounts as Lender may request with Trustee and Lender being named as additional insureds in such liability insurance policies. Additionally, Grantor shall maintain such other insurance, including but not limited to hazard, business interruption, and boiler insurance, as Lender may reasonably require. Policies shall be written in form, amounts, coverages and basis reasonably acceptable to Lender and issued by a company or companies reasonably acceptable to Lender. Grantor, upon request of Lender, will deliver to Lender from time to time the policies or certificates of insurance in form satisfactory to Lender, including stipulations that coverages will not be cancelled or diminished without at least ten (10) days prior written notice to Lender. Each insurance policy also shall include an endorsement providing that coverage in favor of Lender will not be impaired in any way by any act, omission or default of Grantor or any other person. Should the Real Property be located in an area designated by the Director of the Federal Emergency Management Agency as a special flood hazard area, Grantor agrees to obtain and maintain Federal Flood Insurance, if available, within 45 days after notice is given by Lender that the Property is located in a special flood hazard area, for the full unpaid principal balance of the loan and any prior liens on the property securing the loan, up to the maximum policy limits set under the National Flood Insurance Program, or as otherwise required by Lender, and to maintain such insurance for the term of the loan.

Application of Proceeds. Grantor shall promptly notify Lender of any loss or damage to the Property. Lender may make proof of loss if Grantor fails to do so within fifteen (15) days of the casualty. Whether or not Lender's security is impaired, Lender may, at Lender's election, receive and retain the proceeds of any insurance and apply the proceeds to the reduction of the Indebtedness, payment of any lien affecting the Property, or the restoration and repair of the Property. If Lender elects to apply the proceeds to restoration and repair, Grantor shall repair or replace the damaged or destroyed Improvements in a manner satisfactory to Lender. Lender shall, upon satisfactory proof of such expenditure, pay or reimburse Grantor from the proceeds for the reasonable cost of repair or restoration if Grantor is not in default under this Deed of Trust. Any proceeds which have not been disbursed within 180 days after their receipt and which Lender has not committed to the repair or restoration of the Property shall be used first to pay any amount owing to Lender under this Deed of Trust, then to pay accrued interest, and the remainder, if any, shall be applied to the principal balance of the Indebtedness. If Lender holds any proceeds after payment in full of the Indebtedness, such proceeds shall be paid to Grantor as Grantor's interests may appear.

Grantor's Report on Insurance. Upon request of Lender, however not more than once a year, Grantor shall furnish to Lender a report on each existing policy of insurance showing: (1) the name of the insurer; (2) the risks insured; (3) the amount of the policy; (4) the property insured, the then current replacement value of such property, and the manner of determining that value; and (5) the expiration date of the policy. Grantor shall, upon request of Lender, have an independent appraiser satisfactory to Lender determine the cash value replacement cost of the Property.

LENDER'S EXPENDITURES. If any action or proceeding is commenced that would materially affect Lender's interest in the Property or if Grantor fails to comply with any provision of this Deed of Trust or any Related Documents, including but not limited to Grantor's failure to discharge or pay when due any amounts Grantor is required to discharge or pay under this Deed of Trust or any Related Documents, Lender on Grantor's behalf may (but shall not be obligated to) take any action that Lender deems appropriate, including but not limited to discharging or paying all taxes, liens, security interests, encumbrances and other claims, at any time levied or placed on the Property and paying all costs for insuring, maintaining and preserving the Property. All such expenditures incurred or paid by Lender for such purposes will then bear interest at the rate charged under the Note from the date incurred or paid by Lender to the date of repayment by Grantor. All such expenses will become a part of the Indebtedness and, at Lender's option, will (A) be payable on demand; (B) be added to the balance of the Note and be apportioned among and be payable with any installment payments to become due during either (1) the term of any applicable insurance policy; or (2) the remaining term of the Note; or (C) be treated as a balloon payment which will be due and payable at the Note's maturity. The Deed of Trust also will secure payment of these amounts. Such right shall be in addition to all other rights and remedies to which Lender may be entitled upon Default.

WARRANTY; DEFENSE OF TITLE. The following provisions relating to ownership of the Property are a part of this Deed of Trust:

Title. Grantor warrants that: (a) Grantor holds good and marketable title of record to the Property in fee simple, free and clear of all liens and encumbrances other than those set forth in the Real Property description or in any title insurance policy, title report, or final title opinion issued in favor of, and accepted by, Lender in connection with this Deed of Trust, and (b) Grantor has the full right, power, and authority to execute and deliver this Deed of Trust to Lender.

Defense of Title. Subject to the exception in the paragraph above, Grantor warrants and will forever defend the title to the Property against the lawful claims of all persons. In the event any action or proceeding is commenced that questions Grantor's title or the interest of Trustee or Lender under this Deed of Trust, Grantor shall defend the action at Grantor's expense. Grantor may be the nominal party in such proceeding, but Lender shall be entitled to participate in the proceeding and to be represented in the proceeding by counsel of

Loan No: 9001

DEED OF TRUST (Continued)

Lender's own choice, and Grantor will deliver, or cause to be delivered, to Lender such instruments as Lender may request from time to time to permit such participation.

Compliance With Laws. Grantor warrants that the Property and Grantor's use of the Property complies with all existing applicable laws, ordinances, and regulations of governmental authorities.

Survival of Representations and Warranties. All representations, warranties, and agreements made by Grantor in this Deed of Trust shall survive the execution and delivery of this Deed of Trust, shall be continuing in nature, and shall remain in full force and effect until such time as Borrower's Indebtedness shall be paid in full.

CONDEMNATION. The following provisions relating to condemnation proceedings are a part of this Deed of Trust:

Proceedings. If any proceeding in condemnation is filed, Grantor shall promptly notify Lender in writing, and Grantor shall promptly take such steps as may be necessary to defend the action and obtain the award. Grantor may be the nominal party in such proceeding, but Lender shall be entitled to participate in the proceeding and to be represented in the proceeding by counsel of its own choice, and Grantor will deliver or cause to be delivered to Lender such instruments and documentation as may be requested by Lender from time to time to permit such participation.

Application of Net Proceeds. If all or any part of the Property is condemned by eminent domain proceedings or by any proceeding or purchase in lieu of condemnation, Lender may at its election require that all or any portion of the net proceeds of the award be applied to the Indebtedness or the repair or restoration of the Property. The net proceeds of the award shall mean the award after payment of all reasonable costs, expenses, and attorneys' fees incurred by Trustee or Lender in connection with the condemnation.

IMPOSITION OF TAXES, FEES AND CHARGES BY GOVERNMENTAL AUTHORITIES. The following provisions relating to governmental taxes, fees and charges are a part of this Deed of Trust:

Current Taxes, Fees and Charges. Upon request by Lender, Grantor shall execute such documents in addition to this Deed of Trust and take whatever other action is requested by Lender to perfect and continue Lender's lien on the Real Property. Grantor shall reimburse Lender for all taxes, as described below, together with all expenses incurred in recording, perfecting or continuing this Deed of Trust, including without limitation all taxes, fees, documentary stamps, and other charges for recording or registering this Deed of Trust.

Taxes. The following shall constitute taxes to which this section applies: (1) a specific tax upon this type of Deed of Trust or upon all or any part of the Indebtedness secured by this Deed of Trust; (2) a specific tax on Borrower which Borrower is authorized or required to deduct from payments on the Indebtedness secured by this type of Deed of Trust; (3) a tax on this type of Deed of Trust chargeable against the Lender or the holder of the Note; and (4) a specific tax on all or any portion of the Indebtedness or on payments of principal and interest made by Borrower.

Subsequent Taxes. If any tax to which this section applies is enacted subsequent to the date of this Deed of Trust, this event shall have the same effect as an Event of Default, and Lender may exercise any or all of its available remedies for an Event of Default as provided below unless Grantor either (1) pays the tax before it becomes delinquent, or (2) contests the tax as provided above in the Taxes and Liens section and deposits with Lender cash or a sufficient corporate surety bond or other security satisfactory to Lender.

SECURITY AGREEMENT; FINANCING STATEMENTS. The following provisions relating to this Deed of Trust as a security agreement are a part of this Deed of Trust:

Security Agreement. This instrument shall constitute a Security Agreement to the extent any of the Property constitutes fixtures, and Lender shall have all of the rights of a secured party under the Uniform Commercial Code as amended from time to time.

Security interest. Upon request by Lender, Grantor shall take whatever action is requested by Lender to perfect and continue Lender's security interest in the Rents and Personal Property. In addition to recording this Deed of Trust in the real property records, Lender may, at any time and without further authorization from Grantor, file executed counterparts, copies or reproductions of this Deed of Trust as a financing statement. Grantor shall reimburse Lender for all expenses incurred in perfecting or continuing this security interest. Upon default, Grantor shall not remove, sever or detach the Personal Property from the Property. Upon default, Grantor shall assemble any Personal Property not affixed to the Property in a manner and at a place reasonably convenient to Grantor and Lender and make it available to Lender within three (3) days after receipt of written demand from Lender to the extent permitted by applicable law.

Addresses. The mailing addresses of Grantor (debtor) and Lender (secured party) from which information concerning the security interest granted by this Deed of Trust may be obtained (each as required by the Uniform Commercial Code) are as stated on the first page of this Deed of Trust.

FURTHER ASSURANCES; ATTORNEY-IN-FACT. The following provisions relating to further assurances and attorney-in-fact are a part of this Deed of Trust:

Further Assurances. At any time, and from time to time, upon request of Lender, Grantor will make, execute and deliver, or will cause to be made, executed or delivered, to Lender or to Lender's designee, and when requested by Lender, cause to be filed, recorded, refiled, or rerecorded, as the case may be, at such times and in such offices and places as Lender may deem appropriate, any and all such mortgages, deeds of trust, security deeds, security agreements, financing statements, continuation statements, instruments of further assurance, certificates, and other documents as may, in the sole opinion of Lender, be necessary or desirable in order to effectuate, complete, perfect, continue, or preserve (1) Borrower's and Grantor's obligations under the Note, this Deed of Trust, and the Related Documents, and (2) the liens and security interests created by this Deed of Trust as first and prior liens on the Property, whether now owned or hereafter acquired by Grantor. Unless prohibited by law or Lender agrees to the contrary in writing, Grantor shall reimburse Lender for all costs and expenses incurred in connection with the matters referred to in this paragraph.

Attorney-in-Fact. If Grantor fails to do any of the things referred to in the preceding paragraph, Lender may do so for and in the name of Grantor and at Grantor's expense. For such purposes, Grantor hereby irrevocably appoints Lender as Grantor's attorney-in-fact for the purpose of making, executing, delivering, filing, recording, and doing all other things as may be necessary or desirable, in Lender's sole opinion, to accomplish the matters referred to in the preceding paragraph.

FULL PERFORMANCE. If Borrower and Grantor pay all the Indebtedness when due, and Grantor otherwise performs all the obligations imposed upon Grantor under this Deed of Trust, Lender shall execute and deliver to Trustee a request for full reconveyance and shall execute and deliver to Grantor suitable statements of termination of any financing statement on file evidencing Lender's security interest in the Rents and the Personal Property. Any reconveyance fee required by law shall be paid by Grantor, if permitted by applicable law.

EVENTS OF DEFAULT. Each of the following, at Lender's option, shall constitute an Event of Default under this Deed of Trust:

Payment Default. Borrower fails to make any payment when due under the Indebtedness.

Other Defaults. Borrower or Grantor fails to comply with or to perform any other term, obligation, covenant or condition contained in this Deed of Trust or in any of the Related Documents or to comply with or to perform any term, obligation, covenant or condition contained in any other agreement between Lender and Borrower or Grantor.

Compliance Default. Failure to comply with any other term, obligation, covenant or condition contained in this Deed of Trust, the Note or in any of the Related Documents.

Default on Other Payments. Failure of Grantor within the time required by this Deed of Trust to make any payment for taxes or insurance, or any other payment necessary to prevent filing of or to effect discharge of any lien.

Environmental Default. Failure of any party to comply with or perform when due any term, obligation, covenant or condition contained in any environmental agreement executed in connection with the Property.

Default in Favor of Third Parties. Should Borrower or any Grantor default under any loan, extension of credit, security agreement, purchase or sales agreement, or any other agreement, in favor of any other creditor or person that may materially affect any of Borrower's or any Grantor's property or Borrower's ability to repay the Indebtedness or Borrower's or Grantor's ability to perform their respective obligations under this Deed of Trust or any of the Related Documents.

False Statements. Any warranty, representation or statement made or furnished to Lender by Borrower or Grantor or on Borrower's or Grantor's behalf under this Deed of Trust or the Related Documents is false or misleading in any material respect, either now or at the time made or furnished or becomes false or misleading at any time thereafter.

Defective Collateralization. This Deed of Trust or any of the Related Documents ceases to be in full force and effect (including failure of any collateral document to create a valid and perfected security interest or lien) at any time and for any reason.

DEED OF TRUST (Continued)

Death or Insolvency. The dissolution of Grantor's (regardless of whether election to continue is made), any member withdraws from the limited liability company, or any other termination of Borrower's or Grantor's existence as a going business or the death of any member, the insolvency of Borrower or Grantor, the appointment of a receiver for any part of Borrower's or Grantor's property, any assignment for the benefit of creditors, any type of creditor workout, or the commencement of any proceeding under any bankruptcy or insolvency laws by or against Borrower or Grantor.

Creditor or Forfeiture Proceedings. Commencement of foreclosure or forfeiture proceedings, whether by judicial proceeding, self-help, repossession or any other method, by any creditor of Borrower or Grantor or by any governmental agency against any property securing the Indebtedness. This includes a garnishment of any of Borrower's or Grantor's accounts, including deposit accounts, with Lender. However, this Event of Default shall not apply if there is a good faith dispute by Borrower or Grantor as to the validity or reasonableness of the claim which is the basis of the creditor or forfeiture proceeding and if Borrower or Grantor gives Lender written notice of the creditor or forfeiture proceeding and deposits with Lender monies or a surety bond for the creditor or forfeiture proceeding, in an amount determined by Lender, in its sole discretion, as being an adequate reserve or bond for the dispute.

Breach of Other Agreement. Any breach by Borrower or Grantor under the terms of any other agreement between Borrower or Grantor and Lender that is not remedied within any grace period provided therein, including without limitation any agreement concerning any indebtedness or other obligation of Borrower or Grantor to Lender, whether existing now or later.

Events Affecting Guarantor. Any of the preceding events occurs with respect to any guarantor, endorser, surety, or accommodation party of any of the Indebtedness or any guarantor, endorser, surety, or accommodation party dies or becomes incompetent, or revokes or disputes the validity of, or liability under, any Guaranty of the Indebtedness.

Adverse Change. A material adverse change occurs in Borrower's or Grantor's financial condition, or Lender believes the prospect of payment or performance of the Indebtedness is impaired.

Insecurity. Lender in good faith believes itself insecure.

Right to Cure. If any default, other than a default in payment is curable and if Grantor has not been given a notice of a breach of the same provision of this Deed of Trust within the preceding twelve (12) months, it may be cured if Grantor, after Lender sends written notice to Borrower demanding cure of such default: (1) cures the default within fifteen (15) days; or (2) if the cure requires more than fifteen (15) days, immediately initiates steps which Lender deems in Lender's sole discretion to be sufficient to cure the default and thereafter continues and completes all reasonable and necessary steps sufficient to produce compliance as soon as reasonably practical.

RIGHTS AND REMEDIES ON DEFAULT. If an Event of Default occurs under this Deed of Trust, at any time thereafter, Trustee or Lender may exercise any one or more of the following rights and remedies:

Election of Remedies. Election by Lender to pursue any remedy shall not exclude pursuit of any other remedy, and an election to make expenditures or to take action to perform an obligation of Grantor under this Deed of Trust, after Grantor's failure to perform, shall not affect Lender's right to declare a default and exercise its remedies.

Accelerate Indebtedness. Lender shall have the right at its option without notice to Borrower or Grantor to declare the entire Indebtedness immediately due and payable, including any prepayment penalty which Borrower would be required to pay.

Foreclosure. With respect to all or any part of the Real Property, the Trustee shall have the right to foreclose by notice and sale, and Lender shall have the right to foreclose by judicial foreclosure, in either case in accordance with and to the full extent provided by applicable law. If this Deed of Trust is foreclosed by judicial foreclosure, Lender will be entitled to a judgment which will provide that if the foreclosure sale proceeds are insufficient to satisfy the judgment, execution may issue for the amount of the unpaid balance of the judgment.

UCC Remedies. With respect to all or any part of the Personal Property, Lender shall have all the rights and remedies of a secured party under the Uniform Commercial Code.

Collect Rents. Lender shall have the right, without notice to Borrower or Grantor to take possession of and manage the Property and collect the Rents, including amounts past due and unpaid, and apply the net proceeds, over and above Lender's costs, against the Indebtedness. In furtherance of this right, Lender may require any tenant or other user of the Property to make payments of rent or use fees directly to Lender. If the Rents are collected by Lender, then Grantor irrevocably designates Lender as Grantor's attorney-in-fact to endorse instruments received in payment thereof in the name of Grantor and to negotiate the same and collect the proceeds. Payments by tenants or other users to Lender in response to Lender's demand shall satisfy the obligations for which the payments are made, whether or not any proper grounds for the demand existed. Lender may exercise its rights under this subparagraph either in person, by agent, or through a receiver.

Appoint Receiver. Lender shall have the right to have a receiver appointed to take possession of all or any part of the Property, with the power to protect and preserve the Property, to operate the Property preceding foreclosure or sale, and to collect the Rents from the Property and apply the proceeds, over and above the cost of the receivership, against the Indebtedness. The receiver may serve without bond if permitted by law. Lender's right to the appointment of a receiver shall exist whether or not the apparent value of the Property exceeds the Indebtedness by a substantial amount. Employment by Lender shall not disqualify a person from serving as a receiver.

Tenancy at Sufferance. If Grantor remains in possession of the Property after the Property is sold as provided above or Lender otherwise becomes entitled to possession of the Property upon default of Borrower or Grantor, Grantor shall become a tenant at sufferance of Lender or the purchaser of the Property and shall, at Lender's option, either (1) pay a reasonable rental for the use of the Property, or (2) vacate the Property immediately upon the demand of Lender.

Other Remedies. Trustee or Lender shall have any other right or remedy provided in this Deed of Trust or the Note or available at law or in equity.

Notice of Sale. Lender shall give Grantor reasonable notice of the time and place of any public sale of the Personal Property or of the time after which any private sale or other intended disposition of the Personal Property is to be made. Reasonable notice shall mean notice given at least fifteen (15) days before the time of the sale or disposition. Any sale of the Personal Property may be made in conjunction with any sale of the Real Property.

Sale of the Property. To the extent permitted by applicable law, Borrower and Grantor hereby waives any and all rights to have the Property marshalled. In exercising its rights and remedies, the Trustee or Lender shall be free to sell all or any part of the Property together or separately, in one sale or by separate sales. Lender shall be entitled to bid at any public sale on all or any portion of the Property.

Attorneys' Fees; Expenses. If Lender institutes any suit or action to enforce any of the terms of this Deed of Trust, Lender shall be entitled to recover such sum as the court may adjudge reasonable as attorneys' fees at trial and upon any appeal. Whether or not any court action is involved, and to the extent not prohibited by law, all reasonable expenses Lender incurs that in Lender's opinion are necessary at any time for the protection of its interest or the enforcement of its rights shall become a part of the Indebtedness payable on demand and shall bear interest at the Note rate from the date of the expenditure until repaid. Expenses covered by this paragraph include, without limitation, however subject to any limits under applicable law, Lender's attorneys' fees and Lender's legal expenses, whether or not there is a lawsuit, including attorneys' fees and expenses for bankruptcy proceedings (including efforts to modify or vacate any automatic stay or injunction), appeals, and any anticipated post-judgment collection services, the cost of searching records, obtaining title reports (including foreclosure reports), surveyors' reports, and appraisal fees, title insurance, and fees for the Trustee, to the extent permitted by applicable law. Grantor also will pay any court costs, in addition to all other sums provided by law.

Rights of Trustee. Trustee shall have all of the rights and duties of Lender as set forth in this section.

POWERS AND OBLIGATIONS OF TRUSTEE. The following provisions relating to the powers and obligations of Trustee are part of this Deed of Trust:

Powers of Trustee. In addition to all powers of Trustee arising as a matter of law, Trustee shall have the power to take the following actions with respect to the Property upon the written request of Lender and Grantor: (a) join in preparing and filing a map or plat of the Real Property, including the dedication of streets or other rights to the public; (b) join in granting any easement or creating any restriction on the Real Property; and (c) join in any subordination or other agreement affecting this Deed of Trust or the interest of Lender under this Deed of Trust.

Obligations to Notify. Trustee shall not be obligated to notify any other party of a pending sale under any other trust deed or lien, or of any action or proceeding in which Grantor, Lender, or Trustee shall be a party, unless the action or proceeding is brought by Trustee.

Trustee. Trustee shall meet all qualifications required for Trustee under applicable law. In addition to the rights and remedies set forth

DEED OF TRUST (Continued)

above, with respect to all or any part of the Property, the Trustee shall have the right to foreclose by notice and sale, and Lender shall have the right to foreclose by judicial foreclosure, in either case in accordance with and to the full extent provided by applicable law.

Successor Trustee. Lender, at Lender's option, may from time to time appoint a successor Trustee to any Trustee appointed under this Deed of Trust by an instrument executed and acknowledged by Lender and recorded in the office of the recorder of WASHINGTON County, State of Oregon. The instrument shall contain, in addition to all other matters required by state law, the names of the original Lender, Trustee, and Grantor, the book and page where this Deed of Trust is recorded, and the name and address of the successor trustee, and the instrument shall be executed and acknowledged by Lender or its successors in interest. The successor trustee, without conveyance of the Property, shall succeed to all the title, power, and duties conferred upon the Trustee in this Deed of Trust and by applicable law. This procedure for substitution of Trustee shall govern to the exclusion of all other provisions for substitution.

NOTICES. Any notice required to be given under this Deed of Trust, including without limitation any notice of default and any notice of sale shall be given in writing, and shall be effective when actually delivered, when actually received by telefacsimile (unless otherwise required by law), when deposited with a nationally recognized overnight courier, or, if mailed, when deposited in the United States mail, as first class, certified or registered mail postage prepaid, directed to the addresses shown near the beginning of this Deed of Trust. All copies of notices of foreclosure from the holder of any lien which has priority over this Deed of Trust shall be sent to Lender's address, as shown near the beginning of this Deed of Trust. Any party may change its address for notices under this Deed of Trust by giving formal written notice to the other parties, specifying that the purpose of the notice is to change the party's address. For notice purposes, Grantor agrees to keep Lender informed at all times of Grantor's current address. Unless otherwise provided or required by law, if there is more than one Grantor, any notice given by Lender to any Grantor is deemed to be notice given to all Grantors.

FRAUDS DISCLOSURE. UNDER OREGON LAW, MOST AGREEMENTS, PROMISES AND COMMITMENTS MADE BY US (LENDER) CONCERNING LOANS AND OTHER CREDIT EXTENSIONS WHICH ARE NOT FOR PERSONAL, FAMILY OR HOUSEHOLD PURPOSES OR SECURED SOLELY BY THE BORROWER'S RESIDENCE MUST BE IN WRITING, EXPRESS CONSIDERATION AND BE SIGNED BY US TO BE ENFORCEABLE.

MISCELLANEOUS PROVISIONS. The following miscellaneous provisions are a part of this Deed of Trust:

Amendments. This Deed of Trust, together with any Related Documents, constitutes the entire understanding and agreement of the parties as to the matters set forth in this Deed of Trust. No alteration of or amendment to this Deed of Trust shall be effective unless given in writing and signed by the party or parties sought to be charged or bound by the alteration or amendment.

Annual Reports. If the Property is used for purposes other than Grantor's residence, Grantor shall furnish to Lender, upon request, a certified statement of net operating income received from the Property during Grantor's previous fiscal year in such form and detail as Lender shall require. "Net operating income" shall mean all cash receipts from the Property less all cash expenditures made in connection with the operation of the Property.

Caption Headings. Caption headings in this Deed of Trust are for convenience purposes only and are not to be used to interpret or define the provisions of this Deed of Trust.

Merger. There shall be no merger of the interest or estate created by this Deed of Trust with any other interest or estate in the Property at any time held by or for the benefit of Lender in any capacity, without the written consent of Lender.

Governing Law. This Deed of Trust will be governed by federal law applicable to Lender and, to the extent not preempted by federal law, the laws of the State of Oregon without regard to its conflicts of law provisions. This Deed of Trust has been accepted by Lender in the State of Oregon.

Choice of Venue. If there is a lawsuit, Grantor agrees upon Lender's request to submit to the jurisdiction of the courts of Washington County, State of Oregon.

Joint and Several Liability. All obligations of Borrower and Grantor under this Deed of Trust shall be joint and several, and all references to Grantor shall mean each and every Grantor, and all references to Borrower shall mean each and every Borrower. This means that each Grantor signing below is responsible for all obligations in this Deed of Trust.

No Waiver by Lender. Lender shall not be deemed to have waived any rights under this Deed of Trust unless such waiver is given in writing and signed by Lender. No delay or omission on the part of Lender in exercising any right shall operate as a waiver of such right or any other right. A waiver by Lender of a provision of this Deed of Trust shall not prejudice or constitute a waiver of Lender's right otherwise to demand strict compliance with that provision or any other provision of this Deed of Trust. No prior waiver by Lender, nor any course of dealing between Lender and Grantor, shall constitute a waiver of any of Lender's rights or of any of Grantor's obligations as to any future transactions. Whenever the consent of Lender is required under this Deed of Trust, the granting of such consent by Lender in any instance shall not constitute continuing consent to subsequent instances where such consent is required and in all cases such consent may be granted or withheld in the sole discretion of Lender.

Severability. If a court of competent jurisdiction finds any provision of this Deed of Trust to be illegal, invalid, or unenforceable as to any person or circumstance, that finding shall not make the offending provision illegal, invalid, or unenforceable as to any other person or circumstance. If feasible, the offending provision shall be considered modified so that it becomes legal, valid and enforceable. If the offending provision cannot be so modified, it shall be considered deleted from this Deed of Trust. Unless otherwise required by law, the illegality, invalidity, or unenforceability of any provision of this Deed of Trust shall not affect the legality, validity or enforceability of any other provision of this Deed of Trust.

Successors and Assigns. Subject to any limitations stated in this Deed of Trust on transfer of Grantor's interest, this Deed of Trust shall be binding upon and inure to the benefit of the parties, their successors and assigns. If ownership of the Property becomes vested in a person other than Grantor, Lender, without notice to Grantor, may deal with Grantor's successors with reference to this Deed of Trust and the Indebtedness by way of forbearance or extension without releasing Grantor from the obligations of this Deed of Trust or liability under the Indebtedness.

Time is of the Essence. Time is of the essence in the performance of this Deed of Trust.

Waive Jury. All parties to this Deed of Trust hereby waive the right to any jury trial in any action, proceeding, or counterclaim brought by any party against any other party.

Waiver of Homestead Exemption. Grantor hereby releases and waives all rights and benefits of the homestead exemption laws of the State of Oregon as to all Indebtedness secured by this Deed of Trust.

Commercial Deed of Trust. Grantor agrees with Lender that this Deed of Trust is a commercial deed of trust and that Grantor will not change the use of the Property without Lender's prior written consent.

DEFINITIONS. The following capitalized words and terms shall have the following meanings when used in this Deed of Trust. Unless specifically stated to the contrary, all references to dollar amounts shall mean amounts in lawful money of the United States of America. Words and terms used in the singular shall include the plural, and the plural shall include the singular, as the context may require. Words and terms not otherwise defined in this Deed of Trust shall have the meanings attributed to such terms in the Uniform Commercial Code:

Beneficiary. The word "Beneficiary" means Sterling Savings Bank, and its successors and assigns.

Borrower. The word "Borrower" means POWIN PACIFIC PROPERTIES, LLC and includes all co-signers and co-makers signing the Note and all their successors and assigns.

Deed of Trust. The words "Deed of Trust" mean this Deed of Trust among Grantor, Lender, and Trustee, and includes without limitation all assignment and security interest provisions relating to the Personal Property and Rents.

Default. The word "Default" means the Default set forth in this Deed of Trust in the section titled "Default".

Event of Default. The words "Event of Default" mean any of the events of default set forth in this Deed of Trust in the events of default section of this Deed of Trust.

Grantor. The word "Grantor" means JOSEPH LU and MEI YI LU.

Guaranty. The word "Guaranty" means the guaranty from guarantor, endorser, surety, or accommodation party to Lender, including without limitation a guaranty of all or part of the Note.

Improvements. The word "Improvements" means all existing and future improvements, buildings, structures, mobile homes affixed on the Real Property, facilities, additions, replacements and other construction on the Real Property.

agreements, guaranties, security agreements, mortgages, deeds of trust, security deeds, collateral mortgages, and all other instruments, agreements and documents, whether now or hereafter existing, executed in connection with the Indebtedness.
Rents. The word "Rents" means all present and future rents, revenues, income, issues, royalties, profits, and other benefits derived from the Property.
Trustee. The word "Trustee" means BRAD WILLIAMS C/O UPF Washington Incorporated, whose address is 910 WEST BOONE AVE, SPOKANE, WA 99201 and any substitute or successor trustees.
EACH GRANTOR ACKNOWLEDGES HAVING READ ALL THE PROVISIONS OF THIS DEED OF TRUST, AND EACH GRANTOR AGREES TO ITS TERMS.
GRANTOR: xX
INDIVIDUAL'ACKNOWLEDGMENT OFFICIAL SEAL STATE OF DEMONSTRES OF DEMONSTRES SEPTEMBER 20, 2013 STATE OF DEMONSTRES SEPTEMBER 20, 2013 COUNTY OF DEMONSTRES SEPTEMBER 20, 2013
On this day before me, the undersigned Notary Public, personally appeared JOSEPH LU, to me known to be the individual described in and who executed the Deed of Trust, and acknowledged that he or she signed the Deed of Trust as his or her free and voluntary act and deed, for the uses and purposes therein mentioned. Given under my hand and official seal this day of day of By

for the promissory note or agreement. The maturity date of the Note is June 1, 2021. Personal Property. The words "Personal Property" mean all equipment, fixtures, and other articles of personal property now or hereafter owned by Grantor, and now or hereafter attached or affixed to the Real Property; together with all accessions, parts, and additions to, all

Note. The word "Note" means the promissory note dated June 3, 2011, in the original principal amount of \$3,000,000.00 from Borrower to Lender, together with all renewals of, extensions of, modifications of, refinancings of, consolidations of, and substitutions

replacements of, and all substitutions for, any of such property; and together with all proceeds (including without limitation all insurance proceeds and refunds of premiums) from any sale or other disposition of the Property.

Property. The word "Property" means collectively the Real Property and the Personal Property.

Lender. The word "Lender" means Sterling Savings Bank, its successors and assigns.

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Loan No: 9001

provision of this Deed of Trust.

Notary Public in and for the State of

Real Property. The words "Real Property" mean the real property, interests and rights, as further described in this Deed of Trust.

Related Documents. The words "Related Documents" mean all promissory notes, credit agreements, loan agreements, environmental

(Continued	d)

DEED OF TRUST

Indebtedness. The word "Indebtedness" means all principal, interest, and other amounts, costs and expenses payable under the Note or Related Documents, together with all renewals of, extensions of, modifications of, consolidations of and substitutions for the Note or Related Documents and any amounts expended or advanced by Lender to discharge Grantor's obligations or expenses incurred by Trustee or Lender to enforce Grantor's obligations under this Deed of Trust, together with interest on such amounts as provided in this Deed of Trust. Specifically, without limitation, Indebtedness includes all amounts that may be indirectly secured by the Cross-Collateralization

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INDIVIDUALIACKNOWLEDGMENT

My commission expires WIT - L

STATE OF DRAW)) SS	OFFICIAL SEAL JENNIFER M INOUYE
COUNTY OF WAGAMAGTAM)	NOTARY PUBLIC - OREGON COMMISSION NO. A442767
On this day before me, the undersigned Notary Public, person executed the Deed of Trust, and acknowledged that he or sh uses and purposes therein mentioned. Given under my hand and official seal this	nally appeared MEI YI LU ne signed the Deed of Tr day of Residing at My commis	U, to me known to be the individual described in and w rust as his or her free and voluntary act and deed, for the mean of the free and voluntary act and deed, for the mean of the mean o

REQUEST FOR FULL RECONVEYANCE

(To be used only when obligations have been paid in full)

To: ____, Trustee

The undersigned is the legal owner and holder of all Indebtedness secured by this Deed of Trust. All sums secured by this Deed of Trust have been fully paid and satisfied. You are hereby directed, upon payment to you of any sums owing to you under the terms of this Deed of Trust or pursuant to any applicable statute, to cancel the Note secured by this Deed of Trust (which is delivered to you together with this Deed of Trust), and to reconvey, without warranty, to the parties designated by the terms of this Deed of Trust, the estate now held by you under this Deed of Trust. Please mail the reconveyance and Related Documents to:

Beneficiary: _____ Date: _____ Ву: _____ lts: _____

Loan No: 9001

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Exhibit "A"

PARCEL I:

A parcel of land in the Northwest one-quarter of Section 23, Township 2 South, Range 1 West, of the Willamette Meridian, in the County of Washington and State of Oregon, being a portion of those certain tracts of land conveyed to John Hiller as described in Book 216, Page 69 and in Book 319, Page 304 and a portion of that certain tract of land conveyed to David W. and Gail M. Shepherd in Book 1039, Page 632, Washington County Deed Records, Washington County, Oregon, being more particularly described as follows:

Beginning at a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc.", which is on the North line of said Hiller tract as described in said Book 319, Page 304 which bears South 89° 54' 47" West, 348.81 feet along the North line of said Hiller tracts from a 5/8 inch iron rod marking the Northeast corner of said Book 216, Page 69; thence South 00° 15' 00" West, 397.08 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence South 23° 36' 48" East, 296.52 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc." on the North right-of-way line of Herman Road (County Road No. 469), a 40.00 foot wide road; thence South 67° 34' 00" West, 50.00 feet along said North right-of-way line to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence leaving said North right-ofway line North 23° 36' 48" West, 278.80 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence South 89° 54' 47" West, 309.83 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc." in the West line of said Hiller tract as described in said Book 319, Page 304; thence along said West line North 00° 15' 00" West, 432.34 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "LS 510 JW CHASE" marking the Northwest corner of said Book 319, Page 304; thence along the North line of said Book 319, Page 304, North 89° 54' 47" East, 348.81 feet to the point of beginning.

PARCEL II:

A parcel of land in the Northwest one-quarter of Section 23, Township 2 South, Range 1 West, of the Willamette Meridian, in the County of Washington and State of Oregon, being a portion of those certain tracts of land conveyed to John Hiller as described in Book 216, Page 69 and in Book 319, Page 304 and a portion of that certain tract of land conveyed to David W. and Gail M. Shepherd in Book 1039, Page 632, Washington County Deed Records, Washington County, Oregon, being more particularly described as follows:

Beginning at a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc." on the West line of said Hiller tract as described in said Book 319, Page 304 which bears South 00° 15' 00" West along the West line of said Hiller tract 432.34 feet from the Northwest corner of said tract; thence leaving said West line North 89° 54' 47" East, 309.83 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence South 23° 36' 48" East, 278.80 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc." in the North right-of-way line of Herman Road (County Road No. 419), a 40.00 foot wide road; thence along said North rightof-way line South 67° 34' 00" West, 458.06 feet to the Southwest corner of said Hiller tract; thence along the West line of said Hiller tract North 00° 15' 00" East, 429.79 feet to the point of beginning.

Preliminary Title Report ORRQ 6/2005 Page 3 Preliminary Title Report

PARCEL III:

e e . . .

A parcel of land in the Northwest one-quarter of Section 23, Township 2 South, Range 1 West, of the Willamette Meridian, in the County of Washington and State of Oregon, being a portion of those certain tracts of land conveyed to John Hiller as described in Book 216, Page 69 and in Book 319, Page 304 and a portion of that certain tract of land conveyed to David W. and Gail M. Shepherd in Book 1039, Page 632, Washington County Deed Records, Washington County, Oregon, being more particularly described as follows:

Beginning at a 5/8 inch iron rod marking the Northeast corner of said Hiller tract as described in said Book 216, Page 69; thence along the East line of said Hiller tract South 00° 15' 00" West, 425.00 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence South 89° 54' 47" West, 165.00 feet; thence South 00° 15' 00" West, 217.65 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc." on the Northerly right-of-way line of Herman Road (County Road No. 489), a 40.00 foot wide road; thence along said Northerly right-of-way line South 67° 34' 00" West, 69.20 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence leaving said Northerly right-of-way line North 23° 36' 48" West, 296.52 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence North 00° 15' 00" East, 397.08 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc." on the North line of said Book 319, Page 304; thence along said North line and along the North line of Book 216, Page 69, North 89° 54' 47" East, 348.81 feet to the point of beginning.

PARCEL IV:

Beginning 40 rods South and 60 rods West of the Northeast corner of the Northwest onequarter of Section 23, Township 2 South, Range 1 West, of the Willamette Meridian, in the City of Tualatin, County of Washington and State of Oregon; thence 425 feet South to the true place of beginning; thence South 235 feet; thence West 165 feet; thence North 235 feet; thence East 165 feet to the place of beginning.

Preliminary Title Report ORRQ 6/2005 Page 4




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2S 1 23BA-S1

2S 1 23BA-S1



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FOR OTHER USE Map areas delineated by either gray shading or a cross-hatched pattern are for reference only and may not indicate the most current property boundaries. Please consult the appropriate map for the most current information.

2S 1 23BA-S2



2S 1 23BA-S2

Property Detail Report

9975 SW Herman Rd, Tualatin, OR 97062-7911

APN: R531525

Owner Information					
Owner Name:	Lu Qbf II LLC				
Vesting: Mailing Address:	Po Box 483, Tualatin, OR 97	062-0483		Occupancy:	Unknown
Location Information	1				
Legal Description: APN: Munic / Twnshp:	Acres 6.60 R531525 Tualatin	Alternate APN: Twnshp-Rng-Sec:	2\$123BA02900 02\$-01W-23	County: Census Tract / Block: Legal Lot / Block:	Washington, OR 032001 / 1015
Subdivision: Neighborhood: Elementary School: Latitude:	Tualatin & Sherwood Schumacher Place Tualatin Elementar 45.38735	Fract #: School District: Middle School: Longitude:	Tigard-Tualatin School Dis Hazelbrook Middle -122.78007	Legal Book / Page: strict 23J High School:	Tualatin High Scho
Last Transfer / Conve	eyance - Current Owner				
Transfer / Rec Date: Buyer Name:	12/27/2012 / 02/08/2013 Powin Qbf LLC	Price: Seller Name:	Lu Joseph & Mei Y	Transfer Doc #: Deed Type:	2013.12461 Special Warranty Deed
Last Market Sale					
Sale / Rec Date: Multi / Split Sale:	10/16/2009 / 11/03/2009 Y	Sale Price / Type: Price / Sq. Ft.:	\$5,000,000 / Confirmed	Deed Type: New Construction:	High Liability Loan
1st Mtg Amt / Type: 2nd Mtg Amt / Type: Soller Name	\$3,500,000 / Conventional	1st Mtg Rate / Type: 2nd Mtg Rate / Type:	500.0 / Fixed	1st Mtg Doc #: Sale Doc #:	2009.96524 2009.96523
Lender:	Jiaren LLC			Title Company:	Lawyers Title
Prior Sale Informatio	n				
Sale / Rec Date: 1st Mtg Amt / Type: Prior Lender:		Sale Price / Type: 1st Mtg Rate / Type:		Prior Deed Type: Prior Sale Doc #:	N/A
Property Characteris	stics				
Gross Living Area: Living Area: Total Adj. Area: Above Grade: Basement Area: Style: Foundation: Quality: Condition:		Total Rooms: Bedrooms: Baths (F / H): Pool: Fireplace: Cooling: Heating: Exterior Wall: Construction Type:	0	Year Built / Eff: Stories: Parking Type: Garage #: Garage Area: Porch Type: Patio Type: Roof Type: Roof Material:	
Site Information					
Land Use: State Use:	Vacant Land- Industrial 2300 - 2300	Lot Area: Lot Width / Depth:	287,496 Sq. Ft.	Zoning: # of Buildings:	ML
County Use:	2300 - County Appraised Vacant Industrial Land	Usable Lot:		Res / Comm Units:	
Site Influence: Flood Zone Code: Community Name:	Ae City Of Tualatin	Acres: Flood Map #: Flood Panel #:	6.6 41067C0544E 0544E	Water / Sewer Type: Flood Map Date: Inside SFHA:	11/04/2016 True
Tax Information					
Assessed Year: Tax Year: Tax Area: Property Tax: Exemption:	2023 2022 023.76 \$22,638.15	Assessed Value: Land Value: Improvement Value: Improved %: Delinquent Year:	\$1,346,560	Market Total Value: Market Land Value: Market Imprv Value: Market Imprv %:	\$2,264,030 \$2,264,030



Disclaimer: This report is not an insured product or service or a representation of the condition of title to real property. It is not an abstract, legal opinion, opinion of title, title insurance, commitment or preliminary report, or any form of title insurance or guaranty. Estimated property values are: (i) based on available data; (ii) are not guaranteed or warranted; (iii) do not constitute an appraisal; and (iv) should not be relied upon in lieu of an appraisal. This report is issued exclusively for the benefit of the applicant therefor, and may not be used or relied upon by any other person. This report may not be reproduced in any manner without the issuing party's prior written consent. The issuing party does not represent or warrant that the information herein is complete or free from error, and the information herein is provided without any warranties of any kind, as-is, and with all faults. As a material part of the consideration given in exchange for the issuance of this report, recipient agrees that the issuing party's sole liability for any loss or damage caused by an error or omission due to inaccurate information or negligence in preparing this report shall be limited to the fee charged for the report. Recipient accepts this report with this limitation and agrees that the issuing party would not have issued this report but for the limitation of liability described above. The issuing party makes no representation or warranty as to the legality or propriety of recipient's use of the information herein.

School information is copyrighted and provided by GreatSchools.org.

After Recording, return to: Lu QBF II, LLC PO Box 483 Tualatin, OR 97062

Send Tax Statements to:

Lu QBF II, LLC PO Box 483 Tualatin, OR 97062



SPECIAL WARRANTY DEED

LU QBF, LLC, an Oregon Limited Liability Company, hereinafter called "Grantor", hereby conveys and specially warrants to LU QBF II, LLC, an Oregon Limited Liability Company, hereinafter called "Grantee", all of Grantor's interest in and to the following described real properties situated in the County of Washington and State of Oregon free from encumbrances or defects created or suffered by Grantor except as specifically set forth herein below, such properties being more particularly described as follows, to wit:

For legal description see Exhibit "A" attached hereto, incorporated by reference and made a part of this instrument.

TO HAVE AND TO HOLD the same unto said Grantee and Grantees' successors and assigns forever.

The true and actual consideration paid for this transfer, stated in terms of dollars, is \$-0-. However, the actual consideration consists of other property or value given or promised, which is the whole consideration.

This Conveyance is made solely as an adjustment of common boundary between adjoining properties (City of Tualatin Approval Case File No. PLA21-0001, 10005 SW HERMAN RD, Property Line Adjustment).

THE LIABILITY AND OBLIGATIONS OF THE GRANTOR(S) TO GRANTEE AND GRANTEE'S SUCCESSORS AND ASSIGNS UNDER THE WARRANTIES AND COVENANTS CONTAINED HEREIN OR PROVIDED BY LAW SHALL BE LIMITED TO THE EXTENT OF COVERAGE THAT WOULD BE AVAILABLE TO GRANTOR(S) UNDER A STANDARD POLICY OF TITLE INSURANCE CONTAINING EXCEPTIONS FOR MATTERS OF PUBLIC RECORD. THE LIMITATIONS CONTAINED HEREIN EXPRESSLY DO NOT RELIEVE GRANTOR(S) OF ANY LIABILITY OR OBLIGATIONS UNDER THIS INSTRUMENT, BUT MERELY DEFINE THE SCOPE, NATURE AND AMOUNT OF SUCH LIABILITY OR OBLIGATIONS.

BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON TRANSFERRING FEE TITLE SHOULD INQUIRE ABOUT THE PERSON'S RIGHTS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007 AND SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009. THIS INSTRUMENT DOES NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATON OF APPLICABLE LAND USE LAWS AND REGULATIONS. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON ACQUIRING FEE TITLE TO THE PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY THAT THE UNIT OF LAND BEING TRANSFERRED IS A LAWFULLY ESTABLISHED LOT OR PARCEL, AS DEFINED IN ORS 92.010 OR 215.010, TO VERIFY THE APPROVED USES OF THE LOT OR PARCEL, TO DETERMINE ANY LIMITS ON LAWSUITS AGAINST FARMING OR FOREST PRACTICES, AS DEFINED IN ORS 30.930, AND TO INQUIRE ABOUT THE RIGHTS OF NEIGHBORING PROPERTY OWNERS, IF ANY UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007 AND SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009, AND SECTIONS 2 TO 7, CHAPTER 8, OREGON LAWS 2010.

In construing this instrument, where the context so requires the singular includes the plural and all grammatical changes shall be made so that this instrument shall apply equally to business, other entities and to individuals.

IN WITNESS WHEREOF the undersigned have executed this instrument this $\frac{3\gamma_{c}}{2}$ day of February, 2022

GRANTOR:

Lu QBF, LLC, an Oregon Limited Liability Company By its member, Lu Pacific Properties, LLC, an Oregon Limited Liability Company

SS.

Peter Lu, Managing Member

Danny Lu, Managing Member

STATE OF OREGON

County of Washington

2022, personally appeared before me the above-named Peter Lu, as Managing On February Member of Lu Pacific Properties, LLC, an Oregon limited liability company, Member of Lu QBF, LLC, an Oregon limited liability company.

OFFICIAL STAMP Bradley C Holbrook NOTARY PUBLIC - OREGON COMMISSION NO. 1001750 STATE OF OREGON July 9, 2024 SS. County of Washington

Brally C. Hel m

On Fobrum 3²², 2022, personally appeared before me the above-named Danny Lu, as Managing Member of Lu Pacific Properties, LLC, an Oregon limited liability company, Member of Lu QBF, LLC, an Oregon limited liability company.

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and a local division of the local division o		COMMISSIO	N NO. 1001750	
	MY COMMIS	SION EXPIRES	July 9, 2024	
			Statistics of the state of the state of the state of the state	-

Notary Public for Oregon

EXHIBIT A LEGAL DESCRIPTION

Tract 1

A tract of land for Property Line Adjustment purposes in the N.W. 1/4 of Section 23, Township 2 South, Range 1 West, W.M., Washington County, Oregon, described as follows:

Being a portion of Tracts 1, 2 and 3 of that tract of land described in Special Warranty Deed to Lu QBF, LLC, recorded January 8, 2021 as Document No. 2021-003040, Washington County Deed Records, more particularly described as follows:

Beginning at a 5/8" iron rod at the Southwest corner of said Tract 1, thence along the West line of said Lu QBF, LLC tract, North 00°15'00" East, 432.33 feet to a 5/8" iron rod at the Northwest corner of said Parcel 1;

Thence along the North line of said Tract 1, North 89°54'47" East, 697.62 feet to the Northeast corner of said Tract 1, from which point a 5/8" iron rod bears North 07°27'37" East, 0.98 feet;

Thence along the East line of said Lu QBF, LLC tract, South 00°15'00" West, 349.03 feet to a 5/8" iron rod with red plastic cap marked "Weddle Surveying";

Thence leaving said East line along the line common to said Tracts 1 and 3, North 89°45'00" West, 321.11 feet;

Thence South 00°00'00" East, 222.97

feet; Thence South 39°36'06" East,

95.93 feet;

Thence South 22°26'00" East, 10.66 feet to a point 43.50 feet, by perpendicular measure, from the centerline of S.W. Herman Road;

Thence parallel with said centerline, South 67°34'48" West, 74.57 feet;

Thence North 22°29'15" West, 110.56 feet;

Thence North 00°00'00" West, 147.73 feet;

Thence South 89°54'47" West, 330.87 feet to the Point of

Beginning. Containing therein 6.604 acres, more or less.

The Basis of Bearing for this description is per Survey No. 34022, Washington County Survey Records.

Tract 3

A tract of land for Property Line Adjustment purposes in the N.W. 1/4 of Section 23, Township 2 South, Range 1 West, W.M., Washington County, Oregon, described as follows:

Being a portion of Tracts 1 and 3 of that tract of land described in Special Warranty Deed to Lu QBF, LLC, recorded January 8, 2021 as Document No. 2021-003040, Washington County Deed Records, more particularly described as follows:

Beginning at a 5/8" iron rod with red plastic cap marked "Weddle Surveying" at the Northeast corner of said Tract 3;

Thence along the North line of said Tract 3, North 89°45'00" West, 321.11 feet;

Thence leaving said North line, South 00°00'00" East, 222.97 feet;

Thence South 39°36'06" East, 95.93 feet;

Thence South 22°26'00" East, 10.66 feet to a point 43.50 feet, by perpendicular measure, from the centerline of S.W. Herman Road;

Thence parallel with said centerline, North 67°34'48" East, 275.87 feet to the East line of said Lu QBF, LLC tract;

Thence along said East line, North 00°15'00" East, 200.13 feet the Point of Beginning.

Containing therein 1.878 acres, more or less.

The Basis of Bearing for this description is per Survey No. 34022, Washington County Survey Records.



After Recording, return to:

Dianne L. Haugeberg, Attorney P.O. Box 480 McMinnville, OR 97128

Send Tax Statements to:

Joseph Lu Powin QBF, LLC 20550 S.W. 115th Avenue Tualatin, OR 97062

SPECIAL WARRANTY DEED

JOSEPH LU and MEI YI LU, husband and wife, "Grantors", hereby convey and specially warrant to POWIN QBF, LLC, an Oregon Limited Liability Company, "Grantee", all of Grantor's interest in and to the following described real property situate in the County of Washington, State of Oregon, free of encumbrances created or suffered by Grantor and except for matters of public record, to-wit:

See legal description attached hereto as Exhibit A and by this reference incorporated herein.

THE LIABILITY AND OBLIGATIONS OF THE GRANTOR(S) TO GRANTEE AND GRANTEE'S SUCCESSORS AND ASSIGNS UNDER THE WARRANTIES AND COVENANTS CONTAINED HEREIN OR PROVIDED BY LAW SHALL BE LIMITED TO THE EXTENT OF COVERAGE THAT WOULD BE AVAILABLE TO GRANTOR(S) UNDER A STANDARD POLICY OF TITLE INSURANCE CONTAINING EXCEPTIONS FOR MATTERS OF PUBLIC RECORD. THE LIMITATIONS CONTAINED HEREIN EXPRESSLY DO NOT RELIEVE GRANTOR(S) OF ANY LIABILITY OR OBLIGATIONS UNDER THIS INSTRUMENT, BUT MERELY DEFINE THE SCOPE, NATURE AND AMOUNT OF SUCH LIABILITY OR OBLIGATIONS.

The true and actual consideration paid for this transfer, stated in terms of dollars, is \$-0-. However, the actual consideration consists of or includes other property or value given or promised which is the whole consideration.

"BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON TRANSFERRING FEE TITLE SHOULD INQUIRE ABOUT THE PERSON'S RIGHTS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007 AND SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009. THIS INSTRUMENT DOES NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATON OF APPLICABLE LAND USE LAWS AND REGULATIONS. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON ACQUIRING FEE TITLE TO THE PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY THAT THE UNIT OF LAND BEING TRANSFERRED IS A LAWFULLY ESTABLISHED LOT OR PARCEL, AS DEFINED IN ORS 92.010 OR 215.010, TO VERIFY THE APPROVED USES OF THE LOT OR PARCEL, TO DETERMINE ANY LIMITS ON LAWSUITS AGAINST FARMING OR FOREST PRACTICES, AS DEFINED IN ORS 30.930, AND TO INQUIRE ABOUT THE RIGHTS OF NEIGHBORING PROPERTY OWNERS, IF ANY UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007 AND SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009, AND SECTIONS 2 TO 7, CHAPTER 8, OREGON LAWS 2010."

DATED this 27th day of Ver , 2012.

GRANTOR:

GRANTOR:

Joseph Lu

Mei Yi Lu

STATE OF OREGON)) ss. County of <u>Washington</u>)

On December <u>2</u>, 2012, personally appeared before me the above-named **JOSEPH LU and MEI YI Lu**, husband and wife, who acknowledged the within instrument as their true and voluntary act and deed.



Notary Public for Oregon F:\Law\EP\Lu Business Entities\Powin QBF LLC_Deed

Page 1 of 3 – SPECIAL WARRANTY DEED

EXHIBIT "A"

Parcel 1

A parcel of land in the Northwest one-quarter of Section 23, Township 2 South, Range 1 West, of the Willamette Meridian, in the County of Washington and State of Oregon, being a portion of those certain tracts of land conveyed to John Hiller as described in Book 216, Page 69 and in Book 319, Page 304 and a portion of that certain tract of land conveyed to David W. and Gail M. Shepherd in Book 1039, Page 632, Washington County Deed Records, Washington County, Oregon, being more particularly described as follows:

Beginning at a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc.", which is on the North line of said Hiller tract as described in said Book 319, page 304 which bears South 89° 54' 47" West, 348.81 feet along the North line of said Hiller tracts from a 5/8 inch iron rod marking the Northeast corner of said Book 216, Page 69; thence South 00° 15' 00" West, 397.08 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence South 23° 36' 48" East, 296.52 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc." on the North right-of-way line of Herman Road (County Road No. 469), a 40.00 foot wide road; thence South 67° 34' 00" West, 50.00 feet along said North right-of-way line to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence South 67° 34' 00" West, 50.00 feet along said North right-of-way line to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence South 67° 34' 00" West, 50.00 feet along said North right-of-way line to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence South 89° 54' 47" West, 309.83 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence South 89° 54' 47" West, 309.83 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence south 89° 54' 47" West, 309.83 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence south 89° 54' 47" West, 309.83 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc." in the West line of said Hiller tract as described in said Book 319, Page 304; thence along said West line North 00° 15' 00" West, 432.34 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "LS 510 JW CHASE" marking the Northwest corner of said Book 319, Page 304; thence along the North line of said Book 319, page 304, North 89° 54' 47" East, 348.81 feet to the point of beginning.

Parcel 2

A parcel of land in the Northwest one-quarter of Section 23, Township 2 South, Range 1 West, of the Willamette Meridian, in the County of Washington and State of Oregon, being a portion of those certain tracts of land conveyed to John Hiller as described in Book 216, Page 69 and in Book 319, Page 304 and a portion of that certain tract of land conveyed to David W. and Gail M. Shepherd in Book 1039, Page 632, Washington County Deed Records, Washington County, Oregon, being more particularly described as follows:

Beginning at a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc." on the West line of said Hiller tract as described in said Book 319, page 304 which bears South 00° 15' 00" West along the West line of said Hiller tract 432.34 feet from the Northwest corner of said tract; thence leaving said West line North 89° 54' 47" East, 309.83 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence South 23° 36' 48" East, 278.80 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc." in the North right-of-way line of Herman Road (County Road No. 419), a 40.00 foot wide road; thence along said North right-of-way line South 67° 34' 00" West, 458.06 feet to the Southwest corner of said Hiller tract; thence along the West line of said Hiller tract North 00° 15' 00" East, 429.79 feet to the point of beginning.

Parcel 3

A parcel of land in the Northwest one-quarter of Section 23, Township 2 South, Range 1 West, of the Willamette Meridian, in the County of Washington and State of Oregon, being a portion of those certain tracts of land conveyed to John Hiller as described in Book 216, page 69 and in Book 319, Page 304 and a portion of that certain tract of land conveyed to David W. and Gail M. Shepherd in Book 1039, Page 632, Washington County Deed Records, Washington County, Oregon, being more particularly described as follows:

Beginning at a 5/8 inch iron rod marking the Northeast corner of said Hiller tract as described in said Book 216, page 69; thence along the East line of said Hiller tract South 00° 15' 00" West, 425.00 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence South 89° 54' 47" West, 165.00 feet; thence South 00° 15' 00" West, 217.65 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc." on the Northerly right-of-way line of Herman Road (County Road No. 489), a 40.00 foot wide road; thence along said Northerly right-of-way line South 67° 34' 00" West, 69.20 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence leaving said Northerly right-of-way line North 23° 36' 48" West, 296.52 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence leaving said Northerly right-of-way line North 23° 36' 48" West, 296.52 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence North 00° 15' 00" East, 397.08 feet to a 5/8 inch iron rod with yellow plastic cap inscribed "OTAK, Inc."; thence North 1ine of said Book 319, Page 304; thence along said North line and along the North line of Book 216, Page 69, North 89° 54' 47" East, 348.81 feet to the point of beginning.

Page 2 of 3 – SPECIAL WARRANTY DEED

Parcel 4

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Beginning 40 rods South and 60 rods West of the Northeast corner of the Northwest one-quarter of Section 23, Township 2 South, Range 1 West, of the Willamette Meridian, in the City of Tualatin, County of Washington and State of Oregon; thence 425 feet South to the true place of beginning; thence South 235 feet; thence West 165 feet; thence North 235 feet; thence East 165 feet to the place of beginning.

EXCEPTING THEREFROM any portion of said land lying within the Southern Pacific Railroad right-of-way.

(For informational purposes only, the above description covers: Tax Lot Account No. R2042036, Map: 2S123B-00901;Tax Lot Account No. R531525, Map: 2S123BA-02900; Tax Lot Account No. R531534, Map: 2S123BA-03100; and Tax Lot Account No. R531035, Map: 2S123B-00900.)

Page 3 of 3 – SPECIAL WARRANTY DEED



Joe Nelson, Director of Assessment and Taxation, Ex-Officio County Clerk

WHEN RECORDED MAIL TO:

Heritage Bank Attn: Loan Operations 3615 Pacific Ave Tacoma, WA 98418

FOR RECORDER'S USE ONLY

CONSTRUCTION DEED OF TRUST

THIS DEED OF TRUST is dated August 15, 2022, among LU QBF II, LLC, an Oregon Limited Liability Company, whose address is 11325 SW TUALATIN SHERWOOD RD, TUALATIN, OR 97062 ("Grantor"); HERITAGE BANK, whose address is 325 West Metro Oregon Commercial Lending, 1000 SW Broadway, Suite 2170, Portland, OR 97205 (referred to below sometimes as "Lender" and sometimes as "Beneficiary"); and Kevin P. Moran, Attorney at Law, whose address is P.O. Box 2980, Silverdale, WA 98383 (referred to below as "Trustee").

CONVEYANCE AND GRANT. For valuable consideration, represented in the Note dated August 15, 2022, in the original principal amount of \$13,750,000.00, from Borrower to Lender, Grantor conveys to Trustee for the benefit of Lender as Beneficiary all of Grantor's right, title, and interest in and to the following described real property, together with all existing or subsequently erected or affixed buildings, improvements and fixtures; all easements, rights of way, and appurtenances; all water, water rights and ditch rights (including stock in utilities with ditch or irrigation rights); and all other rights, royalties, and profits relating to the real property, including without limitation all minerals, oil, gas, geothermal and similar matters, (the "Real Property") located in Washington County, State of Oregon:

Tract 1

A tract of land for Property Line Adjustment purposes in N.W. ¼ of Section 23, Township 2 South, Range 1 West, W.M., Washington County, Oregon, described as follows:

Being a portion of Tracts 1, 2 and 3 of that tract of land described in Special Warranty Deed to Lu QBF, LLC, recorded January 8, 2021 as Document No. 2021-003040, Washington Country Deed Record, more particularly described as follows:

Beginning at a 5/8" iron rod at the Southwest corner of said Tract 1, thence along the West line of said Lu QBF, LLC tract, North 00°15'00" East, 432.33 feet to a 5/8" iron rod at the Northwest corner of said Parcel 1;

Thence along the North line of said Tract 1, North 89°54'47" East, 697.62 feet to the Northeast corner of said Tract 1, from which point a 5/8" iron rod bears North 07°27'37" East, 0.98 feet;

Thence along the East line of said Lu QBF, LLC tract, South 00°15'00" West, 349.03 feet to a 5/8" iron rod with red plastic cap marked "Weddle Surveying";

Thence leaving said East line along the line common to said Tracts 1 and 3, North 89°45'00" West, 321.11 feet;

Thence South 00°00'00" East, 222.97 feet;

Thence South 39°36'06" East, 95.93 feet; Thence South 22°26'00" East, 10.66 feet to a point 43.50 feet, by perpendicular measure, from the centerline of SW Herman Road; Thence parallel with said centerline, South 67°34'48" West, 74.57 feet; Thence North 22°29'15" West, 110.56 feet; Thence North 00°00'00" West, 147.73 feet; Thence South 89°54'47" West, 330.87 feet to the Point of Beginning.

Tract 3

A tract of land for Property Line Adjustment purposes in the N.W. ¼ of Section 23, Township 2 South, Range 1 West, W.M., Washington County, Oregon, described as follows:

Being a portion of Tract 1 and 3 of that tract of land described in Special Warranty Deed to Lu QBF, LLC, recorded January 8, 2021 as Document No. 2021-003040, Washington County Deed Records, more particularly described as follows:

Beginning at a 5/8" iron rod with red plastic cap marked "Weddle Surveying" at the Northeast corner of said Tract 3;

Thence along the North line of said Tract 3, North 89°45'00" West, 321.11 feet;

Thence leaving said North line, South 00°00'00" East, 222.97 feet;

Thence South 39°36'06" East, 95.93 feet;

Thence South 22°26'00" East, 10.66 feet to a point 43.50 feet, by perpendicular measure, from the centerline of SW Herman Road;

Thence parallel with said centerline, North 67°34'48" East, 275.87 feet to the East line of said Lu QBF, LLC tract;

Thence along said East line, North 00°15'00" East, 200.13 feet to the Point of Beginning.



The Real Property or its address is commonly known as 9905 and 9975 SW Herman Road, Tualatin, OR 97062. The Real Property tax identification number is R531525 and R531534.

Grantor presently assigns to Lender (also known as Beneficiary in this Deed of Trust) all of Grantor's right, title, and interest in and to all present and future leases of the Property and all Rents from the Property. In addition, Grantor grants to Lender a Uniform Commercial Code security interest in the Personal Property and Rents.

JUNIOR LIENS. Grantor shall not incur any junior liens to this Deed of Trust without the prior written consent of Lender.

THIS DEED OF TRUST, INCLUDING THE ASSIGNMENT OF RENTS AND THE SECURITY INTEREST IN THE RENTS AND PERSONAL PROPERTY, IS GIVEN TO SECURE (A) PAYMENT OF THE INDEBTEDNESS AND (B) PERFORMANCE OF ANY AND ALL OBLIGATIONS UNDER THE NOTE, THE RELATED DOCUMENTS, AND THIS DEED OF TRUST. THIS DEED OF TRUST, INCLUDING THE ASSIGNMENT OF RENTS AND THE SECURITY INTEREST IN THE RENTS AND PERSONAL PROPERTY, IS ALSO GIVEN TO SECURE ANY AND ALL OF BORROWER'S OBLIGATIONS UNDER THAT CERTAIN CONSTRUCTION LOAN AGREEMENT BETWEEN BORROWER AND LENDER OF EVEN DATE HEREWITH. ANY EVENT OF DEFAULT UNDER THE CONSTRUCTION LOAN AGREEMENT, OR ANY OF THE RELATED DOCUMENTS REFERRED TO THEREIN, SHALL ALSO BE AN EVENT OF DEFAULT UNDER THIS DEED OF TRUST. THIS DEED OF TRUST IS GIVEN AND ACCEPTED ON THE FOLLOWING TERMS:

GRANTOR'S REPRESENTATIONS AND WARRANTIES. Grantor warrants that: (a) this Deed of Trust is executed at Borrower's request and not at the request of Lender; (b) Grantor has the full power, right, and authority to enter into this Deed of Trust and to hypothecate the Property; (c) the provisions of this Deed of Trust do not conflict with, or result in a default under any agreement or other instrument. binding upon Grantor and do not result in a violation of any law, regulation, court decree or order applicable to Grantor; (d) Grantor has established adequate means of obtaining from Borrower on a continuing basis information about Borrower's financial condition; and (e) Lender has made no representation to Grantor about Borrower (including without limitation the creditworthiness of Borrower).

GRANTOR'S WAIVERS. Grantor waives all rights or defenses arising by reason of any "one action" or "anti-deficiency" law, or any other law which may prevent Lender from bringing any action against Grantor, including a claim for deficiency to the extent Lender is otherwise entitled to a claim for deficiency, before or after Lender's commencement or completion of any foreclosure action, either judicially or by exercise of a power of sale.

PAYMENT AND PERFORMANCE. Except as otherwise provided in this Deed of Trust, Borrower shall pay to Lender all Indebtedness secured by this Deed of Trust as it becomes due, and Borrower and Grantor shall perform all their respective obligations under the Note, this Deed of Trust, and the Related Documents.

CONSTRUCTION MORTGAGE. This Deed of Trust is a "construction mortgage" for the purposes of Sections 9-334 and 2A-309 of the Uniform Commercial Code, as those sections have been adopted by the State of Oregon.

POSSESSION AND MAINTENANCE OF THE PROPERTY. Borrower and Grantor agree that Borrower's and Grantor's possession and use of the Property shall be governed by the following provisions:

Possession and Use. Until the occurrence of an Event of Default, Grantor may (1) remain in possession and control of the Property; (2) use, operate or manage the Property; and (3) collect the Rents from the Property. The following provisions relate to the use of the Property or to other limitations on the Property. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON TRANSFERRING FEE TITLE SHOULD INQUIRE ABOUT THE PERSON'S RIGHTS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009, AND SECTIONS 2 TO 7, CHAPTER 8, OREGON LAWS 2010. THIS INSTRUMENT DOES NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATION OF APPLICABLE LAND USE LAWS AND REGULATIONS. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON ACQUIRING FEE TITLE TO THE PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY THAT THE UNIT OF LAND BEING TRANSFERRED IS A LAWFULLY ESTABLISHED LOT OR PARCEL, AS DEFINED IN ORS 92.010 OR 215.010, TO VERIFY THE APPROVED USES OF THE LOT OR PARCEL, TO DETERMINE ANY LIMITS ON LAWSUITS AGAINST FARMING OR FOREST PRACTICES, AS DEFINED IN ORS 30.930, AND TO INQUIRE ABOUT THE RIGHTS OF NEIGHBORING PROPERTY OWNERS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009, AND SECTIONS 2 TO 7, CHAPTER 8, OREGON LAWS 2010.

Duty to Maintain. Grantor shall maintain the Property in tenantable condition and promptly perform all repairs, replacements, and maintenance necessary to preserve its value.

Nuisance, Waste. Grantor shall not cause, conduct or permit any nuisance nor commit, permit, or suffer any stripping of or waste on or to the Property or any portion of the Property. Without limiting the generality of the foregoing, Grantor will not remove, or grant to any other party the right to remove, any timber, minerals (including oil and gas), coal, clay, scoria, soil, gravel or rock products without Lender's prior written consent.

Removal of Improvements. Grantor shall not demolish or remove any improvements from the Real Property without Lender's prior written consent. As a condition to the removal of any improvements, Lender may require Grantor to make arrangements satisfactory to Lender to replace such Improvements with Improvements of at least equal value.

Lender's Right to Enter. Lender and Lender's agents and representatives may enter upon the Real Property at all reasonable times to attend to Lender's interests and to inspect the Real Property for purposes of Grantor's compliance with the terms and conditions of this Deed of Trust.

Compliance with Governmental Requirements. Grantor shall promptly comply with all laws, ordinances, and regulations, now or hereafter in effect, of all governmental authorities applicable to the use or occupancy of the Property, including without limitation, the Americans With Disabilities Act. Grantor may contest in good faith any such law, ordinance, or regulation and withhold compliance during any proceeding, including appropriate appeals, so long as Grantor has notified Lender in writing prior to doing so and so long as, in Lender's sole opinion, Lender's interests in the Property are not jeopardized. Lender may require Grantor to post adequate security or a surety bond, reasonably satisfactory to Lender, to protect Lender's interest,

Duty to Protect. Grantor agrees neither to abandon or leave unattended the Property. Grantor shall do all other acts, in addition to those acts set forth above in this section, which from the character and use of the Property are reasonably necessary to protect and preserve the Property.

Construction Loan. If some or all of the proceeds of the loan creating the Indebtedness are to be used to construct or complete construction of any improvements on the Property, the improvements shall be completed no later than the maturity date of the Note (or such earlier date as Lender may reasonably establish) and Grantor shall pay in full all costs and expenses in connection with the work. Lender will disburse loan proceeds under such terms and conditions as Lender may deem reasonably necessary to insure that the interest created by this Deed of Trust shall have priority over all possible liens, including those of material suppliers and workmen. Lender may require, among other things, that disbursement requests be supported by receipted bills, expense affidavits, waivers of liens, construction progress reports, and such other documentation as Lender may reasonably request.

TAXES AND LIENS. The following provisions relating to the taxes and liens on the Property are part of this Deed of Trust:

Payment. Grantor shall pay when due (and in all events prior to delinquency) all taxes, special taxes, assessments, charges (including water and sewer), fines and impositions levied against or on account of the Property, and shall pay when due all claims for work done on or for services rendered or material furnished to the Property. Grantor shall maintain the Property free of all liens having priority over or equal to the interest of Lender under this Deed of Trust, except for the lien of taxes and assessments not due and except as otherwise provided in this Deed of Trust.

Right to Contest. Grantor may withhold payment of any tax, assessment, or claim in connection with a good faith dispute over the obligation to pay, so long as Lender's interest in the Property is not jeopardized. If a lien arises or is filed as a result of nonpayment, Grantor shall within fifteen (15) days after the lien arises or, if a lien is filed, within fifteen (15) days after Grantor has notice of the filing, secure the discharge of the lien, or if requested by Lender, deposit with Lender cash or a sufficient corporate surety bond or other security satisfactory to Lender in an amount sufficient to discharge the lien plus any costs and attorneys' fees, or other charges that could accrue as a result of a foreclosure or sale under the lien. In any contest, Grantor shall defend itself and Lender and shall

DEED OF TRUST (Continued)

satisfy any adverse judgment before enforcement against the Property. Grantor shall name Lender as an additional obligee under any surety bond furnished in the contest proceedings.

Evidence of Payment. Grantor shall upon demand furnish to Lender satisfactory evidence of payment of the taxes or assessments and shall authorize the appropriate governmental official to deliver to Lender at any time a written statement of the taxes and assessments against the Property.

Notice of Construction. Grantor shall notify Lender at least fifteen (15) days before any work is commenced, any services are furnished, or any materials are supplied to the Property, if any mechanic's lien, materialmen's lien, or other lien could be asserted on account of the work, services, or materials and the cost exceeds \$1,000.00. Grantor will upon request of Lender furnish to Lender advance assurances satisfactory to Lender that Grantor can and will pay the cost of such improvements.

PROPERTY DAMAGE INSURANCE. The following provisions relating to insuring the Property are a part of this Deed of Trust.

Maintenance of Insurance. Grantor shall procure and maintain policies of fire insurance with standard extended coverage endorsements on a replacement basis for the full insurable value covering all improvements on the Real Property in an amount sufficient to avoid application of any coinsurance clause, and with a standard mortgagee clause in favor of Lender. Grantor shall also procure and maintain comprehensive general liability insurance in such coverage amounts as Lender may request with Trustee and Lender being named as additional insureds in such liability insurance policies. Additionally, Grantor shall maintain such other insurance, including but not limited to hazard, business interruption, and boiler insurance, as Lender may reasonably require. Policies shall be written in form, amounts, coverages and basis reasonably acceptable to Lender and issued by a company or companies reasonably acceptable to Lender. Grantor, upon request of Lender, will deliver to Lender from time to time the policies or certificates of insurance in form satisfactory to Lender, including stipulations that coverages will not be cancelled or diminished without at least thirty (30) days prior written notice to Lender. Each insurance policy also shall include an endorsement providing that coverage in favor of Lender will not be impaired in any way by any act, omission or default of Grantor or any other person. Should the Real Property be located in an area designated by the Administrator of the Federal Emergency Management Agency as a special flood hezard area, Grantor agrees to obtain and maintain flood insurance, if available, within 45 days after notice is given by Lender that the Property is located in a special flood hazard area, for the full unpaid principal balance of the loan and any prior liens on the property securing the loan, up to the maximum policy limits set under the National Flood Insurance Program, or as otherwise required by Lender, and to maintain such insurance for the term of the loan. Flood insurance may be purchased under the National Flood Insurance Program, from private insurers providing "private flood insurance" as defined by applicable federal flood insurance statutes and regulations, or from another flood insurance provider that is both acceptable to Lender in its sole discretion and permitted by applicable federal flood insurance statutes and regulations.

Application of Proceeds. Grantor shall promptly notify Lender of any loss or damage to the Property if the estimated cost of repair or replacement exceeds \$1,000.00. Lender may make proof of loss if Grantor fails to do so within fifteen (15) days of the casualty. Whether or not Lender's security is impaired, Lender may, at Lender's election, receive and retain the proceeds of any insurance and apply the proceeds to the reduction of the Indebtedness, payment of any lien affecting the Property, or the restoration and repair of the Property. If Lender elects to apply the proceeds to restoration and repair, Grantor shall repair or replace the damaged or destroyed improvements in a manner satisfactory to Lender. Lender shall, upon satisfactory proof of such expenditure, pay or reimburse Grantor from the proceeds for the reasonable cost of repair or restoration if Grantor is not in default under this Deed of Trust. Any proceeds which have not been disbursed within 180 days after their receipt and which Lender has not committed to the repair or restoration of the Property shall be used first to pay any amount owing to Lender under this Deed of Trust, then to pay accrued interest, and the remainder, if any, shall be applied to the principal balance of the indebtedness. If Lender holds any proceeds after payment in full of the indebtedness, such proceeds shall be paid to Grantor as Grantor's interests may appear.

Grantor's Report on Insurance. Upon request of Lender, however not more than once a year. Grantor shall furnish to Lender a report on each existing policy of insurance showing: (1) the name of the insurer; (2) the risks insured; (3) the amount of the policy; (4) the property insured, the then current replacement value of such property, and the manner of determining that value; and (5) the expiration date of the policy. Grantor shall, upon request of Lender, have an independent appraiser satisfactory to Lender determine the cash value replacement cost of the Property.

LENDER'S EXPENDITURES. If any action or proceeding is commenced that would materially affect Lender's interest in the Property or if Grantor fails to comply with any provision of this Deed of Trust or any Related Documents, including but not limited to Grantor's failure to discharge or pay when due any amounts Grantor is required to discharge or pay under this Deed of Trust or any Related Documents, Lender on Grantor's behalf may (but shall not be obligated to) take any action that Lender deems appropriate, including but not limited to discharging or paying all taxes, liens, security interests, encumbrances and other claims, at any time levied or placed on the Property and paying all costs for insuring, maintaining and preserving the Property. All such expenditures incurred or paid by Lender for such purposes will then bear interest at the rate charged under the Note from the date incurred or paid by Lender to the date of repayment by Grantor. All such expenses will become a part of the Indebtedness and, at Lender's option, will (A) be payable on demand; (B) be added to the balance of the Note and be apportioned among and be payable with any installment payments to become due during either (1) the term of any applicable insurance policy; or (2) the remaining term of the Note; or (C) be treated as a balloon payment which will be due and payable at the Note's maturity. The Deed of Trust also will secure payment of these amounts. Such right shall be in addition to all other rights and remedies to which Lender may be entitled upon the occurrence of any Event of Default.

WARRANTY; DEFENSE OF TITLE. The following provisions relating to ownership of the Property are a part of this Deed of Trust:

Title. Grantor warrants that: (a) Grantor holds good and marketable title of record to the Property in fee simple, free and clear of all liens and encumbrances other than those set forth in the Real Property description or in any title insurance policy, title report, or final title opinion issued in favor of, and accepted by, Lender in connection with this Deed of Trust, and (b) Grantor has the full right, power, and authority to execute and deliver this Deed of Trust to Lender.

Defense of Title. Subject to the exception in the paragraph above, Grantor warrants and will forever defend the title to the Property against the lawful claims of all persons. In the event any action or proceeding is commenced that questions Grantor's title or the interest of Trustee or Lender under this Deed of Trust, Grantor shall defend the action at Grantor's expense. Grantor may be the nominal party in such proceeding, but Lender shall be entitled to participate in the proceeding and to be represented in the proceeding by counsel of Lender's own choice, and Grantor will deliver, or cause to be delivered, to Lender such instruments as Lender may request from time to time to permit such participation.

Compliance With Laws. Grantor warrants that the Property and Grantor's use of the Property complies with all existing applicable laws, ordinances, and regulations of governmental authorities.

Survival of Representations and Warranties. All representations, warranties, and agreements made by Grantor in this Deed of Trust shall survive the execution and delivery of this Deed of Trust, shall be continuing in nature, and shall remain in full force and effect until such time as Borrower's indebtedness shall be paid in full.

CONDEMNATION. The following provisions relating to condemnation proceedings are a part of this Deed of Trust:

Proceedings. If any proceeding in condemnation is filed, Grantor shall promptly notify Lender in writing, and Grantor shall promptly take such steps as may be necessary to defend the action and obtain the award. Grantor may be the nominal party in such proceeding, but Lender shall be entitled to participate in the proceeding and to be represented in the proceeding by counsel of its own choice, and Grantor will deliver or cause to be delivered to Lender such instruments and documentation as may be requested by Lender from time to time to permit such participation.

Application of Net Proceeds. If all or any part of the Property is condemned by eminent domain proceedings or by any proceeding or purchase in lieu of condemnation. Lender may at its election require that all or any portion of the net proceeds of the award be applied to the Indebtedness or the repair or restoration of the Property. The net proceeds of the award shall mean the award after payment of all reasonable costs, expenses, and attorneys' fees incurred by Trustee or Lender in connection with the condemnation.

IMPOSITION OF TAXES, FEES AND CHARGES BY GOVERNMENTAL AUTHORITIES. The following provisions relating to governmental taxes, fees and charges are a part of this Deed of Trust:

Current Taxes, Fees and Charges. Upon request by Lender, Grantor shall execute such documents in addition to this Deed of Trust

and take whatever other action is requested by Lender to perfect and continue Lender's lien on the Real Property. Grantor shall reimburse Lender for all taxes, as described below, together with all expenses incurred in recording, perfecting or continuing this Deed of Trust, including without limitation all taxes, fees, documentary stamps, and other charges for recording or registering this Deed of Trust.

Taxes. The following shall constitute taxes to which this section applies: (1) a specific tax upon this type of Deed of Trust or upon all or any part of the Indebtedness secured by this Deed of Trust; (2) a specific tax on Borrower which Borrower is authorized or required to deduct from payments on the Indebtedness secured by this type of Deed of Trust; (3) a tax on this type of Deed of Trust chargeable against the Lender or the holder of the Note; and (4) a specific tax on all or any portion of the Indebtedness or on payments of principal and interest made by Borrower.

Subsequent Taxes. If any tax to which this section applies is enacted subsequent to the date of this Deed of Trust, this event shall have the same effect as an Event of Default, and Lender may exercise any or all of its available remedies for an Event of Default as provided below unless Grantor either (1) pays the tax before it becomes delinquent, or (2) contests the tax as provided above in the Taxes and Liens section and deposits with Lender cash or a sufficient corporate surety bond or other security satisfactory to Lender.

SECURITY AGREEMENT; FINANCING STATEMENTS. The following provisions relating to this Deed of Trust as a security agreement are a part of this Deed of Trust:

Security Agreement. This instrument shall constitute a Security Agreement to the extent any of the Property constitutes fixtures, and Lender shall have all of the rights of a secured party under the Uniform Commercial Code as amended from time to time.

Security interest. Upon request by Lender, Grantor shall take whatever action is requested by Lender to perfect and continue Lender's security interest in the Rents and Personal Property. In addition to recording this Deed of Trust in the real property records, Lender may, at any time and without further authorization from Grantor, file executed counterparts, copies or reproductions of this Deed of Trust as a financing statement. Grantor shall reimburse Lender for all expenses incurred in perfecting or continuing this security interest. Upon default, Grantor shall not remove, sever or detach the Personal Property from the Property. Upon default, Grantor shall assemble any Personal Property not affixed to the Property in a manner and at a place reasonably convenient to Grantor and Lender and make it available to Lender within three (3) days after receipt of written demand from Lender to the extent permitted by applicable law.

Addresses. The mailing addresses of Grantor (debtor) and Lender (secured party) from which information concerning the security interest granted by this Deed of Trust may be obtained (each as required by the Uniform Commercial Code) are as stated on the first page of this Deed of Trust.

FURTHER ASSURANCES; ATTORNEY-IN-FACT. The following provisions relating to further assurances and attorney-in-fact are a part of this Deed of Trust:

Further Assurances. At any time, and from time to time, upon request of Lender, Grantor will make, execute and deliver, or will cause to be made, executed or delivered, to Lender or to Lender's designee, and when requested by Lender, cause to be filed, recorded, refiled, or rerecorded, as the case may be, at such times and in such offices and places as Lender may deem appropriate, any and all such mortgages, deeds of trust, security deeds, security agreements, financing statements, continuation statements, instruments of further assurance, certificates, and other documents as may, in the sole opinion of Lender, be necessary or desirable in order to effectuate, complete, perfect, continue, or preserve (1). Borrower's and Grantor's obligations under the Note, this Deed of Trust, and the Related Documents, and (2) the liens and security interests created by this Deed of Trust as first and prior liens on the Property, whether now owned or hereafter acquired by Grantor. Unless prohibited by law or Lender agrees to the contrary in writing, Grantor shall reimburse Lender for all costs and expenses incurred in connection with the matters referred to in this paragraph.

Attorney-in-Fact. If Grantor fails to do any of the things referred to in the preceding paragraph, Lender may do so for and in the name of Grantor and at Grantor's expense. For such purposes, Grantor hereby irrevocably appoints Lender as Grantor's attorney-in-fact for the purpose of making, executing, delivering, filing, recording, and doing all other things as may be necessary or desirable, in Lender's sole opinion, to accomplish the matters referred to in the preceding paragraph.

FULL PERFORMANCE. If Borrower and Grantor pay all the Indebtedness when due, and Grantor otherwise performs all the obligations imposed upon Grantor under this Deed of Trust, Lender shall execute and deliver to Trustee a request for full reconveyance and shall execute and deliver to Grantor suitable statements of termination of any financing statement on file evidencing Lender's security interest in the Rents and the Personal Property. Any reconveyance fee required by law shall be paid by Grantor, if permitted by applicable law.

EVENTS OF DEFAULT. Each of the following, at Lender's option, shall constitute an Event of Default under this Deed of Trust:

Payment Default. Borrower fails to make any payment when due under the indebtedness.

Other Defaults. Borrower or Grantor fails to comply with or to perform any other term, obligation, covenant or condition contained in this Deed of Trust or in any of the Related Documents or to comply with or to perform any term, obligation, covenant or condition

contained in any other agreement between Lender and Borrower or Grantor.

Compliance Default. Failure to comply with any other term, obligation, covenant or condition contained in this Deed of Trust, the Note or in any of the Related Documents.

Default on Other Payments. Failure of Grantor within the time required by this Deed of Trust to make any payment for taxes or insurance, or any other payment necessary to prevent filing of or to effect discharge of any lien.

Environmental Default. Failure of any party to comply with or perform when due any term, obligation, covenant or condition contained in any environmental agreement executed in connection with the Property.

Default in Favor of Third Parties. Should Borrower or any Grantor default under any loan, extension of credit, security agreement, purchase or sales agreement, or any other agreement, in favor of any other creditor or person that may materially affect any of Borrower's or any Grantor's property or Borrower's ability to repay the Indebtedness or Borrower's or Grantor's ability to perform their respective obligations under this Deed of Trust or any of the Related Documents.

False Statements. Any warranty, representation or statement made or furnished to Lender by Borrower or Grantor or on Borrower's or Grantor's behalf under this Deed of Trust or the Related Documents is false or misleading in any material respect, either now or at the time made or furnished or becomes false or misleading at any time thereafter.

Defective Collateralization. This Deed of Trust or any of the Related Documents ceases to be in full force and effect (including failure of any collateral document to create a valid and perfected security interest or lien) at any time and for any reason.

Death or Insolvency. The dissolution of Grantor's (regardless of whether election to continue is made), any member withdraws from the limited liability company, or any other termination of Borrower's or Grantor's existence as a going business or the death of any member, the insolvency of Borrower or Grantor, the appointment of a receiver for any part of Borrower's or Grantor's property, any assignment for the benefit of creditors, any type of creditor workout, or the commencement of any proceeding under any bankruptcy or insolvency laws by or against Borrower or Grantor.

Creditor or Forfeiture Proceedings. Commencement of foreclosure or forfeiture proceedings, whether by judicial proceeding, self-help, repossession or any other method, by any creditor of Borrower or Grantor or by any governmental agency against any property securing the Indebtedness. This includes a garnishment of any of Borrower's or Grantor's accounts, including deposit accounts, with Lender. However, this Event of Default shall not apply if there is a good faith dispute by Borrower or Grantor as to the validity or reasonableness of the claim which is the basis of the creditor or forfeiture proceeding and if Borrower or Grantor gives Lender written notice of the creditor or forfeiture proceeding and deposits with Lender monies or a surety bond for the creditor or forfeiture proceeding, in an amount determined by Lender, in its sole discretion, as being an adequate reserve or bond for the dispute.

Breach of Other Agreement. Any breach by Borrower or Grantor under the terms of any other agreement between Borrower or Grantor and Lender that is not remedied within any grace period provided therein, including without limitation any agreement concerning any indebtedness or other obligation of Borrower or Grantor to Lender, whether existing now or later.

Events Affecting Guarantor. Any of the preceding events occurs with respect to any Guarantor of any of the indebtedness or any

Guarantor dies or becomes incompetent, or revokes or disputes the validity of, or liability under, any Guaranty of the Indebtedness.

Adverse Change. A material adverse change occurs in Borrower's or Grantor's financial condition, or Lender believes the prospect of payment or performance of the Indebtedness is impaired.

RIGHTS AND REMEDIES ON DEFAULT. If an Event of Default occurs under this Deed of Trust, at any time thereafter, Trustee or Lender may exercise any one or more of the following rights and remedies:

Election of Remedies. Election by Lender to pursue any remedy shall not exclude pursuit of any other remedy, and an election to make expenditures or to take action to perform an obligation of Grantor under this Deed of Trust, after Grantor's failure to perform, shall not affect Lender's right to declare a default and exercise its remedies.

Accelerate indebtedness. Lender shall have the right at its option without notice to Borrower or Grantor to declare the entire indebtedness immediately due and payable, including any prepayment penalty which Borrower would be required to pay.

Foreclosure. With respect to all or any part of the Real Property, the Trustee shall have the right to foreclose by notice and sale, and Lender shall have the right to foreclose by judicial foreclosure, in either case in accordance with and to the full extent provided by applicable law. If this Deed of Trust is foreclosed by judicial foreclosure, Lender will be entitled to a judgment which will provide that if the foreclosure sale proceeds are insufficient to satisfy the judgment, execution may issue for the amount of the unpaid balance of the judgment.

UCC Remedies. With respect to all or any part of the Personal Property, Lender shall have all the rights and remedies of a secured party under the Uniform Commercial Code.

Collect Rents. Lender shall have the right, without notice to Borrower or Grantor to take possession of and manage the Property and collect the Rents, including amounts past due and unpaid, and apply the net proceeds, over and above Lender's costs, against the Indebtedness. In furtherance of this right, Lender may require any tenant or other user of the Property to make payments of rent or use fees directly to Lender. If the Rents are collected by Lender, then Grantor irrevocably designates Lender as Grantor's attorney-in-fact to endorse instruments received in payment thereof in the name of Grantor and to negotiate the same and collect the proceeds. Payments by tenants or other users to Lender in response to Lender's demand shall satisfy the obligations for which the payments are made, whether or not any proper grounds for the demand existed. Lender may exercise its rights under this subparagraph either in person, by agent, or through a receiver.

Appoint Receiver. Lender shall have the right to have a receiver appointed to take possession of all or any part of the Property, with the power to protect and preserve the Property, to operate the Property preceding foreclosure or sale, and to collect the Rents from the Property and apply the proceeds, over and above the cost of the receivership, against the Indebtedness. The receiver may serve without bond if permitted by law. Lender's right to the appointment of a receiver shall exist whether or not the apparent value of the Property exceeds the Indebtedness by a substantial amount. Employment by Lender shall not disgualify a person from serving as a receiver.

Tenancy at Sufferance. If Grantor remains in possession of the Property after the Property is sold as provided above or Lender otherwise becomes entitled to possession of the Property upon default of Borrower or Grantor, Grantor shall become a tenant at sufferance of Lender or the purchaser of the Property and shall, at Lender's option, either (1) pay a reasonable rental for the use of the Property, or (2) vacate the Property immediately upon the demand of Lender.

Other Remedies. Trustee or Lender shall have any other right or remedy provided in this Deed of Trust or the Note or available at law or in equity.

Notice of Sale. Lender shall give Grantor reasonable notice of the time and place of any public sale of the Personal Property or of the time after which any private sale or other intended disposition of the Personal Property is to be made. Reasonable notice shall mean notice given at least fifteen (15) days before the time of the sale or disposition. Any sale of the Personal Property may be made in conjunction with any sale of the Real Property.

Sale of the Property. To the extent permitted by applicable law, Borrower and Grantor hereby waives any and all rights to have the Property marshalled. In exercising its rights and remedies, the Trustee or Lender shall be free to sell all or any part of the Property together or separately, in one sale or by separate sales. Lender shall be entitled to bid at any public sale on all or any portion of the Property.

Attorneys' Fees; Expenses. If Lender institutes any suit or action to enforce any of the terms of this Deed of Trust, Lender shall be entitled to recover such sum as the court may adjudge reasonable as attorneys' fees at trial and upon any appeal. Whether or not any court action is involved, and to the extent not prohibited by law, all reasonable expenses Lender incurs that in Lender's opinion are necessary at any time for the protection of its interest or the enforcement of its rights shall become a part of the Indebtedness payable on demand and shall bear interest at the Note rate from the date of the expenditure until repaid. Expenses covered by this paragraph include, without limitation, however subject to any limits under applicable law, Lender's attorneys' fees and Lender's legal expenses, whether or not there is a lawsuit, including attorneys' fees and expenses for bankruptcy proceedings (including efforts to modify or vacate any automatic stay or injunction), appeals, and any anticipated post-judgment collection services, the cost of searching records, obtaining title reports (including foreclosure reports), surveyors' reports, and appraisal fees, title insurance, and fees for the Trustee, to the extent permitted by applicable law. Grantor also will pay any court costs, in addition to all other sums provided by law.

Rights of Trustee. Trustee shall have all of the rights and duties of Lender as set forth in this section.

POWERS AND OBLIGATIONS OF TRUSTEE. The following provisions relating to the powers and obligations of Trustee are part of this Deed of Trust:

Powers of Trustee. In addition to all powers of Trustee arising as a matter of law, Trustee shall have the power to take the following actions with respect to the Property upon the written request of Lender and Grantor: (a) join in preparing and filing a map or plat of the Real Property, including the dedication of streets or other rights to the public; (b) join in granting any easement or creating any restriction on the Real Property; and (c) join in any subordination or other agreement affecting this Deed of Trust or the interest of Lender under this Deed of Trust.

Obligations to Notify. Trustee shall not be obligated to notify any other party of a pending sale under any other trust deed or lien, or of any action or proceeding in which Grantor, Lender, or Trustee shall be a party, unless the action or proceeding is brought by Trustee.

Trustee. Trustee shall meet all qualifications required for Trustee under applicable law. In addition to the rights and remedies set forth above, with respect to all or any part of the Property, the Trustee shall have the right to foreclose by notice and sale, and Lender shall have the right to foreclose by judicial foreclosure, in either case in accordance with and to the full extent provided by applicable law.

Successor Trustee. Lender, at Lender's option, may from time to time appoint a successor Trustee to any Trustee appointed under this Deed of Trust by an instrument executed and acknowledged by Lender and recorded in the office of the recorder of Washington County, State of Oregon. The instrument shall contain, in addition to all other matters required by state law, the names of the original Lender, Trustee, and Grantor, the book and page where this Deed of Trust is recorded, and the name and address of the successor trustee, and the instrument shall be executed and acknowledged by Lender or its successors in interest. The successor trustee, without conveyance of the Property, shall succeed to all the title, power, and duties conferred upon the Trustee in this Deed of Trust and by applicable law. This procedure for substitution of Trustee shall govern to the exclusion of all other provisions for substitution.

NOTICES. Any notice required to be given under this Deed of Trust, including without limitation any notice of default and any notice of sale shall be given in writing, and shall be effective when actually delivered, when actually received by telefacsimile (unless otherwise required by law), when deposited with a nationally recognized overnight courier, or, if mailed, when deposited in the United States mail, as first class, certified or registered mail postage prepaid, directed to the addresses shown near the beginning of this Deed of Trust. All copies of notices of foreclosure from the holder of any lien which has priority over this Deed of Trust shall be sent to Lender's address, as shown near the beginning of this Deed of Trust. Any party may change its address for notices under this Deed of Trust by giving formal written notice to the other parties, specifying that the purpose of the notice is to change the party's address. For notice purposes, Grantor

DEED OF TRUST (Continued)

agrees to keep Lender informed at all times of Grantor's current address. Unless otherwise provided or required by law, if there is more than one Grantor, any notice given by Lender to any Grantor is deemed to be notice given to all Grantors.

DUE ON SALE. The property shall not be transferred without the Beneficiary's prior written consent. The following shall be considered "transfers" for purposes of this paragraph, whether occurring voluntarily, involuntarily, or by operation of law:

(a) The sale (by contract or otherwise), conveyance or other transfer of the property or any part of or interest in the property; and

(b) The creation of any encumbrance against or upon the property; and

(c) If Grantor is a corporation, the transfer of more than twenty five percent (25%) of its voting shares; and

(d) If Grantor is a general or limited partnership, the transfer of more than twenty five percent (25%) of the general partners' interests (including any transfer of more than twenty five percent (25%) of the voting shares of any single general partner or group of general partners owing such percentage).

Any such transfer without Beneficiary's prior written consent shall constitute an event of default under this Deed of Trust and shall give to Beneficiary the right to declare all sums secured by this Deed of Trust immediately due and payable. This right may be exercised at any time after a transfer. Acceptance of one or more monthly payments on the Note secured by this Deed of Trust from a party other than Grantor shall not constitute the waiver of Beneficiary's right under this paragraph. This provision shall apply to each and every sale, transfer, conveyance or encumbrance whether or not Beneficiary has consented or waived its rights, whether by action or non-action in connection with any prior sale, transfer, conveyance or encumbrance, whether one or more. If Beneficiary declares the sums secured hereby to be immediately due and payable in accordance with this paragraph, and grantor fails to pay such sums, Beneficiary may exercise any and all rights to sell the property in accordance with covenants of this Deed of Trust.

Not withstanding the foregoing, Beneficiary will allow a Small Business Administration (SBA) 504 (second lien) which shall not be considered a "transfer" for the purpose of this paragraph.

At Beneficiary's sole option, after approving the credit worthiness of the proposed purchasers. Beneficiary may consent to a sale, conveyance or transfer of said property. If Beneficiary consents to a transfer other than as defined in subparagraph (b) above, Grantor shall pay Beneficiary a fee equal to one percent (1%) of the then unpaid balance of the Note secured by this Deed of Trust and Beneficiary may increase the interest rate and/or margin on the Note secured by this Deed of Trust.

MISCELLANEOUS PROVISIONS. The following miscellaneous provisions are a part of this Deed of Trust:

Amendments. This Deed of Trust, together with any Related Documents, constitutes the entire understanding and agreement of the parties as to the matters set forth in this Deed of Trust. No alteration of or amendment to this Deed of Trust shall be effective unless given in writing and signed by the party or parties sought to be charged or bound by the alteration or amendment.

Annual Reports. If the Property is used for purposes other than Grantor's residence. Grantor shall furnish to Lender, upon request, a certified statement of net operating income received from the Property during Grantor's previous fiscal year in such form and detail as Lender shall require. "Net operating income" shall mean all cash receipts from the Property less all cash expenditures made in connection with the operation of the Property.

Caption Headings. Caption headings in this Deed of Trust are for convenience purposes only and are not to be used to interpret or define the provisions of this Deed of Trust.

Merger. There shall be no merger of the interest or estate created by this Deed of Trust with any other interest or estate in the Property at any time held by or for the benefit of Lender In any capacity, without the written consent of Lender.

Governing Law. This Deed of Trust will be governed by federal law applicable to Lender and, to the extent not preempted by federal law, the laws of the State of Oregon without regard to its conflicts of law provisions. This Deed of Trust has been accepted by Lender in the State of Oregon.

Choice of Venue. If there is a lawsuit, Grantor agrees upon Lender's request to submit to the jurisdiction of the courts of Multhomah County, State of Oregon.

Joint and Several Liability. All obligations of Borrower and Grantor under this Deed of Trust shall be joint and several, and all references to Grantor shall mean each and every Grantor, and all references to Borrower shall mean each and every Borrower. This means that each Grantor signing below is responsible for all obligations in this Deed of Trust. Where any one or more of the parties is a corporation, partnership, limited liability company or similar entity, it is not necessary for Lender to inquire into the powers of any of the officers, directors, partners, members, or other agents acting or purporting to act on the entity's behalf, and any obligations made or created in reliance upon the professed exercise of such powers shall be guaranteed under this Deed of Trust.

No Waiver by Lender. Lender shall not be deemed to have waived any rights under this Deed of Trust unless such waiver is given in writing and signed by Lender. No delay or omission on the part of Lender in exercising any right shall operate as a waiver of such right or any other right. A waiver by Lender of a provision of this Deed of Trust shall not prejudice or constitute a waiver of Lender's right otherwise to demand strict compliance with that provision or any other provision of this Deed of Trust. No prior waiver by Lender, nor any course of dealing between Lender and Grantor, shall constitute a waiver of any of Lender's rights or of any of Grantor's obligations as to any future transactions. Whenever the consent of Lender is required under this Deed of Trust, the granting of such consent by Lender in any instance shall not constitute continuing consent to subsequent instances where such consent is required and in all cases such consent may be granted or withheld in the sole discretion of Lender.

Severability. If a court of competent jurisdiction finds any provision of this Deed of Trust to be illegal, invalid, or unenforceable as to any circumstance, that finding shall not make the offending provision illegal, invalid, or unenforceable as to any other circumstance. If feasible, the offending provision shall be considered modified so that it becomes legal, valid and enforceable. If the offending illegality, invalidity, or unenforceability of any provision of this Deed of Trust shall not affect the legality, validity or enforceability of any provision of this Deed of Trust shall not affect the legality, validity or enforceability of

Successors and Assigns. Subject to any limitations stated in this Deed of Trust on transfer of Grantor's interest, this Deed of Trust shall be binding upon and inure to the benefit of the parties, their successors and assigns. If ownership of the Property becomes vested in a person other than Grantor, Lender, without notice to Grantor, may deal with Grantor's successors with reference to this Deed of Trust and the Indebtedness by way of forbearance or extension without releasing Grantor from the obligations of this Deed of Trust or liability under the indebtedness.

Time is of the Essence. Time is of the essence in the performance of this Deed of Trust.

Waive Jury. All parties to this Deed of Trust hereby waive the right to any jury trial in any action, proceeding, or counterclaim brought by any party against any other party.

Waiver of Homestead Exemption. Grantor hereby releases and waives all rights and benefits of the homestead exemption laws of the State of Oregon as to all Indebtedness secured by this Deed of Trust.

Commercial Deed of Trust. Grantor agrees with Lender that this Deed of Trust is a commercial deed of trust and that Grantor will not change the use of the Property without Lender's prior written consent.

DEFINITIONS. The following capitalized words and terms shall have the following meanings when used in this Deed of Trust. Unless specifically stated to the contrary, all references to dollar amounts shall mean amounts in lawful money of the United States of America. Words and terms used in the singular shall include the plural, and the plural shall include the singular, as the context may require. Words and terms not otherwise defined in this Deed of Trust shall have the meanings attributed to such terms in the Uniform Commercial Code:

Beneficiary. The word "Beneficiary" means HERITAGE BANK, and its successors and assigns.

Borrower. The word "Borrower" means LU PACIFIC PROPERTIES, LLC; and LU QBF II, LLC and includes all co-signers and co-makers signing the Note and all their successors and assigns.

Deed of Trust. The words "Deed of Trust" mean this Deed of Trust among Grantor, Lender, and Trustee, and includes without

limitation all assignment and security interest provisions relating to the Personal Property and Rents.

Event of Default. The words "Event of Default" mean any of the events of default set forth in this Deed of Trust in the events of default section of this Deed of Trust.

Grantor. The word "Grantor" means LU QBF II, LLC.

Guarantor. The word "Guarantor" means any guarantor, surety, or accommodation party of any or all of the indebtedness.

Guaranty. The word "Guaranty" means the guaranty from Guarantor to Lender, including without limitation a guaranty of all or part of the Note.

Improvements. The word "Improvements" means all existing and future improvements, buildings, structures, mobile homes affixed on the Real Property, facilities, additions, replacements and other construction on the Real Property.

Indebtedness. The word "Indebtedness" means all principal, interest, and other amounts, costs and expenses payable under the Note or Related Documents, together with all renewals of, extensions of, modifications of, consolidations of and substitutions for the Note or Related Documents and any amounts expended or advanced by Lender to discharge Grantor's obligations or expenses incurred by Trustee or Lender to enforce Grantor's obligations under this Deed of Trust, together with interest on such amounts as provided in this Deed of Trust.

Lender. The word "Lender" means HERITAGE BANK, its successors and assigns.

Note. The word "Note" means the promissory note dated August 15, 2022, in the original principal amount of \$13,750,000.00 from Borrower to Lender, together with all renewals of, extensions of, modifications of, refinancings of, consolidations of, and substitutions for the promissory note or agreement. The maturity date of the Note is August 1, 2032.

Personal Property. The words "Personal Property" mean all equipment, fixtures, and other articles of personal property now or hereafter owned by Grantor, and now or hereafter attached or affixed to the Real Property; together with all accessions, parts, and additions to, all replacements of, and all substitutions for, any of such property; and together with all proceeds (including without limitation all insurance proceeds and refunds of premiums) from any sale or other disposition of the Property.

Property. The word "Property" means collectively the Real Property and the Personal Property.

Real Property. The words "Real Property" mean the real property, interests and rights, as further described in this Deed of Trust.

Related Documents. The words "Related Documents" mean all promissory notes, credit agreements, ioan agreements, environmental agreements, guaranties, security agreements, mortgages, deeds of trust, security deeds, collateral mortgages, and all other instruments, agreements and documents, whether now or hereafter existing, executed in connection with the indebtedness.

Rents. The word "Rents" means all present and future rents, revenues, income, issues, royatties, profits, and other benefits derived from the Property.

Trustee. The word "Trustee" means Kevin P. Moran, Attorney at Law, whose address is P.O. Box 2980, Silverdale, WA 98383 and any substitute or successor trustees.

GRANTOR ACKNOWLEDGES HAVING READ ALL THE PROVISIONS OF THIS DEED OF TRUST, AND GRANTOR AGREES TO ITS TERMS.

GRANTOR:

LU QBF II, LLC By: DANNY LU. Manager of LU QBF II, LLC

By:

PETER &U, Manager of LU QBF II, LLC

LIMITED LIABILITY COMPANY ACKNOWLEDGMENT

STATE OF) JESSICA LYNN CHEDISTER
COUNTY OF <u>Multhoman</u>) SS () COMMISSION NO. 981802 MY COMMISSION EXPIRES DECEMBER 5, 2022
On this <u>29</u> the day of <u>Au</u> personally appeared DANNY LU, Manager of LU QE company that executed the Deed of Trust and ack liability company, by authority of statute, its arti mentioned, and on oath stated that he or she is au of the limited liability company.	AUS+
ByChedists	Residing at MILWALLKIO DR
Notary Public in and for the State of $0R$	My commission expires 12 5 22

DEED OF TRUST (Continued)

		CUMPANT ACKNOWLEDGMENT
STATE OF DR	nomah)) SS) SS) OFFICIAL STAMP JESSICA LYNN CHEDISTER NOTARY PUBLIC-OREGON COMMISSION NO. 981802
		MY COMMISSION EXPIRES DECEMBER 5, 2022
On this 294 personally appeared PETI company that executed t liability company, by au mentioned, and on oath s of the limited liability com	day of <u>AUGUS</u> R LU, Manager of LU QBF H, LU he Deed of Trust and acknowledg thority of statute, its articles of stated that he or she is authorized spany.	4, 20 32 , before me, the undersigned Notary Public C, and known to me to be a member or designated agent of the limited liability ged the Deed of Trust to be the free and voluntary act and deed of the limited f organization or its operating agreement, for the uses and purposes therein t to execute this Deed of Trust and in fact executed the Deed of Trust on behal
- (Vlastia		
By	<u>~</u>	Residing at (Y) () (A) (A) (A) (A) (A) (A) (A) (A) (A
By <u>AUCA</u>	ne State of <u>OR</u>	Residing at <u>YIII WALK LL, UK</u> My commission expires <u>(Q. 5'- 3-</u>
By <u>AUG</u>	REQUEST FC	Residing at
By	REQUEST FC (To be used only v	Residing at
To: To: The undersigned is the let have been fully paid and s of Trust or pursuant to at this Deed of Trust), and t by you under this Deed of	REQUEST FC (To be used only v , Trust gal owner and holder of all Indebt satisfied. You are hereby directed ny applicable statute, to cancel th o reconvey, without warranty, to Trust. Please mail the reconveya	Residing at
To: To: The undersigned is the let have been fully paid and s of Trust or pursuant to a this Deed of Trust), and t by you under this Deed of Date:	REQUEST FC (To be used only v , Trust gal owner and holder of all indebt satisfied. You are hereby directed iny applicable statute, to cancel the o reconvey, without warranty, to Trust. Please mail the reconveya	Residing at
By	REQUEST FC (To be used only v , Trust gal owner and holder of all indebt satisfied. You are hereby directed iny applicable statute, to cancet the o reconvey, without warranty, to Trust. Please mail the reconveya	Residing at

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2S 1 23BA-S1

2S 1 23BA-S1



bespin



FOR OTHER USE Map areas delineated by either gray shading or a cross-hatched pattern are for reference only and may not indicate the most current property boundaries. Please consult the appropriate map for the most current information.

2S 1 23BA-S2



2S 1 23BA-S2

Exhibit D

Service Provider Letters



SENSITIVE AREA PRE-SCREENING SITE ASSESSMENT

		lean Water Services File Number 24-000607
1	Jurisdiction: Washington County	24-000007
2.	Property Information (example: 1S234AB01400)	3. Owner Information
	Tax lot ID(s):	Name:
	2S123BA03200	Company: Life Front Communities
		Address:
<u> </u>	Site Address: 9700 SW Tualatin Rd.	City, State, Zip: Tualatin,Oregon,97062
	City, State, Zip: <u>Tualatin, Oregon, 97062</u>	Phone/fax: (9/1) 201-2462
	Nearest cross street:	Email:
4.	Development Activity (check all that apply)	4. Applicant Information
	Addition to single family residence (rooms, deck, garage)	Name: Blakely Vogel
	🛛 Lot line adjustment 🔲 Minor land partition	Company: Miller Nash LLP
	Residential condominium 🔲 Commercial condominium	Address: 1140 SW Washington St., Ste 700
	Residential subdivision	City, State, Zip: Portland, Oregon, 97205
	Single lot commercial Multi lot commercial	Phone/TaX: 503-349-7454
	Other	EITIdII. blakely.vogel@millernash.com
6.	Will the project involve any off-site work? I Yes X No	Unknown
	Location and description of off-site work:	
7.	Additional comments or information that may be needed to Property line between tax lots 2S123BA03200, 2S123BA03100, and 2S123B	understand your project:
	Print/turo pame Blakely Vogel	es for the purpose of inspecting project site conditions and gathering ith the information contained in this document, and to the best of my ate.
		This type duc
	Signature ONLINE SOBMITTAL	Date
F	OR DISTRICT USE ONLY	
	Sensitive areas potentially exist on site or within 200' of the site. THI ISSUANCE OF A SERVICE PROVIDER LETTER. If Sensitive Area	E APPLICANT MUST PERFORM A SITE ASSESSMENT PRIOR TO as exist on the site or within 200 feet on adjacent properties, a Natural
	Based on review of the submitted materials and best available inform	nation sensitive areas do not appear to exist on site or within 200' of the
	site. This Sensitive Area Pre-Screening Site Assessment does NOT elir	minate the need to evaluate and protect water quality sensitive areas if
	they are subsequently discovered. This document will serve as your S	Service Provider Letter as required by Resolution and Order 19-5, Section
	3.02.1, as amended by Resolution and Order 19-22. All required per	rmits and approvals must be obtained and completed under applicable
	local, State and federal law. Based on review of the submitted materials and best available inform	nation the above referenced project will not significantly impact the
	existing or potentially sensitive area(s) found near the site. This Sensi	itive Area Pre-Screening Site Assessment does NOT eliminate the need to
	evaluate and protect additional water quality sensitive areas if they a	are subsequently discovered. This document will serve as your Service
	Provider Letter as required by Resolution and Order 19-5, Section 3.	02.1, as amended by Resolution and Order 19-22. All required permits and
	THIS SERVICE PROVIDER LETTER IS NOT VALID UNLESS	CWS APPROVED SITE PLAN(S) ARE ATTACHED.
	The proposed activity does not meet the definition of development of	or the lot was platted after 9/9/95 ORS 92.040(2). NO SITE ASSESSMENT
_	Mila Janabaa / ina	02/44/2024
Re	eviewed by <u>man goingung</u> Linne	Date
	Once complete, email to: SPLReview@clean	IWaterservices.org • Fax: (503) 681-4439
	UK mail to: SPL Review, Clean Water Services, 2	SOU SVV HIIISDORO HIGNWAY, HIIISDORO, Uregon 9/123



FIRE CODE / LAND USE / BUILDING REVIEW **APPLICATION**

North Operating Center 11945 SW 70th Avenue Tigard, OR 97223 Phone: 503-649-8577

South Operating Center 8445 SW Elligsen Rd Wilsonville, OR 97070 Phone: 503-649-8577

REV 6-30-20

Project Information	Permit/Review Type (check one):
Applicant Name: <u>Blakely Vogel (on behalf of owner)</u> Address: <u>1140 SW Washington Street, Ste. 700, Portland OR</u> <u>97205</u> Phone: <u>(503) 3497454</u> Email: <u>Blakely.Vogel@millernash.com (PREFERRED)</u>	 Land Use / Building Review - Service Provider Permit Emergency Radio Responder Coverage Install/Test LPG Tank (Greater than 2,000 gallons) Flammable or Combustible Liquid Tank Installation (Greater than 1,000 gallons) * Exception: Underground Storage Tanks (UST)
Site Address: <u>9700 SW Tualatin Rd.</u> City: Tualatin	are deferred to DEQ for regulation.
Map & Tax Lot #: <u>2S123BA03200; 2S123BA03100; &</u> 2S123BA02900	Exterior Toxic, Pyrophoric or Corrosive Gas Installation (in excess of 810 cu.ft.)
Business Name: Life Front Communities Land Use/Building Jurisdiction: <u>RML; ML</u>	 Tents or Temporary Membrane Structures (in excess of 10,000 square feet) Temporary Haunted House or similar
Land Use/ Building Permit # Choose from: Tualatin	 OLCC Cannabis Extraction License Review Ceremonial Fire or Bonfire (For gathering, ceremony or other assembly)
Project Description Property line between above-listed tax lots to be adjusted several feet to the west to match long-existing use of those properties. No construction or modification of buildings involved or anticipated.	For Fire Marshal's Office Use Only TVFR Permit #_2024

Approval/Inspection Conditions (For Fire Marshal's Office Use Only)

	This section is for application approval only	This section used when site inspection is required
	Mc 3/19/2024 Fire Marshal or Designee Date	Inspection Comments:
	Conditions:	n/A
	See Attached Conditions:	
	/	Final TVFR Approval Signature & Emp ID Date
- 64		

Exhibit E

Neighborhood/Developer Meeting Documentation

CERTIFICATION OF SIGN POSTING



As the applicant for the Plan Map Amendment project, I hereby certify that on this day, four (4) sign(s) were posted on the subject properties in accordance with the requirements of the Tualatin Development Code and the Community Development Division.

Applicant's Name: Benjamin Kilo, President of Life Front Communities

Applicant's Signature: <u>KM</u> Kb

Date: 03/06/2024

(Please Print)

AFFIDAVIT OF MAILING NOTICE

STATE OF OREGON)) SS COUNTY OF WASHINGTON)

I. Blakely Vogel, being first duly sworn, depose and say:

That between 28 days and 14 days before the Neighborhood/Developer Meeting on the 12th day of July, 2023, I served upon the persons shown on Exhibit "A" (Mailing Area List), attached hereto and by this reference incorporated herein, a copy of the Notice of Neighborhood/Developer Meeting marked Exhibit "B," attached hereto and by this reference incorporated herein, by mailing to them a true and correct copy of the original hereof. I further certify that the addresses shown on said Exhibit "A" are their regular addresses as determined from the books and records of the Washington County and/or Clackamas County Departments of Assessment and Taxation Tax Rolls, and that said envelopes were placed in the United States Mail with postage fully prepared thereon.

day of

Signature

SUBSCRIBED AND SWORN to before me this



Notary Public for Orego My commission expir

RE: AF of M

EXHIBIT A

Mailing Area List

[See Attached Mailing Area List]

TLID	OWNER	ADDRESS	CITY	STATE	ZIP
2S123BA03800	ZELLNER MARK & ZELLNER ADIRA	18155 SW CHEYENNE WAY	TUALATIN	OR	97062
2S123AB05600	ZELLER GAIL & CLARK LIV TRUST & ZELLER RYAN	16294 SW DAHLIA CT	TIGARD	OR	97224
2S123BA90062	ZBINDEN ELIZABETH K	9762 SW TUALATIN RD	TUALATIN	OR	97062
2S114CD01100	ZABEL RICHARD & BAYNE MARGARET E	17755 SW SHAWNEE TRL	TUALATIN	OR	97062
2S123BD00800	WSM MANUFACTURING	9500 SW TUALATIN RD	TUALATIN	OR	97062
2S114CD06200	WOOD CASEY J	9885 SW PAWNEE PATH	TUALATIN	OR	97062
2S114CC04400	WONGLAVON SATHIEN & WONG PAVEENA T	10105 SW WASCO WAY	TUALATIN	OR	97062
2S114CD06300	WOMER GREG MICHAEL	16321 SE WIDEGON CT	DAMASCUS	OR	97089
2S114CD10900	WIZER SUZANNE M	17900 SW SIOUX CT	TUALATIN	OR	97062
2S123BA02700	WINONA CEMETERY ASSOC	8380 SW TONKA ST	TUALATIN	OR	97062
2S114CD06800	WILSON KENT CLIFFORD	17870 SW CHIPPEWA TRL	TUALATIN	OR	97062
2S114CD07800	WILSON JEREMY & WILSON LIZZETT	17655 SW CHIPPEWA TRL	TUALATIN	OR	97062
2S114CD03500	WILLIAMS ZACHARY S & WILLIAMS ERIN M	17845 SW CHEYENNE WAY	TUALATIN	OR	97062
2S123AB13500	WILKINSON LINDA	9255 SW SWEEK DR	TUALATIN	OR	97062
2S114CC03200	WILKERSON PEGGIE J TRUST	17925 SW YAQUINA CT	TUALATIN	OR	97062
2S114CD10400	WILCOX JOHN M & WILCOX NANCY L	17855 SW SIOUX CT	TUALATIN	OR	97062
2S123AB09400	WHITE JAMES D	9299 SW CASCARA LN	TUALATIN	OR	97062
2S123AB04300	WETTERLIN JOSHUA K	15769 SW 82ND AVE	TIGARD	OR	97224
2S123AB14600	WELKER DEANN	9183 SW SWEEK DR	TUALATIN	OR	97062
2S123AB08700	WEISS JEFFRY	10130 SW LANCASTER RD	PORTLAND	OR	97219
2S114CD07600	WEATHERS CHARLES E & ENGLE KAREN	17715 SW CHIPPEWA TRAIL	TUALATIN	OR	97062
2S114CD07700	WATKINS JAMES & BARRY LAUREN	17685 SW CHIPPEWA TRL	TUALATIN	OR	97062
2S123BB01100	WASHINGTON COUNTY FACILITIES MGMT	169 N 1ST AVE #42	HILLSBORO	OR	97124
2S114CC03600	WARD SCOTT & SANCHEZ RENEE	17805 SW YAQUINA CT	TUALATIN	OR	97062
2S114CD01900	WARD TYLER DANIEL & BOEHMER MADALINE ANN	17970 SW CHEYENNE WAY	TUALATIN	OR	97062
2S123AB04700	WARD MEGAN	18638 SW 92ND TER	TUALATIN	OR	97062
2S123AB06200	WANG WEILING	1466 IROQUOIS ST	SHRUB OAK	NY	10588
2S123AB13900	WANG WEI & RESSLER JEFFREY P	13391 SW HILLSHIRE DR	TIGARD	OR	97223
2S123BA01700	WALCUTT SUSAN E	18180 SW CHEYENNE WAY	TUALATIN	OR	97062
2S114CD06600	WAGER TERRENCE KEVIN & MCGINLEY CHRISTINE MARIE	17810 SW CHIPPEWA TRL	TUALATIN	OR	97062
2S123AB09700	VU CHANKRASNA	9288 SW SWEEK DR	TUALATIN	OR	97062
2S114CD03800	VOILES ANNA MARGARET	9715 SW PAWNEE PATH	TUALATIN	OR	97062
2S123AB12000	VOAS AMY E	18629 SW 93RD TER	TUALATIN	OR	97062
2S123AB12600	VISSER ROBERT & TUNG CHIA-FONG	13850 SW 159TH TER	TIGARD	OR	97223
2S114CC01100	VANMECHELEN NANCY & NATHAN REV TRUST	17925 SW SHASTA TRL	TUALATIN	OR	97062
2S123BD00400	VALMONT COATINGS & PACIFIC STATES GALVANIZING	ONE VALMONT PLZ-5TH FLOOR	OMAHA	NE	68154
2S114CD11200	USELMAN MOLLIE K	17940 SW SIOUX CT	TUALATIN	OR	97062
2S123AB04100	URGUPLUOGLU KATHY	18584 SW 92ND TER	TUALATIN	OR	97062
2S123BA03900	ULRICH RONALD J & ULRICH SHARON A	18175 SW CHEYENNE WAY	TUALATIN	OR	97062

2S123AB02200	TURNER REV TRUST	PO BOX 230653	TIGARD	OR	97281
2S114D000500	TUALATIN COUNTRY CLUB	PO BOX 277	TUALATIN	OR	97062
2S123AB00100	TUALATIN MEADOWS APARTMENTS LP	PO BOX 1660	PORTSMOUTH	NH	03802
2S123AB00300	TUALATIN CITY OF	18880 SW MARTINAZZI AVE	TUALATIN	OR	97062
2S123AB00400	TUALATIN CITY OF	18880 SW MARTINAZZI AVE	TUALATIN	OR	97062
2S123AB15700	TUALATIN CITY OF	18880 SW MARTINAZZI AVE	TUALATIN	OR	97062
2S123AB15800	TUALATIN CITY OF	18880 SW MARTINAZZI AVE	TUALATIN	OR	97062
2S123AB15900	TUALATIN CITY OF	18880 SW MARTINAZZI AVE	TUALATIN	OR	97062
2S123AB16000	TUALATIN CITY OF	18880 SW MARTINAZZI AVE	TUALATIN	OR	97062
2S123BA04390	TUALATIN CITY OF	18880 SW MARTINAZZI AVE	TUALATIN	OR	97062
2S123BC01400	TRUMBO INVESTMENTS LLC	14365 SW 144TH AVE	TIGARD	OR	97224
2S123BA02406	TRIFECTA INVESTMENT GROUP LLC	PO BOX 4804	TUALATIN	OR	97062
2S123BA00400	TRADEWINDS TRUST	PO BOX 594	TUALATIN	OR	97062
2S123B000800	TOTE 'N STOW INC	PO BOX 25216	PORTLAND	OR	97298
2S123BB00300	TOTE 'N STOW INC	PO BOX 25216	PORTLAND	OR	97298
2S123BA04400	TONA MARGITU	18245 SW CHEYENNE WAY	TUALATIN	OR	97062
2S123BA70005	TOLAR STREET PROPERTIES LLC	13455 SW 22ND ST	BEAVERTON	OR	97008
2S123BA70006	TOLAR STREET PROPERTIES LLC	13455 SW 22ND ST	BEAVERTON	OR	97008
2S114CD03600	TOBEY REBA R	PO BOX 4232	TUALATIN	OR	97062
2S123AB02800	TK&S REAL PROPERTIES LLC	10240 SW SEDLAK CT	TUALATIN	OR	97062
2S123AB06700	TK&S REAL PROPERTIES LLC	10240 SW SEDLAK CT	TUALATIN	OR	97062
2S123AB11000	TK&S REAL PROPERTIES LLC	10240 SW SEDLAK CT	TUALATIN	OR	97062
2S123AB14500	TK&S REAL PROPERTIES LLC	10240 SW SEDLAK CT	TUALATIN	OR	97062
2S123AB02600	THOMPSON PAYTON D & THOMPSON CHRISTINE	20567 SW ELK HORN CT	TUALATIN	OR	97062
2S123BA00800	THOMPSON FAMILY TRUST	17985 SW SHAWNEE TRL	TUALATIN	OR	97062
2S114CC00501	THOMASSEN AARON JENS	17850 SW SHASTA TRL	TUALATIN	OR	97062
2S114CC02000	THOMASON BARBARA J	10100 SW WASCO WAY	TUALATIN	OR	97062
2S114CD01300	TANG TING & TANG LESLIE CORY	146 KINGSGATE RD	LAKE OSWEGO	OR	97035
2S123BA02407	SWENDSEID FAMILY TRUST	1677 KENEWA ST	OJAI	CA	93023
2S114CC01800	SWEENEY JUDY D	17715 SW SHASTA TRAIL	TUALATIN	OR	97062
2S123AB03600	SWANSON DAVID & SWANSON AMANDA	18575 SW 91ST TER	TUALATIN	OR	97062
2S114CD11300	STUBBS BRIAN G & STUBBS SUSAN M	248 HOLDER LN SE	SALEM	OR	97306
2S114CD01400	STRICKLAND JARED ANDREW & STRICKLAND BRITTNEY LYNNE	17845 SW SHAWNEE TRL	TUALATIN	OR	97062
2S123AB07200	STOUT TRAVIS M	9274 SW CASCARA LN	TUALATIN	OR	97062
2S123BA90032	STONE ANGELINA DIANA	9774 SW TUALATIN RD	TUALATIN	OR	97062
2S123BA80004	STEWART JESSICA M	PO BOX 2015	GEARHART	OR	97318
2S114CD09900	STEPHENSON JULIE A	17945 SW SIOUX CT	TUALATIN	OR	97062
2S123AB07800	STEINPREIS RAYMOND L	11777 SW QUEEN ELIZABETH ST APT #215	KING CITY	OR	97224
2S123AB05700	STEELE FRED B JR & STEELE JACQUELYN L	15337 SW SUNSET BLVD	SHERWOOD	OR	97140

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2S123AB13400	STEELMAN PATRICK & VOLLAN OLIVIA	9267 SW SWEEK DR	TUALATIN	OR	97062
2S123AB02100	STATES BAILEY B	22808 SW HIGHLAND DR	SHERWOOD	OR	97140
2S114CD01200	ST CLAIR MONA	17785 SW SHAWNEE TRL	TUALATIN	OR	97062
2S114CD00700	SPROUSE FAMILY TRUST	17780 SW SHAWNEE TRL	TUALATIN	OR	97062
2S123AB01200	SPRADLEY LORELLE A	18652 SW 91ST TER	TUALATIN	OR	97062
2S123AB13700	SPEARE JOE & SPEARE PAMELA SUE	PO BOX 355	TUALATIN	OR	97062
2S114CC04101	SMITH ALAN L & SMITH DIANNA C	10195 SW WASCO WAY	TUALATIN	OR	97062
2S123BA03600	SMITH HERBERT T JR & BEVERLEY A REV LIV TRUST	18115 SW CHEYENNE WAY	TUALATIN	OR	97062
2S123BA80003	SMITH MARGARET F & DONALD M SMITH REV LIV TRUST	9721 SW TUALATIN RD	TUALATIN	OR	97062
2S123AB15200	SMALL MATTHEW & SMALL JAMEE	9121 SW SWEEK DR	TUALATIN	OR	97062
2S123AB03700	SKOF ROBERT	PO BOX 1873	LAKE OSWEGO	OR	97035
2S123AB02000	SINCLAIR BRIAN GRAHAM	18721 SW 91ST TER	TUALATIN	OR	97062
2S123AB10300	SIMS ADAM C & SIMS MARILYN	1671 VILLAGE PARK LN	LAKE OSWEGO	OR	97034
2S123AB04000	SIMPSON RACHEL	18576 SW 92ND TER	TUALATIN	OR	97062
2S123AB11900	SIMCOE ROBERT DANIEL & SIMCOE PATRICIA DAWN	1410 NE OLSON RD	GRANTS PASS	OR	97526
2S114CD09300	SHUGERT MARK	297 NE TRALEE CT	HILLSBORO	OR	97124
2S123AB00500	SHERER CHARLENE R	18592 SW 91ST TER	TUALATIN	OR	97062
2S114CC00200	SHAW FAMILY TRUST	17780 SW SHASTA TRL	TUALATIN	OR	97062
2S123AB01600	SEYMOUR JAMIE L	18692 SW 91ST TER	TUALATIN	OR	97062
2S114CD06500	SEVERSON BRANDT E & BIGELOW SHELLEY & BIGELOW GREGORY	22511 SW 106TH AVE	TUALATIN	OR	97062
2S114CD11000	SELBY WILLIAM R & SELBY SHARYN L	17910 SW SIOUX CT	TUALATIN	OR	97062
2S114CD10000	SEDILLO FAMILY TRUST & SEDILLO SURVIVOR'S TRUST	17915 SW SIOUX CT	TUALATIN	OR	97062
2S114CC03700	SCHWENN NOELLE & SCHWENN JASON JAMES & TRENOR JOHN	17775 SW YAQUINA CT	TUALATIN	OR	97062
2S123BA90021	SCHNABEL ERIKA	9780 SW TUALATIN RD	TUALATIN	OR	97062
2S123AB11300	SCHIEDLER JEFFREY & KUCK JORDAN	18693 SW 93RD TER	TUALATIN	OR	97062
2S123AB05400	SCHEPPACH PATRICIA & CAMACHO DAVID	18704 SW 92ND TER	TUALATIN	OR	97062
2S123AB12100	SCHAUB LINDSEY M	18621 SW 93RD TER	TUALATIN	OR	97062
2S123AB07600	SANDOVAL JODY & POURHASSAN NADER	9240 SW CASCARA LN	TUALATIN	OR	97062
2S123AB09800	SABERI BABAK ROBERT W	9284 SW SWEEK DR	TUALATIN	OR	97062
2S114CC02500	RUSSO WILLIAM KIRKPATRICK & BURKE MADISON ELIZABETH	17840 SW YAQUINA CT	TUALATIN	OR	97062
004000404500				<u></u>	07000
2S123BA04500		18225 SW CHEYENNE WAY	TUALATIN	OR	97062
2S114CD10100	RUNNELS CHRISTA M & RUNNELS CHRISTOPHER M	17895 SW SIOUX CI	TUALATIN	OR	97062
2S123AB00700	RUIZ BERTHAK	18610 SW 91ST TER	TUALATIN	OR	97062
2S114CC04300				UK	97062
2S114CD01600	ROSS MICHAEL S & ROSS DIANE MIDDLETON	1/905 SW SHAWNEE IRL		OR	97062
2S123AB04500		82/5 SW SENECA ST		UK OR	97062
2S123AB03900		18562 SW 92ND TER		UK	97062
281238000702	RUSEDALE PROPERTIES LLC	PU BUX 431	LAKE USWEGO	OR	97034

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2S123BB00200	ROLLING FRITO-LAY SALES LP	3131 S VAUGHN WAY #301	AURORA	со	80014
2S123BA02100	ROLFE LIVING TRUST	18060 SW CHEYENNE WAY	TUALATIN	OR	97062
2S123BA80002	RODRIGUEZ NESTOR RAFAEL	9715 SW TUALATIN RD	TUALATIN	OR	97062
2S114CD10500	ROCHA JOSEPH D & JOY M FAMILY TRUST	17845 SW SIOUX CT	TUALATIN	OR	97062
2S123AB15000	ROBERT CYNTHIA & ROBERT DOUGLAS	15784 SW COLYER WAY	TIGARD	OR	97224
2S123BA04100	RHOADS JOHN & RHOADS SHARON	18210 SW SHAWNEE TRL	TUALATIN	OR	97062
2S123BA02405	REYNOLDS RICKY R & REYNOLDS-WEAKLAND KARI M	13848 SW 159TH TER	TIGARD	OR	97223
2S123AB08400	REIGLE TYLER ALEXANDER & SIMONETTI LARA AGOSTINA	9233 SW CASCARA LN	TUALATIN	OR	97062
2S123AB07100	REEVES KEVIN MATTHEW	9282 SW CASCARA LN	TUALATIN	OR	97062
2S123BA02600	RED DOG PROPERTIES LLC	4960 IRELAND LN	WEST LINN	OR	97068
2S123AB05300	RANSOM SCOTT PIETER	18690 SW 92ND TER	TUALATIN	OR	97062
2S123BA90041	RAE DEBRA	9772 SW TUALATIN RD	TUALATIN	OR	97062
2S123BC01200	PZHERMAN LLC	PO BOX 1696	BEAVERTON	OR	97075
2S114CC00700	PUHL FREDERIC J	17900 SW SHASTA TRL	TUALATIN	OR	97062
2S123BD01100	POWDER TECH INC	PO BOX 3221	TUALATIN	OR	97062
2S114CC01900	POULSON LINDA S & POULSON JEFFREY W	10050 SW WASCO WAY	TUALATIN	OR	97062
2S123AB08100	PINTOS EDUARDO J & SOLORIO PATRICIA	9211 SW CASCARA LN	TUALATIN	OR	97062
2S114CC03000	PIKE ROBERT & PIKE GAIL	17960 SW YAQUINA CT	TUALATIN	OR	97062
2S123BA04000	PHILLIPS JOHN C & PHILLIPS JANET P	18190 SW SHAWNEE TRAIL	TUALATIN	OR	97062
2S114CD01501	PETERSON ROBERT J & QUIMBY-PETERSON SALLY C	17875 SW SHAWNEE TRL	TUALATIN	OR	97062
2S114CC02200	PERONA STEPHEN & PERONA MEGAN	17750 SW YAQUINA CT	TUALATIN	OR	97062
2S114CD02200	PERMAN KEVIN L & MARLYN J LIV TRUST	17880 SW CHEYENNE WAY	TUALATIN	OR	97062
2S123AB09000	PATTERSON STEPHEN M & PATTERSON KATHLEEN GREENE	9279 SW CASCARA LN	TUALATIN	OR	97062
2S123AB11100	PARADIS CHERYL	18715 SW 93RD TER	TUALATIN	OR	97062
2S123BC01300	PACIFIC PARTNER WAREHOUSE LLC	PO BOX 2034	LAKE OSWEGO	OR	97035
2S123BD00600	PACIFIC STATES INDUSTRIAL PARK OWNERS OF ALL LOTS			OR	00000
2S114CC00900	OVERTON DAVID M & OVERTON ALLYSON	17960 SW SHASTA TRL	TUALATIN	OR	97062
2S123BA90042	OUBRE STEVEN J & OUBRE CINDY L & OUBRE NICHOLAS J	9770 SW TUALATIN RD	TUALATIN	OR	97062
2S123BD01000	OREGON SANDBLASTING & COATING INC	PO BOX 1171	TUALATIN	OR	97062
2S123AB00800	ORANGE STAR PROPERTIES LLC	4931 SW 76TH AVE #367	PORTLAND	OR	97225
2S123AB01500	ONSAGER PER & ONSAGER PHOENIX S	18686 SW 91ST TER	TUALATIN	OR	97062
2S123AB03300	O'NEILL ELAINE A REV TRUST	PO BOX 1755	LAKE GROVE	OR	97035
2S123BA70000	ONE HUNDREDTH COURT INDUSTRIAL CONDO UNIT OWNERS			OR	00000
2S114CC01000	OLIVER CARMEN LEANN	17955 SW SHASTA TRL	TUALATIN	OR	97062
2S123BA04300	OGORZALY REGINA A	18250 SW SHAWNEE TRAIL	TUALATIN	OR	97062
2S123AB09900	O'DONNELL KATIE	9272 SW SWEEK DR	TUALATIN	OR	97062

2S123AB14700	NORRIS MICHELLE K	9171 SW SWEEK DR	TUALATIN	OR	97062
2S123BD00300	NIEMEYER JOHN E & MEADER JEFFREY W	15 82ND DR STE 210	GLADSTONE	OR	97027
2S123BA04700	NICHUALS VARONIKA	18195 SW CHEYENNE WAY	TUALATIN	OR	97062
2S123BA80005	NELSON CHRISTOPHER T & NELSON GARY R & NELSON PATSY A	9733 SW TUALATIN RD	TUALATIN	OR	97062
2S114CD07500	NAUMOV BORIS	19679 WILDWOOD DR	WEST LINN	OR	97068
2S114CC00300	MYERS FAMILY TRUST	17810 SW SHASTA TRL	TUALATIN	OR	97062
2S123AB04600	MURRELL STEPHEN M & MURRELL ELIZABETH JEAN	18634 SW 92ND TER	TUALATIN	OR	97062
2S123BA03500	MURPHY KATHLEEN M	18085 SW CHEYENNE WAY	TUALATIN	OR	97062
2S123AB15400	MULLEN PATRICK M	9101 SW SWEEK DR	TUALATIN	OR	97062
2S123AB12800	MORSE LAUREN M & SHIMADA SEAN Y	18551 SW 93RD TER	TUALATIN	OR	97062
2S114CD07001	MORO PETER & MORO PATRICIA M	12610 NE 59TH AVE	VANCOUVER	WA	98686
2S114CD10800	MORAN AMY L	17870 SW SIOUX CT	TUALATIN	OR	97062
2S123AB08600	MORALES ROGELIO GUINTO & ALEMAN MARTHA RAMIREZ &	9241 SW CASCARA LN	TUALATIN	OR	97062
004004044000				00	07000
2S123AB14800		955 NVV HIGHLAND TER	CORVALLIS	OR	97330
2S123BC00300		111 SW COLUMBIA ST STE 1380	PORILAND	OR	97201
2S123AB06900	MILLER PETER R JR & MILLER DANA	9294 SW CASCARA LN	TUALATIN	OR	97062
2S114CD07201	MEARS SAMUEL JACK & MEARS CLAIRE BETH	17835 SW CHIPPEWA TRL	TUALATIN	OR	97062
2S123AB13300		9273 SW SWEEK DR	TUALATIN	OR	97062
2S123AB09500	MCDONALD CASSIE A & MCDONALD ROBERT A	9296 SW SWEEK DR	TUALATIN	OR	97062
2S114CD02600		17760 SW CHEYENNE WAY	TUALATIN	OR	97062
2S123AB15100	MCCLAIN SCOTT	9133 SW SWEEK DR	TUALATIN	OR	97062
2S123BA02403	MAYES DEBORAH P & MAYES CURTIS R	18270 SW CHEYENNE WAY	TUALATIN	OR	97062
2S123AB08900	MASEDA HALEY M & MASEDA JOHN J	9265 SW CASCARA LN	TUALATIN	OR	97062
2S114CC04200	MARTIN WILTON & HONERHEA TRUST	10175 SW WASCO WAY	TUALATIN	OR	97062
2S123AB07700	MARSTON JEFFREY C	9234 SW CASCARA LN	TUALATIN	OR	97062
2S114CD00300	MARSDEN DONALD W TRUST & MARSDEN PHYLLIS LEE TRUST	17900 SW SHAWNEE TRL	TUALATIN	OR	97062
2S123BB01101	MARKS 18400 LLC	18200 SW TETON AVE	TUALATIN	OR	97062
2S123BA04200	MANOUGIAN RYAN & MCVITTIE NICOLE	18230 SW SHAWNEE TRL	TUALATIN	OR	97062
2S123AB07900	MAGINNIS THOMAS DAVID & MAGINNIS ASHLEY CATHERINE	9220 SW CASCARA LN	TUALATIN	OR	97062
2S123AB07400	MADSEN CHRIS & MICHELLE TRUST	1897 ARROYO AVE	OCEANSIDE	CA	92056
2S114CD02300	MACKEY ELLEN JEAN	17850 SW CHEYENNE WAY	TUALATIN	OR	97062
2S123AB06800	LUNDGREEN BETH	9298 SW CASCARA LN	TUALATIN	OR	97062
2S123BA02900	LU QBF II LLC	PO BOX 483	TUALATIN	OR	97062
2S123BA03100	LU QBF II LLC	PO BOX 483	TUALATIN	OR	97062
2S123BA05500	LU QBF LLC	PO BOX 483	TUALATIN	OR	97062
2S123BA02800	LONDON POINTE LLC	7831 SE LAKE RD	PORTLAND	OR	97267
2S123BA80006	LOMBOS ALLAN JIM & LOMBOS SHERILY LAROSE	9735 SW TUALATIN RD	TUALATIN	OR	97062

2S123AB00600	LLOYD JACK W & ST MARIE JUNE B	18604 SW 91ST TER	TUALATIN	OR	97062
2S123AB13100	LITERA GEORGE J	9287 SW SWEEK DR	TUALATIN	OR	97062
2S123AB11800	LIPPY SIRI	18647 SW 93RD TER	TUALATIN	OR	97062
2S114CC01500	LINVILLE JAMES M & LINVILLE MARCIA T	PO BOX 3833	TUALATIN	OR	97062
2S123AB03500	LIN YING	13449 NW ALVADA ST	PORTLAND	OR	97229
2S123BA03200	LIFE FRONT 2 LLC	3015 NE 44th AVE	PORTLAND	OR	97213
2S123AB00200	LIBERTY OAKS HOA	4386 SW MACADAM AVE STE 102	PORTLAND	OR	97239
2S123AB11400	LIBERTY OAKS INVESTMENTS LLC	14787 SW MILLIKAN WAY	BEAVERTON	OR	97003-
2S123AB11500	LIBERTY OAKS INVESTMENTS LLC	14787 SW MILLIKAN WAY	BEAVERTON	OR	97003-
2S123AB11600	LIBERTY OAKS INVESTMENTS LLC	14787 SW MILLIKAN WAY	BEAVERTON	OR	97003-
2S123AB11700	LIBERTY OAKS INVESTMENTS LLC	14787 SW MILLIKAN WAY	BEAVERTON	OR	97003-
2S123AB14100	LIBERTY OAKS INVESTMENTS LLC	14787 SW MILLIKAN WAY	BEAVERTON	OR	97003-
2S123AB14200	LIBERTY OAKS INVESTMENTS LLC	14787 SW MILLIKAN WAY	BEAVERTON	OR	97003-
2S123AB14300	LIBERTY OAKS INVESTMENTS LLC	14787 SW MILLIKAN WAY	BEAVERTON	OR	97003-
2S123AB14400	LIBERTY OAKS INVESTMENTS LLC	14787 SW MILLIKAN WAY	BEAVERTON	OR	97003-
2S123AB16100	LIBERTY OAKS HOA	4386 SW MACADAM AVE STE 102	PORTLAND	OR	97239
2S123AB05000	LI QINGYU & SHEN DONGLAN	5358 NW PRIMINO AVE	PORTLAND	OR	97229
2S123AB09600	LEWIS MILES	9292 SW SWEEK DR	TUALATIN	OR	97062
2S123AB12400	LEPAIGE LOREEN RENE	18593 SW 93RD TER	TUALATIN	OR	97062
2S123AB07000	LEMERY JAMES M	9290 SW CASCARA LN	TUALATIN	OR	97062
2S114CD07300	LEIGHS INVESTMENTS #3 LLC	9531 SW SILETZ DR	TUALATIN	OR	97062
2S114CC00800	LEE KADENCE ROBERT & LEE REMINGTON A	17930 SW SHASTA TRL	TUALATIN	OR	97062
2S114CD06900	LAZOFF GREGG A & LAZOFF MICHELLE F	17900 SW CHIPPEWA TRL	TUALATIN	OR	97062
2S114CC03100	LAWRENCE FAMILY TRUST	17935 SW YAQUINA CT	TUALATIN	OR	97062
2S123BA01300	LAW ROGER W	18135 SW SHAWNEE TRL	TUALATIN	OR	97062
2S123AB06400	LANMAN KATHLEEN	9277 SW TANOAK LN	TUALATIN	OR	97062
2S123BA01600	LANDIS JAMES W	18210 SW CHEYENNE WAY	TUALATIN	OR	97062
2S123AB02300	LANDAU TYLER	18697 SW 91ST TER	TUALATIN	OR	97062
2S123AB07500	KUSKE SONJA	8397 SW DURHAM LN	TIGARD	OR	97224
2S123AB03100	KRUGER LISABETH CORSON	18627 SW 91ST TER	TUALATIN	OR	97062
2S123BA01200	KOPETSKI COLIN JAMES & KOPETSKI ARLENE ABES	18105 SW SHAWNEE TRL	TUALATIN	OR	97062
2S114CC02100	KISH KIRSTEN SANDSTROM	17720 SW YAQUINA CT	TUALATIN	OR	97062
2S114CC03900	KISER MICHAEL D & KISER AMBER N	17715 SW YAQUINA CT	TUALATIN	OR	97062
2S123BA90051	KIRKPATRICK DAVID & KIRKPATRICK JANE & MCGOWAN LUKE E ET	8170 SW VLAHOS DR #215	WILSONVILLE	OR	97070
	AL				
2S123BA90052	KIRKPATRICK DAVID & KIRKPATRICK JANE & KRINKE LINDSAY E	8170 SW VLAHOS DR #215	WILSONVILLE	OR	97070
2S114CD10601	KINNAN ROBERT W	17850 SW SIOUX CT	TUALATIN	OR	97062
2S114CC02300	KING MICHELE R	17780 SW YAQUINA CT	TUALATIN	OR	97062
2S114CD09800	KILLINGER STEVEN W & KILLINGER APRIL	17965 SW SIOUX CT	TUALATIN	OR	97062
2S114CD00600	KEYSER CARY A & KEYSER KATHLEEN E	17810 SW SHAWNEE TRL	TUALATIN	OR	97062

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2S123BA04901	KEISTER MATTHEW K REV TRUST & KEISTER HEATHER L REV TRUS	T 17485 SW 107TH AVE	TUALATIN	OR	97062
2S114CC02400	KASPRICK ALEXANDRA & ODEGAARD LEONARD	17810 SW YAQUINA CT	TUALATIN	OR	97062
2S123BA00200	KASH FLORENCE REV LIV TRUST	18140 SW SHAWNEE TRL	TUALATIN	OR	97062
2S123BA04800	KARIMI ENTERPRISES LLC	27599 SW MOUNTAIN RD	WEST LINN	OR	97068
2S123AB01900	KALAMARIS ALISSA M	19304 SW 55TH CT	TUALATIN	OR	97062
2S123AB05100	KAILIULI JESSICA L	18674 SW 92ND TER	TUALATIN	OR	97062
2S123B000701	KAI USA LTD	18600 SW TETON AVE	TUALATIN	OR	97062
2S123AB00900	JUAREZ RIGOBERTO Z	18634 SW 91ST TER	TUALATIN	OR	97062
2S123AB10400	JONES TYLER & MINOR COURTNEY	9236 SW SWEEK DR	TUALATIN	OR	97062
2S114CC03400	JOHNSON K DALE & WALRATH BARBARA A	17865 SW YAQUINA CT	TUALATIN	OR	97062
2S123AB03800	JOHNSON BRITTNEY C	18550 SW 92ND TER	TUALATIN	OR	97062
2S123BA01000	JOHANSON PHILLIP D & JOHANSON CAROL L	18045 SW SHAWNEE TRL	TUALATIN	OR	97062
2S123BA00600	ISHAM RODERICK S & ISHAM EILEEN O	18020 SW SHAWNEE TRL	TUALATIN	OR	97062
2S114CD01000	INGRAM NICOLE G & BLACK JEREMY AARON	17725 SW SHAWNEE TRL	TUALATIN	OR	97062
2S123BD00700	ICHOR SYSTEMS INC	9660 SW HERMAN RD	TUALATIN	OR	97062
2S123AB09100	HUNT NICHOLAS ALLEN & HUNT GLADYS JESSENIA	9283 SW CASCARA LN	TUALATIN	OR	97062
2S114CC03500	HULL RENELL B	17835 SW YAQUINA CT	TUALATIN	OR	97062
2S123AB01000	HUDDLESON HOLLY	18640 SW 91ST TER	TUALATIN	OR	97062
2S123AB06100	HSU GRACE S REV TRUST	2876 EMERSON ST	PALO ALTO	CA	94306
2S123AB09200	HOWELL MARCELLA A	9291 SW CASCARA LN	TUALATIN	OR	97062
2S114CD00400	HOUGHTON MICHAEL D	17870 SW SHAWNEE TRL	TUALATIN	OR	97062
2S114CD02900	HOUCK CLARENCE ELLSWORTH REV TRUST & HOUCK MARGARET	17730 SW CHEYENNE WAY	TUALATIN	OR	97062
2S123AB08300	HOLMES MCKENNA & HOLMES WILLIAM N	9225 SW CASCARA LN	TUALATIN	OR	97062
2S123AB14000	HOENER KYLAN C & HOENER JOHANNA	9223 SW SWEEK DR	TUALATIN	OR	97062
2S123AB06600	HINES TIMOTHY G & HINES MISTY D	9293 SW TANOAK LN	TUALATIN	OR	97062
2S114CD03001	HILL RANDALL M & GEIGER ROWENA A	17995 SW CHEYENNE WAY	TUALATIN	OR	97062
2S114CD03300	HILL ROBERT E & HILL DANA L	17905 SW CHEYENNE WAY	TUALATIN	OR	97062
2S114CD03700	HILGEFORT BRANDELYN	9710 SW PAWNEE PATH	TUALATIN	OR	97062
2S123AB10500	HENNINGER DANA	9230 SW SWEEK DR	TUALATIN	OR	97062
2S123AB10200	HELLBERG JENNIFER A	9248 SW SWEEK DR	TUALATIN	OR	97062
2S123AB12700	HEATH NATHAN F & HEATH CHELSEA R	18565 SW 93RD TER	TUALATIN	OR	97062
2S123AB13000	HARRISON PAMELA K	3619 RINKES CT	NEWBERG	OR	97132
2S123AB11200	HARKLESS MYCHAL SEAN & ARAIZA ERIKA Y	18707 SW 93RD TER	TUALATIN	OR	97062
2S123AB12300	HANSELL JULIE L	18601 SW 93RD TER	TUALATIN	OR	97062

Mailing List_9700 SW Tualatin Rd 4888-0962-5960 v.2.xls

9260 SW SWEEK DR

97062

TUALATIN

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OR

97062

97062

OR

2S123BA04900 KEISTER MATTHEW K REV TRUST & KEISTER HEATHER L REV TRUST 17485 SW 107TH AVE TUALATIN

OR

2S123BA04600 KEISTER MATTHEW K REV TRUST & KEISTER HEATHER L REV TRUST 17485 SW 107TH AVE

2S123AB10000 HANCOCK ELIZABETH N
Mailing List	9700 SW	Tualatin	Rd 4888-0962	2-5960 v.2.xls

2S123AB01800	HAMPTON ALEC IRWIN & REED MICHAEL DANIELLE	18718 SW 91ST TER	TUALATIN	OR	97062
2S123BA04601	HALL DAVE & LINDA TRUST	10135 SE 222ND DR	DAMASCUS	OR	97089
2S114CD00500	HAGER LORRAINE M TRUST	17840 SW SHAWNEE TRAIL	TUALATIN	OR	97062
2S114CC03300	HACKETT LIV TRUST	17895 SW YAQUINA CT	TUALATIN	OR	97062
2S114CC01200	GROMLICH ALAN ROBERT & SIEGLINDE H TORRES-ORTIZ REV LIV	16779 NW YORKTOWN DR	BEAVERTON	OR	97006
	TRUST				
2S123BA80001	GRAHAM ALLAN B TRUST	9705 SW TUALATIN RD	TUALATIN	OR	97062
2S123BA90031	GRAHAM KATHLEEN J	9776 SW TUALATIN RD-UNIT A	TUALATIN	OR	97062
2S123BA90012	GOODING ELISA	9782 SW TUALATIN RD	TUALATIN	OR	97062
2S123AB08000	GOOD ANNETTA FAYE & GOOD MARLIN RAY	9214 SW CASCARA LN	TUALATIN	OR	97062
2S114CD09400	GONZALEZ RAUL	17960 SW CHIPPEWA TRL	TUALATIN	OR	97062
2S114CD07400	GODOWSKI KAZ	17775 SW CHIPPEWA TRAIL	TUALATIN	OR	97062
2S123AB08500	GLADIS DEBORAH	9237 SW CASCARA LN	TUALATIN	OR	97062
2S123AB05500	GILBERT GAIL D	18716 SW 92ND TER	TUALATIN	OR	97062
2S114CD03400	GETAHUN AZEB & BIZUNEH SAMUEL	17875 SW CHEYENNE WAY	TUALATIN	OR	97062
2S114CD01700	GERMOND JONATHAN P & GERMOND MARIANNE C	17935 SW SHAWNEE TRL	TUALATIN	OR	97062
2S114CC00600	GARZA DANIEL & GARZA BRIDGETTE	6855 SW NYBERG ST UNIT #J102	TUALATIN	OR	97062
2S123BA01400	GARDEN CAROL LIV TRUST	7871 SW PONDEROSA DR	SANDY	UT	84094
2S123AB14900	GARD VALERIE GAIL	9157 SW SWEEK DR	TUALATIN	OR	97062
2S123BC00700	FUENTE ROSE LLC	33120 NE LESLEY RD	NEWBERG	OR	97132
2S123AB13200	FRY JENNIFER LYNN	9285 SW SWEEK DR	TUALATIN	OR	97062
2S123BA01900	FROST FAMILY LIV TRUST	18120 SW CHEYENNE WAY	TUALATIN	OR	97062
2S114CC02900	FREGOSO OMAR	17930 SW YAQUINA CT	TUALATIN	OR	97062
2S123BA90022	FREDRICKSON BRIAN & FREDRICKSON ROSELYN	9778 SW TUALATIN RD	TUALATIN	OR	97062
2S123AB04200	FOX KAREN RAE PERL TRUST	18590 SW 92ND TER	TUALATIN	OR	97062
2S123AB06500	FOLEY KRISTA	9289 SW TANOAK LN	TUALATIN	OR	97062
2S123AB02700	FERRY MICHELLE ANN	18655 SW 91ST TER	TUALATIN	OR	97062
2S114CD11100	FERNANDEZ KASEY & FERNANDEZ MICHAEL	17920 SW SIOUX CT	TUALATIN	OR	97062
2S123BA00500	FAZZOLARI STEVEN J & FAZZOLARI CHRISTINE L	18050 SW SHAWNEE TRL	TUALATIN	OR	97062
2S114CD09500	EVANSTEIN MARC & EVANSTEIN EMILY	17955 SW CHIPPEWA TRL	TUALATIN	OR	97062
2S123BA00700	ESTES BETTY RAE TRUST	17970 SW SHAWNEE TRL	TUALATIN	OR	97062
2S123AB15300	EMBREE DOUGLAS S & EMBREE JESSICA D	9115 SW SWEEK DR	TUALATIN	OR	97062
2S123AB09300	EDWARDS BRYAN C & ROCHELLE-STEPHENS TAYLOR T	9297 SW CASCARA LN	TUALATIN	OR	97062
2S123AB03200	EASTERLY CHRISTINE LYNN	18611 SW 91ST TER	TUALATIN	OR	97062
2S123BA70001	EASTBOUND PROPERTIES LLC	32019 NE CORRAL CREEK RD	NEWBERG	OR	97132
2S123BA70002	EASTBOUND PROPERTIES LLC	32019 NE CORRAL CREEK RD	NEWBERG	OR	97132
2S114CC00100	DUNLAP WILLIAM R	17750 SW SHASTA TRL	TUALATIN	OR	97062
2S123AB02400	DULING ISAAC PATRICK	18689 SW 91ST TER	TUALATIN	OR	97062
2S114CC03801	DULIERE JEFFREY L & DULIERE MARCELINA G	17745 SW YAQUINA CT	TUALATIN	OR	97062
2S123AB06300	DOVER CONNIE	9269 SW TANOAK LN	TUALATIN	OR	97062
2S123AB10600	DOUGLASS L	9224 SW SWEEK DR	TUALATIN	OR	97062

2S123BC01500	DJI INVESTMENT LLC	10100 SW HERMAN RD	TUALATIN	OR	97062
2S123BA02300	DIXON LARRY D & DIXON ALICE E	18000 SW CHEYENNE WAY	TUALATIN	OR	97062
2S123AB04400	DING XIAOHONG	19240 MEGLY CT	LAKE OSWEGO	OR	97034
2S123BA03400	DICKIE SARAH CORREA & DICKIE JOSHUA	18025 SW CHEYENNE WAY	TUALATIN	OR	97062
2S114CD09600	DEVERS CHRISTOPHER J & DEVERS KIM L	17925 SW CHIPPEWA TRL	TUALATIN	OR	97062
2S123AB01700	DESANTIS DANIEL DOMINIC & MILLER KATHERINE ADELE	18704 SW 91ST TER	TUALATIN	OR	97062
2S123AB10800	DEPAOLIS KATE E	9216 SW SWEEK DR	TUALATIN	OR	97062
2S123AB10100	DEMISSE TEREFE	15885 SW SERENA CT	TIGARD	OR	97224
2S123BA03401	DEJAGER JOHN & CYNTHIA FAMILY TRUST	18926 INDIAN SPRINGS CIR	LAKE OSWEGO	OR	97035
2S123BA01100	DECKER JAY E REV TRUST & CARLSON SUSAN K REV TRUST &	18075 SW SHAWNEE TRL	TUALATIN	OR	97062
	JACKSON ZEPHRINE C ESTAT				
2S114CC02800	DANESHI ALI & EMADI PARASTOO	17920 SW YAQUINA CT	TUALATIN	OR	97062
2S123AB15600	CURL SPENCER & CURL SARAH	9089 SW SWEEK DR	TUALATIN	OR	97062
2S123BA90011	CRIST KELLY & CRIST MARGARET	9784 SW TUALATIN RD	TUALATIN	OR	97062
2S114CC01300	CRISP STANLEY D	17865 SW SHASTA TRL	TUALATIN	OR	97062
2S114CC04500	CRALL RICHARD F & CRALL BARBARA	10055 SW WASCO WAY	TUALATIN	OR	97062
2S114CC04600	CRALL RICHARD F & CRALL BARBARA M	10055 SW WASCO WAY	TUALATIN	OR	97062
2S114CD00100	CORRIGAN MAXINE	17960 SW SHAWNEE TRL	TUALATIN	OR	97062
2S114CD10300	COOPER ZACHARY RYAN	17875 SW SIOUX CT	TUALATIN	OR	97062
2S123AB02900	COOK SHAWNA MICHELLE	18643 SW 91ST TER	TUALATIN	OR	97062
2S123AB03000	COLEMAN AISHA & COLEMAN JAMES	18635 SW 91ST TER	TUALATIN	OR	97062
2S114CD00800	CHEEK JOSEPH & CHEEK TERRA	17750 SW SHAWNEE TRL	TUALATIN	OR	97062
2S114CC01600	CHAPMAN PAUL G & CHAPMAN VALERIE D	17805 SW SHASTA TRL	TUALATIN	OR	97062
2S123BA00701	CHAFF DAVID A	29791 SW KINSMAN RD	WILSONVILLE	OR	97070
2S123AB05800	CHADWICK KATHLEEN M	9227 SW TANOAK LN	TUALATIN	OR	97062
2S123BA80000	CEDARWOOD CONDOS OWNERS OF UNITS			OR	00000
2S114CD02500	CARRASCO TONI REV LIV TRUST	17790 SW CHEYENNE WAY	TUALATIN	OR	97062
2S123BA00900	CAMPBELL ROBERT E & ELTINGE BARBARA A	18015 SW SHAWNEE TRL	TUALATIN	OR	97062
2S123AB01300	BUTTERCREEK FARM LLC	23325 SW STAFFORD RD	TUALATIN	OR	97062
2S123AB13600	BUSHMAN MARTIN BENJAMIN & BUSHMAN ERIKA H	15321 SW SUNSET BLVD	SHERWOOD	OR	97140
2S123BB00100	BUDIHAS ROBERT J REV TRUST	18175 SW 100TH CT	TUALATIN	OR	97062
2S123BA01800	BRYANT ROBERT C & BRYANT CHRISTINE R	18150 SW CHEYENNE WAY	TUALATIN	OR	97062
2S123AB13800	BRUCE ROBERT A	9231 SW SWEEK DR	TUALATIN	OR	97062
2S123AB01400	BROCKMANN FRED & BROCKMANN ANNALISA	10955 SW EVANS CT	TUALATIN	OR	97062
2S114CD00201	BRITTON CHARLES A & BRITTON GENEE M	17930 SW SHAWNEE TRL	TUALATIN	OR	97062
2S114CD10200	BRITTON JEFFREY T & BRITTON CHARLENE A				
2S123BA90000	BRIAN PARK CONDOMINIUM OWNERS OF UNITS			OR	00000
2S114CD02400	BREWSTER-FUJI JANELLE L	17820 SW CHEYENNE WAY	TUALATIN	OR	97062
2S114CD01800	BRADEN JOHN B & BRADEN BRENDA L	17965 SW SHAWNEE TRL	TUALATIN	OR	97062
2S123BD00200	BOWLSBY/MCCORD ENTERPRISES LLC	9730 SW HERMAN RD	TUALATIN	OR	97062
2S123AB06000	BOULEY JASON CHRISTOPHER & BOULEY MELINDA A	9239 SW TANOAK LN	TUALATIN	OR	97062

201140002700	DAUGHMAN DIVENDA EEE	17050 OW TAQUINA OT	IUALATIN	OIN	31002
2S114CD06400	BARTOS PAUL RICHARD LIV TRUST & HOWARD ARVA	17750 SW CHIPPEWA TRL	TUALATIN	OR	97062
2S114CD10700	BARRIOS JUANITA HIDALGO & BARRIOS JESUS ALEJANDRO	17860 SW SIOUX CT	TUALATIN	OR	97062
	HIDALGO				
2S123BC01600	BARR FAMILY IX LLC	3455 W FIRST AVE	EUGENE	OR	97402
2S123BC01700	BARR FAMILY IX LLC	3455 W FIRST AVE	EUGENE	OR	97402
2S123BA90061	BARNES WALTER A TRUST	PO BOX 68288	OAK GROVE	OR	97268
2S123AB15500	BALMES LISA L TRUST	9097 SW SWEEK DR	TUALATIN	OR	97062
2S114CC01400	BAKER ROSS E & LAURA E REV LIV TRUST	17300 SW 107TH AVE	TUALATIN	OR	97062
2S114CD02100	BAKER RUTH M & BAKER WARREN EDWARD JR	17910 SW CHEYENNE WAY	TUALATIN	OR	97062
2S114CD03200	BAKER ALEXANDER MARK & BAKER JOEY K	17935 SW CHEYENNE WAY	TUALATIN	OR	97062
2S114CD03100	BAILEY REV TRUST	17965 SW CHEYENNE WAY	TUALATIN	OR	97062
2S123AB08200	BAILEY DAYSHA M	9217 SW CASCARA LN	TUALATIN	OR	97062
2S114CC01700	BACHMAN KERI D & BACHMAN CRAIG A	17765 SW SHASTA TRL	TUALATIN	OR	97062
2S123BA00300	BABCOCK CHRISTOPHER M & BABCOCK LINDA D	18110 SW SHAWNEE TRAIL	TUALATIN	OR	97062
2S123AB05900	AYYOUB KEVIN & AYYOUB ERICA	9235 SW TANOAK LN	TUALATIN	OR	97062
2S114CD06700	AYALA DAVID A & AYALA MARIE E	17840 SW CHIPPEWA TRAIL	TUALATIN	OR	97062
2S123BA02000	ARROYO CHRIS & ARROYO JAQUELINE CUEVAS	18090 SW CHEYENNE WAY	TUALATIN	OR	97062
2S123AB04900	ARMS CHRISTINE J TRUST	2521 BEACON HILL DR	WEST LINN	OR	97068
2S123AB07300	ARASTEH NIMA	9260 SW CASCARA LN	TUALATIN	OR	97062
2S114CD02000	ANDUJO JOANNE E TRUST	17940 SW CHEYENNE WAY	TUALATIN	OR	97062
2S123AB08800	ANDERSEN-GLASS MADELINE & ANDERSEN-GLASS GAVIN	9257 SW CASCARA LN	TUALATIN	OR	97062
2S123AB01100	ANCHETA ALVIN L & ANCHETA CRISTINA V	18648 SW 91ST TER	TUALATIN	OR	97062
2S123BA01500	AMADOR RIGO	18195 SW SHAWNEE TRAIL	TUALATIN	OR	97062
2S114CC00401	ALMY JOINT REV TRUST	17830 SW SHASTA TRL	TUALATIN	OR	97062
2S123AB12900	AKELLA RAVI S	2029 CHANNING WAY, #4C	BERKELEY	CA	94704
2S123AB03400	AIELLO DAX A	8597 SW 91ST TER	TUALATIN	OR	97062
2S123BA70003	AEB PROPERTIES LLC	21136 SW NURSERY WAY	SHERWOOD	OR	97140
2S123BA70004	AEB PROPERTIES LLC	21136 SW NURSERY WAY	SHERWOOD	OR	97140

Mailing List 9700 SW Tualatin Rd 4888-0962-5960 v.2.xls

9222 SW SWEEK DR

18640 SW 92ND TER

18587 SW 93RD TER

18615 SW 93RD TER

8039 GABRIELS CT

17635 SW SHAWNEE TRL

17655 SW SHAWNEE TRL

17865 SW CHIPPEWA TRAIL

37620 SE HIDDEN FALLS RD

18170 SW SHAWNEE TRL

17890 SW YAQUINA CT

17870 SW YAQUINA CT

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2S123AB10700 BOLAND CODY

2S123AB04800 BETTIS SARAH S

2S123AB12200 BENDA MICHAEL

2S123BA02200 BEACON HILL TRUST

2S114CC02700 BAUGHMAN BRENDA LEE

2S123AB12500 BERRY ASHLEY ELIZABETH

2S114CD02800 BOATWRIGHT LYNDA I & BOATWRIGHT JAMES G

2S123AB10900 BECKER KARI LYNN & BECKER CHRISTOPHER ANDREW

2S114CD02700 BEHRENS GREGORY & BEHRENS JENNIFER

2S114CC02600 BECKER CURTIS & BECKER CHRISTINA

2S123BA00100 BAYNE JAMES & CANDIS JOINT TRUST

2S114CD07100 BECK JOHN E & BECK KIMBERLY

2S123AB02500	ACHILOV ABDUMADZHID & ACHILOV GALINA	15681 SW THRASHER WAY	SHERWOOD	OR	97140
2S123AB05200	ABOUELSEOUD AHMED	18688 SW 92ND TER	TUALATIN	OR	97062
2S123BD00500	9620 HERMAN ROAD LLC	5611 NE COLUMBIA BLVD	PORTLAND	OR	97218
2S123BA05001	100TH COURT LLC	5611 NE COLUMBIA BLVD	PORTLAND	OR	97218

Riverpark CIO - riverparkcio@gmail.com

EXHIBIT B

Notice of Neighborhood/Developer Meeting

[See Attached Notice of Neighborhood/Developer Meeting]



Blakely Vogel blakely.vogel@millernash.com 503.349.7454 (direct)

June 22, 2023

VIA FIRST-CLASS MAIL

«OWNER1» «OWNERADDR» «OWNERCITY», «OWNERSTATE» «OWNERZIP»

Subject: Notice of Meeting

Dear Property Owner:

You are cordially invited to attend a meeting on July 12, 2023 from 6:30 pm to 7:30 pm at the Tualatin Library Community Room, 18878 SW Martinzazzi Avenue., Tualatin, OR 97062. This meeting will be held to discuss a proposed project located at 9700 SW Tualatin Road, Tualatin, OR 97062. The proposal is to correct the City of Tualatin's plan map to accurately depict the property line between 9700 SW Tualatin Road and neighboring properties to the west (9905 and 9975 SW Tualatin Road).

NO CONSTRUCTION, BUILDING, OR PHYSICAL ALTERATIONS ARE BEING PROPOSED.

This is an informational meeting to share the proposal with interested neighbors. You will have the opportunity to review preliminary plans and identify topics of interest or consideration. Feel free to contact me with any questions or commentary.

Very truly yours,

Blakely Vogel

cc: Tualatin Community Development Department <u>planning@tualatin.gov</u>; Tualatin Community Development Department

> California Oregon Washington MILLERNASH.COM

Mailing List - 9700 SW Tualatin Rd



TUALGIS

Vogel, Blakely

From:	Vogel, Blakely
Sent:	Thursday, June 15, 2023 1:39 PM
То:	Tualatincio@gmail.com; riverparkcio@gmail.com
Cc:	Rasmussen, William; Forer, Max; Ext - Planning
Subject:	Notice of Public Meeting
Attachments:	Tualatin Public Meeting Notice (ClOs), 4855-7795-4666 v.3.pdf

Dear Tualatin CIOs,

I am writing to inform you of a public meeting for a development project pursuant to notice requirements under TDC 32.120(5)(b)(iii). The attached notice should provide you with all relevant information, but please feel free to reach out to me directly if you have any questions.

Best, Blake



Blakely Vogel blakely.vogel@millernash.com 503.349.7454 (direct)

June 15, 2023

VIA EMAIL

Tualatincio@gmail.com Riverparkcio@gmail.com

Subject:

Dear Tualatin Citizen Involvement Organizations:

You are cordially invited to attend a meeting on July 12, 2023 from 6:30 pm to 7:30 pm at the Tualatin Library Community Room, 18878 SW Martinzazzi Avenue., Tualatin, OR 97062. This meeting will be held to discuss a proposed project located at 9700 SW Tualatin Road, Tualatin, OR 97062. The proposal is to correct the City of Tualatin's plan map to accurately depict the property line between 9700 SW Tualatin Road and neighboring properties to the west (9905 and 9975 SW Tualatin Road).

NO CONSTRUCTION, BUILDING, OR PHYSICAL ALTERATIONS ARE BEING PROPOSED.

This is an informational meeting to share the proposal with interested neighbors. You will have the opportunity to review preliminary plans and identify topics of interest or consideration. Feel free to contact me with any questions or commentary.

Very truly yours,

Blakely Vogel

cc: Tualatin Community Development Department <u>planning@tualatin.gov</u>; Tualatin Community Development Department

> California Oregon Washington MILLERNASH.COM



Blakely Vogel blakely.vogel@millernash.com 503.349.7454 (direct)

Map Amendment Public Meeting Overview

Tualatin Library Community Room July 12, 6:30 pm to 7:30 pm

Background:

- (1) Miller Nash LLP represents Life Front 2, LLC, dba Willow Glen Mobile Home Park in Tualatin;
- (2) The current fence line between Willow Glen (East) and the Lu Pacific Industrial Park (West) marks the true division between the properties and has been in place for decades;
- (3) This property line is roughly 10 feet (give or take) West of what is recorded in the City's records;
 <u>See Maps 1 & 2</u> (Property Lines & Development Zoning)
- (4) Project: correcting the City's records and map;
- (5) The correction process involves a City plan map adjustment, which requires this public meeting;
- (6) Minor consequence: Riverpark CIO and Commercial Industrial CIO boundaries similarly adjusted;
 <u>See Map 3</u> (Tualatin CIO Line)
- (7) Records-correction is the entire project; no construction, building, or physical alterations.

Properties Details:

(1) Willow Glen Mobile Home Park:

- o Address: 9700 SW Tualatin Rd., OR 97062.
- o <u>Zoning</u>: RESIDENTIAL, Medium Low Density Residential (RML).

(2) Lu Pacific Industrial Park:

- <u>Addresses</u>:
 - West-North: 9975 SW Herman Rd, Tualatin, 97062;
 - West-South: 9905 SW Herman Rd, Tualatin, 97062.
- <u>Zoning</u>: INDUSTRIAL, Light Manufacturing (ML).

California Oregon Washington MILLERNASH.COM

Letter ANSI A Landscape





World Transportation The Planning Area Boundary

City Boundary

Taxlots

Planning Districts



Maxar, Microsoft, State of Oregon GEO, Esri, HERE, iPC, TualGIS, Metro, GIG, TualGIS

Letter ANSI A Landscape





World Transportation

City Boundary

Planning Districts

Taxlots

Neighborhood Commercial (CN)

Central Commercial (CC)

E Planning Area Boundary

Commercial Office (CO)

General Commercial (CG)



State of Oregon GEO, Esri, HERE, iPC, TualGIS, Metro, GIG, TualGIS, Maxar

City of Tualatin, Oregon Community Involvement Organizations (CIOs)







State of Oregon GEO, Esri, HERE, iPC, TualGIS, Metro, GIG, TualGIS, Maxar

Attendee Name	Organization	Address	Phone Number	Email
1. Kent Wilson	Home owner	chippewaTR		
2. JAY4) 4 (0)	2 11	SIDRY CT.		
3. ALLAN LOMBOS	Li	9735 SW NALA	D~/	
4. Terny Waver	Home awner	Chinney to TRI-	971 4005544	
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July 12, 2023 Public Meeting Notes

Introduction: Blakely Vogel of Miller Nash LLP presenting, representing Life 2 Front, LLC, owner of Willow Glen Mobile Home Park.

Topics:

- Project generally: adjusting the property lines and City map to account for existing property divisions;
- property line adjustment project;
- map amendment project; and
- no construction planned as part of this project.

Discussion (Talking Points & Speakers):

- Multiple attendees asked about the impact of the project beyond the property line adjustment and map amendment; they were informed that (1) adjustment and amendment were the whole of the project, and (2) there would be no further impacts beyond them.
- Multiple attendees asked about on-going construction projects in the general area, and they were informed that such construction is completely unrelated to the proposed project.
- No attendee expressed concern over the project as proposed.

Exhibit F

Pre-Application Meeting Summary



City of Tualatin COMMUNITY DEVELOPMENT PLANNING DIVISION

Pre-Application Meeting Request

The purpose of the Scoping and Pre-Application meetings is to offer early assistance in the land use and permitting process. This includes thoughtful feedback on preliminary design direction and visioning, outlining expectations, and to assist the applicant in attaining a complete application at first submittal.

PROJECT DESCRIPTION

Project name/title: Property Line Adjustment between Tax Lots.

What is the primary purpose of this pre-application meeting (What would you like to accomplish)? (Attach additional sheets if needed.)

Discuss the possibility of adjusting the property line between Tax Lot 2S123BA03200 (medium low density residential) to the

east, and Tax Lots 2S123BA02900 and 2S123BA03100 to the west (both light manufacturing). Owners of all properties have

agreed to a possible property line adjustment and would like to explore whether this project would create the need for rezoning

the affected parcels due to Approval criterion TDC 36.100(4)(b). Please see attached narrative for more information.

PROPERTY INFORMATION

Property address/location(s): <u>9700 SW Tualatin Rd., Tualatin, OR 97062;</u>

9905 SW Herman Rd., Tualatin, OR 97062; and 9975 SW Herman Rd., Tualatin, OR 97062.

Tax map and tax lot no.(s): <u>2S123BA03200</u>; <u>2S123BA03100</u>; and <u>2S123BA02900</u>. Zoning: <u>Medium Low Density Residential</u>, and Light Manufacturing.

PROPERTY OWNER/HOLDER INFORMATION

Name(s): Life Front Communities

Address: 9700 SW Tualatin Rd.

Phone:	(971)) 201-2462

City/state: Tualatin, OR Zip: 97062

_____ Phone: _____

APPLICANT INFORMATION

Name [.]	SAME
I Valle.	•/ •/ •

City/state: _____ Zip: _____

Contact person: Blakely Vogel

Phone: (503) 349-7454 Email: blakely.vogel@millernash.com

Pre-application Conference Information

All of the information identified on this form is required and must be submitted to the Planning Division with this application. Conferences are scheduled subject to availability and a minimum of two weeks after receiving this application and all materials. Pre-application conferences are one (1) hour long and are typically held on Wednesdays between 2-4 p.m.

REQUIRED SUBMITTAL ELEMENTS

(Note: Requests will not be accepted without the required submittal elements)

A complete application form and accompanying fee.

1 hard copy and an electronic set of the following:

- Preliminary site and building plans, drawn to scale, showing existing and proposed features. (Plans do not need to be professionaly prepared; just accurate and reliable.)
- ☐ A detailed narrative description of the proposal that clearly identifies the location, existing and proposed uses, and any proposed construction.
- □ A list of all questions or issues the applicant would like the City to address.

FOR STAFF USE ONLY

Case No.:	
Related Case No.(s):	
Application fee:	
Application accepted:	
By: Date:	
Date of pre-app:	
Time of pre-app:	
Planner assigned to pre-app:	

If more than four (4) people are expected to attend the pre-application conference in your group, please inform the City in advance so that alternate room arrangements can be made to accommodate the group.

What type of development are you proposing? (Check all that apply)

[] Industrial [] Commercial [] Residential [] Institutional [] Mixed-use

Please provide a brief description of your project: (Attach additional sheets if needed.) Please include description of existing uses and structures in addition to what is proposed.

Project is a property line adjustment; development project questions are inapplicable.

Are you familiar with the development process in Washington or Clackamas County or Tualatin?
[] Yes
[] No

If yes, please identify an example project:

Are you familiar with the sections of the Tualatin Development Code (TDC) that pertain to your proposed development?

X Yes [] No

Is the property under enforcement action? If yes, please attached a notice of the violation.

Please provide the names of City, TVF&R, CWS, and County staff with whom you have already discussed this proposal:

N/A.



PROPERTY LINE ADJUSTMENT PROPOSAL

9700 SW Tualatin Road Pre-Application Meeting Summary

The pre-application conference is intended to be a tool to assist applicants in navigating the land use process, but is not intended to be an exhaustive review that identifies or resolves all potential issues, and does not bind or preclude the City from enforcing any applicable regulations or from applying regulations in a manner differently than may have been indicated at the time of the pre-application conference.

Required Land Use Reviews

Submit electronically via eTrakit: <u>https://permits.ci.tualatin.or.us/eTrakit/.</u>

Property Line Adjustment:

Please contact Tony Doran, Engineering Associate, at 503.691.3035 or <u>tdoran@tualatin.gov</u> with any infrastructure and as-built questions.

Type I Application– See Tualatin Development Code Chapter <u>36.100</u>: <u>https://www.tualatinoregon.gov/sites/default/files/fileattachments/engineering/page/5159/development</u> - app sub par pla w sign and mailing labels.pdf

Ministerial action decided by City Staff

Submittal materials listed in:

- <u>TDC 32.140</u>, including a Citizen Involvement Organization (CIO) statement. More information may be found here: <u>https://www.tualatincio.org/riverpark-cio</u>
- <u>TDC 36.100(3)</u>, including a:
 - \circ $\;$ Chain of title and legal description for affected properties
 - Site Plan, drawn to scale, that indicates:
 - The dimensions and areas of the units of land before and after the proposed property line adjustment; and
 - Setbacks, building separations, lot coverage, vehicular access, and public and private utilities.
 - Narrative with findings to address approval criteria listed in: <u>TDC 36.100(4)</u>
 - Adjustment must not result in nonconforming development or increase the degree of nonconformity of existing development
 - The property line adjustment is not prohibited by any existing City land use approval, or previous condition of approval
 - AR 20-0002: Herman Road Industrial
 - AR 87-34, 88-03, 89-01 Willow Court Development reviews

Required Service Provider Letters

 Clean Water Services will comment on additional natural resource, through their Review process. The Service Provider Letter from CWS is a requirement of a complete land use or Engineering permit submittal: <u>https://dynamic.cleanwaterservices.org/Forms/PreScreen</u>.

Considerations:

- <u>TDC 36</u> does not preclude the split zoning, however, split lots are not desired. Industrial development would not be allowed on the residential portion and vice versa.
 - Depending on the specifics the parcels and development on each, the adjustment could create a nonconformity (in either land unit or development or both), which is prohibited by the code.
 - Once a nonconforming use is terminated, any subsequent use of the subject lot must conform to the current standards and criteria of this Code. After a nonconforming use is terminated, the use must not be allowed to resume, in whole or in part, under the same or different ownership or management.

Plan Map Amendment (Zone Change):

- May be submitted concurrently with the PLA application.
- Applicant-initiated Plan Map Amendment is a <u>Type IV-A</u> process that is decided by City Council.
 - An advisory recommendation is sought at Tualatin Planning Commission prior to a City Council hearing. The applicant team is invited to attend and share information at this meeting, as are members of the public, but it is not a formal hearing.
- Application packet: <u>https://www.tualatinoregon.gov/sites/default/files/fileattachments/planning/page/5083/pma_i</u> <u>nstructions_withform.pdf</u>
- Requires narrative findings to approval criteria listed in <u>TDC 33.070(5)</u> with supporting evidence including:
 - Findings that the zone change will correct a mapping error and will have a de minimis impact on:
 - The Transportation Planning Rule (TPR);
 - Applicable goals and policies found in <u>Tualatin Comprehensive Plan</u> including Chapters 3 and 4 which states:
 - Service provider letter from the Tigard-Tualatin School District.
- Example of a recent plan map amendment application is found on our projects website: https://www.tualatinoregon.gov/planning/pma-21-0001-tualatin-heights-apartments

 For Council recording and packets: https://www.tualatinoregon.gov/planning/pma-21-0001-tualatin-heights-apartments

Neighborhood Developer Meeting:

- Holding a Neighborhood/Developer meeting is required for a zone change application.
- Neighborhood/Developer meetings should be held in-person and generally no more than six months prior to application. More detailed information about this meeting, is

online here: <u>https://www.tualatinoregon.gov/planning/neighborhood-developer-</u><u>meetings</u>

- Applicants are responsible for mailing and posting notice of your Neighborhood Developer meeting. The City can provide a list of addresses for your notice letters for a \$35 fee. Place your request by emailing: <u>planning@tualatin.gov.</u>
- Be sure to email the meeting invite to planning@tualatin.gov.

Vogel, Blakely

From:	Vogel, Blakely
Sent:	Wednesday, February 28, 2024 9:06 AM
То:	Erin Engman
Cc:	Steve Koper; Lindsey Hagerman
Subject:	RE: PRE23-0002 9700 SW TUALATIN RD

Hi Erin,

The project and parties have not changed at all, so we should be good regarding TDC 32.110(6).

Thank you for your prompt reply and assistance on this project. It is much appreciated.

Best, Blake

From: Erin Engman <eengman@tualatin.gov>
Sent: Wednesday, February 28, 2024 8:45 AM
To: Vogel, Blakely <Blakely.Vogel@MillerNash.com>
Cc: Steve Koper <skoper@tualatin.gov>; Lindsey Hagerman <lhagerman@tualatin.gov>
Subject: RE: PRE23-0002 9700 SW TUALATIN RD

[EXTERNAL MESSAGE: This email originated from outside of the firm. Do not click links or open attachments unless you recognize the sender and know the content is safe.]

Good morning Blakely-

And thanks for checking in on the project! As long as the following haven't changed under TDC 32.110(6), then we can consider this email chain as fulfilling the follow-up conference requirement.

- The proposed use, layout, and/or design of the proposal have significantly changed; or
- The owner and/or developer of a project changes after the pre-application conference and prior to application submittal.

I appreciate you staying on top of the application criteria,

Erin Engman, AICP

Senior Planner City of Tualatin | Planning Division 503.691.3024 | <u>www.tualatinoregon.gov</u>

From: Vogel, Blakely <<u>Blakely.Vogel@MillerNash.com</u>>
Sent: Tuesday, February 27, 2024 6:30 PM
To: Erin Engman <<u>eengman@tualatin.gov</u>>
Cc: Steve Koper <<u>skoper@tualatin.gov</u>>; Lindsey Hagerman <<u>lhagerman@tualatin.gov</u>>
Subject: RE: PRE23-0002 9700 SW TUALATIN RD

Hi Erin (et al.),

Apologies for the radio silence on the below project, but the surveyor contracted to assist with the application process delayed the project by taking significantly longer than anticipated.

That being said, the pre-application conference is only valid for 6 months and that elapsed, based on your last email, on 1/26/2024. (TDC 32.110(6)(a)). This compounds our issues, as the public meeting we held for the plan map amendment on 7/12/2023, is potentially no longer valid, as the public meeting must occur between the pre-application conference and submission of the application (TDC 32.120(3)).

Is there a way to fulfill the pre-application conference requirement without hosting another public meeting?

Happy to discuss this and any further details of the project as needed.

Best (and belated happy New Year), Blake

Blakely Vogel Attorney

Miller Nash LLP US Bancorp Tower | 111 SW Fifth Ave, Ste 3400 | Portland, OR 97204 Direct: 503.205.2506 | Office: 503.224.5858 Email | Insights | Website

<u>WE ARE MOVING</u>! Effective March 11, 2024 you can find us at our new Portland office located at **1140 SW Washington St, Ste 700, Portland, OR 97205**.

Our attorneys regularly offer insights to address the challenges faced by our clients. To visit the Miller Nash industry-focused blog overview page on our updated website: *please click this link*.

From: Erin Engman <<u>eengman@tualatin.gov</u>>
Sent: Wednesday, July 26, 2023 9:09 AM
To: Vogel, Blakely <<u>Blakely.Vogel@MillerNash.com</u>>
Cc: Steve Koper <<u>skoper@tualatin.gov</u>>; Lindsey Hagerman <<u>lhagerman@tualatin.gov</u>>
Subject: RE: PRE23-0002 9700 SW TUALATIN RD

[EXTERNAL MESSAGE: This email originated from outside of the firm. Do not click links or open attachments unless you recognize the sender and know the content is safe.]

Hi Blakely-

Thanks for checking in the map amendment. We recently had a residential plan map amendment go before council that was controversial to some community members, so that may explain the interest in your application.

And since it sounds like the proposal hasn't changed and that you may not have any additional questions on the plan map amendment process, then this email conversation could suffice as the follow-up conference.

Hope your week is going well,

Erin Engman, AICP

Senior Planner City of Tualatin | Planning Division 503.691.3024 | www.tualatinoregon.gov

From: Vogel, Blakely <<u>Blakely.Vogel@MillerNash.com</u>>
Sent: Thursday, July 20, 2023 3:28 PM
To: Erin Engman <<u>eengman@tualatin.gov</u>>
Cc: Steve Koper <<u>skoper@tualatin.gov</u>>; Lindsey Hagerman <<u>lhagerman@tualatin.gov</u>>
Subject: RE: PRE23-0002 9700 SW TUALATIN RD

Erin,

Apologies for the gap in communications, but this project is moving along. We recently had a public meeting about the plan map amendment that went well (though a surprising number of people showed up despite the limited subject matter).

There was a miscommunication between us and the surveyor, and it looks like we're a few months out from a full survey. This pushes us past the time period by which an application must be submitted for a map amendment after a pre-application meeting, which by my understanding would be August 8, 2023. (TDC 32.110(6)(a)). Unless we can get the surveyor in gear, is there a way to avoid needing a second pre-application conference? The project has not changed in the least.

Hope all are well.

Best, Blake

Blakely Vogel Attorney

Miller Nash LLP US Bancorp Tower | 111 SW Fifth Ave, Ste 3400 | Portland, OR 97204 Direct: 503.205.2506 | Office: 503.224.5858 Email | Insights | Website

Our attorneys regularly offer insights to address the challenges faced by our clients. To visit the Miller Nash industry-focused blog overview page on our updated website: <u>please click this link</u>.

From: Erin Engman <<u>eengman@tualatin.gov</u>>
Sent: Wednesday, April 26, 2023 12:08 PM
To: Vogel, Blakely <<u>Blakely.Vogel@MillerNash.com</u>>; Rasmussen, William <<u>william.rasmussen@millernash.com</u>>; Cc: Steve Koper <<u>skoper@tualatin.gov</u>>; Lindsey Hagerman <<u>lhagerman@tualatin.gov</u>>
Subject: RE: PRE23-0002 9700 SW TUALATIN RD

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Hi Blakely-

Thank you for reaching out with your questions. For the property line adjustment submittal, I would suggest referring to <u>Tualatin Development Code 36.100</u>. You'll want to submit narrative statements to address (4) Approval Criteria.

I would also recommend paying close attention to criteria (4)(b): (b)The property line adjustment will not create nonconforming units of land or nonconforming development, or increase the degree of nonconformity in existing units of land or existing development

For more information on what may constitute a Nonconforming Situation, please refer to TDC <u>Chapter 35</u>. Development standards for the industrial property that is zoned Light Manufacturing is found in <u>Chapter 60</u>, and for the mobile home park property zoned Medium-Low Density is found in <u>Chapter 41</u> and <u>Chapter 34.500</u>.

Please let me know if other questions arise along the way,

Erin Engman, AICP Senior Planner City of Tualatin | Planning Division 503.691.3024 | www.tualatinoregon.gov

From: Vogel, Blakely <<u>Blakely.Vogel@MillerNash.com</u>>
Sent: Tuesday, April 25, 2023 4:49 PM
To: Erin Engman <<u>eengman@tualatin.gov</u>>; Rasmussen, William <<u>william.rasmussen@millernash.com</u>>
Cc: Steve Koper <<u>skoper@tualatin.gov</u>>; Lindsey Hagerman <<u>lhagerman@tualatin.gov</u>>
Subject: RE: PRE23-0002 9700 SW TUALATIN RD

Erin,

Thank you again for the notes from our pre-application meeting. Our client and the other property owner have decided to go ahead with the project and submit applications for a property line adjustment and plan map amendment.

Also, thank you for recommending the PMA 21-0001—Tualatin Heights Apartment project as an example for the map amendment project. It has been helpful so far. I also reviewed the City's planning projects and found the <u>PAR22-0002</u>_<u>23370 SW Boones Ferry Road Partition</u> project. I assume that it is a good example to work from because both partitions and property line adjustments are covered under chapter 36 of the TDC (though obviously subject to different approval criteria). Please let me know if this is not the case.

I'm sure I'll have questions as we proceed, and please let me know if there is anything you recommend we do from the outset of this process that makes life easier for everyone.

Best, Blake

Blakely Vogel Attorney

Miller Nash LLP US Bancorp Tower | 111 SW Fifth Ave, Ste 3400 | Portland, OR 97204 Direct: 503.205.2506 | Office: 503.224.5858 Email | Insights | Website Our attorneys regularly offer insights to address the challenges faced by our clients. To visit the Miller Nash industry-focused blog overview page on our updated website: <u>please click this link</u>.

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From: Erin Engman <<u>eengman@tualatin.gov</u>>
Sent: Thursday, March 30, 2023 10:33 AM
To: Rasmussen, William <<u>william.rasmussen@millernash.com</u>>; Vogel, Blakely <<u>Blakely.Vogel@MillerNash.com</u>>
Cc: Steve Koper <<u>skoper@tualatin.gov</u>>; Lindsey Hagerman <<u>lhagerman@tualatin.gov</u>>
Subject: RE: PRE23-0002 9700 SW TUALATIN RD

[EXTERNAL MESSAGE: This email originated from outside of the firm. Do not click links or open attachments unless you recognize the sender and know the content is safe.]

Hi Will and Blakely-

Hope you have been well. Please find our preapplication notes attached from our Property Line Adjustment conversation a few weeks ago.

Feel free to reach out with additional questions.

Erin Engman, AICP

Senior Planner City of Tualatin | Planning Division 503.691.3024 | <u>www.tualatinoregon.gov</u>

Exhibit G

Citizen Involvement Organization Contact Information

Vogel, Blakely

From:	Vogel, Blakely
Sent:	Tuesday, May 9, 2023 9:11 AM
То:	riverparkcio@gmail.com
Cc:	Rasmussen, William
Subject:	Notice of Property Line Adjustment
Attachments:	Map.png; Riverpark CIO Boundary, 4888-0299-1713 v.1.pdf

Dear Riverpark Community Involvement Organization Board,

As per TDC 32.140(1)(h), I am writing to you on behalf of the owners of Willow Glen Mobile Home Park, located at 9700 SW Tualatin RD, Tualatin, OR 97062 (the "**Property**"). Recent dealings with the two properties to the immediate west of the Property, 9975 and 9905 Tualatin RD, Tualatin, OR 97062, brought it to our attention that the actual property line between these properties is different than the line recorded in the City of Tualatin's Plan Map ("**Plan Map**"). As you can see in the map attached here, the Property extends further west than as drawn in the current Plan Map. Additionally, this line defines the Riverpark CIO boundary, as the additional attachment shows.

As such, we will be applying to the City of Tualatin to adjust the property line to match the actual property line between the Property and adjacent properties, and also to amend the Plan Map accordingly. No new development is needed or proposed.

Please let me know if you have any questions or would like to discuss the matter further.

Best, Blake

Letter ANSI A Landscape



February 14, 2023

City Boundary

World Transportation 💶 Planning Area Boundary

Taxlots





Maxar, Microsoft, State of Oregon GEO, Esri, HERE, IPC, TualGIS, Metro, GIG, TualGIS

City of Tualatin, Oregon Community Involvement Organizations (CIOs)







Maxar, Microsoft, State of Oregon GEO, Esri, HERE, iPC, TualGIS, Metro, GIG, TualGIS

CERTIFICATION OF SIGN POSTING



Proposal submitted as:

PMA24-0001



In addition to the requirements of TDC 32.150, the 18" x 24" sign must display the meeting date, time, and address as well as a contact phone number. A template of this sign is available at: <u>https://www.tualatinoregon.gov/planning/neighborhooddeveloper-meeting-information-packet</u>

As the applicant for the <u>Property Line Adjustment and Plan Map Amendment</u> project, I hereby certify that on this day, 4 sign(s) was/were posted on the subject properties in accordance with the requirements of the Tualatin Development Code and the Community Development Division.

Applicant's Name: <u>Benjamin Kilo, President of Life Front Communities</u> Docusigned by: (Please Print) Applicant's Signature: Buyamin kilo Applicant's Signature: United States Signature: Document Signature

_{Date:}__July 2, 2024

CERTIFICATION OF SIGN POSTING



FOR MORE INFORMATION (503) 349-7454

In addition to the requirements of TDC 32.150, the 18" x 24" sign must display the meeting date, time, and address as well as a contact phone number. A template of this sign is available at: <u>https://www.tualatinoregon.gov/planning/neighborhooddeveloper-meeting-information-packet</u>

As the applicant for the <u>Property Line Adjustment and Plan Map Amendment</u> project, I hereby certify that on this day, 4 sign(s) was/were posted on the subject properties in accordance with the requirements of the Tualatin Development Code and the Community Development Division.

Applicant's Name: <u>Benjamin Kilo, President of Life Front Communities</u> DocuSigned by: (Please Print) Applicant's Signature: Buyamin kilo

Applicant's Signature: $\underbrace{\mathcal{V}}_{\mathfrak{S}}$

Date: July 2, 2024



AFFIDAVIT OF MAILING

STATE OF OREGON)

) ss

COUNTY OF WASHINGTON)

I, Lindsey Hagerman being first duly sworn, depose and say:

day of June______, I served upon the persons shown on Exhibit A, That on the 11 attached hereto and by this reference incorporated herein, a copy of a Notice of Hearing/Application/Decision marked Exhibit B, attached hereto and by this reference incorporated herein, by mailing to them a true and correct copy of the original hereof. I further certify that the addresses reflect information received from the relevant party or agency, and that said envelopes were placed in the United States Mail at Tualatin, Oregon, prepared to receive postage administered by city staff. Posting of the notice has been completed in three public places.

Dated this 11 of, June 2024 Signature

SUBSCRIBED AND SWORN to before me this 6/11(2024)

Notary Public for Oregon

My commission expires: 10/2/2027

RE: PMA24-0001 NOTICE OF PUBLIC HEARING



Exhibit A.

TLID				
2S123BA05001				
2S123BB00501				
2S123BB90002				
2S123BD00500				
2S123BB00701				
2S123AB05200				
2S114CC07300				
2S123AB02500				
2S115DD01700				
2S114CC05700				
2S123BA70003				
2S123BA70004				
2S115DD02100				
2S123AB03400				
2S123AB12900				
2S123BA01600				
2S114CC00401				
2S123BA01500				
2S123AB01100				
2S123AB00500				
2S114CD02000				
2S123AB07300				
2S123AB04900				
2S123BA02000				
2S122AA00400				
2S114CD06700				
2S123AB05900				
2S123BA00300				
2S114CC01700				
2S114CD01501				
2S114CD03100				
2S115DD02900				
2S123AB08200				
2S114CC01400				
2S114CD02100				
2S114CD03200				
2S123AB15500				
2S114CC07700				
2S123BA90061				
2S123BC01600				
2S123BC01700				
2S114CD10700				
2S114CD06200				
2S114CC10300				
2S114CD06400				
2S114CC11400				
2S114CC02700				
2S123BA00100				
2S123BA02200				
2S114CD07100				
2S114CC02600				
2S123AB10900				
2S114CD00300				
2S114CD02700				
2S115DD02000				
2S123AR12200				
2S123AR12500				
2S123AB04800				
25120,000				
2S114CC06100				
2S114CD02800				

OWNER1

2

100TH COURT LLC 18355 SW TETON AVENUE TUALATIN OR LLC **3 J'S PROPERTIES LLC** 9620 HERMAN ROAD LLC AAA OREGON/IDAHO ABOUELSEOUD AHMED ABRAMS HOWARD R REV LIV TRUST ACHILOV ABDUMADZHID & ACHILOV GALINA ACKERMAN CLINTON ACKLEY KRISTEN & ROTTMAN ERIK A AEB PROPERTIES LLC **AEB PROPERTIES LLC** AIELLO FAMILY TRUST AIELLO DAX A **AKELLA RAVI S** ALICENNE & ALEXIS PROPERTIES LLC ALMY JOINT REV TRUST AMADOR RIGO ANCHETA ALVIN L & ANCHETA CRISTINA V ANDRADE AURELIO & ANDRADE CAITLYNN ANDUJO JOANNE E TRUST **ARASTEH NIMA** ARMS CHRISTINE J TRUST ARROYO CHRIS & ARROYO JAQUELINE CUEVAS ASCENTEC ENGINEERING LLC AYALA DAVID A & AYALA MARIE E AYYOUB KEVIN & AYYOUB ERICA BABCOCK CHRISTOPHER M & BABCOCK LINDA D BACHMAN KERI D & BACHMAN CRAIG A BAILEY MAXWELL WILLIAM BAILEY REV TRUST **BAILEY TRUST** BAILEY DAYSHA M BAKER ROSS E & LAURA E REV LIV TRUST BAKER RUTH M & BAKER WARREN EDWARD JR BAKER ALEXANDER MARK & BAKER JOEY K **BALMES LISA L TRUST BANEY JOACHIM E** BARNES WALTER A TRUST BARR FAMILY IX LLC BARR FAMILY IX LLC BARRIOS JUANITA HIDALGO & BARRIOS JESUS ALEJANDRO HIDALGO BARTEL RILEY & BARTEL MAYA BARTLETT EDWARD A & BARTLETT CONDE L BARTOS PAUL RICHARD LIV TRUST & HOWARD ARVA BASS KATHERINE LYNN **BAUGHMAN BRENDA LEE BAYNE JAMES & CANDIS JOINT TRUST BEACON HILL TRUST BECK JOHN E & BECK KIMBERLY BECKER CURTIS & BECKER CHRISTINA** BECKER KARI LYNN & BECKER CHRISTOPHER ANDREW BEECHLER LAURIE L FAMILY TRUST **BEHRENS GREGORY & BEHRENS JENNIFER BELL TAMERA J & JURCHEN STEVEN L** BENDA MICHAEL BERRY ASHLEY ELIZABETH **BETTIS SARAH S BILITZ MARTIN & BILITZ MICHAELA DANIELA** BLATT CHARLES M JR & BLATT NAOMI T BOATWRIGHT LYNDA I & BOATWRIGHT JAMES G

OWNERADDR	OWNERCITY	OWNERSTATE	OWNERZIP
5611 NE COLUMBIA BLVD	PORTLAND	OR	97218
17455 SW RIDGEVIEW LN	LAKE OSWEGO	OR	97034
10400 SW TUALATIN RD	TUALATIN	OR	97062
5611 NE COLUMBIA BLVD	PORTLAND	OR	97218
600 MARKET ST	PORTLAND	OR	97201
18688 SW 92ND TER	TUALATIN	OR	97062
7799 SW MONTCLAIR DR	PORTLAND	OR	97225
15681 SW THRASHER WAY	SHERWOOD	OR	97140
17987 SW 106TH AVE	TUALATIN	OR	97062
17961 SW 105TH CT	TUALATIN	OR	97062
21136 SW NURSERY WAY	SHERWOOD	OR	97140
21136 SW NURSERY WAY	SHERWOOD	OR	97140
10650 SW PUEBLO CT	TUALATIN	OR	97062
8597 SW 91ST TER	TUALATIN	OR	97062
2029 CHANNING WAY, #4C	BERKELEY	CA	94704
17865 SW PACIFIC HWY APT # B202	TUALATIN	OR	97062
17830 SW SHASTA TRL	TUALATIN	OR	97062
18195 SW SHAWNEE TRAIL	TUALATIN	OR	97062
18648 SW 91ST TER	TUALATIN	OR	97062
18592 SW 91ST TER	TUALATIN	OR	97062
17940 SW CHEYENNE WAY	TUALATIN	OR	97062
9260 SW CASCARA LN	TUALATIN	OR	97062
2521 BEACON HILL DR	WEST LINN	OR	97068
18090 SW CHEYENNE WAY	TUALATIN	OR	97062
18500 SW 108TH AVE	TUALATIN	OR	97062
17840 SW CHIPPEWA TRAIL	TUALATIN	OR	97062
9235 SW TANOAK LN	TUALATIN	OR	97062
18110 SW SHAWNEE TRAIL	TUALATIN	OR	97062
17765 SW SHASTA TRL	TUALATIN	OR	97062
17875 SW SHAWNEE TRL	TUALATIN	OR	97062
17965 SW CHEYENNE WAY	TUALATIN	OR	97062
17971 SW 106TH AVE	TUALATIN	OR	97062
9217 SW CASCARA LN	TUALATIN	OR	97062
17300 SW 107TH AVE	TUALATIN	OR	97062
17910 SW CHEYENNE WAY	TUALATIN	OR	97062
17935 SW CHEYENNE WAY	TUALATIN	OR	97062
9097 SW SWEEK DR	TUALATIN	OR	97062
PO BOX 3474	PORTLAND	OR	97208
PO BOX 68288	OAK GROVE	OR	97268
3455 W FIRST AVE	EUGENE	OR	97402
3455 W FIRST AVE	EUGENE	OR	97402
17860 SW SIOUX CT	TUALATIN	OR	97062
9885 SW PAWNEE PATH	TUALATIN	OR	97062
10200 SW ANDERSON CT	TUALATIN	OR	97062
17750 SW CHIPPEWA TRL	TUALATIN	OR	97062
10200 SW WASCO WAY	TUALATIN	OR	97062
17890 SW YAQUINA CT	TUALATIN	OR	97062
18170 SW SHAWNEE TRL	TUALATIN	OR	97062
37620 SE HIDDEN FALLS RD	WASHOUGAL	WA	98671
17865 SW CHIPPEWA TRAIL	TUALATIN	OR	97062
17870 SW YAQUINA CT	TUALATIN	OR	97062
8039 GABRIELS CT	JESSUP	MD	20794
17900 SW SHAWNEE TRL	TUALATIN	OR	97062
17655 SW SHAWNEE TRL	TUALATIN	OR	97062
10644 SW PUEBLO ST	TUALATIN	OR	97062
18615 SW 93RD TER	TUALATIN	OR	97062
1399 9TH AVE #219	SAN DIEGO	CA	92101
18640 SW 92ND TER	TUALATIN	OR	97062
10479 SW PUEBLO ST	TUALATIN	OR	97062
17897 SW 105TH CT	TUALATIN	OR	97062
17635 SW SHAWNEE TRL	TUALATIN	OR	97062
2S123AB10700 2S114CC07000 2S123AB06000 2S123BD00200 2S114CD01800 2S114CD02400 2S123BA90000 2S114CD00201 2S114CD10200 2S123AB01400 2S123AB13800 2S123BA01800 2S123BB00100 2S123AB01300 2S114CC10200 2S114CD02500 2S123BA80000 2S123AB05800 2S123BA00701 2S115DD01800 2S123B000600 2S123BB00400 2S114CC01600 2S114CD00800 2S115DD02500 2S114CC06700 2S123BA90051 2S114CC11200 2S123AB03000 2S123AB02900 2S114CD10300 2S114CD00100 2S114CC04500 2S114CC04600 2S115DD01400 2S114CC01300 2S123BA90011 2S123AB15600 2S114CC10400 2S114CC02800 2S114CC05500 2S123BA01100 2S123BA03401 2S123AB10100 2S114CC10700 2S123AB10800 2S123AB01700 2S114CD09600 2S114CC10100 2S123BA03400 2S123AB04400 2S123BA02300 2S123BC01500 2S115DD02300 2S114CD10500 2S123AB10600 2S123AB06300 2S114CC03801 2S123AB02400 2S123BA70001 2S123BA70002 2S123AB03200

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BOLAND CODY BORTHWICK MELODY **BOULEY JASON CHRISTOPHER & BOULEY MELINDA A** BOWLSBY/MCCORD ENTERPRISES LLC BRADEN JOHN B & BRADEN BRENDA L BREWSTER-FUJI JANELLE L BRIAN PARK CONDOMINIUM OWNERS OF UNITS **BRITTON CHARLES A & BRITTON GENEE M BRITTON JEFFREY T & BRITTON CHARLENE A BROCKMANN FRED & BROCKMANN ANNALISA** BRUCE ROBERT A **BRYANT ROBERT C & BRYANT CHRISTINE R BUDIHAS ROBERT J REV TRUST** BUTTERCREEK FARM LLC CADY RICHARD & CHANTE REGINA CARRASCO TONI REV LIV TRUST CEDARWOOD CONDOS OWNERS OF UNITS CHADWICK KATHLEEN M CHAFF DAVID A CHALFAN TRUST CHAMBERLAIN HUSSA PROPERTIES CHAMBERLAIN PARTNERS LLC CHAPMAN PAUL G & CHAPMAN VALERIE D **CHEEK JOSEPH & CHEEK TERRA** CLARK DAVID A & CLARK CATHERINE M CODINO VAL H & CODINO LOIS D COHEN MARY **COLE NORMAN & COLE DEBORAH COLEMAN AISHA & COLEMAN JAMES** COOK SHAWNA MICHELLE COOPER ZACHARY RYAN CORRIGAN MAXINE **CRALL RICHARD F & CRALL BARBARA CRALL RICHARD F & CRALL BARBARA M CRALL RICHARD F & CRALL BARBARA M** CRISP STANLEY D **CRIST KELLY & CRIST MARGARET CURL SPENCER & CURL SARAH** CURTIS LYNNE GERETTE TRUST **DANESHI ALI & EMADI PARASTOO** DEAVILLE CASEY D DECKER JAY E REV TRUST & CARLSON SUSAN K REV TRUST & JACKSON ZEPHRINE C ESTAT **DEJAGER JOHN & CYNTHIA FAMILY TRUST** DEMISSE TEREFE **DENNIS AUSTIN & DENNIS LAUREN E** DEPAOLIS KATE E **DESANTIS DANIEL DOMINIC & MILLER KATHERINE ADELE** DEVERS CHRISTOPHER J & DEVERS KIM L **DEVLIN ELIZA YEUNG & DEVLIN RICHARD DICKIE SARAH CORREA & DICKIE JOSHUA DING XIAOHONG DIXON LARRY D & DIXON ALICE E** DJI INVESTMENT LLC DONAUGH ANTHONY M & DONAUGH CHRISTI S DOUGHTY RICHARD D & DREW-DOUGHTY SHIELA LYNN DOUGLASS L DOVER CONNIE DULIERE JEFFREY L & DULIERE MARCELINA G DULING ISAAC PATRICK EASTBOUND PROPERTIES LLC EASTBOUND PROPERTIES LLC EASTERLY CHRISTINE LYNN

9222 SW/ SWEEK DR	τι ίδι δτινι	OR	97062
			07062
			97002
		UR	97062
9730 SW HERMAN RD		OR	97062
17965 SW SHAWNEE TRL	TUALATIN	OR	97062
17820 SW CHEYENNE WAY	TUALATIN	OR	97062
		OR	00000
17930 SW SHAWNEE TRL	TUALATIN	OR	97062
10955 SW EVANS CT	TUALATIN	OR	97062
9231 SW SWEEK DR	TUALATIN	OR	97062
18150 SW CHEYENNE WAY	TUALATIN	OR	97062
18175 SW 100TH CT	TUALATIN	OR	97062
23325 SW STAFFORD RD	TUALATIN	OR	97062
10230 SW ANDERSON CT	TUALATIN	OR	97062
17790 SW CHEYENNE WAY	TUALATIN	OR	97062
		OR	00000
9227 SW TANOAK I N	τι ίδι δτινι	OR	97062
		OR	97002
		OR	07035
			07060
			97002
			97062
17805 SW SHASTA TRL		OR	97062
17750 SW SHAWNEE TRL		OR	97062
10639 SW PUEBLO CT	TUALATIN	OR	97062
17962 SW 1051H CT	TUALATIN	OR	97062
9768 SW TUALATIN RD	TUALATIN	OR	97062
10270 SW WASCO WAY	TUALATIN	OR	97062
18635 SW 91ST TER	TUALATIN	OR	97062
18643 SW 91ST TER	TUALATIN	OR	97062
17875 SW SIOUX CT	TUALATIN	OR	97062
17960 SW SHAWNEE TRL	TUALATIN	OR	97062
10055 SW WASCO WAY	TUALATIN	OR	97062
10055 SW WASCO WAY	TUALATIN	OR	97062
10055 SW WASCO WAY	TUALATIN	OR	97062
17865 SW SHASTA TRL	TUALATIN	OR	97062
9784 SW TUALATIN RD	TUALATIN	OR	97062
9089 SW SWEEK DR	TUALATIN	OR	97062
10215 SW ANDERSON CT	TUALATIN	OR	97062
17920 SW YAQUINA CT	TUALATIN	OR	97062
17970 SW 105TH CT	TUALATIN	OR	97062
18075 SW SHAWNEE TRL	TUALATIN	OR	97062
18926 INDIAN SPRINGS CIR	LAKE OSWEGO	OR	97035
15885 SW SERENA CT	TIGARD	OR	97224
10250 SW LADD CT	TUALATIN	OR	97062
9216 SW SWEEK DR	TUALATIN	OR	97062
18704 SW 91ST TER	TUALATIN	OR	97062
17925 SW CHIPPEWA TRI	TUALATIN	OR	97062
10290 SW ANDERSON CT		OR	97062
18025 SW CHEVENNE WAY		OR	97062
19240 MEGLY CT	LAKE OSWEGO	OR	97034
18000 SW/ CHEVENNE WAY		OR	97062
10100 SW/ HERMAN RD		OR	97062
		OR	97002
			07062
17040 3W SIUUA UT 0224 SIM SIMEEK DD			91002 07060
			97002
			91002
			97062
			97062
32019 NE CORRAL CREEK RD	NEWBERG	UK	9/132
32019 NE CORRAL CREEK RD	NEWBERG	OK	9/132
18611 SW 91ST LER	TUALATIN	UK	97062

2S123AB09300 2S123BA00900 2S123AB15300 2S123BA00700 2S114CD09500 2S123BA00500 2S114CD11100 2S123AB02700 2S123AB06500 2S123AB04200 2S123BA90022 2S114CC02900 2S123BA01900 2S123AB13200 2S123BC00700 2S123AB14900 2S123BA01400 2S114CC00600 2S114CD03400 2S123AB05500 2S115DD02700 2S123AB08500 2S114CD07400 2S114CC05800 2S114CD09400 2S123AB08000 2S123BA90012 2S123BA80001 2S123BA90031 2S114CC01200 2S114CC10900 2S114CC05400 2S114CC03300 2S114CD00500 2S123BA04601 2S123AB01800 2S123AB10000 2S123AB12300 2S123AB11200 2S114CC10500 2S123AB13000 2S123AB12700 2S123AB10200 2S122AA00100 2S115DD01900 2S115DD02400 2S123AB10500 2S114CC11700 2S114CD03700 2S114CD03001 2S114CD03300 2S114CC07500 2S123AB06600 2S123AB14000 2S123AB08300 2S114CD02900 2S114CD00400 2S123AB09200 2S123AB06100 2S123AB01000 2S114CC03500 2S123AB09100

7

EDWARDS BRYAN C & ROCHELLE-STEPHENS TAYLOR T **ELTINGE BARBARA A TRUST** EMBREE DOUGLAS S & EMBREE JESSICA D ESTES BETTY RAE TRUST **EVANSTEIN MARC & EVANSTEIN EMILY** FAZZOLARI STEVEN J & FAZZOLARI CHRISTINE L FERNANDEZ KASEY & FERNANDEZ MICHAEL FERRY MICHELLE ANN FOLEY KRISTA FOX KAREN RAE PERL TRUST FREDRICKSON BRIAN & FREDRICKSON ROSELYN FREGOSO OMAR FROST FAMILY LIV TRUST **FRY JENNIFER LYNN** FUENTE ROSE LLC GARD VALERIE GAIL GARDEN CAROL LIV TRUST **GARZA DANIEL & GARZA BRIDGETTE GETAHUN AZEB & BIZUNEH SAMUEL** GILBERT GAIL D **GIRDNER DOUGLAS R & GIRDNER SANDRA L GLADIS DEBORAH GODOWSKI KAZ** GONZALEZ JULIE A REV TRUST GONZALEZ RAUL GOOD ANNETTA FAYE & GOOD MARLIN RAY GOODING ELISA **GRAHAM ALLAN B TRUST GRAHAM KATHLEEN J REV LIV TRUST GROMLICH ALAN ROBERT & SIEGLINDE H TORRES-ORTIZ REV LIV TRUST GROVER BLAIN A & GROVER LAURA M GUY CARRIE & GUY TIMOTHY M** HACKETT LIV TRUST HAGER LORRAINE M TRUST HALL DAVE & LINDA TRUST HAMPTON ALEC IRWIN & REED MICHAEL DANIELLE HANCOCK ELIZABETH N HANSELL JULIE L HARKLESS MYCHAL SEAN & ARAIZA ERIKA Y HARNEW WARREN LIVING TRUST HARRISON PAMELA K HEATH NATHAN F & HEATH CHELSEA R HELLBERG JENNIFER A HELSER LLC HELTNESS ERIC TODD & HELTNESS CHERYL LYNN HEMANN MAURA A REV LIV TRUST HENNINGER DANA HERROLD WILLIAM N REV LIV TRUST & HERROLD MARILYN R REV LIV TRUST & HERROLD * HILGEFORT BRANDELYN HILL RANDALL M & GEIGER ROWENA A HILL ROBERT E & HILL DANA L HILLIARD DAVID M & DRAPER ELIZABETH L HINES TIMOTHY G & HINES MISTY D HOENER KYLAN C & HOENER JOHANNA HOLMES MCKENNA & HOLMES WILLIAM N HOUCK CLARENCE ELLSWORTH REV TRUST & HOUCK MARGARET ANN REV TRUST HOUGHTON MICHAEL D HOWELL MARCELLA A HSU GRACE S REV TRUST HUDDLESON HOLLY HULL RENELL B HUNT NICHOLAS ALLEN & HUNT GLADYS JESSENIA

9297 SW CASCARA I N	τυαι άτιν	OR	97062
18015 SW SHAWNEE TRI		OR	97062
9115 SW SWEEK DR		OR	97062
17070 SW/ SHAWNEE TRI		OR	07062
			07062
		OR	97002
18050 SW SHAWNEE TRL		OR	97062
		OR	97062
18655 SVV 91ST TER	TUALATIN	OR	97062
9289 SW TANOAK LN	TUALATIN	OR	97062
18590 SW 92ND TER	TUALATIN	OR	97062
9778 SW TUALATIN RD	TUALATIN	OR	97062
17930 SW YAQUINA CT	TUALATIN	OR	97062
18120 SW CHEYENNE WAY	TUALATIN	OR	97062
9285 SW SWEEK DR	TUALATIN	OR	97062
33120 NE LESLEY RD	NEWBERG	OR	97132
9157 SW SWEEK DR	TUALATIN	OR	97062
7871 SW PONDEROSA DR	SANDY	UT	84094
6855 SW NYBERG ST UNIT #J102	TUALATIN	OR	97062
17875 SW CHEYENNE WAY	TUALATIN	OR	97062
18716 SW 92ND TER	TUALATIN	OR	97062
10623 SW PUEBLO CT	TUALATIN	OR	97062
9237 SW CASCARA LN	TUALATIN	OR	97062
17775 SW CHIPPEWA TRAIL	TUALATIN	OR	97062
17565 SW 110TH AVE		OR	97062
17960 SW CHIPPEWA TRI		OR	97062
9214 SW CASCARA I N		OR	97062
9782 SW THALATIN RD		OR	97062
		OR	07062
		OR	97002
		OR	07002
		OR	97000
			97002
		OR	97002
		OR	97062
17640 SVV SHAWINEE TRAIL		OR	97062
10135 SE 222ND DR		OR	97089
18718 SW 9151 TER		OR	97062
		OR	97062
18601 SW 93RD TER		OR	97062
18707 SW 93RD TER	TUALATIN	OR	97062
10275 SW ANDERSON CT	TUALATIN	OR	97062
3619 RINKES CI	NEWBERG	OR	9/132
18565 SW 93RD TER	TUALATIN	OR	97062
PO BOX 1448	TUALATIN	OR	97062
PO BOX 1569	TUALATIN	OR	97062
10632 SW PUEBLO CT	TUALATIN	OR	97062
10645 SW PUEBLO CT	TUALATIN	OR	97062
9230 SW SWEEK DR	TUALATIN	OR	97062
10285 SW WASCO WAY	TUALATIN	OR	97062
9710 SW PAWNEE PATH	TUALATIN	OR	97062
17995 SW CHEYENNE WAY	TUALATIN	OR	97062
17905 SW CHEYENNE WAY	TUALATIN	OR	97062
10316 SW PUEBLO ST	TUALATIN	OR	97062
9293 SW TANOAK LN	TUALATIN	OR	97062
9223 SW SWEEK DR	TUALATIN	OR	97062
9225 SW CASCARA LN	TUALATIN	OR	97062
17730 SW CHEYENNE WAY	TUALATIN	OR	97062
17870 SW SHAWNEE TRL	TUALATIN	OR	97062
9291 SW CASCARA LN	TUALATIN	OR	97062
2876 EMERSON ST	PALO ALTO	CA	94306
18640 SW 91ST TER	TUALATIN	OR	97062
17835 SW YAQUINA CT	TUALATIN	OR	97062
9283 SW CASCARA LN	TUALATIN	OR	97062

2S114CC07100 2S123BD00700 2S114CD01000 2S123BA00600 2S115DD01100 2S123AB08800 2S123BC00600 2S123BA01000 2S114CC03400 2S123AB03800 2S123AB10400 2S114CD01700 2S123AB00900 2S123B000701 2S123AB05100 2S123AB01900 2S123BA04800 2S123BA00200 2S114CC02400 2S123BA04901 2S114CD00600 2S114CD09800 2S115DD03000 2S114CC02300 2S114CD10601 2S123BA90052 2S114CC03900 2S114CC02100 2S115DD00900 2S123BA01200 2S123AB03100 2S123AB07500 2S123AB06400 2S123BA01300 2S114CD06900 2S114CC00800 2S114CD07300 2S123AB07000 2S123AB12400 2S123AB09600 2S123AB05000 2S123AB00200 2S123AB14400 2S123AB16100 2S123BA03200 2S123AB03500 2S114CC01500 2S123AB11800 2S123AB13100 2S123AB00600 2S114CC05600 2S123BA80006 2S123BA02800 2S114CC05900 2S123BA02900 2S123BA03100 2S123BA05500 2S122AA00700 2S123AB06800 2S114CD02300 2S115DD03200 2S114CC11300

Mailing List_Tracts_1_2_3

HURDLE FAMILY REV TRUST ICHOR SYSTEMS INC **INGRAM NICOLE G & BLACK JEREMY AARON ISHAM RODERICK S & ISHAM EILEEN O JAGODNIK BRIAN & JAGODNIK LAUREN** JIMENEZ JUANITA MARIA JKLM INVESTMENT COMPANY LLC JOHANSON PHILLIP D & JOHANSON CAROL L JOHNSON K DALE & WALRATH BARBARA A JOHNSON BRITTNEY C JONES TYLER & MINOR COURTNEY JPMC GERMOND TRUST JUAREZ RIGOBERTO Z KAI USA LTD KAILIULI JESSICA L KALAMARIS ALISSA M KARIMI ENTERPRISES LLC KASH FLORENCE REV LIV TRUST **KASPRICK ALEXANDRA & ODEGAARD LEONARD** KEISTER MATTHEW K REV TRUST & KEISTER HEATHER L REV TRUST **KEYSER CARY A & KEYSER KATHLEEN E KILLINGER STEVEN W & KILLINGER APRIL** KINDRED LYLE V & KINDRED ELAINE A KING MICHELE R KINNAN ROBERT W TRUST **KIRKPATRICK JANE & KRINKE LINDSAY E** KISER MICHAEL D & KISER AMBER N KISH KIRSTEN SANDSTROM KNAPKE STEVEN J & KNAPKE LIEN K **KOPETSKI COLIN JAMES & KOPETSKI ARLENE ABES** KRUGER LISABETH CORSON KUSKE SONJA LANMAN KATHLEEN LAW ROGER W LAZOFF GREGG A & LAZOFF MICHELLE F LEE KADENCE ROBERT & LEE REMINGTON A LEIGHS INVESTMENTS #3 LLC LEMERY JAMES M LEPAIGE LOREEN RENE LEWIS MILES LI QINGYU & SHEN DONGLAN LIBERTY OAKS HOA LIBERTY OAKS INVESTMENTS LLC LIBERTY OAKS HOA LIFE FRONT 2 LLC LIN YING LINVILLE JAMES M & LINVILLE MARCIA T LIPPY SIRI LITERA GEORGE J LLOYD JACK W & ST MARIE JUNE B LOANZON EMMELINE V TRUST LOMBOS ALLAN JIM & LOMBOS SHERILY LAROSE LONDON POINTE LLC LONGTIN DAVID E JR LU QBF II LLC LU QBF II LLC LU QBF LLC LUMBER FAMILY CO LLC LUNDGREEN BETH MACKEY ELLEN JEAN MACMILLEN JAMES WILSON & MACMILLEN DONNA JEAN MADLAND RONALD P & MADLAND PU CHUN

15927 SE LARK AVE	MILWAUKIE	OR	97267
9660 SW HERMAN RD	TUALATIN	OR	97062
17725 SW SHAWNEE TRL	TUALATIN	OR	97062
18020 SW SHAWNEE TRL	TUALATIN	OR	97062
10536 SW PUEBLO ST	TUALATIN	OR	97062
9257 SW CASCARA LN	TUALATIN	OR	97062
18880 SW TETON AVE	TUALATIN	OR	97062
18045 SW SHAWNEE TRL	TUALATIN	OR	97062
17865 SW YAQUINA CT	TUALATIN	OR	97062
18550 SW 92ND TER	TUALATIN	OR	97062
9236 SW SWEEK DR	TUALATIN	OR	97062
17935 SW SHAWNEE TRL	TUALATIN	OR	97062
18634 SW 91ST TER	TUALATIN	OR	97062
18600 SW TETON AVE	TUALATIN	OR	97062
18674 SW 92ND TER	TUALATIN	OR	97062
19304 SW 55TH CT	TUALATIN	OR	97062
27599 SW MOUNTAIN RD	WEST LINN	OR	97068
18140 SW SHAWNEE TRL	TUALATIN	OR	97062
17810 SW YAQUINA CT	TUALATIN	OR	97062
17485 SW 107TH AVE	TUALATIN	OR	97062
17810 SW SHAWNEE TRL	TUALATIN	OR	97062
17965 SW SIOUX CT	TUALATIN	OR	97062
17968 SW 106TH AVE	TUALATIN	OR	97062
17780 SW YAQUINA CT	TUALATIN	OR	97062
17850 SW SIOUX CT	TUALATIN	OR	97062
8170 SW VLAHOS DR #215	WILSONVILLE	OR	97070
17715 SW YAQUINA CT	TUALATIN	OR	97062
17720 SW YAQUINA CT	TUALATIN	OR	97062
17997 SW 105TH CT	TUALATIN	OR	97062
18105 SW SHAWNEE TRL	TUALATIN	OR	97062
18627 SW 91ST TER	TUALATIN	OR	97062
8397 SW DURHAM LN	TIGARD	OR	97224
9277 SW TANOAK LN	TUALATIN	OR	97062
18135 SW SHAWNEE IRL	TUALATIN	OR	97062
17900 SW CHIPPEWA TRL		OR	97062
17930 SW SHASTA TRL		OR	97062
9531 SW SILETZ DR		OR	97062
		OR	97062
18593 SW 93RD TER		OR	97062
		OR	97062
		OR	97229
		OR	91239
A386 SW/ MACADAM AV/E STE 102		OR	97003-2330
			97239
		OR	97213
		OR	97062
18647 SW 93RD TER		OR	97062
9287 SW SWEEK DR		OR	97062
18604 SW 91ST TER		OR	97062
17994 SW 105TH CT		OR	97062
9735 SW TUALATIN RD		OR	97062
7831 SELAKE RD	PORTI AND	OR	97267
17929 SW 105TH CT	TUALATIN	OR	97062
PO BOX 483	TUALATIN	OR	97062
PO BOX 483	TUALATIN	OR	97062
PO BOX 483	TUALATIN	OR	97062
PO BOX 1427	TUALATIN	OR	97062
9298 SW CASCARA LN	TUALATIN	OR	97062
17850 SW CHEYENNE WAY	TUALATIN	OR	97062
10547 SW PUEBLO ST	TUALATIN	OR	97062
10240 SW WASCO WAY	TUALATIN	OR	97062

2S123AB07400 2S115DD01500 2S123AB07900 2S114CC06500 2S123BA04200 2S123BB00600 2S123BB01000 2S123BB01101 2S123AB07700 2S123AB08900 2S123BA02403 2S123AB13600 2S123AB15100 2S114CD02600 2S115DD01200 2S123AB09500 2S123AB13300 2S114CD07201 2S123AB06900 2S123BC00300 2S123AB14800 2S123AB08600 2S114CD10800 2S114CD07001 2S114CC06400 2S123AB12800 2S114CC06600 2S114CC04200 2S123AB15400 2S123BA03500 2S123AB04600 2S114CC00300 2S114CD07500 2S123BA80005 2S114CC07900 2S114CC08000 2S123BA04700 2S123BD00300 2S123AB14700 2S123AB09900 2S123AB02300 2S123BA04300 2S114CC01000 2S123BA70000 2S123AB03300 2S123AB01500 2S123AB00800 2S123BD01000 2S123AB07800 2S123BA90042 2S114CC00900 2S123BC01300 2S123BD00600 2S123AB11100 2S114CC06300 2S114CC07400 2S123AB09000 2S114CC06800 2S114CC07800 2S114CD02200 2S114CC02200 2S123BA04000

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MADSEN CHRIS & MICHELLE TRUST MAGILKE GILBERT & MAGILKE GAIL L MAGINNIS THOMAS DAVID & MAGINNIS ASHLEY CATHERINE MALETA SANDRA L & MALETA GREGORY B MANOUGIAN RYAN & MCVITTIE NICOLE MARKS 18200 LCC MARKS 18400 LLC MARKS 18400 LLC MARSTON JEFFREY C MASEDA HALEY M & MASEDA JOHN J MAYES DEBORAH P & MAYES CURTIS R MAZELIN TAMARA SU & MAZELIN CURTIS AULDWIN MCCLAIN SCOTT MCCLURE FAMILY TRUST MCCURTAIN LIV TRUST MCDONALD CASSIE A & MCDONALD ROBERT A MCNEIL SIERRA LEE MEARS SAMUEL JACK & MEARS CLAIRE BETH MILLER PETER R JR MJMARK LLC & MARK PROPERTIES LP MOORE MARCIA & MOORE CASEY MORALES ROGELIO GUINTO & ALEMAN MARTHA RAMIREZ & CAMPUSANO LUIS MIGUEL MORAN AMY L MORO PETER & MORO PATRICIA M MORRISSEY FAMILY TRUST MORSE LAUREN M & SHIMADA SEAN Y MOWERY DANA KAY MULLER ROBERT & MULLER PAMELA MULLEN PATRICK M MURPHY KATHLEEN M MURRELL STEPHEN M & MURRELL ELIZABETH JEAN MYERS FAMILY TRUST NAUMOV BORIS NELSON CHRISTOPHER T & NELSON GARY R & NELSON PATSY A **NEUMANN DANIEL & NEUMANN SYDNEY** NGUYEN HONG T & TRI VINH V NICHUALS VARONIKA NIEMEYER JOHN E & MEADER JEFFREY W NORRIS MICHELLE K O'DONNELL KATIE OGLES KADEN & OGLES MADISON & OGLES MELINDA OGORZALY REGINA A **OLIVER CARMEN LEANN** ONE HUNDREDTH COURT INDUSTRIAL CONDO UNIT OWNERS **O'NEILL ELAINE A REV TRUST ONSAGER PER & ONSAGER PHOENIX S ORANGE STAR PROPERTIES LLC OREGON SANDBLASTING & COATING INC ORR CAITLIN ELIZABETH** OUBRE STEVEN J & OUBRE CINDY L & OUBRE NICHOLAS J **OVERTON DAVID M & OVERTON ALLYSON** PACIFIC PARTNER WAREHOUSE LLC PACIFIC STATES INDUSTRIAL PARK OWNERS OF ALL LOTS PARADIS CHERYL PARK KRISTEN PARKER DAVID SCOTT & CAVALLO KIMBERLY G PATTERSON STEPHEN M & PATTERSON KATHLEEN GREENE PENNIMAN STEVEN K & PHYLLIS D REV LIV TRUST PENSADO ERNESTO & ALVARENGA NALLY M PERMAN KEVIN L & MARLYN J LIV TRUST PERONA STEPHEN & PERONA MEGAN PHILLIPS JOHN C & PHILLIPS JANET P

		CA	02056
		OP	92030
		OR	07062
			97002
			97002
10230 SVV SHAWINEE IKL			97062
		OR	97062
		OR	97062
18200 SW TETON AVE	TUALATIN	OR	97062
9234 SW CASCARA LN	TUALATIN	OR	97062
9265 SW CASCARA LN	TUALATIN	OR	97062
18270 SW CHEYENNE WAY	TUALATIN	OR	97062
9247 SW SWEEK DR	TUALATIN	OR	97062
9133 SW SWEEK DR	TUALATIN	OR	97062
17760 SW CHEYENNE WAY	TUALATIN	OR	97062
10560 SW PUEBLO ST	TUALATIN	OR	97062
9296 SW SWEEK DR	TUALATIN	OR	97062
9273 SW SWEEK DR	TUALATIN	OR	97062
17835 SW CHIPPEWA TRL	TUALATIN	OR	97062
9294 SW CASCARA LN	TUALATIN	OR	97062
111 SW COLUMBIA ST STE 1380	PORTLAND	OR	97201
955 NW HIGHLAND TER	CORVALLIS	OR	97330
9241 SW CASCARA LN	TUALATIN	OR	97062
17870 SW SIOUX CT	TUALATIN	OR	97062
12610 NE 59TH AVE	VANCOUVER	WA	98686
17924 SW 105TH CT	TUALATIN	OR	97062
18551 SW 93RD TER	TUALATIN	OR	97062
17948 SW 105TH CT	TUALATIN	OR	97062
10175 SW WASCO WAY	TUALATIN	OR	97062
9101 SW SWEEK DR	TUALATIN	OR	97062
18085 SW CHEYENNE WAY	TUALATIN	OR	97062
18634 SW 92ND TER	TUALATIN	OR	97062
17810 SW SHASTA TRL	TUALATIN	OR	97062
19679 WILDWOOD DR	WEST LINN	OR	97068
9733 SW TUALATIN RD	TUALATIN	OR	97062
10412 SW PUEBLO ST	TUALATIN	OR	97062
10444 SW PUEBLO ST	TUALATIN	OR	97062
18195 SW CHEYENNE WAY	TUALATIN	OR	97062
15 82ND DR STE 210	GLADSTONE	OR	97027
9171 SW SWEEK DR	TUALATIN	OR	97062
9272 SW SWEEK DR	TUALATIN	OR	97062
18697 SW 91ST TER	TUALATIN	OR	97062
18250 SW SHAWNEE TRAIL	TUALATIN	OR	97062
17955 SW SHASTA TRL	TUALATIN	OR	97062
		OR	00000
PO BOX 1755	LAKE GROVE	OR	97035
18686 SW 91ST TER	TUALATIN	OR	97062
4931 SW 76TH AVE #367	PORTLAND	OR	97225
PO BOX 1171	TUALATIN	OR	97062
PO BOX 2876	OREGON CITY	OR	97045
9770 SW TUALATIN RD	TUALATIN	OR	97062
17960 SW SHASTA TRL	TUALATIN	OR	97062
PO BOX 2034	LAKE OSWEGO	OR	97035
		OR	00000
18715 SW 93RD TER	TUALATIN	OR	97062
17902 SW 105TH CT	TUALATIN	OR	97062
10301 SW PUEBLO ST	TUALATIN	OR	97062
9279 SW CASCARA LN	TUALATIN	OR	97062
8374 VEREDA DEL PADRE	GOLETA	CA	93117
10380 SW PUEBLO ST	TUALATIN	OR	97062
17880 SW CHEYENNE WAY	TUALATIN	OR	97062
17750 SW YAQUINA CT	TUALATIN	OR	97062
18190 SW SHAWNEE TRAIL	TUALATIN	OR	97062

2S114CC03000 2S123AB08100 2S114CC01900 2S123BD01100 2S115DD01600 2S114CC11100 2S114CC00700 2S114CC06200 2S123BC01200 2S123BA90041 2S123AB05300 2S114CC05300 2S123BA02600 2S123AB07100 2S123AB08400 2S123BA02405 2S123BA04100 2S114CC06000 2S123AB15000 2S115DD01300 2S123BA80002 2S123BA02100 2S123BB00200 2S123B000702 2S114CC11000 2S123AB03900 2S114CD01600 2S123AB04500 2S114CC04300 2S123AB00700 2S114CD10100 2S123BA04500 2S114CC02500 2S115DD03300 2S123AB09800 2S123AB07600 2S115DD02800 2S123AB12100 2S123AB05400 2S123AB11300 2S123BA90021 2S114CC03700 2S114CD10000 2S114CD11000 2S114CD06500 2S123AB01600 2S114CC11500 2S114CC00200 2S114CC11600 2S114CD09300 2S123AB11900 2S123AB04000 2S123AB10300 2S123AB02000 2S123AB03700 2S123AB15200 2S114CC04101 2S114CC10800 2S123BA03600 2S123BA80003 2S123AB13700 2S123AB01200

Mailing List_Tracts_1_2_3

PIKE ROBERT & PIKE GAIL PINTOS EDUARDO J & SOLORIO PATRICIA POULSON LINDA S & POULSON JEFFREY W POWDER TECH INC PR 17995 SW 106TH LLC **PUGSLEY CLAYTON & PUGSLEY JODI** PUHL FREDERIC J PUPPO MIKK PZHERMAN LLC RAE DEBRA RANSOM SCOTT PIETER RAXTER NORA SUSAN **RED DOG PROPERTIES LLC REEVES KEVIN MATTHEW REIGLE TYLER ALEXANDER & SIMONETTI LARA AGOSTINA REYNOLDS RICKY R & REYNOLDS-WEAKLAND KARI M RHOADS JOHN & RHOADS SHARON** RICHEY LELAND R & RICHEY VALERIE J FAMILY TRUST **ROBERT CYNTHIA & ROBERT DOUGLAS ROBINSON RONALD L & ROBINSON MICHELLE** RODRIGUEZ NESTOR RAFAEL ROLFE LIVING TRUST ROLLING FRITO-LAY SALES LP ROSEDALE PROPERTIES LLC ROSENBAUM BRIAN LIVING TRUST **ROSKOP JASON M & ROSKOP KINDRA M ROSS MICHAEL S & ROSS DIANE MIDDLETON** ROSS RONALD O & ROSS ILGA A **ROTH-KLEPPER DEBORAH** RUIZ BERTHA K **RUNNELS CHRISTA M & RUNNELS CHRISTOPHER M** RUPERT LIV TRUST RUSSO WILLIAM KIRKPATRICK & BURKE MADISON ELIZABETH **RUVALCABA CHRIS & RUVALCABA ESTHER** SABERI BABAK ROBERT W SANDOVAL JODY & POURHASSAN NADER SATTLER BRIAN L & WALCZYK KERRY M SCHAUB LINDSEY M SCHEPPACH PATRICIA & CAMACHO DAVID SCHIEDLER JEFFREY & KUCK JORDAN SCHNABEL ERIKA SCHWENN NOELLE & SCHWENN JASON JAMES & TRENOR JOHN SEDILLO FAMILY TRUST & SEDILLO SURVIVOR'S TRUST SELBY WILLIAM R & SELBY SHARYN L SEVERSON BRANDT E & BIGELOW SHELLEY & BIGELOW GREGORY SEYMOUR JAMIE L SHAUB STACY L & SHAUB JIM M SHAW FAMILY TRUST SHOFNER TERRI L SHUGERT MARK SIMCOE DANIEL & DAWN LIV TRUST SIMPSON RACHEL SIMS ADAM C & SIMS MARILYN SINCLAIR BRIAN GRAHAM SKOF ROBERT SMALL MATTHEW & SMALL JAMEE SMITH ALAN L & SMITH DIANNA C SMITH ERIC T & SMITH SUZANNE M SMITH HERBERT T JR & BEVERLEY A REV LIV TRUST SMITH MARGARET F & DONALD M SMITH REV LIV TRUST SPEARE JOE & SPEARE PAMELA SUE SPRADLEY LORELLE A

17960 SW YAQUINA CT	TUALATIN	OR	97062
9211 SW CASCARA LN	TUALATIN	OR	97062
10050 SW WASCO WAY	TUALATIN	OR	97062
		OR	97062
		OP	07062
			97002
10295 SW LADD CT		UR	97062
17900 SW SHASTA TRL	TUALATIN	OR	97062
17894 SW 105TH CT	TUALATIN	OR	97062
PO BOX 1696	BEAVERTON	OR	97075
9772 SW TUALATIN RD	TUALATIN	OR	97062
18690 SW 92ND TER	TUALATIN	OR	97062
10476 SW PUEBLO ST	TUALATIN	OR	97062
4960 IRFLAND I N	WESTLINN	OR	97068
9282 SW/ CASCARA I N		OR	97062
		OP	07062
			97002
		UR	97223
18210 SW SHAWNEE IRL	TUALATIN	OR	97062
17911 SW 105TH CT	TUALATIN	OR	97062
15784 SW COLYER WAY	TIGARD	OR	97224
17976 SW 106TH AVE	TUALATIN	OR	97062
9715 SW TUALATIN RD	TUALATIN	OR	97062
18060 SW CHEYENNE WAY	TUALATIN	OR	97062
10 INVERNESS DR EAST STE 250	ENGLEWOOD	CO	80112
PO BOX 151	WESTLINN	OR	97068
		OP	07062
			97002
18562 SW 92ND TER		UR	97062
17905 SW SHAWNEE IRL		OR	97062
8275 SW SENECA ST	TUALATIN	OR	97062
10155 SW WASCO WAY	TUALATIN	OR	97062
18610 SW 91ST TER	TUALATIN	OR	97062
17895 SW SIOUX CT	TUALATIN	OR	97062
18225 SW CHEYENNE WAY	TUALATIN	OR	97062
17840 SW YAQUINA CT	TUALATIN	OR	97062
10529 SW PUEBLO ST	TUALATIN	OR	97062
9284 SW SWEEK DR	TUALATIN	OR	97062
9240 SW CASCARA I N		OR	97062
10615 SW PLIEBLO CT		OR	97062
18621 SW 03PD TEP		OP	07062
18704 SW 02ND TEP		OP	07062
			07062
			97002
		UR	97062
17775 SW YAQUINA CI		OR	97062
17915 SW SIOUX CT	TUALATIN	OR	97062
17910 SW SIOUX CT	TUALATIN	OR	97062
22511 SW 106TH AVE	TUALATIN	OR	97062
18692 SW 91ST TER	TUALATIN	OR	97062
10225 SW WASCO WAY	TUALATIN	OR	97062
17780 SW SHASTA TRL	TUALATIN	OR	97062
10265 SW WASCO WAY	TUALATIN	OR	97062
		TN	37055
			07526
			07060
10370 SW 92ND TER		OR	97062
1671 VILLAGE PARK LN	LAKE OSWEGO	OR	97034
18721 SW 91ST TER	IUALATIN	OR	97062
PO BOX 1873	LAKE OSWEGO	OR	97035
9121 SW SWEEK DR	TUALATIN	OR	97062
10195 SW WASCO WAY	TUALATIN	OR	97062
10210 SW LADD CT	TUALATIN	OR	97062
18115 SW CHEYENNE WAY	TUALATIN	OR	97062
9721 SW TUALATIN RD	TUALATIN	OR	97062
PO BOX 355	TUALATIN	OR	97062
18652 SW 91ST TER	TUALATIN	OR	97062
			J. J.J.

2S114CD00700 2S114CD01200 2S123AB02100 2S123AB05700 2S123AB13400 2S114CD09900 2S123BA80004 2S123BA90032 2S123AB07200 2S114CD01400 2S114CD11300 2S123AB03600 2S114CC00100 2S114CC01800 2S123BA02407 2S115DD03100 2S114CD01300 2S114CC10600 2S123BB90000 2S114CC00501 2S114CC02000 2S123AB02600 2S123BA00800 2S123AB02800 2S123AB06700 2S123AB11000 2S123AB14500 2S114CD03600 2S123BA70005 2S123BA70006 2S123BA04400 2S123B000800 2S123BB00300 2S114CC07200 2S123BA00400 2S123BA02406 2S123BC01400 2S114D000500 2S123AB00100 2S123B000602 2S123BA04390 2S123AB02200 2S123BA03900 2S123BC00900 2S123AB04100 2S114CD11200 2S115DD02600 2S123BD00400 2S114CC01100 2S114CC03100 2S123AB12600 2S123AB12000 2S114CD03800 2S115DD01000 2S123AB09700 2S114CD06600 2S123BA01700 2S123AB06200 2S123AB13900 2S114CC03600 2S114CD01900 2S123AB04700

Mailing List_Tracts_1_2_3

SPROUSE FAMILY TRUST ST CLAIR MONA STATES BAILEY B STEELE FRED B JR & STEELE JACQUELYN L **STEELMAN PATRICK & VOLLAN OLIVIA** STEPHENSON JULIE A STEWART JESSICA M STONE ANGELINA DIANA STOUT TRAVIS M STRICKLAND JARED ANDREW & STRICKLAND BRITTNEY LYNNE STUBBS BRIAN G & STUBBS SUSAN M SWANSON DAVID & SWANSON AMANDA SWEENEY DANIEL SWEENEY JUDY D SWENDSEID FAMILY TRUST SYNDER BROOKE & CHANDLER KYLE TANG TING & TANG LESLIE CORY **TAYLOR SHELBY MARIE & TAYLOR HARPER I** TETON INDUSTRIAL CONDO OWNERS OF ALL UNITS THOMASSEN AARON JENS THOMASON BARBARA J THOMPSON PAYTON D & THOMPSON CHRISTINE THOMPSON FAMILY TRUST **TK&S REAL PROPERTIES LLC TK&S REAL PROPERTIES LLC TK&S REAL PROPERTIES LLC TK&S REAL PROPERTIES LLC** TOBEY REBA R TOLAR STREET PROPERTIES LLC TOLAR STREET PROPERTIES LLC **TONA MARGITU** TOTE 'N STOW INC TOTE 'N STOW INC **TOWLE CORDES K & KRAEMER JILL J** TRADEWINDS TRUST TRIFECTA INVESTMENT GROUP LLC TRUMBO INVESTMENTS LLC TUALATIN COUNTRY CLUB TUALATIN MEADOWS APARTMENTS LP TUALATIN TETON LLC TUALATIN CITY OF DEVELOPMENT COMMISSION TURNER REV TRUST ULRICH RONALD J & ULRICH SHARON A UNITED STATES POSTAL SERVICE URGUPLUOGLU KATHY **USELMAN MOLLIE K** VALDENEGRO GILLIAN F TRUST VALMONT COATINGS INC VANMECHELEN NANCY & NATHAN REV TRUST VIAY HECTOR R LOPEZ & ORTIZ MARITZA CAMACHO **VISSER ROBERT & TUNG CHIA-FONG** VOAS AMY E VOILES ANNA MARGARET VT TRUST **VU CHANKRASNA** WAGER TERRENCE KEVIN & MCGINLEY CHRISTINE MARIE WALCUTT SUSAN E WANG WEILING WANG WEI & RESSLER JEFFREY P WARD SCOTT & SANCHEZ RENEE WARD TYLER DANIEL & BOEHMER MADALINE ANN WARD MEGAN

17780 SW SHAWNEE TRL	TUALATIN	OR	97062
17785 SW SHAWNEE TRL	TUALATIN	OR	97062
22808 SW HIGHLAND DR	SHERWOOD	OR	97140
15337 SW SUNSET BLVD	SHERWOOD	OR	97140
9267 SW SWEEK DR	TUALATIN	OR	97062
17945 SW SIOUX CT	TUALATIN	OR	97062
PO BOX 2015	GEARHART	OR	97318
9774 SW TUALATIN RD	TUALATIN	OR	97062
9274 SW CASCARA LN	TUALATIN	OR	97062
17845 SW SHAWNEE TRL	TUALATIN	OR	97062
248 HOLDER LN SE	SALEM	OR	97306
18575 SW 91ST TER	TUALATIN	OR	97062
22975 DONNA LN	BEND	OR	97701
17715 SW SHASTA TRAIL	TUALATIN	OR	97062
1677 KENEWA ST	OJAI	CA	93023
10573 SW PUEBLO ST	TUALATIN	OR	97062
17815 SW SHAWNEE TRL	TUALATIN	OR	97062
10280 SW LADD CT	TUALATIN	OR	97062
	-	OR	00000
10640 SW BANNOCH ST	TUALATIN	OR	97062
10100 SW WASCO WAY	TUALATIN	OR	97062
20567 SW ELK HORN CT	TUALATIN	OR	97062
17985 SW SHAWNEE TRI		OR	97062
10240 SW SEDLAK CT		OR	97062
10240 SW SEDLAK CT		OR	97062
10240 SW SEDLAK CT		OR	97062
10240 SW SEDLAK CT		OR	97062
PO BOX 4232		OR	97062
13455 SW 22ND ST	BEAVERTON	OR	97002
13455 SW 22ND ST	BEAVERTON	OR	97008
18245 SW CHEVENNE WAY		OR	97062
		OR	97002
PO BOX 25216			07208
15045 SW 141ST AVE		OR	97290
			97224
PO BOX 4804	ΤΠΔΙ ΔΤΙΝ	OR	97002
14365 SW/ 144TH AVE	TIGARD	OR	97002
			07062
			97002
			92014
			97203
			97002
			07062
			97002
			00112
10004 SW 92ND TER			97002
			97002
			97 140
			00104
17925 SW SHASTA IRL			97062
			97062
			97223
18629 SVV 93RD TER		OR	97062
9715 SW PAWNEE PATH		OR	97062
17989 SW 1051H C1		OR	97062
9288 SW SWEEK DR	TUALATIN	OR	97062
		UK	97062
		UR	97062
	SHRUB OAK	NY	10588
13391 SW HILLSHIRE DR	TIGARD	OR	97223
17805 SW YAQUINA CT	IUALATIN	OR	97062
17970 SW CHEYENNE WAY	TUALATIN	OR	97062
18638 SW 92ND TER	TUALATIN	OR	97062

2S123BB01100 2S114CD07700 2S123BB90001 2S114CD07600 2S123AB08700 2S123AB14600 2S123AB04300 2S123AB09400 2S114CD10400 2S114CC03200 2S114CD03500 2S115DD02200 2S114CD06800 2S114CD07800 2S123BA02700 2S114CD10900 2S114CD06300 2S114CC04400 2S123BD00800 2S114CC07600 2S114CD01100 2S123BA90062 2S123AB05600 2S123BA03800 2S123AB13500

WASHINGTON COUNTY FACILITIES MGMT WATKINS JAMES & BARRY LAUREN WAVE PROPERTY HOLDINGS LLC WEATHERS CHARLES E & ENGLE KAREN WEISS JEFFRY WELKER DEANN WETTERLIN JOSHUA K WHITE JAMES D WILCOX JOHN M & WILCOX NANCY L WILKERSON PEGGIE J TRUST WILLIAMS ZACHARY S & WILLIAMS ERIN M WILLIAMS MATTHEW STEVEN WILSON KENT CLIFFORD WILSON JEREMY & WILSON LIZZETT WINONA CEMETERY ASSOC WIZER SUZANNE M WOMER GREG MICHAEL WONGLAVON SATHIEN & WONG PAVEENA T WSM MANUFACTURING YODER MATTHEW & YODER CARRIE ZABEL RICHARD & BAYNE MARGARET E ZBINDEN ELIZABETH K ZELLER GAIL & CLARK LIV TRUST & ZELLER RYAN ZELLNER MARK & ZELLNER ADIRA ZHU YI

169 N 1ST AVE #42	HILLSBORO	OR	97124
17685 SW CHIPPEWA TRL	TUALATIN	OR	97062
35 PANORAMA CREST AVE	LAS VEGAS	NV	89135
17715 SW CHIPPEWA TRAIL	TUALATIN	OR	97062
10130 SW LANCASTER RD	PORTLAND	OR	97219
9183 SW SWEEK DR	TUALATIN	OR	97062
15769 SW 82ND AVE	TIGARD	OR	97224
9299 SW CASCARA LN	TUALATIN	OR	97062
17855 SW SIOUX CT	TUALATIN	OR	97062
17925 SW YAQUINA CT	TUALATIN	OR	97062
17845 SW CHEYENNE WAY	TUALATIN	OR	97062
10655 SW PUEBLO CT	TUALATIN	OR	97062
17870 SW CHIPPEWA TRL	TUALATIN	OR	97062
17655 SW CHIPPEWA TRL	TUALATIN	OR	97062
8380 SW TONKA ST	TUALATIN	OR	97062
17900 SW SIOUX CT	TUALATIN	OR	97062
16321 SE WIDEGON CT	DAMASCUS	OR	97089
10105 SW WASCO WAY	TUALATIN	OR	97062
9500 SW TUALATIN RD	TUALATIN	OR	97062
10332 SW PUEBLO ST	TUALATIN	OR	97062
17755 SW SHAWNEE TRL	TUALATIN	OR	97062
9762 SW TUALATIN RD	TUALATIN	OR	97062
16294 SW DAHLIA CT	TIGARD	OR	97224
18155 SW CHEYENNE WAY	TUALATIN	OR	97062
9255 SW SWEEK DR	TUALATIN	OR	97062



NOTICE IS HEREBY GIVEN that an application for a Plan Map Amendment (PMA 24-0001) will be heard by Tualatin City Council:

> Monday, July 22, 2024 at 7 pm Tualatin City Services Building 10699 SW Herman Road

To view the application materials visit: <u>www.tualatinoregon.gov/projects</u>

TO PROVIDE COMMENTS: Email: kleonard@tualatin.gov Mail: Planning Division Attn: Keith Leonard, AICP 10699 SW Herman Road Tualatin, OR 97062

Questions?: 503-691-3029 or kleonard@tualatin.gov

To attend the hearing, there are two options:

- Zoom Teleconference. Details at: www.tualatinoregon.gov/citycouncil/council-meetings
- Attend in person at the Tualatin City Services Building.



Miller Nash LLP on behalf of the property owners, Life Front 2 LLC and LU QBF II LLC, is requesting a zoning map adjustment for an approximately 3,645 square-foot portion of land that has been historically occupied by the Willow Glen Mobile Home Park. This subject property will be deeded from the property owner to Willow

Glen Mobile Home Park through property line adjustment. The Willow Glen Mobile Home Park, located at 9700 SW Tualatin Road (Tax Map/Lot 2S123BA03200) is zoned Medium Low Density Residential (RML). The proposed zoning map adjustment (Plan Map Amendment (PMA)) will rezone the 3,645 square foot portion of property located at 9975 SW Herman Road (Tax Map/Lot 2S123BA02900) and 9905 SW Herman Road (Tax Map/Lot 2S123BA03100) from Light Manufacturing (ML) to RML, consistent with its historical use as part of the Mobile Home Park. No additional dwelling units will result in approval of this PMA.

- **Criteria**: Tualatin Development Code (TDC) Chapters 32 and 33; Tualatin Comprehensive Plan; Applicable Oregon Statewide Planning Goals; Applicable Oregon Administrative Rules including compliance with the Transportation Planning Rule; and Metropolitan Service District's Urban Growth Management Functional Plan.
- Application materials are public record and are available for review. Copies can be viewed online or obtained at a reasonable cost, by contacting the Planning Division.



NOTICE OF PUBLIC HEARING AND OPPORTUNITY TO COMMENT CASE FILE: PMA 24-0001 — Willow Glen Plan Map Amendment (Adjustment)

NOTICE IS HEREBY GIVEN that an application for a Plan Map Amendment (PMA 24-0001) will be heard by Tualatin City Council:

Monday, July 22, 2024 at 7 pm Tualatin City Services Building 10699 SW Herman Road

To view the application materials visit: <u>www.tualatinoregon.gov/projects</u>

TO PROVIDE COMMENTS:

Email: kleonard@tualatin.gov Mail: Planning Division Attn: Keith Leonard, AICP 10699 SW Herman Road Tualatin, OR 97062

Questions?: 503-691-3029 or kleonard@tualatin.gov

To attend the hearing, there are two options:

- Zoom Teleconference. Details at: www.tualatinoregon.gov/citycouncil/council-meetings
- Attend in person at the Tualatin City Services Building.



Miller Nash LLP on behalf of the property owners, Life Front 2 LLC and LU QBF II LLC, is requesting a zoning map adjustment for an approximately 3,645 square-foot portion of land that has been historically occupied by the Willow Glen Mobile Home Park. This subject property will be deeded from the property owner to Willow

Glen Mobile Home Park through property line adjustment. The Willow Glen Mobile Home Park, located at 9700 SW Tualatin Road (Tax Map/Lot 2S123BA03200) is zoned Medium Low Density Residential (RML). The proposed zoning map adjustment (Plan Map Amendment (PMA)) will rezone the 3,645 square foot portion of property located at 9975 SW Herman Road (Tax Map/Lot 2S123BA02900) and 9905 SW Herman Road (Tax Map/Lot 2S123BA03100) from Light Manufacturing (ML) to RML, consistent with its historical use as part of the Mobile Home Park. No additional dwelling units will result in approval of this PMA.

- **Criteria**: Tualatin Development Code (TDC) Chapters 32 and 33; Tualatin Comprehensive Plan; Applicable Oregon Statewide Planning Goals; Applicable Oregon Administrative Rules including compliance with the Transportation Planning Rule; and Metropolitan Service District's Urban Growth Management Functional Plan.
- Application materials are public record and are available for review. Copies can be viewed online or obtained at a reasonable cost, by contacting the Planning Division.



9 10699 SW Herman Road, Tualatin, Oregon 97062



TUALATINOREGON.GOV/PLANNING





PO Box 22109 Portland, OR 97269-2169 Phone: 503-684-0360 Fax: 503-620-3433 E-mail: legals@commnewspapers.com

SEE EXHIBIT A

AFFIDAVIT OF PUBLICATION State of Oregon, County of Washington, ss I, Kristine Humphries, being first duly sworn, depose and say that I am the Principal Clerk of the The Times, a newspaper of general circulation, published in Washington Coun-ty, Oregon, as defined by ORS 193.010 and 193.020, that

Ad#: 331752 **Owner: City of Tualatin** Description: NOTICE OF HEARING

A copy of which is hereto annexed, was published in the entire issue of said newspaper for 1 week(s) in the following issue: 06/20/2024

Kristine Humphries (Principal Clerk)

Subscribed and sworn to before me this 06/20/2024.

NOTARY PUBLIC FOR OREGON

Acct #: 146536 Attn: LINDSEY HAGERMAN TUALATIN, CITY OF 10699 SW HERMAN RD TUALATIN, OR 97062



EXHIBIT A

NOTICE OF HEARING **CITY OF TUALATIN, OREGON**

NOTICE IS HEREBY GIVEN that a public hearing will be held before the City of Tualatin City Council at 7:00 p.m., Monday, July 22, 2024, held online over Zoom and additionally accessible at the Tualatin City Services Building (10699 SW Herman Road).

You are invited to attend and participate in the public hearing. Under consideration is the following application:

A Plan Map Amendment (Adjustment) (PMA 24-0001). The applications have been made by Miller Nash LLP on behalf of the property owners, Life Front 2 LLC and LU QBF II LLC, is requesting a zoning map adjustment for an approximately 3,681 square-foot portion of land that has been historically occupied by the Willow Glen Mobile Home Park. This subject property will be deeded from the property owner to Willow Glen Mobile Home Park through property line adjustment. The Willow Glen Mobile Home Park, located at 9700 SW Tualatin Road (Tax Map/Lot 2S123BA03200) is zoned Medium Low Density Residential (RML). The proposed zoning map adjustment (Plan Map Amendment (PMA)) will rezone the 3,681 square foot portion of property located at 9975 SW Herman Road (Tax Map/Lot 2S123BA002900) and 9905 SW Herman Road (Tax Map/Lot 2S123BA03100) from Light Manufacturing (ML) to RML, consistent with its historical use as part of the Mobile Home Park. No additional dwelling units will result in approval of this PMA.

The public is invited to comment by e-mail, writing or by testifying at the hearing. Written comments can be made by email to Keith Leonard at kleonard@ tualatin.gov or submitted at the hearing. Failure to raise an issue at the hearing or in writing or to provide sufficient specificity to afford the City Council an opportunity to respond to the issue precludes appeal to the Land Use Board of Appeals (LUBA). Legislative hearings begin with the Mayor opening the hearing, presentation of the staff report, public testimony, questions of staff or anyone who testified by Council, after which the Mayor closes the public hearing, and Council may then deliberate to a decision and a motion would be made to either approve, deny, or continue the public hearing. The time of individual testimony may be limited.

To attend the hearing, there are two options:

Zoom teleconference. Instructions on how to provide comment will be provided during the meeting itself.

Full instructions and a current link are available at: https://www.tualatinoregon. gov/citycouncil/council-meetings · Attend in person at the Tualatin City Services Building.

To view the application materials visit: https://www.tualatinoregon.gov/plan ning/willow-glen-plan-map-amendment-adjustment-pma24-0001

A copy of the staff report, exhibits, and findings for PMA 24-0001 will be available one week before the hearing at: https://www.tualatinoregon.gov/citycouncil.

Application materials are public record and are available for review. Copies can be viewed online or obtained at a reasonable cost, by contacting the Planning Division (503-691-3026 or planning@tualatin.gov).

To grant the amendment, Council must find the proposal meets the applicable criteria of Tualatin Development Code (TDC) Chapters 32 and 33 and the Tualatin Comprehensive Plan; Applicable Oregon Administrative Rules including compliance with the Transportation Planning Rule and Metropolitan Service District's Urban Growth Management Functional Plan. Published June 20, 2024.

Π331752

From: Sent: To:	Keith Leonard Friday, June 7, 2024 9:47 AM kenken@clackamas.us; Dyami_Valentine@washingtoncountyor.gov; theresa_cherniak@co.washington.or.us; deqinfo@deq.state.or.us; landusenotifications@oregonmetro.gov; ODOT_R1_DevRev@odot.oregon.gov; baldwinb@trimet.org; LUComments@cleanwaterservices.org; alex.mcgladrey@tvfr.com; KHerrod@republicservices.com; info@theintertwine.org; Anneleah@tualatinchamber.com; OR.METRO.ENGINEERING@ZIPLY.COM; tod.shattuck@pgn.com; brandon.fleming@pgn.com; Kenneth.Spencer@pgn.com; david.underwood@pgn.com; richard.girard@nwnatural.com: icrawford@wccca.com
Cc:	Keith Leonard
Subject:	UPDATED NOTICE OF HEARING: PMA24-0001 - Willow Glen Property Line Adjustment
Attachments:	PMA 24-0001 Notice - sent 6-7-24.pdf



UPDATED HEARING DATE FROM JULY 8TH TO JULY 22^{nd} NOTICE OF HEARING AND OPPORTUNITY TO COMMENT

NOTICE IS HEREBY GIVEN that a public hearing will be held before the City of Tualatin City Council at 7:00 p.m., **Monday, July 22, 2024**, held online over Zoom and additionally accessible at the Tualatin City Services Building (10699 SW Herman Road).

Miller Nash LLP on behalf of the property owners, Life Front 2 LLC and LU QBF II LLC, is requesting a zoning map adjustment for an approximately 3,645 square-foot portion of land that has been historically occupied by the Willow Glen Mobile Home Park. This subject property will be deeded from the property owner to Willow Glen Mobile Home Park through property line adjustment. The Willow Glen Mobile Home Park through property line adjustment. The Willow Glen Mobile Home Park, located at 9700 SW Tualatin Road (Tax Map/Lot 2S123BA03200) is zoned Medium Low Density Residential (RML). The proposed zoning map adjustment (Plan Map Amendment (PMA)) will rezone the 3,645 square foot portion of property located at 9975 SW Herman Road (Tax Map/Lot 2S123BA03200) and 9905 SW Herman Road (Tax Map/Lot 2S123BA03100) from Light Manufacturing (ML) to RML, consistent with its historical use as part of the Mobile Home Park. No additional dwelling units will result in approval of this PMA.

You may view the application materials on our Projects web page: <u>https://www.tualatinoregon.gov/planning/willow-glen-plan-map-amendment-adjustment-pma24-0001</u>

Comments due for staff report: June 26, 2024. Comments made after that date but prior to the close of the written record will be included in the written record but may not be included in the staff report to the City Council.

To grant the amendment, Council must find the proposal meets the applicable criteria of Tualatin Development Code (TDC) Chapters 32 and 33 and the Tualatin Comprehensive Plan; Applicable Oregon Statewide Planning Goals; Applicable Oregon Administrative Rules including compliance with the Transportation Planning Rule; and Metropolitan Service District's Urban Growth Management Functional Plan.

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Application materials are public record and are available for review. Copies can be viewed online or obtained at a reasonable cost, by contacting the Planning Division (503-691-3026 or <u>planning@tualatin.gov</u>).

Keith Leonard, AICP Associate Planner City of Tualatin | Planning 503.691.3029 | www.tualatinoregon.gov



From:	Keith Leonard
Sent:	Friday, June 7, 2024 9:47 AM
То:	Riverparkcio@gmail.com; jasuwi7@gmail.com;
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	sonyanybergrygh@gmail.com; tualatincio@gmail.com; Megan George
Cc:	Keith Leonard
Subject:	UPDATED NOTICE OF HEARING: PMA24-0001 - Willow Glen Property Line
	Adjustment
Attachments:	PMA 24-0001 Notice - sent 6-7-24.pdf



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Keith Leonard, AICP

Associate Planner City of Tualatin | Planning 503.691.3029 | <u>www.tualatinoregon.gov</u>



From:	Keith Leonard
Sent:	Friday, June 7, 2024 9:47 AM
То:	Vogel, Blakely
Cc:	Forer, Max; Keith Leonard
Subject:	UPDATED NOTICE OF HEARING: PMA24-0001 - Willow Glen Property Line
A	Aujustinent

Attachments:





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Keith Leonard, AICP Associate Planner City of Tualatin | Planning 503.691.3029 | <u>www.tualatinoregon.gov</u>



From:	Keith Leonard
Sent:	Friday, June 7, 2024 9:47 AM
То:	Kim McMillan; Mike McCarthy; Mike McCarthy; Tony Doran; Hayden
	Ausland; Terrance Leahy; Sherilyn Lombos; Don Hudson; Heather Heidel;
	Kevin McConnell; Rich Mueller; Tom Steiger; Martin Loring; Tom Scott;
	Erin Engman; Madeleine Nelson; Steve Koper; Lindsey Hagerman
Cc:	Keith Leonard
Subject:	UPDATED NOTICE OF HEARING: PMA24-0001 - Willow Glen Property Line
-	Adjustment
Attachments:	PMA 24-0001 Notice - sent 6-7-24 pdf

Attachments:



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Keith Leonard, AICP Associate Planner City of Tualatin | Planning 503.691.3029 | www.tualatinoregon.gov



From:	DLCD Plan Amendments <plan.amendments@dlcd.oregon.gov></plan.amendments@dlcd.oregon.gov>
Sent:	Friday, May 31, 2024 2:19 PM
То:	Keith Leonard
Subject:	Confirmation of PAPA Online submittal to DLCD

<u>Tualatin</u>

Your notice of a proposed change to a comprehensive plan or land use regulation has been received by the Oregon Department of Land Conservation and Development. Local File #: PMA24-0001 DLCD File #: <u>003-24</u> Proposal Received: 5/31/2024 First Evidentiary Hearing: 7/8/2024 Submitted by: KLTualatin6!

If you have any questions about this notice, please reply or send an email to <u>plan.amendments@dlcd.oregon.gov</u>.

From:	DLCD Plan Amendments <plan.amendments@dlcd.oregon.gov></plan.amendments@dlcd.oregon.gov>
Sent:	Friday, June 7, 2024 9:56 AM
То:	Keith Leonard
Subject:	Confirmation of PAPA Online submittal to DLCD

<u>Tualatin</u>

Your notice of a revised proposal for a change to a comprehensive plan or land use regulation has been received by the Oregon Department of Land Conservation and Development. Local File #: PMA24-0001 DLCD File #: <u>003-24</u> Original Proposal Received: 5/31/2024 Date of Revision: 6/7/2024 First Evidentiary Hearing: 7/22/2024 Submitted by: KLTualatin6!

If you have any questions about this notice, please reply or send an email to <u>plan.amendments@dlcd.oregon.gov</u>.


TO:	Tualatin Planning Commissioners
THROUGH:	Steve Koper, AICP, Assistant Community Development Director
FROM:	Erin Engman AICP, Senior Planner and
DATE:	July 17, 2024

SUBJECT:

The Tualatin Planning Commission is asked to provide a recommendation to the City Council on adoption of the Stormwater Master Plan, the Basalt Creek Parks and Recreation Plan, and corresponding amendments to relevant Comprehensive Plan policies and Development Code references (Plan Text and Plan Map Amendments PTA/PMA 24-0003)

EXECUTIVE SUMMARY:

The City began work to update its Stormwater Master Plan update in 2019 and its Basalt Creek Parks and Recreation Master Plan in 2021.

Stormwater Master Plan

Work on the Stormwater Master Plan, which had not been updated since 1973, began in 2019 and culminated in City Council consideration in 2021 under Ordinance 1453-21. However, Council ultimately repealed their decision through Ordinance 1455-21 in response to public testimony requesting a Basalt Creek Stormwater Management Addendum.

Since that time, staff has worked with consultants to study the existing conditions within the Basalt Creek planning area, finding that existing conditions are substandard. The study resulted in a Master Plan addendum that identifies the Basalt Creek area drainage basin for application of the most stringent stormwater standards (meeting the 25-year storm event and hydro-modification) to all future development. Of note, these standards were applied to recent development applications in the Basalt Creek sub-basin, including the Autumn Sunrise Subdivision and Plambeck Gardens multifamily development.

Basalt Creek Parks and Recreation Master Plan

The Parks and Recreation Master Plan was most recently adopted into the Comprehensive Plan in 2019 under Ordinance 1427-19. This plan identified a need for land acquisition and related park and trail planning in the Basalt Creek planning area.

As a result, the City, after significant engagement and outreach, created the Basalt Creek Parks and Recreation Plan, which analyzed the 367-acre planning area and provides recommendations and concepts for future park land and trails. Subsequently in 2022, Council accepted the work of the Basalt Creek Parks and Recreation plan under Resolution 5593-22. The final step in adoption of the Basalt Creeks Parks and Recreation Plan is to amend the Comprehensive plan to include it as a part of the overall Parks and Recreation Master Plan.

OUTCOMES OF DECISION:

A recommendation of adoption of PTA / PMA 24-0003 to City Council would:

- Adopt the Stormwater Master Plan and Basalt Creek Parks and Recreation Plan as a supporting technical background documents to the Tualatin Comprehensive Plan;
- Update Comprehensive Plan Map 8-4 and Development Code Map 72-2 to include trail alignments identified in the Basalt Creek Parks and Recreation Plan;
- Update policies in Chapter 9 specific to stormwater management practices, reflecting updated recommendations, practices, and partnerships;
- Add Comprehensive Plan Map 9-3 Stormwater capital projects; and
- Update references to the Stormwater Master Plan in the Comprehensive Plan and Development Code.

CLIMATE IMPACTS:

The amendments support a number of Tualatin's Climate Action Plan (CAP) strategies, including:

- Action 1.1.11 Support Clean Water Services in implementing the strategies included in their Thermal Load Management Plan.
- Action 1.1.13 Protect and restore the Tualatin River watershed.
- Action 1.3.3 Evaluate strategies to reduce flooding in floodprone areas.
- Action 1.3.4 Increase flood capacity on publicly owned lands.
- Action 1.3.8 Consider constructing large, regional stormwater management facilities to increase stormwater management capacity.

ALTERNATIES TO RECOMMENDATION:

The Planning Commission may alternatively:

- 1) Approval either as proposed or with modifications; or
- 2) Make a neutral recommendation (neither approval nor denial) on the proposed amendments.

ATTACHMENTS:

Presentation

- Exhibit 1 PTA/PMA 24-0003 Findings and Analysis
- Exhibit 2 PMA 24-0003 Map Amendment
- Exhibit 3 PTA 24-0003 Text Amendment
- Exhibit 4 Stormwater Master Plan
- Exhibit 4a Stormwater Master Plan Appendices A-D
- Exhibit 4b Stormwater Master Plan Appendices E-I
- Exhibit 5 Basalt Creek Parks and Recreation Plan
- Exhibit 5a Basalt Creek Parks and Recreation Plan Appendices
- Exhibit 6 Clackamas County UGMA
- Exhibit 7 Washington County UPAA
- Exhibit 8 Public Comments



ADOPTION READY MASTER PLANS

Tualatin Planning Commission July 17, 2024

Presented by: Erin Engman, Senior Planner Steve Koper, Assistant Community Development Director Brown No Caldwell

Prepared for City of Tualatin Oregon

City of Tualatin Stormwater Master Plan



April 2019 | DRAFT-FINAL



AGENDA

- Background and Summary
- Overview of Amendments
- Approval Criteria
- Questions
- Recommendation to Council



What does it do?

- Provides an assessment of existing conditions and assets
- Identifies potential Capital Improvement Plan projects
- Identifies areas (erosion, downstream capacity impacts, etc.) that require a "sub-basin strategy" to address unique needs through application of enhanced standards



Previous Consideration

- <u>February 8, 2021</u>: Council adopted the Stormwater Master Plan and corresponding text amendments under Ord. 1453-21.
- <u>March 8, 2021</u>: Council repealed Ord. 1453-21 under Ord. 1455-21 in response to public testimony requesting a stormwater management addendum, specific to the Basalt Creek area.



Work done since 2021

- <u>2021-2022</u>: The City worked with Brown and Caldwell to study the existing conditions within the Basalt Creek area.
- <u>September 2023</u>: The City engaged AKS to produce maps that illustrate existing and potential stormwater facilities; and existing natural resource areas within the Basalt Creek planning area.







Addendum Conclusion

- A Master Plan Addendum is being created requiring the most stringent stormwater standards in the Basalt Creek sub-basin.
 - o 25-Year storm event
 - Hydro-modification
- Existing environmental regulations in Tualatin Development Code and CWS standards will also limit development in environmentally sensitive areas.



B.C. PARKS & REC PLAN

What does it do?

- Assess recreation opportunities in Basalt Creek planning area centered on community engagement
- Identify key parks and recreation investments and estimated costs
- Identify steps towards implementation



B.C. PARKS & REC PLAN

Previous Work

- <u>2019</u>: The Parks and Recreation Master Plan was adopted under Ordinance 1427-19. This plan identified the need for park and trail planning in the Basalt Creek planning area.
- <u>2022</u>: In response to this need, and after significant public involvement, the Basalt Creek Parks and Recreation Plan was created. This work was accepted by Council under Resolution 5593-22.



AMENDMENTS

PTA/PMA24-0003

- Adopt plans as a supporting technical documents to the Tualatin Comprehensive Plan;
- Update Chapter 9 policies specific to stormwater management practices;
- Add Map 9-3 Stormwater Plan;
- Amend Map 8-4 and 72-2 consistent with the Basalt Creek Parks and Recreation Plan;
- Update references in the Development Code.



Implements Climate Action Plan



- Action 1.1.11 Support CWS in implementing the strategies included in their Thermal Load Management Plan.
- Action 1.1.13 Protect and restore the Tualatin River watershed.
- Action 1.3.3 Evaluate strategies to reduce flooding in flood-prone areas.
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APPROVAL CRITERIA

- Statewide Planning Goals
- Oregon Administrative Rules
- Metro Code
- Tualatin Development Code:
 - Chapter 33.250 Type IV-B
 - Chapter 33.070 Plan Amendments



RECOMMENDATION

The Planning Commission is asked to provide a recommendation on the proposed amendments (<u>PTA/PMA24-0003</u>).

Recommendation of approval would:

- Adopt both plans as supporting documents to the Comprehensive Plan;
- Add Map 9-4;
- Amend Maps 8-4 and 72-2; and
- Amend relevant Comprehensive Plan policies and Development Code references.





ANALYSIS AND FINDINGS

STORMWATER MASTER PLAN & BASALT CREEK PARKS AND RECREATION PLAN ADOPTION

July 17, 2024

Case #:	PTA/PMA24-0003
Project:	Master Plan Adoption
Procedure:	Type IV-B, Legislative

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PTA/PMA24-0003 Findings and Analysis July 17, 2024 I. INTRODUCTION

A. Applicable Criteria

Applicable Statewide Planning Goals; Oregon Administrative Rules Chapter 660; Metro Chapter 3.02 (Wastewater Management Plan); Tualatin Comprehensive Plan Chapter 9; and Tualatin Development Code Chapters 33.

B. Project Description

The City began work to update its Stormwater Master Plan update in 2019 and its Basalt Creek Parks and Recreation Master Plan in 2021.

Stormwater Master Plan

Work on the Stormwater Master Plan, which had not been updated since 1973, began in 2019 and culminated in City Council consideration of 2021 under Ordinance 1453-21. However, Council ultimately repealed their decision through Ordinance 1455-21 in response to public testimony requesting a Basalt Creek Stormwater Management Addendum.

Since that time, staff has worked with consultants to study the existing conditions within the Basalt Creek planning area, finding that existing conditions are substandard. The study resulted in a Master Plan addendum that identifies the Basalt Creek area drainage basin for application of the most stringent stormwater standards (meeting the 25-year storm event and hydro-modification) to all future development. Of note, these standards were applied to recent development applications in the Basalt Creek sub-basin, including the Autumn Sunrise Subdivision and Plambeck Gardens multifamily development.

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As a result, the City, after significant engagement and outreach, created the Basalt Creek Parks and Recreation Plan, which analyzed the 367-acre planning area and provides recommendations and concepts for future park land and trails. Subsequently in 2022, Council accepted the work of the Basalt Creek Parks and Recreation plan under Resolution 5593-22. The final step in adoption of the Basalt Creeks Parks and Recreation Plan is to amend the Comprehensive plan to include it as a part of the overall Parks and Recreation Master Plan.

The proposed Plan Text and Map Amendments (PTA/ PMA 24-0003) would update Chapter 9 (Public Facilities and Services) of the Comprehensive Plan and Chapter 74 of the Development Code consistent with these documents.

CHAPTER	TITLE	PROPOSED AMENDMENT
8	Transportation	Amend Map 8-4: Bicycle and Pedestrian Plan
9	Public Facilities	 Delete references to previous drainage plan Update goals and policies consistent with the 2019 Master Plan Adopt Map 9-3: Stormwater Master Plan

Table 1—Summary of proposed code amendments

Appendix A	Maps	Amend Map 72-2
74	Public Improvement Requirements	 Replace reference to Tualatin Drainage Plan with Stormwater Master Plan

C. Attachments

- Exhibit 2. PMA 24-0003 Map Amendments
- Exhibit 3. PTA 24-0003 Text Amendments
- Exhibit 4. Stormwater Master Plan
- Exhibit 4a. Stormwater Master Plan Appendices A-D
- Exhibit 4b. Stormwater Master Plan Appendices E-I
- Exhibit 5. Basalt Creek Parks and Recreation Plan
- Exhibit 5a. Basalt Creek Parks and Recreation Plan Appendices
- Exhibit 6. Clackamas County UGMA
- Exhibit 7. Washington County UPAA
- Exhibit 8. Public Comments

A. Oregon Statewide Planning Goals

State planning regulations require cities to adopt and amend Comprehensive Plans and land use regulations in compliance with state land use goals. Because the proposed code amendments have a limited scope, their impact to Statewide Planning Goals is limited to those goals addressed below.

Goal 1 – Citizen Involvement

To develop a citizen involvement program that insures the opportunity for citizens to be involved in all phases of the planning process.

Finding:

The Stormwater Master Plan was opened for a public comment period in Fall 2020. An online "open house" featuring project information and synopsis video were available during the comment period to aid public understanding of the project.

The Basalt Creek Parks and Recreation Master Plan followed a 10-month planning and public involvement period that included a community tabling event, web page, surveys, focus groups, and a public open house and meetings.

The amendments are subject to the public notification requirements specified in TDC 32.250. A notice will be published in the Tualatin Times, and a public hearing will be held. A public meeting will be held by the Planning Commission on July 17, 2024 and a public hearing will be held by the City Council August 12, 2024. Any comments submitted by the community will be included in the City Council hearing packet. The proposed amendments conform to Goal 1.

Goal 2 – Land Use Planning

To establish a land use planning process and policy framework as a basis for all decision and actions related to use of land and to assure an adequate factual base for such decisions and actions.

Finding:

The Department of Land Conservation and Development has acknowledged the City's Comprehensive Plan as being consistent with the statewide planning goals. And the Development Code provides a policy framework which service as the basis for all decisions and actions related to land use. The proposed text amendments to the Tualatin Development Code have been processed in accordance with these procedures. The proposed amendments conform to Goal 2.

Goal 6 – Air, Water and Land Resources Quality To maintain and improve the quality of the air, water and land resources of the state.

Finding:

A functioning stormwater management system is in the best interest of water quality and the protection of other natural resources. The Stormwater Master Plan has been developed in coordination with the applicable regional agencies, including Clean Water Services.

Future development of trails or parks facilities as indicated by the Basalt Creek Parks and Recreation Master Plan will still need to comply with the state, national and regional regulations and protections for air, water and land resources. The proposed amendments conform to Goal 6. To satisfy the recreational needs of the citizens of the state and visitors and, where appropriate, to provide for the siting of necessary recreational facilities including destination resorts.

Finding:

The Basalt Creek Parks and Recreation Master Plan complements two previous planning efforts: the Basalt Creek Comprehensive Plan, which described future land uses and needed infrastructure for Basalt Creek, and the Tualatin Parks and Recreation Master Plan, which identified a need for land acquisition and related park and trail planning. The Basalt Creek Parks and Recreation Master Plan assessed recreational opportunities in Basalt Creek, established a development framework to guide future park and trail investments in the area, while estimating costs and identifying steps towards implementation. The proposed amendments conform to Goal 8.

Goal 11 – Public Facilities and Services

To plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban and rural development.

Finding:

The Stormwater Master Plan is intended to serve the needs of present and future development. No extension of services is proposed beyond the Tualatin Urban Planning Area, which is within the Urban Growth Boundary. The proposed amendments conform to Goal 11.

B. Oregon Administrative Rules (OAR)

660-011-0010

The Public Facility Plan

(1) The public facility plan shall contain the following items:

- (a) An inventory and general assessment of the condition of all the significant public facility systems which support the land uses designated in the acknowledged comprehensive plan;
 (b) A list of the significant public facility projects which are to support the land uses designated in the acknowledged comprehensive plan. Public facility project descriptions or specifications of these projects as necessary;
- (c) Rough cost estimates of each public facility project;
- (d) A map or written description of each public facility project's general location or service area; (e) Policy statement(s) or urban growth management agreement identifying the provider of each public facility system. If there is more than one provider with the authority to provide the system within the area covered by the public facility plan, then the provider of each project shall be designated;
- (f) An estimate of when each facility project will be needed; and
- (g) A discussion of the provider's existing funding mechanisms and the ability of these and possible new mechanisms to fund the development of each public facility project or system.

(2) Those public facilities to be addressed in the plan shall include, but need not be limited to those specified in OAR 660-011-0005 (Definitions)(5). Facilities included in the public facility plan other than those included in OAR 660-011-0005 (Definitions)(5) will not be reviewed for compliance with this rule.

(3) It is not the purpose of this division to cause duplication of or to supplant existing applicable facility plans and programs. Where all or part of an acknowledged comprehensive plan, facility master

plan either of the local jurisdiction or appropriate special district, capital improvement program, regional functional plan, similar plan or any combination of such plans meets all or some of the requirements of this division, those plans, or programs may be incorporated by reference into the public facility plan required by this division. Only those referenced portions of such documents shall be considered to be a part of the public facility plan and shall be subject to the administrative procedures of this division and ORS Chapter 197 (Comprehensive Land Use Planning).

Finding:

The Stormwater System Master Plan (2019) contains information regarding the condition of current stormwater management systems, anticipated capital investments, and details such as location and associated costs. A map and additional descriptions of anticipated capital improvements is included in the plan and proposed to be adopted as Map 9-3 of the Comprehensive Plan. Public facilities have been planned in conjunction with other relevant agencies, especially Clean Water Services. Funding mechanisms including System Development Charges and utility rates is also discussed within the Plan.

Separate sections of the Tualatin Comprehensive Plan address transportation, potable water, and sanitary sewer. No changes to these sections are being proposed with the proposed amendments.

The Basalt Creek Parks and Recreation Master Plan identified recreational opportunities, including trail investments in the Basalt Creek area, while estimating costs and steps towards implementation. The trails have been planned in conjunction with other relevant agencies including Metro, Wilsonville, Sherwood, and Washington County. The Basalt Creek Parks and Recreation Master Plan is proposed to be adopted as a supporting document to the Comprehensive Plan.

These standards are met.

Rule 660-011-0015

Responsibility for Public Facility Plan Preparation

(1) Responsibility for the preparation, adoption and amendment of the public facility plan shall be specified within the urban growth management agreement. If the urban growth management agreement does not make provision for this responsibility, the agreement shall be amended to do so prior to the preparation of the public facility plan. In the case where an unincorporated area exists within the Portland Metropolitan Urban Growth Boundary which is not contained within the boundary of an approved urban planning area agreement with the County, the County shall be the responsible agency for preparation of the facility plan for that unincorporated area. The urban growth management agreement shall be submitted with the public facility plan as specified in OAR 660-011-0040 (Date of Submittal of Public Facility Plans).

(2) The jurisdiction responsible for the preparation of the public facility plan shall provide for the coordination of such preparation with the city, county, special districts and, as necessary, state and federal agencies and private providers of public facilities. The Metropolitan Service District is responsible for public facility plans coordination within the District consistent with ORS 197.190 and 268.390 (Planning for activities and areas with metropolitan impact).

(3) Special districts, including port districts, shall assist in the development of the public facility plan for those facilities they provide. Special districts may object to that portion of the facilities plan adopted as part of the comprehensive plan during review by the Commission only if they have completed a special district agreement as specified under ORS 197.185 and 197.254 (Bar to contesting

acknowledgment, appealing or seeking amendment)(3) and (4) and participated in the development of such portion of the public facility plan.

(4) Those state agencies providing funding for or making expenditures on public facility systems shall participate in the development of the public facility plan in accordance with their state agency coordination agreement under ORS 197.180 (State agency planning responsibilities) and 197.712 (Commission duties)(2)(f).

Finding:

The City of Tualatin is within both Clackamas and Washington Counties and has separate agreements that function as the applicable urban growth management agreement. The City of Tualatin-Clackamas County Urban Growth Management Agreement (1992) (Exhibit 6) recognizes the City's authority for public facilities planning within the UGB in accordance with this administrative rule. The Washington County—City of Tualatin Urban Planning Area Agreement (2019) (Exhibit 7) likewise acknowledges that the City is responsible for the preparation, adoption, and amendment of the public facility plan required by this section. The City has coordinated with Clean Water Services and applicable partners in the development of the Plan proposed for adoption and relevant text amendments. These standards are met.

Rule 660-011-0020

Public Facility Inventory and Determination of Future Facility Projects

(1) The public facility plan shall include an inventory of significant public facility systems. Where the acknowledged comprehensive plan, background document or one or more of the plans or programs listed in OAR 660-011-0010 (The Public Facility Plan)(3) contains such an inventory, that inventory may be incorporated by reference. The inventory shall include:

(a) Mapped location of the facility or service area;

(b) Facility capacity or size; and

(c) General assessment of condition of the facility (e.g., very good, good, fair, poor, very poor).

(2) The public facility plan shall identify significant public facility projects which are to support the land uses designated in the acknowledged comprehensive plan. The public facility plan shall list the title of the project and describe each public facility project in terms of the type of facility, service area, and facility capacity.

(3) Project descriptions within the facility plan may require modifications based on subsequent environmental impact studies, design studies, facility master plans, capital improvement programs, or site availability. The public facility plan should anticipate these changes as specified in OAR 660-011-0045 (Adoption and Amendment Procedures for Public Facility Plans).

Finding:

The Stormwater Master Plan updates the City's inventory of public facility systems. This inventory includes location data, as well as information about the condition and size or existing facilities. The updated Comprehensive Plan will incorporate this updated inventory information by reference. The Stormwater Master Plan additionally identifies significant projects needed to support further growth and development in Tualatin consistent with the acknowledged Comprehensive Plan.

Findings and Analysis July 17, 2024 The majority of the Basalt Creek Planning Area is rural land that is eligible for annexation into the City of Tualatin. As such, the Basalt Creek Parks and Recreation Master Plan acknowledges there are no existing park or trail facilities but identifies where those improvements should be considered and the estimated costs. The amendments are consistent with these standards.

Rule 660-011-0025 Timing of Required Public Facilities

PTA/PMA24-0003

(1) The public facilities plan shall include a general estimate of the timing for the planned public facility projects. This timing component of the public facilities plan can be met in several ways depending on whether the project is anticipated in the short term or long term. The timing of projects may be related directly to population growth, e.g., the expansion or new construction of water treatment facilities. Other facility projects can be related to a measure of the facility's service level being met or exceeded, e.g., a major arterial or intersection reaching a maximum vehicle-per-day standard. Development of other projects may be more long term and tied neither to specific population levels nor measures of service levels, e.g., sewer projects to correct infiltration and inflow problems. These projects can take place over a long period of time and may be tied to the availability of long-term funding. The timing of projects may also be tied to specific years.

(2) Given the different methods used to estimate the timing of public facilities, the public facility plan shall identify projects as occurring in either the short term or long term, based on those factors which are related to project development. For those projects designated for development in the short term, the public facility plan shall identify an approximate year for development. For those projects designated for development over the long term, the public facility plan shall provide a general estimate as to when the need for project development would exist, e.g., population level, service level standards, etc. Timing provisions for public facility projects shall be consistent with the acknowledged comprehensive plan's projected growth estimates. The public facility plan shall consider the relationships between facilities in providing for development.

(3) Anticipated timing provisions for public facilities are not considered land use decisions as specified in ORS 197.712 (Commission duties)(2)(e), and, therefore, cannot be the basis of appeal under ORS 197.610 (Submission of proposed comprehensive plan or land use regulation changes to Department of Land Conservation and Development)(1) and (2) or 197.835 (Scope of review)(4).

Finding:

The Stormwater Master Plan includes information on whether anticipated capital projects are "High Priority (2019-2029) or "Lower Priority (Future)" as seen in Table 7-1. This determination is in relationship to identified system capacity needs. These standards are met.

Rule 660-011-0030 Location of Public Facility Projects

(1) The public facility plan shall identify the general location of the public facility project in specificity appropriate for the facility. Locations of projects anticipated to be carried out in the short term can be specified more precisely than the locations of projects anticipated for development in the long term.
 (2) Anticipated locations for public facilities may require modifications based on subsequent environmental impact studies, design studies, facility master plans, capital improvement programs, or

land availability. The public facility plan should anticipate those changes as specified in OAR 660-011-0045 (Adoption and Amendment Procedures for Public Facility Plans).

Rule 660-011-0035

Determination of Rough Cost Estimates for Public Facility Projects and Local Review of Funding Mechanisms for Public Facility Systems

(1) The public facility plan shall include rough cost estimates for those sewer, water, and transportation public facility projects identified in the facility plan. The intent of these rough cost estimates is to:

(a) Provide an estimate of the fiscal requirements to support the land use designations in the acknowledged comprehensive plan; and

(b) For use by the facility provider in reviewing the provider's existing funding mechanisms (e.g., general funds, general obligation and revenue bonds, local improvement district, system development charges, etc.) and possible alternative funding mechanisms. In addition to including rough cost estimates for each project, the facility plan shall include a discussion of the provider's existing funding mechanisms and the ability of these and possible new mechanisms to fund the development of each public facility project or system. These funding mechanisms may also be described in terms of general guidelines or local policies.

(2) Anticipated financing provisions are not considered land use decisions as specified in ORS 197.712 (Commission duties)(2)(e) and, therefore, cannot be the basis of appeal under ORS 197.610 (Submission of proposed comprehensive plan or land use regulation changes to Department of Land Conservation and Development)(1) and (2) or 197.835 (Scope of review)(4).

Finding:

The Stormwater Master Plan includes information about the proposed location of specific capital projects. The Plan also includes cost estimates, including SDC eligible costs associated with the separate projects. The Plan includes additional discussion of funding mechanisms. These standards are met.

Rule 660-011-0045

Adoption and Amendment Procedures for Public Facility Plans

(1) The governing body of the city or county responsible for development of the public facility plan shall adopt the plan as a supporting document to the jurisdiction's comprehensive plan and shall also adopt as part of the comprehensive plan:

(a) The list of public facility project titles, excluding (if the jurisdiction so chooses) the descriptions or specifications of those projects;

(b) A map or written description of the public facility projects' locations or service areas as specified in sections (2) and (3) of this rule; and

(c) The policy(ies) or urban growth management agreement designating the provider of each public facility system. If there is more than one provider with the authority to provide the system within the area covered by the public facility plan, then the provider of each project shall be designated.

(2) Certain public facility project descriptions, location or service area designations will necessarily change as a result of subsequent design studies, capital improvement programs, environmental impact studies, and changes in potential sources of funding. It is not the intent of this division to:

(a) Either prohibit projects not included in the public facility plans for which unanticipated funding has been obtained;

(b) Preclude project specification and location decisions made according to the National Environmental Policy Act; or

(c) Subject administrative and technical changes to the facility plan to ORS 197.610 (Submission of proposed comprehensive plan or land use regulation changes to Department of Land Conservation and Development)(1) and (2) or 197.835 (Scope of review)(4).

(3) The public facility plan may allow for the following modifications to projects without amendment to the public facility plan:

(a) Administrative changes are those modifications to a public facility project which are minor in nature and do not significantly impact the project's general description, location, sizing, capacity, or other general characteristic of the project;

(b) Technical and environmental changes are those modifications to a public facility project which are made pursuant to "final engineering" on a project or those that result from the findings of an Environmental Assessment or Environmental Impact Statement conducted under regulations implementing the procedural provisions of the National Environmental Policy Act of 1969 (40 CFR Parts 1500–1508) or any federal or State of Oregon agency project development regulations consistent with that Act and its regulations.

(c) Public facility project changes made pursuant to subsection (3)(b) of this rule are subject to the administrative procedures and review and appeal provisions of the regulations controlling the study (40 CFR Parts 1500–1508 or similar regulations) and are not subject to the administrative procedures or review or appeal provisions of ORS Chapter 197 (Comprehensive Land Use Planning), or OAR chapter 660 division 18.

(4) Land use amendments are those modifications or amendments to the list, location or provider of, public facility projects, which significantly impact a public facility project identified in the comprehensive plan and which do not qualify under subsection (3)(a) or (b) of this rule. Amendments made pursuant to this subsection are subject to the administrative procedures and review and appeal provisions accorded "land use decisions" in ORS Chapter 197 (Comprehensive Land Use Planning) and those set forth in OAR chapter 660 division 18.

Finding:

The proposed amendments modify the existing Public Facilities and Parks, Open Space, and Environment components of Tualatin's acknowledged Comprehensive Plan. Consistency with urban growth management policies is considered in Section C detailing consistency with applicable Metro Code. The proposed amendments are consistent with these standards.

Rule 660-011-0050

Standards for Review by the Department

The Department of Land Conservation and Development shall evaluate the following, as further defined in this division, when reviewing public facility plans submitted under this division:

(1)Those items as specified in OAR 660-011-0010 (The Public Facility Plan)(1);

(2) Whether the plan contains a copy of all agreements required under OAR 660-011-0010 (The Public Facility Plan) and 660-011-0015 (Responsibility for Public Facility Plan Preparation); and

(3) Whether the public facility plan is consistent with the acknowledged comprehensive plan.

PTA/PMA24-0003 Findings and Analysis July 17, 2024 Finding:

As discussed above, the proposed amendments to adopt the Stormwater Master Plan and Basalt Creek Parks and Recreation Plan as supporting documents to the Comprehensive Plan consistent with the requirements of OAR 660-011-0010. The proposed amendments are consistent with these standards.

660-034-0040 Planning for Local Parks

(1) Local park providers may prepare local park master plans, and local governments may amend acknowledged comprehensive plans and zoning ordinances pursuant to the requirements and procedures of ORS 197.610 to 197.625 in order to implement such local park plans. Local governments are not required to adopt a local park master plan in order to approve a land use decision allowing parks or park uses on agricultural lands under provisions of ORS 215.213 or 215.283 or on forestlands under provisions of OAR 660-006-0025(4), as further addressed in sections (3) and (4) of this rule. If a local government decides to adopt a local park plan as part of the local comprehensive plan, the adoption shall include:

(a) A plan map designation, as necessary, to indicate the location and boundaries of the local park; and

(b) Appropriate zoning categories and map designations (a "local park" zone or overlay zone is recommended), including objective land use and siting review criteria, in order to authorize the existing and planned park uses described in local park master plan.

(2) Unless the context requires otherwise, this rule does not require changes to:

(a) Local park plans that were adopted as part of an acknowledged local land use plan prior to July 15, 1998; or

(b) Lawful uses in existence within local parks on July 15, 1998.

(3) All uses allowed under Statewide Planning Goal 3 are allowed on agricultural land within a local park and all uses allowed under Statewide Planning Goal 4 are allowed on forest land within a local park, in accordance with applicable laws, statewide goals, and rules.

(4) Although some of the uses listed in OAR 660-034-0035(2)(a) to (g) are not allowed on agricultural or forest land without an exception to Goal 3 or Goal 4, a local government is not required to take an exception to Goals 3 or 4 to allow such uses on land within a local park provided such uses, alone or in combination, meet all other statewide goals and are described and authorized in a local park master plan that:

(a) Is adopted as part of the local comprehensive plan in conformance with Section (1) of this rule and consistent with all statewide goals;

(b) Is prepared and adopted applying criteria comparable to those required for uses in state parks under OAR chapter 736, division 18; and

(c) Includes findings demonstrating compliance with ORS 215.296 for all uses and activities proposed on or adjacent to land zoned for farm or forest use.

Finding:

The Basalt Creek Parks and Recreation Master Plan is proposed to be adopted as a supporting document to the Comprehensive Plan and will be used as a tool to implement local park plans. The proposed amendments are consistent with these standards.

C. Metro Code

Title 3: Water Quality and Flood Management 3.07.330 Implementation Alternatives for Cities and Counties

(2) Demonstrate that existing city and county comprehensive plans and implementing ordinances substantially comply with the performance standards in Section 3.07.340 and the intent of this title.

3.07.340 Performance Standards

(a) Flood Management Performance Standards.

(1) The purpose of these standards is to reduce the risk of flooding, prevent or reduce risk to human life and property, and maintain functions and values of floodplains such as allowing for the storage and conveyance of stream flows through existing and natural flood conveyance systems.

(2) All development, excavation and fill in the Flood Management Areas shall conform to the following performance standards:

(A) Development, excavation and fill shall be performed in a manner to maintain or increase flood storage and conveyance capacity and not increase design flood elevations.

(B) All fill placed at or below the design flood elevation in Flood Management Areas shall be balanced with at least an equal amount of soil material removal.

(C) Excavation shall not be counted as compensating for fill if such areas will be filled with water in non-storm winter conditions.

(D) Minimum finished floor elevations for new habitable structures in the Flood Management Areas shall be at least one foot above the design flood elevation.

(E) Temporary fills permitted during construction shall be removed.

(F) Uncontained areas of hazardous materials as defined by DEQ in the Flood Management Area shall be prohibited.

(3) The following uses and activities are not subject to the requirements of subsection(2):

(A) Excavation and fill necessary to plant new trees or vegetation.

(B) Excavation and fill required for the construction of detention facilities or structures, and other facilities such as levees specifically designed to reduce or mitigate flood impacts. Levees shall not be used to create vacant buildable lands.

(C) New culverts, stream crossings, and transportation projects may be permitted if designed as balanced cut and fill projects or designed to not significantly raise the design flood elevation. Such projects shall be designed to minimize the area of fill in Flood Management Areas and to minimize erosive velocities. Stream crossing shall be as close to perpendicular to the stream as practicable. Bridges shall be used instead of culverts wherever practicable.

(b) Water Quality Performance Standards.

(1) The purpose of these standards is to: 1) protect and improve water quality to support the designated beneficial water uses as defined in Title 10, and 2) protect the functions and values of the Water Quality Resource Area which include, but are not limited to:

(A) Providing a vegetated corridor to separate Protected Water Features from development;

(B) Maintaining or reducing stream temperatures;

(C) Maintaining natural stream corridors;

(D) Minimizing erosion, nutrient and pollutant loading into water;

(E) Filtering, infiltration and natural water purification; and

(F) Stabilizing slopes to prevent landslides contributing to sedimentation of water features.

(2) Local codes shall require all development in Water Quality Resource Areas to conform to the following performance standards:

(A) The Water Quality Resource Area is the vegetated corridor and the Protected Water Feature. The width of the vegetated corridor is specified in Table 3.07-3. At least three slope measurements along the water feature, at no more than 100-foot increments, shall be made for each property for which development is proposed. Depending on the width of the property, the width of the vegetated corridor will vary.

(B) Water Quality Resource Areas shall be protected, maintained, enhanced or restored as specified in Section 3.07.340(b)(2).

(C) Prohibit development that will have a significant negative impact on the functions and values of the Water Quality Resource Area, which cannot be mitigated in accordance with subsection (2)(F).
(D) Native vegetation shall be maintained, enhanced or restored, if disturbed, in the Water Quality Resource Area. Invasive nonnative or noxious vegetation may be removed from the Water Quality Resource Area. Use of native vegetation shall be encouraged to enhance or restore the Water Quality Resource Area. This shall not preclude construction of energy dissipaters at outfalls consistent with watershed enhancement, and as approved by local surface water management agencies.
(E) Uncontained areas of hazardous materials as defined by DEQ in the Water Quality Resource Area

shall be prohibited.

(F) Cities and counties may allow development in Water Quality Resource Areas provided that the governing body, or its designate, implement procedures which: (i) Demonstrate that no practicable alternatives to the requested development exist which will not disturb the Water Quality Resource Area; and (ii) If there is no practicable alternative, limit the development to reduce the impact associated with the proposed use; and (iii) Where the development occurs, require mitigation to ensure that the functions and values of the Water Quality Resource Area are restored.

(G) Cities and counties may allow development for repair, replacement or improvement of utility facilities so long as the Water Quality Resource Area is restored consistent with Section 3.07.340(b)(2)(D).

(H) The performance standards of Section 3.07.340(b)(2) do not apply to routine repair and maintenance of existing structures, roadways, driveways, utilities, accessory uses and other development.

(3) For lots or parcels which are fully or predominantly within the Water Quality Resource Area and are demonstrated to be unbuildable by the vegetative corridor regulations, cities and counties shall reduce or remove vegetative corridor regulations to assure the lot or parcel will be buildable while still providing the maximum vegetated corridor practicable. Cities and counties shall encourage landowners to voluntarily protect these areas through various means, such as conservation easements and incentive programs.

(c) Erosion and Sediment Control.

(1) The purpose of this section is to require erosion prevention measures and sediment control practices during and after construction to prevent the discharge of sediments.

(2) Erosion prevention techniques shall be designed to prevent visible and measurable erosion as defined in Title 10.

(3) To the extent erosion cannot be completely prevented, sediment control measures shall be designed to capture, and retain on-site, soil particles that have become dislodged by erosion.

(d) Implementation Tools to Protect Water Quality and Flood Management Areas.

(1) Cities and counties shall either adopt land use regulations, which authorize transfer of permitted units and floor area to mitigate the effects of development restrictions in Water Quality and Flood Management Areas, or adopt other measures that mitigate the effects of development restrictions.

(2) Metro encourages local governments to require that approvals of applications for partitions, subdivisions and design review actions be conditioned upon one of the following:

(A) Protection of Water Quality and Flood Management Areas with a conservation easement;

(B) Platting Water Quality and Flood Management Areas as common open space; or

(C) Offer of sale or donation of property to public agencies or private non-profits for preservation where feasible.

(3) Additions, alterations, rehabilitation or replacement of existing structures, roadways, driveways, accessory uses and development in the Water Quality and Flood Management Area may be allowed provided that:

(A) The addition, alteration, rehabilitation or replacement is not inconsistent with applicable city and county regulations, and

(B) The addition, alteration, rehabilitation or replacement does not encroach closer to the Protected Water Feature than the existing structures, roadways, driveways or accessory uses and development, and

(C) The addition, alteration, rehabilitation or replacement satisfies Section 3.07.340(c) of this title. (D) In determining appropriate conditions of approval, the affected city or county shall require the applicant to:

(i) Demonstrate that no reasonably practicable alternative design or method of development exists that would have a lesser impact on the Water Quality Resource Area than the one proposed; and (ii) If no such reasonably practicable alternative design or method of development exists, the project should be conditioned to limit its disturbance and impact on the Water Quality Resource to the minimum extent necessary to achieve the proposed addition, alteration, restoration, replacement or rehabilitation; and

(iii) Provide mitigation to ensure that impacts to the functions and values of the Water Quality Resource Area will be mitigated or restored to the extent practicable.

(4) Cities and counties may choose not to apply the Water Quality and Flood Management Area performance standards of Section 3.07.340 to development necessary for the placement of structures when it does not require a grading or building permit.

(5) Metro encourages cities and counties to provide for restoration and enhancement of degraded Water Quality Resource Areas through conditions of approval when development is proposed, or through incentives or other means.

(6) Cities and counties shall apply the performance standards of this title to Title 3 Wetlands as shown on the Metro Water Quality and Flood Management Areas Map and locally adopted Water Quality and Flood Management Areas maps. Cities and counties may also apply the performance standards of this title to other wetlands.

(e) Map Administration. Cities and counties shall amend their comprehensive plans and implementing ordinances to provide a process for each of the following:

(1) Amendments to city and county adopted Water Quality and Flood Management Area maps to correct the location of Protected Water Features, Water Quality Resource Areas and Flood Management Areas. Amendments shall be initiated within 90 days of the date the city or county receives information establishing a possible map error.

(2) Modification of the Water Quality Resource Area upon demonstration that the modification will offer the same or better protection of water quality, the Water Quality and Flood Management Area and Protected Water Feature.

(3) Amendments to city and county adopted Water Quality and Flood Management Area maps to add Title 3 Wetlands when the city or county receives significant evidence that a wetland meets any one of the following criteria:

(A) The wetland is fed by surface flows, sheet flows or precipitation, and has evidence of flooding during the growing season, and has 60 percent or greater vegetated cover, and is over one-half acre in size; or The wetland qualifies as having "intact water quality function" under the 1996 Oregon Freshwater Wetland Assessment Methodology; or

(B) The wetland is in the Flood Management Area, and has evidence of flooding during the growing season, and is five acres or more in size, and has a restricted outlet or no outlet; or The wetland qualifies as having "intact hydrologic control function" under the 1996 Oregon Freshwater Wetland Assessment Methodology; or

(C) The wetland or a portion of the wetland is within a horizontal distance of less than one-fourth mile from a water body which meets the Department of Environmental Quality definition of "water quality limited" water body in OAR Chapter 340, Division 41. Examples of significant evidence that a wetland exists that may meet the criteria above are a wetland assessment conducted using the 1996 Oregon Freshwater Wetland Assessment Methodology, or correspondence from the Division of State Lands that a wetland determination or delineation has been submitted or completed for property in the city or county.

(4) Cities and counties are not required to apply the criteria in Section 3.07.340(e)(3) to water quality or stormwater detention facilities.

Finding:

The proposed amendments will adopt the Stormwater Master Plan as a supporting document to the Tualatin Comprehensive Plan, as well as update comprehensive plan policies specific to stormwater management practices and will add Map 9-3 which illustrates public stormwater infrastructure and capital projects. A minor update to the development code will correct references to the Stormwater Master Plan within the Comprehensive Plan. Existing stormwater regulation will remain as previously acknowledged by Metro and DLCD.

Drainage, storm water and surface water runoff in Tualatin are addressed in the Tualatin Drainage Plan, the Surface Water Management Ordinance (SWM Ordinance) (Ord. No. 846-91) and Tualatin Development Code Chapter 74. The stormwater management policies and requirements in the SWM Ordinance were adopted by the City and other jurisdictions in the Tualatin River Basin to implement Clean Water Services requirements for control of sedimentation and water quality, which had been found by Metro to be consistent with Title 3, thus bringing Tualatin into conformance with Title 3 as well. The proposed amendments are consistent with Title 3.

D. Tualatin Comprehensive Plan

Chapter 7 — Parks, Open Space & Environment

Finding:

The proposed amendments will adopt the Basalt Creek Parks and Recreation Plan as a supporting document to the Tualatin Comprehensive Plan. The adoption remains consistent with Goal 1, to expand accessible and inclusive parks and facilities to support community interests and recreation needs and Goal 3, to conserve and restore natural areas to support wildlife, promote ecological functions, and connect residents to nature and the outdoors. No amendments are proposed to the existing Chapter 7 goals or policies.

PTA/PMA24-0003 Findings and Analysis July 17, 2024 Chapter 9 — Public Facilities and Services

Finding:

The proposed amendments will adopt the Stormwater Master Plan as a supporting document to the Tualatin Comprehensive Plan, as well as update certain Chapter 9 policies consistent with the master plan. These amendments remain consistent with Goal 9.3, to provide a plan for routing surface drainage through the City, utilizing natural drainages when possible. The Master Plan adoption inherently poses an update with data reflecting the present development patterns, challenge areas, and provides a plan for managing stormwater flows.

Specific policies are updated to reflect current data as studied in the Stormwater Master Plan and reflect current administrative practices and partnerships. Other than where it is appropriate to update said Comprehensive Plan policies, the changes remain consistent with the Comprehensive Plan.

E. Tualatin Development Code

Chapter 33: Applications and Approval Criteria Section 33.070 Plan Amendments

[...]

(2) Applicability. Quasi-judicial amendments may be initiated by the City Council, the City staff, or by a property owner or person authorized in writing by the property owner. Legislative amendments may only be initiated by the City Council.

Finding:

A Plan Text Amendment and Plan Map Amendment are proposed. This proposal is legislative in nature and therefore has been processed consistent with the Type IV-B procedures in Chapter 32. This criterion is met.

[...]

(5) Approval Criteria.

- (a) Granting the amendment is in the public interest.
- (b) The public interest is best protected by granting the amendment at this time.

Finding:

The amendment would adopt and implement the Stormwater Master Plan and the Basalt Creek Parks and Recreation Plan.

Text and map amendments are included to ensure that the Tualatin Comprehensive Plan and Development Code accurately reflects the current Stormwater Master Plan for future implementation.

Without these updates, the development of important infrastructure could be stymied. A functioning stormwater system is in the interest of public health, safety, and local prosperity. Criteria (a) and (b) are met.

(c) The proposed amendment is in conformity with the applicable objectives of the Tualatin Comprehensive Plan.

Finding:

The applicable goals and policies of the Tualatin Comprehensive Plan have been considered, and are discussed above in Section D. Criterion (c) is met.

(d) The following factors were consciously considered:

- (i) The various characteristics of the areas in the City;
- (ii) The suitability of the areas for particular land uses and improvements in the areas;
- (iii) Trends in land improvement and development;

(iv) Property values;

(v) The needs of economic enterprises and the future development of the area; needed right- of-way and access for and to particular sites in the area;

(vi) Natural resources of the City and the protection and conservation of said resources;

(vii) Prospective requirements for the development of natural resources in the City;

(viii) The public need for healthful, safe, esthetic surroundings and conditions;

Finding:

The proposed amendments to the plan text do not change any land use designation or zoning, and do not have a direct impact on the mix of allowed uses. Both a functioning stormwater management system and parks and recreation program, is however important to supporting citywide development potential and property value. The plans include a coordinated approach to managing infrastructure improvements that will be needed to support new development in Tualatin, preserve development, and allow for daily activities to continue in a healthy and safe manner. Furthermore, a functioning stormwater management system and parks plan is critical to protecting natural resources.

Criterion (d) is met.

(e) If the amendment involves residential uses, then the appropriate school district or districts must be able to reasonably accommodate additional residential capacity by means determined by any affected school district.

Finding:

The amendment does not involve residential uses. Criterion (e) does not apply.

(f) Granting the amendment is consistent with the applicable State of Oregon Planning Goals and applicable Oregon Administrative Rules, including compliance with the Transportation Planning Rule TPR (OAR 660-012-0060).

Finding:

Section C details findings for the applicable Oregon Planning Rules. Criterion (f) is met.

(g) Granting the amendment is consistent with the Metropolitan Service District's Urban Growth Management Functional Plan.

Finding:

The plan adoptions and amendments to Chapter 9 of the Comprehensive Plan do not affect any portion of the Urban Growth Functional Management Plan. Criterion (g) is met.

(h) Granting the amendment is consistent with Level of Service F for the p.m. peak hour and E for the one-half hour before and after the p.m. peak hour for the Town Center 2040 Design Type (TDC Map 9-4), and E/E for the rest of the 2040 Design Types in the City's planning area.

PTA/PMA24-0003 Findings and Analysis July 17, 2024 **Finding:**

The proposed amendments do not affect vehicle trips. Future development of parks and trails would be required to be consistent with applicable transportation and public facilities plans and requirements. Criteria (h) is met.

(i) Granting the amendment is consistent with the objectives and policies regarding potable water, sanitary sewer, and surface water management pursuant to TDC 12.020, water management issues are adequately addressed during development or redevelopment anticipated to follow the granting of a plan amendment.

Finding:

The amendments have implications for surface water management, which are discussed in Section B. Criterion (i) is met.

(j) The applicant has entered into a development agreement. This criterion applies only to an amendment specific to property within the Urban Planning Area (UPA), also known as the Planning Area Boundary (PAB), as defined in both the Urban Growth Management Agreement (UGMA) with Clackamas County and the Urban Planning Area Agreement (UPAA) with Washington County. TDC Map 9-1 illustrates this area.

Finding:

The proposed amendments are not property specific, and this criterion does not apply.

III. RECOMMENDATION

Based on the application and the above analysis and findings, the proposed annexation complies with applicable Oregon Administration Rules, Metro Code, and TDC. Accordingly, staff recommends City Council approval of File No. PTA/PMA24-0003.

EXISTING Map 8-4: Bicycle and Pedestrian Plan



PROPOSED Map 8-4: Bicycle and Pedestrian Plan








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Tualatin Comprehensive Plan

[...]

PART II

PLAN IMPLEMENTATION

TECHNICAL MEMORANDA					
Background and Supporting Documents Adopted as part of the Comprehensive Plan					
Title Adoption Date Ordina					
Stormwater Master Plan	, 2024	<u>-24</u>			
Economic Opportunities Analysis	August 28, 2023	1480-23			
Water Master Plan	July 10, 2023	1476-23			
Housing Needs Analysis	December 14, 2020	1450-20			
Parks and Recreation Master Plan	November 25, 2019	1427-19			
Sewer Master Plan	November 25, 2019	1427-19			
	August 28, 2023;	1480-23;			
Transportation System Dian (TCD)	November 25, 2019;	1427-19;			
	April 22, 2019;	1418-19;			
	February 25, 2013	1354-13			
Natural Resource Inventory and Local Wetlands	July 14, 1997	979-97			
Inventory	, ,				
Historic Resource Technical Study and Inventory	May 24, 1993;	894-93;			
	October 14, 1991	844-91			
Area-Specific Concept Plans					
Basalt Creek Parks & Recreation Plan	, 2024	<u>-24</u>			
Basalt Creek Concept Plan	April 22, 2019	1418-19			
Southwest Tualatin Concept Plan	April 25, 2011	1321-11			
Northwest Tualatin Concept Plan	June 27. 2005	1191-05			

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CHAPTER 9 - PUBLIC FACILITIES AND SERVICES

[...]

DRAINAGE PLAN AND SURFACE WATER MANAGEMENT STORMWATER MANAGEMENT

The Tualatin Drainage Plan is the City's drainage plan. It was originally prepared by Robert A. Wright, Consulting Engineers in 1972 and adopted in 1975 (Ord. 280-75) and in 1979 as an element of the Tualatin Community Plan (Ord. 491-79). The Tualatin Drainage Plan is referenced in the Technical Memoranda. With the supporting technical material, the Tualatin Drainage Plan provides an overall view of the drainage system, its major problems and their solutions, and is the City's stormwater and surface water drainage policy.

The Tualatin Drainage Plan was updated in the fall of 1995 by the Hedges Creek Subbasin Plan. The HCS Plan is outlined in Chapter 1 of the HCSS Report and implements the recommended drainage and stormwater management activities and facilities. The HCS Plan relies on the technical data and analysis documented in the HCSS report. The HCSS Report and the HCS Plan identify the critical importance of the Hedges Creek Marsh to drainage, stormwater management and water quality in the subbasin. The HCS Plan provides for drainage improvements, stormwater detention requirements and a number of non-structural activities for better management of water quantity and water quality in the Hedges Creek Subbasin.

Map 14-1 is from Figure I-1 of the HCS Plan. It shows the drainage pattern revisions and drainage system improvements for the Hedges Creek Subbasin. The drainage pattern revisions and drainage system improvements shown in Map 14-1 are incorporated into the Tualatin Drainage Plan.

The HCSS Report is a comprehensive technical document that provides data and analysis of stormwater drainage in the Hedges Creek Subbasin. From an analysis of several alternatives, the report recommended specific management activities and facilities to control water quantity and quality problems associated with urban stormwater runoff in the Hedges Creek Subbasin. The HCS Plan incorporates the report's recommended activities and facilities.

The Northwest Tualatin Concept Plan 2005 identifies stormwater drainage options for the area west of Cipole Road and south of Pacific Highway 99W.

The Southwest Tualatin Concept Plan 2010 identifies stormwater drainage options for the area south of SW Tualatin-Sherwood Road and east of SW 124th Avenue. Goals and Policies.

<u>The Stormwater Master Plan (2019) is adopted as a background document to the</u> <u>Comprehensive Plan as seen in Part II. Capital projects and related information is contained in</u> <u>the Stormwater Master Plan. The Plan supports regulatory directives under Clean Water</u> <u>Services (CWS).</u>

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Goal 9.3 Provide a plan for routing surface drainage through the City, utilizing the natural drainages where possible. Update the plan as needed with drainage studies of problem areas and to respond to changes in the drainage pattern caused by urban development.

Policy 9.3.1 Coordinate the City's Drainage Plan and Stormwater Management regulations with the City's Floodplain District, Wetland Protection District and Natural Resource Protection Overlay District regulations, and with the plans of <u>USA-Clean Water Services</u> and other regional, state, and federal agencies to achieve consistency among the plans.

Policy 9.3.2 Protect areas of the city with observed and/or reported instream erosion and hydromodification risk by requiring development to implement controls related to flow control.

Policy 9.3.3 Increase water quality treatment throughout the City by expanding treatment area coverage through water quality retrofits and enhancing the level of treatment provided. Continue working with state and regional agencies on surface water management and water <u>quality</u> Reduce sediment and other pollutants reaching the public storm and surface water system by implementing the Oregon Department of Environmental Quality (DEQ) and USA requirements for surface water management and water quality in the Tualatin River basin. Reduce soil erosion, manage surface water runoff and improve surface water quality.

Policy 9.3.4 Identify and solve existing problems in the drainage system and plan for construction of drainage system improvements that support future development.

Policy 9.3.5 Provide standards for surface water management and water quality by which development will be reviewed and approved. Review and update the standards as needed.

Policy 9.3. Clearly indicate responsibilities for maintaining stormwater management and water quality facilities.

Policy 9.3.7 Enforce drainage and stormwater management standards.

Policy 9.3.8 Route stormwater runoff from the upper Hedges Creek Subbasin through the Wetland Protected Area marsh which as a wetland provides important drainage, stormwater management and water quality benefits.

Policy 9.3.9 Protect the Wetland Protected Area marsh and its important drainage, stormwater management and water quality functions in the Hedges Creek Subbasin.

Policy 9.3.10 Require new development to provide onsite pollution reduction facilities when necessary to treat stormwater runoff prior to entering Hedges Creek and protect the marsh from urban stormwater pollutants.

Policy 9.3.<u>11</u> To reduce sedimentation and erosive stormwater flow volumes, require onsite stormwater detention facilities for new development in the Hedges Creek Subbasin upstream from the Wetland Protected Area marsh.

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Policy 9.3.12 Consider opportunities to construct regional pollution reduction facilities to treat stormwater runoff prior to entering Hedges Creek and protect the marsh from urban stormwater pollutants.

Policy 9.3.<u>13</u> Restrict beaver dam activity in the Wetland Protected Area marsh to retain the drainage flow through the marsh area and to reduce flooding between Teton Avenue and Tualatin Road. Implement beaver management techniques to selectively encourage/discourage beaver activity based on the characteristics of the stormwater drainage systems, topography, and vegetation.

Policy 9.3.14 As outlined in the HCS Plan, the City will a <u>Coordinate with</u> CWS with nonstructural activities including to implement public education programs and water quality and management activity monitoring.

Policy 9.3.15 Comply with Metro's Urban Growth Management Functional Plan, Title 3.

Policy 9.3.16 Develop and support a program for continual public water quality facility maintenance, including both routine maintenance and larger system restoration and redesign as needed.

Policy 9.3.17 Validate and construct water quality retrofits, prioritizing project opportunities based on annual inspection efforts.

[...]

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Tualatin Development Code

CHAPTER 74 PUBLIC IMPROVEMENT REQUIREMENTS

[...]

TDC 74.630. - Storm Drainage System.

- (1) Storm drainage lines must be installed to serve each property in accordance with City standards. Storm drainage construction plans and calculations must be submitted to the City Manager for review and approval prior to construction.
- (2) The storm drainage calculations must confirm that adequate capacity exists to serve the site. The discharge from the development must be analyzed in accordance with the City's Storm and Surface Water Regulations.
- (3) If there are undeveloped properties adjacent to the proposed development site which can be served by the storm drainage system on the proposed development site, the applicant must extend storm drainage lines to the common boundary line with these properties. The lines must be sized to convey expected flows to include all future development from all up stream areas that will drain through the lines on the site, in accordance with the <u>adopted</u> <u>Stormwater Master Plan Tualatin Drainage Plan in TDC Chapter 14</u>.

TDC 74.650. - Water Quality, Storm Water Detention and Erosion Control.

The applicant must comply with the water quality, stormwater detention and erosion control requirements in the <u>Tualatin Municipal Code</u>Surface Water Management Ordinance. If required:

- (1) On subdivision and partition development applications, prior to approval of the final plat, the applicant must arrange to construct a permanent on-site water quality facility and stormwater detention facility and submit a design and calculations indicating that the requirements of the <u>Tualatin Municipal Code</u>Surface Water Management Ordinance will be satisfied and obtain a Stormwater Connection Permit from Clean Water Services; or
- (2) On all other development applications, prior to issuance of any building permit, the applicant must arrange to construct a permanent on-site water quality facility and stormwater detention facility and submit a design and calculations indicating that the requirements of the <u>Tualatin Municipal CodeSurface Water Management Ordinance</u> will be met and obtain a Stormwater Connection Permit from Clean Water Services.
- (3) For on-site private and regional non-residential public facilities, the applicant must submit a stormwater facility agreement, which will include an operation and maintenance plan provided by the City, for the water quality facility for the City's review and approval. The

PTA 24-0003 Master Plan Text Amendments

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applicant must submit an erosion control plan prior to issuance of a Public Works Permit. No construction or disturbing of the site must occur until the erosion control plan is approved by the City and the required measures are in place and approved by the City.

[...]



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Prepared for City of Tualatin Oregon

City of Tualatin Stormwater Master Plan



April 2019 | DRAFT-FINAL









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Stormwater Master Plan

Prepared for City of Tualatin, Oregon April 2019

DRAFT-FINAL



6500 SW Macadam Avenue, Suite 200 Portland, OR 97239 T: 503.244.7005 This page intentionally left blank.

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List of Abbreviations

1D	one-dimensional	NRCS	National Resources Conservation
2D	two-dimensional		Service
AACE	Association for the Advancement of	ODFW	Oregon Department of Fish and Wildlife
	Cost Engineering	0&M	operations and maintenance
ac	acre	OSP	open space
BC	Brown and Caldwell	PCB	polychlorinated biphenyl
BMP	best management practice	Permit	NPDES Permit
CB	catch basin	Plan	2019 Tualatin Stormwater Master Plan
CCTV	closed-circuit television	PW	City's Public Works Standards
CIP	capital improvement projects	ROW	right-of-way
City	City of Tualatin	R/R	repair and replacement
COM	commercial zoning	SBUH	Santa Barbara Urban Hydrograph
CWA	Clean Water Act	SDC	stormwater development charge
CWS	Clean Water Services	sf	square foot/feet
DEQ	Department of Environmental Quality	SMP	2019 Tualatin Stormwater Master Plan
DDE	dichlorodiphenyldichloroethylene	SWMP	Stormwater Management Plan
DDT	dichlorophenyltrichloroethane	TDC	Tualatin Development Code
District	Clean Water Services District	TM	technical memorandum
EPA	U.S. Environmental Protection Agency	TMDL	total maximum daily load
FTE	full-time equivalent	VAC	vacant development
GI	green infrastructure	WPA	Wetlands Protection Area
GIS	geographic information system	WQ	water quality
H/H	hydrologic and hydraulic	XPSWMM	XP-Storm Water Management Model
HSG	hydrologic soil groups		
I-5	Interstate 5		
I-205	Interstate 205		
IGA	intergovernmental agreement		
IND	industrial zoning		
INS	institutional zoning		
LIDA	low impact development applications		
Lidar	Light Detection and Ranging		
LF	linear foot/feet		
LOS	level of service		
mg	milligram(s)		
MH	manhole(s)		

NPDES National Pollutant Discharge Elimination System

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Executive Summary

In 2016, the City of Tualatin (City) initiated development of a multi-objective stormwater master plan to guide stormwater project and program priorities over a 10-year planning period. Efforts were initiated due to the outdated nature of the City's previous stormwater plan (dated 1972), the changing regulatory environment for the City, new and redevelopment activities and annexations, and observed system deficiencies warranting additional study.

This 2019 Stormwater Master Plan (Plan or SMP) provides an overview of system improvements needed to address future growth, water quality, maintenance/system condition issues, and capacity issues.

The SMP development process included:

- Identifying and investigating known capacity and maintenance-related problem areas and water quality project opportunity areas.
- Developing hydrologic and hydraulic models to evaluate system capacity for targeted problem areas or systems.
- Evaluating stream channel conditions with respect to erosion and development impacts.
- Assessing current maintenance obligations and stormwater program needs to support identified problem areas.
- Developing an integrated stormwater system capital improvement program, including project and program recommendations and costs.
- Evaluating stormwater utility rates and stormwater development charges (SDC) to implement priority project and program recommendations.
- Developing a Master Plan document that is useful and easy to read, reference, and update.

Master Plan Technical Analyses

Developing this SMP included the following technical analyses to evaluate stormwater system deficiencies and define project and program needs.

Project Needs Identification. This effort included distributing surveys and questionnaires to City staff, GIS data review, site visits and, workshops. Information collected helped with developing a robust inventory of stormwater problem areas specific to stormwater infrastructure, stormwater facilities, outfalls, and natural systems. Stormwater problem areas were reviewed to identify locations in need of further analysis or study.

Water Quality Assessment. Water quality opportunity areas were initially identified using GIS to assess vacant/public lands, high pollutant-generating land use areas (i.e., industrial or commercial), and existing stormwater facility placement. Site visits were conducted in conjunction with identified water quality opportunity areas and identified stormwater problem areas to see if an integrated approach to stormwater management (i.e., installing water quality facilities to mitigate stormwater runoff) could help address the reported issue.



Targeted Stormwater System Capacity Evaluation. Hydrologic and hydraulic (H/H) modeling to simulate rainfall and runoff characteristics was conducted for targeted areas of the city. The models simulate stormwater flow through pipe networks, drainage ditches, and culverts to identify capacity limitations for both current and future development conditions.

Targeted Stream Assessment. A stream assessment was conducted to evaluate specific stream reaches in the city reported to have erosion, invasive vegetation, and hillslope stability issues. The assessment provided baseline information regarding existing physical stream conditions and informed project, program, and policy recommendations.

Maintenance Assessment. A maintenance assessment was conducted to evaluate current City maintenance obligations and maintenance-related stormwater problem areas likely addressed with increased maintenance efforts or activities. Conveyance system deficiencies and public/private water quality facility deficiencies were highlighted and used to support project and program recommendations.

General Recommendations

Project, program and policy recommendations in this SMP are proposed to improve and enhance drainage infrastructure and water resources throughout the city, as summarized by the following general recommendations:

- Implement identified system capacity improvements (i.e., reconfiguration, rerouting, upsizing) to manage more frequent, nuisance system flooding.
- Increase water quality treatment throughout the city by expanding treatment area coverage through water quality retrofits and enhancing the level of treatment provided.
- Conduct proactive maintenance of the City's stormwater infrastructure. Use system condition
 data currently collected (i.e., stormwater facility inspections, closed-circuit television [CCTV]) to
 evaluate needs and priorities.
- Consider the topographic limitations and flat grade of the City's conveyance network with regard to system maintenance activities. Sediment removal and vegetation management are key maintenance needs to ensure conveyance capacity.
- Continue coordination with Clean Water Services to ensure updates to the Tualatin Development Code (TDC) and Public Works (PW) Standards are in line with regulatory drivers and protect stream health.
- Ensure timely implementation of capital projects and programs by establishing updated funding mechanisms and rates. Additional funding is needed to adequately manage the drainage system as material costs increase, flows increase, and the drainage system deteriorates with age and use.

Capital Improvement Program Summary

Project and program recommendations represent an integrated strategy to address stormwater needs in the city. Recommendations include 21 capital projects and six programmatic efforts. Policy recommendations stemming from the stream assessment have also been identified.



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Project Summary

Capital improvement projects (CIP) have been developed to address the following objectives:

- Increases capacity (flood control)
- Address erosion
- Increase water quality treatment (retrofit)
- Improve water quality (through existing site or facility modifications/restoration to address a
 pollutant source issue or improve treatment function)
- Address maintenance needs

Table ES-1 below summarizes the identified capital projects, estimated costs, and priorities. Figure ES-1 shows the location of the proposed CIPs, with priority projects identified. Detailed fact sheets for each CIP can be found in Appendix A.

Table ES-1. Capital Project Summary				
Priority Project	CIP Number	CIP Name	Cost estimates	
	1	Manhasset Storm System Improvements	\$1,581,000	
X (Phase 1) ^a	2	Nyberg Creek Stormwater Improvements	\$3,412,000	
	3	Sandalwood Water Quality Retrofit	\$107,000	
	4	Mohawk Apartments Stormwater Improvements	\$295,000	
X	5	Herman Road Storm System	\$1,023,000	
X	6	Blake St Culvert Replacement	\$552,000	
	7	Boones Ferry Railroad Conveyance Improvements	\$515,000	
	8	89th Avenue Water Quality Retrofit	\$262,000	
	9	125th Court Water Quality Retrofit	\$206,000	
	10	93rd Avenue Green Street	\$224,000	
X	11	Juanita Pohl Water Quality Retrofit	\$156,000	
X	12	Community Park Water Quality Retrofit	\$158,000	
X	13	Water Quality Facility Restoration - Venetia	\$65,000	
X	14	Water Quality Facility Restoration - Piute Court	\$104,000	
X	15	Water Quality Facility Restoration - Sequoia Ridge	\$83,000	
X	16	Water Quality Facility Restoration - Sweek Drive Pond	\$103,000	
	17	Siuslaw Water Quality Facility Retrofit	\$454,000	
X	18	Water Quality Facility Restoration - Waterford	\$180,000	
X	19	Saum Creek Hillslope Repair	\$171,000	
X	20	Hedges Creek Stream Repair	\$327,000	
X	21	Nyberg Water Quality Retrofit	\$2,037,000	
		Total	\$12,015,000	
		Total (Priority projects only)	\$6,482,000	

a. CIP 2, Nyberg Creek Stormwater Improvements includes three phases of development. Phase I implementation is considered priority.



Programmatic Summary

In addition to the identified capital projects, the following stormwater program needs and/or refinements have been identified to address ongoing maintenance deficiencies and proactively address long-term system replacement and water quality improvements:

- Pipe Repair and Replacement (R/R) Program. Establishes an annual funding mechanism to repair and replace piped stormwater infrastructure throughout the city over a 100-year planning period. Efforts will include evaluating CCTV results to prioritize locations requiring R/R.
- Structure R/R Program. Establishes an annual funding mechanism to repair and replace stormwater structures throughout the city over a 100-year planning period.
- **Public Water Quality Facility Maintenance Program.** Increases existing annual funding for public stormwater facility maintenance to address both routine and restorative maintenance activities. Efforts will prioritize locations identified during annual inspection efforts.
- **Public Water Quality Facility Retrofit Program.** Establishes an annual funding mechanism to identify and construct opportunistic water quality retrofits. Retrofits may include rehabilitating existing facilities to promote enhanced treatment or installing green streets in conjunction with transportation improvement projects.
- Stream Vegetation Management. Establishes an annual funding mechanism to conduct instream or riparian vegetation management activities to remove invasive vegetation and assess physical condition changes to stream channels.
- Single Family LIDA Inspection Program. Increases staff resources to support an expanded private stormwater facility inspection program targeting low impact development applications (LIDA) on single-family residential properties.

Policy Recommendations

The Stream Assessment identified two policy recommendations the City may consider in order to improve instream channel health and mitigate the potential for localized flooding and erosion.

- Flow Control Standards. Protect select areas of the city with observed and/or reported instream erosion and hydromodification risk by requiring development to implement controls related to flow control. The City may incorporate flow control requirements in accordance with areas identified and experiencing channel erosion and incision through the adoption of Clean Water Services' (CWS) updated Design and Construction Standards, which include standards for water quantity control and hydromodification.
- Beaver Management Guidelines. Implement (via internal directive or codification) beaver management techniques to selectively encourage/discourage beaver activity based on the characteristics of the stormwater drainage systems, topography, and vegetation.

Implementation

Capital project and program cost information developed as part of this SMP were used to develop a financial plan for the City that outlines stormwater utility rate and SDCs necessary for the City to implement its stormwater capital improvement program while meeting other financial obligations. Capital project costs, program costs, and associated staffing needs were collectively used in the financial plan.

Implementing priority capital projects and programs associated with a 10-year planning period as outlined in this Plan will require a rate increases and adjustments to SDCs. The financial plan has not been directly included in this Plan, pending future City Council approval.



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Section 1 Introduction

The City of Tualatin (City) developed this citywide Stormwater Master Plan (SMP or Plan) to guide stormwater capital project and program decisions over a 10-year planning period. This SMP addresses both water quantity and quality for constructed systems under the City's management.

The City manages approximately 93 miles of piped and open channel stormwater infrastructure. The City has experienced rapid growth and development over the last 20 years that thus has a relatively new collection and conveyance system. However, development rates and projections indicate that the stormwater system will require expansion and upgrades to accommodate future growth. The City needs a proactive plan to address capacity needs, replace failing infrastructure, and address regulatory drivers related to water quality improvement.

This Plan documents the process and methods used to evaluate the City's drainage infrastructure and natural systems. Results of the evaluation provide the City with projects and programmatic stormwater actions for implementation. The study area for this Plan includes all areas within the city limits and three planning areas (Northwest Concept Area, Southwest Concept Area, Basalt Creek Concept Area). Major receiving water bodies include Nyberg Creek, Hedges Creek, Saum Creek and the Tualatin River mainstem.

1.1 Stormwater Master Plan Objectives

The City's overarching goal for this SMP is to guide stormwater infrastructure improvements for the natural and built environment over a 10-year implementation period. Improvements must address future growth, water quality, maintenance/system condition issues, and capacity issues. Outcomes from this effort include a prioritized project list, subsequent program recommendations, and a financial analysis that includes rate recommendations to support the implementation of projects and programs.

Specific objectives related to development of this SMP include:

- Establishing a foundation for evaluating stormwater system needs in Tualatin and soliciting
 information from staff and stakeholders to inform the targeted and integrated identification of
 project needs and improvements.
- Identifying existing problem areas and providing project solutions related to collection, conveyance, treatment and detention. This includes:
 - Developing hydrologic and hydraulic (H/H) models to evaluate system capacity limitations and assess the frequency of nuisance flooding based on current system information as obtained from the City's GIS and survey.
 - Identifying water quality treatment opportunities throughout the city to be accomplished through water quality retrofits and existing system improvements.
 - Assessing stream health and physical conditions to develop a baseline condition assessment for future evaluations and identify project and program needs.
- Developing programs to support proactive maintenance of infrastructure.

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- Reviewing current stormwater program funding, including rates and system development charges, and establishing an updated funding strategy and rates to manage the drainage system and construct recommended (priority) improvements.
- Establishing baseline cost estimates (Association for the Advancement of Cost Engineering [AACE] Class 5) for recommended stormwater improvements for use in planning and budgeting.

This Plan is intended to support regulatory directives under Clean Water Services' (CWS or District's) watershed-based National Pollutant Discharge Elimination System (NPDES) permit (Permit), of which the City is a co-implementor. The City is required to meet stormwater-related obligations and programs as documented in CWS' Stormwater Management Plan (SWMP) and referenced in intergovernmental agreements (IGA). Identifying water quality improvement and stormwater retrofits is a focus of the current (2016) Permit and SWMP.

In addition, the City values its natural systems and open spaces that are available to the community. Protecting natural systems (wetlands, stream channels, riparian corridors, and vegetated buffers) is important for maintaining a livable and healthy city. This Plan was also developed to support management of these natural resources and support their beneficial uses.

1.2 Background and Related Studies

The City's last stormwater master plan was completed in 1972 and does not reflect the current condition or configuration of the City's stormwater infrastructure. The City does not have a capital project list that directly reflects current development activities, population growth, and regulatory drivers. Updated project and program strategies included in this Plan represent priority needs for future budgeting.

The city is one of the fastest growing communities in Oregon, which has prompted the need to invest in infrastructure and consider long-range planning and policy decisions to support businesses and residential life. Copies of various planning-level reports and studies prepared since the last stormwater master plan were obtained to help inform areas of high growth potential and to identify stormwater system deficiencies and needs. Reports and studies reviewed and considered for this master plan update are detailed in Table 1-1.

Table 1-1. Existing Stormwater Planning Documentation and Reports				
Report	Date	Summary and Application to the SMP		
Tualatin Drainage Plan Report	1972	Provides background information and historic basis for the need to update the SMP.		
Hedges Creek Wetlands Master Plan	2002	Provides stormwater management recommendations (culvert upsizing under Tualatin Road, sediment removal) related to the 29-acre Hedges Creek Wetlands.		
Bridgeport Area Stormwater Master Plan	2005	Provides stormwater system information and a subbasin delineation in the Bridgeport Development Area.		
Southwest Tualatin Concept Plan	2010	Provides guidance for industrial development in southwest Tualatin. Planning district/zoning designation is available.		
Basalt Creek Existing Conditions Report	2014	Provides surrounding land use and demographic information for the Basalt Creek Planning Area. Does not provide official planning district/zoning designation or proposed transportation corridors.		
Hedges Creek Stream Assessment	2018	Independent stream assessment from SW Ibach Street to SW 105th Avenue. Results were used to supplement the stream assessment conducted as part of this SMP.		
Basalt Creek Concept Plan	2018	Provides preferred land use and recommends high-level concepts for transportation and infrastructure planning for the Basalt Creek Planning Area.		

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1.3 Stormwater Master Plan Development Process

The approach used to develop this Plan is provided in Figure 1-1.

This process leveraged City staff knowledge and existing data (see Planning Process in Figure 1-1) to conduct focused evaluations on areas/infrastructure where additional investigation is likely to inform capital projects and programs. This approach focused resources on the areas currently identified as problems. The overall process was implemented as follows:

- 1. Data reconnaissance and solicitation of input from City staff and stakeholders was conducted at the beginning of the project to identify stormwater problem areas (Planning Process). Targeted locations requiring modeling or stream assessment to inform project/program needs were identified.
- 2. A water quality assessment was conducted to identify water quality project opportunities and supplement stormwater problem areas and preliminary project needs (Planning Process).
- 3. A capacity evaluation (H/H modeling) and a stream assessment were completed to further define project and program solutions (Capacity Evaluation and Stream Assessment).
- 4. Project Opportunity Areas were defined geographically from identified stormwater problem areas and water quality opportunity areas and vetted based on evaluations/assessments, field visits, and workshops.
- 5. A maintenance assessment was conducted to define current maintenance obligations and programmatic activity needs (Maintenance Assessment).
- 6. Capital project and program descriptions and cost estimates were developed and vetted with City staff for inclusion in the Plan (Capital Improvement Program).
- 7. Staffing analysis, project prioritization, and development of other cost information to support the financial evaluation (rate and system development charges) were completed.
- 8. Documentation of the master planning approach and project and program descriptions and costs was completed at the end of the process.



Figure 1-1. Stormwater Master Plan approach



1.4 Document Organization

Following this introductory Section 1, this SMP is organized as follows:

- Section 2 includes a description of the study area characteristics.
- Section 3 summarizes the planning process, which includes preliminary identification of problem areas, water quality opportunities, modeling needs, and stream assessment needs. Project Opportunity Areas stemming from the planning process are identified.
- Section 4 describes H/H modeling methods and results of the stormwater capacity evaluation and includes identifying capacity-related capital projects.
- Section 5 describes the stream assessment methods and results and identifies capital project, program, and policy recommendations stemming from field observations.
- Section 6 describes the maintenance assessment, including results of the Programmatic Activity Workshop. Capital project and program recommendations stemming from the maintenance assessment are identified.
- Section 7 summarizes the overall capital improvement program recommendations, including the final capital projects, programs and respective cost estimates.
- Section 8 provides an overview of the implementation elements of the capital improvement program, including a summary of staffing needs to support proposed projects and programs, the project prioritization process, level of service determination, and financial evaluation results.



Section 2 Study Area Characteristics

This section provides an overview of study area characteristics and stormwater system operations, including location, topography, soils, land use, drainage system configuration, and stormwater program activities.

Referenced figures reflecting study area characteristics are located at the end of this section.

2.1 Location

The City of Tualatin is located 13 miles southwest of Portland, Oregon. Most of the city is in Washington County, with a small portion of area along the eastern city limits located in Clackamas County (Figure 2-1). Neighboring areas include the cities of Tigard, King City and Durham to the north; the City of Wilsonville to the south; unincorporated Washington County, including the Tualatin River National Wildlife Refuge, to the west; and unincorporated Clackamas County, commonly referred to as the Stafford Triangle, to the east.



Figure 2-1. Location overview



Interstate 5 (I-5) runs north-south through the city, attributing to the large commercial corridor along the I-5 right-of-way (ROW). The intersection of I-5 and Interstate 205 (I-205) is in the southeast area of the city. Oregon Highway 99W intersects the City in the northwest corner. The city boasts a strong commercial and industrial economy, and prominent waterways access and parks, which make the city one of the most livable communities in the Portland metro area.

The city is approximately eight square miles in area, with an additional 1.2 square miles associated with planning areas outside of the city limits (Figure 2-2). The majority (approximately 97 percent) of the city discharges to the Tualatin River and tributaries. Major tributaries include Nyberg Creek, Hedges Creek, Cummins Creek, and Saum Creek. Area along the northern portion of the city discharges north directly to the Tualatin River, whereas the tributaries generally run east-west across the city before discharging into the Tualatin River. The remainder (approximately 3 percent) of the city discharges to Basalt Creek, a tributary located in the southern portion of the City, which runs south to Coffee Lake Creek in the City of Wilsonville before discharging to the Middle Willamette River.

2.2 Future Planning Areas

There are three future planning areas in the city: The Southwest Concept Plan Area, the Northwest Concept Plan Area and the Basalt Creek Planning Area (Figure 2-2).

Concept plans for these areas have been developed to guide future development and expansion as the City grows. These areas have yet to undergo significant development or redevelopment. Concept plans help facilitate communication with citizens and stakeholders by laying out how the area might be developed with respect to land use, transportation, natural resources and utility planning. Concept plans also aid in determining future financial implications and the level of potential investment required to develop and provide infrastructure throughout the planning area.

Detail related to these three future planning areas are as follows:

- Southwest Concept Plan Area: The Southwest (SW) Concept Plan was completed in August 2005 to guide industrial development of a 614-acre area located south of Tualatin-Sherwood Road between SW 115th and 124th avenues. The area is near the Tigard Sand and Gravel Quarry. In 2011, the SW Concept Plan was updated and adopted into the Tualatin Development Code (TDC). The portion of the planning area within the urban growth boundary and north of Tonquin Road (approximately 431 acres) was included in this SMP.
- Northwest Concept Plan Area: The Northwest (NW) Tualatin Concept Plan was completed in March 2005 and incorporated into the City's Development Code in June 2005. The NW concept planning area is 14 acres, located in the northwest corner of the city, and mostly developed. This planning area was included in this SMP.
- **Basalt Creek Planning Area:** The Basalt Creek Concept Plan was adopted by City Council in August 2018. The Plan was developed as a joint effort between the cities of Tualatin and Wilsonville. The area is located between the southern boundary of the Tualatin and northern boundary of Wilsonville. The total planning area encompasses 847 acres. Tualatin's portion of the planning area (approximately 356 acres) was included in this SMP.

2.3 Topography

Tualatin's topography is characterized as relatively flat with gentle slopes (Figure 2-3). The elevation in the city varies from 368 feet at the highest point to 96 feet at the lowest point. The lowest elevation areas are along the northern border of the city at the Tualatin River. The highest elevation areas are near SW Boones Ferry Road and SW Norwood Road.



The flat topography results in limited slope in the stormwater collection system, which contributes to standing water in pipes, backwater conditions, and high sediment accumulation. The average slope in the stormwater collection system ranges from 0.5 percent to 6.5 percent. There are significant wetland areas within the city, particularly along Hedges Creek and the downstream portion of Nyberg Creek, further attributed to the flat topography, high groundwater levels, and proximity to the Tualatin River.

More significant grade changes are observed in the southeast portion of the city, north of Saum Creek, where a steep ridge defines the northern stream bank and the southwest part of the city, adjacent to the SW Concept Plan Area.

2.4 Soils

The National Resources Conservation Service (NRCS) Soil Survey online tool was used to gather soils information for Tualatin. Soils are an important watershed characteristic for evaluating potential runoff rates and volumes. Soils are generalized into four categories or hydrologic soil groups (HSG), which approximate soil runoff potential. These groups are A, B, C, and D, where A soils are characterized by high rates of infiltration and low runoff potential and D soils are characterized by low rates of infiltration and high potential for runoff. HSG conditions are reflected on Figure 2-3.

Most of the soils in Tualatin are HSG Type C soils with pockets of A, B, C/D and D type soils. Table 2-1 shows the NRCS hydrologic soils group by percent coverage within the city limits and planning areas.

Table 2-1. Soil Type within the City and Planning Areas			
Hydrologic Soil Group	Acres	Percent	
А	181	3	
В	708	12	
C	3,820	63	
C/D	876	15	
D	423	7	
Total	6,008	100	

There are saturated soils and wetland soil conditions along stream reaches and throughout the city. The City maintains a Wetlands Protection Area (WPA) GIS inventory that includes riparian areas along Hedges Creek, Nyberg Creek, and Saum Creek.

2.5 Land Use

Tualatin is a community that has experienced significant growth over the last 20 years. The population of Tualatin is approximately 27,500 as of July 1, 2017. The population has increased 5.2 percent between 2010 and 2017.

The city is primarily composed of industrial and residential land use, with significant areas of commercial development along the I-5 corridor and Tualatin-Sherwood Road. Large tracts of open space area (parks, greenways, natural areas, wetlands) are scattered throughout the city. Vacant lands with potential for development are located primarily in the western portion of the city.



Land use coverage was developed in GIS as part of this SMP to evaluate stormwater drainage conditions in the city. Land use coverage was based on City-provided GIS coverage of planning districts (zoning), open space areas, and developable lands. A detailed summary of the process to develop the City's land use coverage and associated impervious area estimates is provided in Technical Memorandum 1 (TM1), included in this SMP in Appendix B. Land use coverage is shown on Figure 2-4. Land use categories and impervious assumptions are reflected in Table 2-2.

Table 2-2. Land Use Categories and Impervious Percentages				
Planning District Designation Modeled Land Use Category		Impervious % (Existing)	Impervious % (Future)	
Low-Density Residential	Low-density residential	43	53	
Medium Low-Density Residential	Madium density residential (MDP)	45	55	
Medium High-Density Residential		45	55	
High-Density Residential	High density residential	50	60	
High-Density High Rise Residential		50	00	
General Commercial				
Central Commercial			78	
Medical Commercial	Commercial (COM)	78		
Office Commercial				
Recreational Commercial				
General Manufacturing				
Light Manufacturing		74	74	
Manufacturing Business Park				
Manufacturing Park				
	Institutional (INS)	35	35	
	Vacant, developable (VAC)ª	5	Consistent with the underlying land use designation	
Institutional	Open Space (OSP), undevelopable – Parks, greenways, natural areas, private ${}^{\mbox{\tiny b}}$	5	5	
	OSP, undevelopable – WPA, setbacks, Natural Resource Preservation Overlay, wetlands ^b	4	4	
	Transportation (Oregon Department of Transportation corridor)	46	46	
	Basalt Creek/rural residential	7	7	

a. Vacant land use reflects area with new or infill development potential. Future development conditions assume development of vacant lands consistent with their associated planning district designation.

b. Open space land use reflects area with no foreseeable development potential.

Future growth for purposes of evaluating stormwater drainage infrastructure is based on projected development (i.e., vacant lands) (see Figure 2-4). Future industrial, primarily in the western half of the city, and commercial and multi-family residential development, is expected. Residential infill development is also anticipated. For the Basalt Creek planning area, future growth and development is expected but the timeframe is unknown. For purposes of this plan, future development conditions were not evaluated or assessed hydrologically for this area.



2.6 Climate and Rainfall

The northern Willamette Valley climate is characterized by cool wet winters and warm dry summers. Most rainfall occurs between October and April. On average, November is the wettest month with an average of 9.3 inches of rainfall. July and August are the warmest and driest months with average high temperatures above 80 degrees Fahrenheit and less than 1 inch of rain per month. The average annual precipitation for the Portland metropolitan area ranges from 37 to 43 inches, with an average of 1.8 inches of snowfall annually.

In December 2015, the Portland metro area experienced a large rainfall event that delivered more than 5 inches of rain over a 3-day period and 2.81 inches in one 24-hour period. This event was estimated to be between a 50- and 100-year frequency event because of the intensity and nature of the rainfall. These "severe" events are expected to occur more frequently as the earth undergoes climate change.

2.7 Natural Systems

Tualatin drains to six major waterbodies: The Tualatin River, Cummins Creeks, Hedges Creek, Nyberg Creek, Saum Creek and Basalt Creek. These waterbodies and their associated drainage basins are shown on Figure 2-5. Cummins Creek, Hedges Creek, Nyberg Creek, and Saum Creek are tributaries to the Tualatin River. Basalt Creek is a tributary to the Willamette River. Contributing city area and planning area by drainage basin is summarized in Table 2-3.

Table 2-3. Major Drainage Basins and Contributing Drainage Area				
Major Drainage Basin	City Area (ac)	Planning Area (ac)		
Tualatin River (direct)	906	0		
Cummins Creek	313	13		
Hedges Creek	2,277	288		
Nyberg Creek	863	0		
Saum Creek	514	34		
Basalt Creek	170	318		

ac = acre

Each major waterbody has unique characteristics and is being impacted by development in different ways. In general, the natural systems within the city are considered highly modified. They have been affected by historic development activities conducted without the inclusion of stormwater management facilities to address water quality and increased flow and runoff volumes. An overview of stream channel conditions is provided in Section 5.

Ownership of the natural system has been identified based on adjacent property ownership (Figure 2-5). Ownership status limits activities the City can conduct to maintain and preserve the waterbody's integrity.

2.8 Stormwater Infrastructure System

The City manages approximately 93 miles (approximately 486,800 linear feet [LF]) of stormwater drainage pipe and 1.5 miles (7,700 LF) of roadside drainage ditches. There are six major receiving waters located throughout the city. As a result, most of the City's drainage infrastructure consists of small dispersed systems rather than large trunk lines. There are 386 mapped outfalls from the piped systems to receiving waters. The majority of pipe in the city is 12-inch concrete pipe.



Tables 2-4 and 2-5 summarize pipe characteristics and major drainage system features in the city as mapped in GIS. Major drainage features include manholes, catch basins, discharge points (outfalls), public water quality facilities (swales), public ponds (detention, dry ponds), and underground injection control wells. Figure 2-6 provides an overview of the stormwater collection and conveyance system.

Table 2-4. System Asset Inventory–Pipes and Open Channels, Public (mapped in GIS)	
Diameter	Length (ft)
Not documented in GIS	11,684.1
0-6	27,891.1
8-12	244,648.3
14-18	102,535.4
20-24	57,762.1
27-30	21,681.0
36	14,519.0
42	1,146.2
48	3,952.9
54	0.0
60	728.4
66	0.0
72	229.2
Mapped Open Channels	7,735.3
Total (Pipe)	494,513.0

Table 2-5. Major Drainage Features (Counts)		
Major Drainage Feature	Number)	
Manholes	1,929	
Catch basins	3,072	
Outfalls	386	
Public water quality facilities (swales)	32	
Public ponds (detention, dry ponds)	52	

Although most development in the city has occurred over the last 25 to 30 years, proactive system inspection and maintenance is needed to ensure continued performance. The City currently has limited information regarding underground utility condition and age. As the city continues to grow and expand, pipe and infrastructure will be added to the City's asset inventory that will need to be managed and maintained.

2.9 Water Quality and Regulatory Drivers

The Oregon Department of Environmental Quality (DEQ) is responsible for implementing provisions of the federal Clean Water Act (CWA) pertaining to stormwater discharges and surface water quality. DEQ conducts permitting for activities that discharge to surface waters, establishes water quality criteria for waterbodies based on designated use, and conducts studies and evaluations to



determine whether a waterbody adheres to water quality standards. Water quality is a specific focus of this SMP.

2.9.1 National Pollutant Discharge Elimination System (NPDES) Permit Program

The NPDES Municipal Separate Storm Sewer permit program regulates discharges of stormwater to receiving waters from urban areas and requires permitted municipalities to develop and implement stormwater control measures to address stormwater quality.

The City is a co-implementer on the CWS watershed-based NPDES permit, along with 12 other jurisdictions in Washington County, for managing stormwater runoff. CWS' NPDES permit was reissued in May 2016 for a 5-year permit term.

Implementation of CWS' NPDES permit is outlined in the CWS SWMP. Stormwater activities or best management practices (BMP) are outlined to address the elements of the permit including public education, public involvement, illicit discharge detection/elimination, construction site management, post-construction stormwater management, industrial/commercial facility inspections, good housekeeping practices for municipal operations, and operations and maintenance (O&M) activities for stormwater management facilities.

In addition to the permit elements listed above, the reissued NPDES permit requires CWS and coimplementers to prepare a stormwater retrofit strategy, prepare a hydromodification assessment (to address instream channel erosion and modifications), and develop TMDL pollutant load reduction benchmarks. These additional requirements prompted the City to incorporate stormwater retrofits for water quality improvement into its capital project development (see Section 3.1.1) and evaluate instream channel conditions to support future hydromodification assessments (see Section 5).

Coordination efforts between the City and CWS are identified in the SWMP and outlined in detail in IGAs between the City and CWA. The City maintains IGAs with CWS for erosion and sediment control and select system O&M activities.

2.9.2 Total Maximum Daily Load (TMDL) and 303(d) Listings

Section 303(d) of the CWA requires states to develop a list of water bodies that do not meet water quality standards. DEQ develops this list for Oregon, which is used to identify and prioritize water bodies for development of TMDLs. A TMDL identifies the assimilation capacity of a water body for specific pollutants and establishes pollutant load allocations for sources of discharge to the water body.

The Willamette and Tualatin rivers are the major receiving waters for Tualatin. These rivers and corresponding tributaries are on the 303(d) list for various parameters of concern and hold TMDLs for specific sources of pollutant loading. CWS is the identified discharge management agency in the Tualatin Subbasin and Willamette Basin TMDLs, and the City is identified as a contributing municipality associated with CWS. Table 2-6 summarizes the TMDL and 303(d) parameters relevant to the City.


Table 2-6. TMDL and 303(d) Summary for Tualatin											
Watershed/ Major Basin	Subbasin(s)	TMDL Year	Applicable TMDL parameters	TMDL surrogate parameters	Applicable 303(d) parameters ^a						
Willamette River	Middle Willamette	2006	 Mercury Bacteria (<i>E. coll</i>) Temperature 	Effective shade (surrogate for temperature)	 Aldrin Biological criteria DDT/DDE Dieldrin Iron Polychlorinated biphenyls (PCB) 						
Tualatin River	Tualatin	2001 and 2012 (update)	 Bacteria (<i>E. coli</i>) Chlorophyll a pH Dissolved oxygen Temperature 	 Total phosphorus (surrogate for chlorophyll a and pH) Total suspended solids (equivalent parameter for settleable volatile solids [SVS], a surrogate for dissolved oxygen) Effective shade (surrogate for temperature) 	 Ammonia Biological criteria Copper Iron Lead Zinc 						

a. The 2016 303(d) list for Oregon was approved by DEQ in January 2019. It is the effective list for Oregon.

2.10 Stormwater Program Management

Stormwater program management includes maintenance, program operations, and program funding as described in the following subsections. This SMP includes an evaluation of maintenance activities and recommended program improvements to supplement capital project needs (see Section 6).

2.10.1 Maintenance Obligations

Maintenance of the City's assets is important to ensure that the full life expectancy is realized. The City allocates six, full-time equivalent (FTE) staff for utility system maintenance in the Public Works Department. Utility system maintenance includes stormwater system maintenance. Utility maintenance crews share responsibilities for multiple utility and infrastructure assets.

As mentioned, the City is a co-implementer on the CWS watershed-based NPDES permit for managing stormwater runoff. Maintenance obligations are outlined in the effective SWMP, dated 2016. Maintenance activities occur on a scheduled basis and in response to citizen and staff requests and are documented annually in the CWS stormwater annual report. Typical maintenance activities include:

- Pipeline inspection (CCTV) and cleaning
- Manhole repair
- Catch basin cleaning
- Public water quality facility inspection and maintenance (water quality manholes, vegetated stormwater facilities, proprietary filter systems). Public ponds are not routinely inspected and maintained by the City.
- Street sweeping



2.10.2 Program Operations

Programmatic stormwater activities are generally implemented to comply with NPDES permit requirements and may be conducted by utility maintenance staff or engineering staff in the Public Works Department.

The City employs two full-time equivalent staff engineers, three engineering associates, and two engineering technicians all responsible for a variety of engineering needs, including stormwater. Program implementation is documented annually in the CWS NPDES annual report. Program activities conducted by the City include:

- Private stormwater quality facility tracking and inspections. Annual notices are mailed to facility owners reminding them of their maintenance obligations.
- Stormwater development review.
- Illicit discharge detection and elimination, including spill response.
- Promotion of regional stormwater public outreach materials and campaigns.

CWS performs erosion control inspections and enforcement on the City's behalf in accordance with an IGA.

2.10.3 Staffing and Program Funding

The stormwater program is funded primarily through stormwater utility fees. Utility fee revenue for the 2019–2020 fiscal year is approximately \$3.4 million. CWS serves as the lead storm utility agency and implements selected program activities on behalf of the city.

A financial evaluation was conducted as part of this master planning effort to determine an annual stormwater utility rate and stormwater development charge (SDC) increase to support the proposed capital improvement program and ensure adequate funding levels to support implementation needs (see Section 8).

Staffing levels to implement the City's stormwater program are considered adequate to implement current project and program needs; however, additional staff resources will be required to ensure timely project implementation and expanded program activities. Detail related to current and projected staffing needs is included in Section 8.1.



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2,250

4,500

🗆 Feet

City of Tualatin

Date: April 2019 Project: Project 149233

Land Use





City of Tualatin

Section 3 Planning Process

This section provides background information related to the initial identification of Stormwater Project Opportunity Areas, which were used to inform capital project and program development efforts. As part of this preliminary effort, areas requiring additional evaluation, including H/H modeling and/or field investigations, were also identified.

Stormwater Project Opportunity Areas were identified based on a variety of data collection and field reconnaissance efforts. This process allowed the City to focus resources and develop information for areas and projects likely to be prioritized in a capital improvement program.

Additional detail related to this process is provided inTM1, included in this SMP as Appendix B. Table 3-1 and Figure 3-1, both at the end of this section, summarize the Stormwater Project Opportunity Areas.

3.1 Project Needs Identification

Stormwater project needs were initially identified through a collaborative process with the City's engineering, planning, and operations staff to assess known stormwater system problems and identify areas where infrastructure improvement, replacement, or retrofit could address observed issues.

From June through December 2016, reconnaissance efforts were conducted to identify current stormwater problems. Questionnaires were distributed to engineering and maintenance staff to document the type and location of reported and observed stormwater system deficiencies. The City's GIS inventory of reported drainage problems was reviewed. Two site visits were conducted to confirm the source of reported stormwater problems and validate whether the problems should be evaluated and addressed in the context of the SMP. Stormwater problem areas identified based on a stream capacity issue (bank overtopping) were generally omitted as a project opportunity, as stream capacity and natural system flooding was not an SMP objective.

Reported stormwater problems and project needs were consolidated by geographic area into defined Stormwater Project Opportunity Areas.

3.1.1 Water Quality Opportunities

Throughout this SMP planning process, expanded coverage of water quality treatment was a priority. An assessment of water quality project opportunities and potential water quality retrofits was conducted to supplement identified stormwater problem areas and project needs. Detail related to this effort is provided in Appendix B.

In the city and throughout the CWS NPDES permit coverage area there is increased emphasis on methods for improving stormwater quality. One method involves identifying opportunities to install water quality treatment facilities, particularly in developed areas of a city with high pollutant load potential (by land use) and limited potential for development and redevelopment (such that treatment requirements per development standards would be triggered). Such water quality retrofits can address stormwater regulatory requirements under the CWS NPDES permit and improve stream health and habitat citywide. identifying retrofit opportunities can be challenging, particularly in



developed areas where space is limited for installing above ground, vegetated treatment facilities as promoted in the NPDES permit.

The initial assessment of water quality project opportunity areas included a review of water-qualityrelated capital improvement projects per the City's 2017-2021 Capital Improvement Plan and review of available vacant/public lands that would support a new treatment facility. Available public lands are considered those not subject to the Tualatin City Charter, Chapter XI provisions, and generally included larger public parking areas or areas within the ROW¹. Locations associated with high pollutant generating land use (i.e., industrial or commercial) and high imperviousness were prioritized for project development.

Reported capacity and maintenance-related stormwater problem areas were also reviewed to see if an integrated approach to stormwater management (i.e., installing water quality facilities to also mitigate stormwater runoff) could help address the reported issue (see Section 6).

Table 3-1 identifies Stormwater Project Opportunity Areas resulting from the assessment of water quality project opportunities. Water quality retrofit potential was identified for each opportunity area.

3.1.2 System Modeling Needs

Five stormwater problem areas were identified that required hydraulic modeling of the storm system to inform the source of capacity limitations and associated project development. These areas included:

- 1. Manhassat Drive (Stormwater Project Opportunity Area 4)
- 2. Boones Ferry Road at Tonka Road (Stormwater Project Opportunity Area 5)
- 3. Herman Road (Stormwater Project Opportunity Area 7)
- 4. Sagert Street at the Shenandoah Apartments (Stormwater Project Opportunity Area 9)
- 5. Mohawk Apartments at Warm Springs Road (Stormwater Project Opportunity Area 10)

Detail related to the H/H modeling methodology, model results, and associated project development is included in Section 4.

3.1.3 Stream Assessment Needs

Bank erosion, channel incision, sediment accumulation, and invasive vegetation are reported in reaches of the City's open channel conveyance system. To investigate these issues and develop a baseline assessment to evaluate stream condition in the future, a field stream assessment was initiated in September 2017.

The City identified and prioritized reaches of Suam Creek, Hedges Creek, and Nyberg Creek under "public ownership" (see Figure 2-5) that have not been previously evaluated but where there are reported problems.

Detail related to the stream assessment effort and associated project and program development is included in Section 5.

¹ Tualatin City Charter, Chapter XI limits the use of publicly owned parks, greenways, and natural areas to be used outside of their original intent without a public vote. The City has interpreted this provision to include using the property to facilitate installation of stormwater facilities.



Project Development Workshop 3.2

A project development workshop was held in October 2017 to finalize project development priorities and identify program needs/activities. Stormwater Project Opportunity Areas stemming from the preliminary project identification effort were presented and initial project concepts discussed.

Results from the hydraulic modeling effort were reviewed to confirm locations where flooding and surcharging have been observed. Project alternatives were discussed with the City to determine preferences related to routing and system configuration (i.e., piped versus open channel). Preliminary results from the stream assessment effort were also reviewed to validate project needs.

In some cases, an identified Stormwater Project Opportunity Area was determined to be better addressed as part of a routine maintenance activity instead of through implementing a standalone capital project. Relevant program needs for the City were discussed and included a pipe repair and replacement program, public water quality facility maintenance programs, and a stream vegetation management program. Section 6 addresses maintenance-related project and program needs.

During the workshop, City staff requested additional water quality-related project opportunities be considered and evaluated. As a result, the water quality opportunity areas were revisited, and additional public properties were identified, specifically parking lots, that could support water quality or LIDA facility installation. Site visits were conducted November 10 and December 17, 2017, to verify opportunities for additional water quality retrofit applications.

3.3 Results

Table 3-1 documents the list of final Stormwater Project Opportunity Areas used to develop capital projects and programs for this SMP. Figure 3-1 identifies each Stormwater Project Opportunity Area by ID (a numeric identifier) and primary project category-capacity/infrastructure need, erosion control, maintenance/condition assessment, and water quality. Multiple project categories may be relevant to one project opportunity, but the predominant category was used for mapping.

Twenty-six individual Stormwater Project Opportunity Areas and three citywide opportunities were identified, which reflects an expanded list of water quality retrofit locations following the project development workshop. Table 3-1 also includes a summary of the citywide preliminary project/program concepts.

It should be noted that not all Stormwater Project Opportunity Areas result in a capital project or program recommendation. Follow-up site visits conducted in November and December 2017 determined that two potential water quality retrofit locations were not viable for a facility installation. Additionally, City staff determined that the ability to retrofit select core parking areas of the City would require Board approval, and these areas should not be considered for proposed projects at this time.



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						Table 3-1. City of Tualatin Stormwater Pro	ject Opportunities				
SW Project		Basin /	Droblom (Water Quality (WQ)		Dealiminany Project Concents and Observations	Additional Data Collection (City Input	Pr	oject Developn	nent
Opportunity Area ID	Location	Waterbody	Project Category	Source	Retrofit Opportunity	Problem/Project Area Description	(per site visits)	(following Project Development Workshop)	Project Need	Programmatic Activity	c No Project
1	Martinazzi Ave (near Tualatin- Sherwood Rd) Tualatin Sherwood Ave (near Martinazzi Ave)	Nyberg Creek	 Maintenance/ Condition Assessment Capacity (pipe grade) 	 Staff Questionnaire City GIS 		 Over curb flooding in heavy rain events. Flooding originally thought to be a backwater issue from Nyberg Creek. System includes high flow bypass pipe down Martinazzi to Izzy's Pond (12") and a low flow pipe (42") to the downstream end of culvert under Martinazzi that is almost fully submerged. Anticipated to be addressed per current CWS project to remove sediment and improve capacity in Nyberg Creek. 	 Flat grade and submerged pipe attributes to sediment accumulation in the pipe down Martinazzi Alternatives include: Pipe replacement (parallel pipe) or reconfiguration/rerouting. Development of an asset management/maintenance related CIP for continuous sediment removal. 	 Given orientation and current backwater, more frequent maintenance likely only means to address this problem area in the near term. City requested expanded model development from Martinazzi to Nyberg Road along Nyberg Creek. Follow up modeling (initiated July 2018) conducted to determine project need. Programmatic activities to be included in Master Plan and rate evaluation. 	TBD	х	
2	Venetia WQ Facility (Lee between 56th and 57th)	Saum Creek	 Maintenance/ Condition Assessment 	• City GIS		 Facility overgrown with large bushes and trees but functional. As-builts available. Facility design is a U-shaped swale with a total flowline of 172 LF and a slope of 1%. The bottom width of the swale is 4' with 4:1 side slopes. Top width is 15' and the water treatment level is 5.7". Flow control MH installed directly upstream of the swale with a 24" bypass directly to the creek for high flow events. 	 No access to inlet/outlet. Limited maintenance access; the existing access path is partially washed out. Steep grade. High flow bypass outfall should be checked and repaired as needed Project needs include: vegetation trim and thinning, removal of invasives replanting as needed 	Keep as a maintenance-related project.	x		
3	Blake St outfall at Saum Creek	Saum Creek	 Erosion Control Maintenance (Debris accumulation) 	• City GIS		 Outfall experiences bank erosion (citizen complaints). Further erosion could impact the adjacent home. Culvert under Blake may be undersized and cause backwater upstream. 	 The bank is steep and appears to be unstable and eroding. Bank instability may not solely be due to the outfall. Adjacent bank instability and groundwater seepage was observed 100' downstream. Further geotechnical investigation may be warranted. The upstream system appears in good order. Project needed to retrofit existing outfall to creek, which is hanging out over the creek and exposed and minimize erosion of the channel. Bank rehabilitation may include: rock buttress pillow wall with plantings to stabilize bank other based on geotechnical guidance 	 Storm pipe upstream of outfall requires replacement due to structural deficiencies. Include outfall pipe replacement (existing failure) from road and private fence replacement in cost estimate. Cost estimate to include geotechnical evaluation of stream reach. 	x		
4	Manhasset Dr (near 10550 SW Manhasset Dr)	Hedges Creek	• Capacity/ Infrastructure Need	 Staff Questionnaire- Storm Area Hot Spots City GIS Stormwater CIP WQ retrofit evaluation 	X	 Frequent flooding of drainage channel between private properties from T-S Rd to Manhasset. Drainage channel has limited capacity and observed debris accumulation. Preliminary modeling indicates that the open channel is undersized for the contributing drainage area. Some contributing pipes are undersized and surcharging during the 25-yr design storm. Retrofit (WQ) opportunity - adjacent undeveloped land that has transportation and warehouse land draining to it. No city easement exists along alignment. 	 CIP needed to alleviate private property flooding and reconfigure collection system System configuration options presented during the workshop include maintaining the open channel and piping the entire alignment. 	 Modified system hydrology needed on upstream industrial parcel. The NE corner of the parcel does not discharge to the system. BC to evaluate with updated hydrology. Piped system requires less maintenance and is preferred. System surcharging is permissible due to flat grade and areas of backslope on the discharge pipe. 	x		

	Table 3-1. City of Tualatin Stormwater Project Opportunities										
SW Project		Pacin /	Droblom /		Water Quality (WQ)		Broliminany Broject Concepts and Observations	Additional Data Collection (City Input	Р	roject Developn	nent
Opportunity Area ID	Location	Waterbody	Project Category	Source	Retrofit Opportunity	Problem/Project Area Description	(per site visits)	(following Project Development Workshop)	Project Need	Programmatic Activity	c No Project
5	Boones Ferry Rd (19417 SW Boones Ferry Rd)	Nyberg Creek	 Capacity/ Infrastructure Need Maintenance (gravel ballast) 	 Storm Area Hot Spots City GIS 	X	 Problem location extends down Boones Ferry, the railroad culvert behind Jiffy Lube, and west along Tonka Avenue. Specific problem locations include: The inlet along the RR tracks (maintenance issue). Gravel is transported and redeposited downstream. StormFilter catchbasins along Boones Ferry are located at a roadway sag and clog, resulting in flooding. The conveyance system along Tonka, Warm Springs and Boones Ferry contributes to flooding. 	 CIP needed for source control and improved conveyance. Gravel transportation mitigation needed to control railroad ballast. Site visit confirmed two existing offline, single cartridge configuration of Storm Filter catchbasins. Additional sediment control or relocation may be needed to improve StormFilter performance. Rerouting of conveyance on Warm Spring, Tonka and Boones Ferry may improve conveyance and alleviate flooding. Preliminary modeling and system configuration alternatives presented during Workshop include revisions to the RR conveyance channel and Boones Ferry routing alternatives. 	 City requested expanded model development from Martinazzi to Nyberg Road along Nyberg Creek (initiated July 2018), which may impact project development. StormFilter relocation needed. Due to project size and scope, project development may require separate projects and/or phasing. Follow up site visit 12/14/17 indicates the most viable option for a StormFilter is upstream along Boones Ferry. 	x		
6	Alsea/BF Rd 99th/Siuslaw Greenway	Hedges Creek	 Capacity/ Infrastructure Need Water Quality 	 Staff Questionnaire WQ retrofit evaluation 	X	 Dual corrugated pipe has the bottom rusted out. No apparent capacity deficiency. High levels of sediment accumulation are observed. Retrofit (WQ and FC) opportunity- This long linear greenway may provide an opportunity for WQ treatment for contributing drainage area (City confirms ok per charter). 	 Project to include replacement of parallel pipes from Boones Ferry to MH upstream of parallel pipes Project to include sediment trap. Area is upstream of observed instream erosion at Alsea Ct. Regrading/amending channel between Siuslaw Ln and 98th Ave would improve downstream erosion issues. 	 Include pipe replacement, sediment trap, and bioswale in cost estimate. Project meets retrofit requirement and promotes stormwater infiltration/retention. City to review upstream system to define upstream limit of replacement. 	x		
7	Herman Rd	Hedges Creek	• Capacity/ Infrastructure Need	 Staff Questionnaire WQ retrofit evaluation 	X	 System has flat grade. Half the road drains to roadside ditch and the other half to a ditch along railroad ROW. System lacks required drainage infrastructure. City wishes to install piped/below ground infrastructure. Survey shows negative pipe slopes for the culverts passing under Herman Road. Survey also indicates pipes under RR are deep relative to upstream and downstream pipes. Preliminary modeling indicates that culverts crossing Herman Road leads to backwater effects and flooding in the ditch/culvert system on the north side of Herman Road. 	 CIP needed to install additional conveyance infrastructure. Preliminary modeled alternatives suggest the system will backwater upstream of the railroad crossing. Piping to be sized with maximum slope possible to limit sedimentation Potential water quality retrofit locations at SE corner of Herman Road and 95th Avenue. 	 Modified system hydrology needed. Golf course does not discharge to system. Preferred configuration is piped system in middle of roadway. Culverts under tracks are frequently maintained. System surcharging is permissible due to flat grade. No water quality treatment needed/not a retrofit opportunity now. Stormwater treatment will be accommodated as part of the roadway widening. 	x		
8	Curves at Blake/105 and 108th	Hedges Creek	 Capacity/Infrastru cture Need Erosion 	Staff Questionnaire		 Roadway lacks collection system and pedestrian access. City is currently in planning stages for roadway update (concept plan in place) but no budget for project yet. Culvert alignment may play a role in design and cost estimate. Current drainage from Coquille/Paulina and 105th is an open channel ditch to culvert inlet. Specific problem locations include: Stream channel experiences 90° bends on both sides of culvert. Culvert is undersized Existing roadway embankments are steep and drainage updates are needed for the roadway. 	 Culvert design to incorporate a sizing and length based on the hydrology and ideal alignment. Observed (during stream assessment) retaining wall deficiencies along the roadway. Assume improvements as part of roadway redesign and not culvert replacement. 	 Per Oregon Department of Fish and Wildlife (ODFW) feedback (1/25/17) culvert fish passage design not necessary. Culvert sizing and construction estimate needed as part of the CIP. Roadway drainage to be addressed with roadway update. Assume configuration of culvert to align with historic channel orientation and not current orientation. Culvert to be sized based on 100-yr flows at point of inlet. 	x		

						Table 3-1. City of Tualatin Stormwater Pro	ject Opportunities				
SW Project		Basin/	Problem /		Water Quality (WQ)		Preliminary Project Concents and Observations	Additional Data Collection / City Input	Pi	oject Developm	nent
Opportunity Area ID	Location	Waterbody	Project Category	Source	Retrofit Opportunity	Problem/Project Area Description	(per site visits)	(following Project Development Workshop)	Project Need	Programmatic Activity	c No Project
9	Sagert St Shenandoah Apts (Sandalwood)	Nyberg Creek	 Erosion Control Capacity/Infrastru cture Need 	 Storm Area Hot Spots WQ retrofit evaluation 	x	 Reported flooding during Oct and Dec 2015 storms. Retrofit (WQ) opportunity by converting existing open channel to WQ facility. Preliminary modeling indicates that the existing pipes upstream of the open channel are undersized and are surcharging during the 25-yr design storm, but no flooding is reported. 	 System flooding may be due to debris from nearby tree limiting capacity of ditch inlet. Limited pipe cover through greenspace. Channel sloughing observed upstream of Sagert St. WQ and detention should be incorporated into this project if possible (project location is upstream of WQ Opportunity Area #10). 	 City easement exists. CIP development to be completed independent of Nyberg system. Surcharging is acceptable. Relocate ditch inlet (away from tree). Maintain open channel conveyance options to qualify as a water quality retrofit. 	x		
10	Mohawk Apts	Nyberg Creek	 Capacity/ Infrastructure Need Maintenance/ Condition Assessment 	• Storm Area Hot Spots		 Conveyance capacity affecting Opportunity Area #5. Inlet behind Mohawk Apts is inundated, resulting in overland flow through adjacent property and flooding Tonka and Warm Springs at the Elks Lodge. City is unaware of any easements that may facilitate correcting the issue. 	 Limited freeboard available prior to overtopping at the inlet. Grate structure installed at inlet likely reducing capacity. Alternatives include: Update/replace inlet and embankment to reduce/remove flooding Pipe open section through apartments and remove inlet Update both inlet and channel to enhance natural function/remove invasive vegetation 	 City unable to access pipe upstream of open channel for CCTV. Need to include CCTV cost into CIP development. CIP to include installation of access locations (manholes) along piped system upstream of open channel. CIP to include replacement of ditch inlet at downstream end of open channel and corrugated metal pipe downstream of open channel. City to confirm easement along open channel alignment. City prefers piping over maintaining open channel. 	x		
11	Piute Ct. WQ Facility	Saum Creek	 Maintenance/ Condition Assessment 	• Storm Area Hot Spots		 Public WQ facility is failing. Sediment and invasive vegetation accumulation. As-builts available. Facility design is approx. 7' deep, 400 square foot (sf) bottom, 3:1 side slope. No access road. Easement status is unknown. 	 Site visit was unable to locate outlet structure. System appears to discharge towards I-205. Potential maintenance access along backside of facility. Installation of access road needed. CIP to include facility regrading with sediment and vegetation removal and replanting. Existing easement available between two houses on Piute Ct. but does not appear to be established or used. 	 Keep as a maintenance project. The outfall structure should be inspected and repaired as needed. City owns easement between two private properties off Piute Ct. Assume construction of a permanent access road off Piute Ct. 	x		
12	Sequoia Ridge WQ Facility	Saum Creek	 Maintenance/ Condition Assessment 	Stormwater CIP		 Facility is overgrown with malfunctioning outlet structure and standing water. As-builts available. Facility design reflects pond volume of 14,250 cubic feet (cf) but was built to 15,500 cf. Pond bottom is approx. 4,000 sf and 5' deep with side slopes of 3:1. Facility was designed in 1997. Outlet structure has a 2" orifice for low flow and a high flow inlet to bypass low flow orifice. Trail connects facility to Saum Creek, resulting in increased public attention. 	 Large cottonwood trees need to be removed Outfall structure needs engineering review. Due to the standing water, there is little beneficial vegetation and will likely need to be fully replanted. As-builts reference recommended maintenance requirements including sediment removal once it exceeds 6" in depth. Mow 2x/yr. Watering in times of drought. Inspections 3x/yr. Project needs include: Replacement of outlet structure Removal of trees Amendment of soils Replanting of vegetation 	 Keep as a maintenance project. The outfall structure should be inspected and repaired as needed. 	x		
13	Sweek Dr WQ Facility	Hedges Creek	 Maintenance/ Condition Assessment 	Stormwater CIP		Facility is overgrown.No as-builts available.	 Large cottonwood trees need to be removed, No outlet structure observed, and facility appears to freely drain. Project needs include: Removal of trees 	Keep as a maintenance project.	x		

	Table 3-1. City of Tualatin Stormwater Project Opportunities										
SW Project		Pacin /	Broblom /		Water Quality (WQ)		Proliminary Project Concents and Observations	Additional Data Collection (City Input	Pr	oject Developme	ent
Opportunity Area ID	Location	Waterbody	Project Category	Source	Retrofit Opportunity	Problem/Project Area Description	(per site visits)	(following Project Development Workshop)	Project Need	Programmatic Activity	No Project
							 Amendment of soils Replanting of vegetation				
		Hedges	Maintenance/	Stormwater CIP		 Maintenance needed due to sediment build up and limited access to outlet structure. As-builts available. Facility is approx. 4' deep, 2,500 sf bottom. Facility was designed in 1993. Original design included WQ swale graded around the pond for preliminary treatment. 	 The WQ swale no longer exists and needs to be regraded into the facility. No vegetation is visible and high sediment accumulation observed. The inlet riprap needs to be replaced. Project needs include: 	 Flow control/flow duration sizing to be referenced in project description. Project to assume maintenance consistent with other public WQ facility. 			
14	waterrord wQ Facility	Creek Conditio Assessm	Condition Assessment	WQ retrofit evaluation	X	 The existing outlet structure in the pond needs to be removed and relocated so maintenance can be performed during high water events. Facility is upstream of observed instream erosion, so flow/volume control may benefit. 	 Relocation and redesign of outfall structure to maximize flow control. Invasive removal. Excavate and regrade WQ swale. Include amended soils and replant Replace inlet structure. 		X		
15	89th Ave/Tualatin- Sherwood Rd Stormwater Outfall	Hedges Creek	• Water Quality	 Stormwater CIP WQ retrofit evaluation 	x	 Project identified in City's 2017-2021 CIP. Project is a WQ manhole (MH) installation to prevent debris from discharging into wetlands. CWS retrofit program driver. Per review of CWS Permit and SWMP, appears to be viable as an outfall retrofit project. 	 Limited opportunity for green infrastructure or any facility with drop requirement. Water surface elevation in adjacent wetlands prohibits use of any facility with large internal drop requirement. Due to a small head drop across the structure conveyance pipe from the structure and a new outfall may need to be constructed. 	 Facility sizing and installation to be included as project 	x		
16	125th to Herman Rd	Cummins Creek	• Water Quality	 Stormwater CIP WQ retrofit evaluation 	X	 Project identified in City's 2017-2021 CIP. Project is a WQ MH installation to treat 143 ac contributing area with no upstream treatment. CWS retrofit program driver. Per review of CWS Permit and SWMP, appears to be viable as an outfall retrofit project. Identifying catchment area challenging due to the railway along south side of SW Herman Road and unknown conveyance pathways. 	 Limited opportunity for green infrastructure or any facility with drop requirement. Water surface elevation in adjacent wetlands prohibits use of any facility with large internal drop requirement. Due to a small head drop across the structure conveyance pipe from the structure and a new outfall may need to be constructed. Catchment delineation and facility placement to be determined during detailed design due to private property constraints. 	Facility sizing and installation to be included as project	x		
17	93rd Ave	Nyberg Creek	Water QualityInfrastructure need	 Staff Questionnaire WQ retrofit evaluation 	x	 Potential for green street pilot project to provide treatment in roadside planters to Avery St. GIS indicates collection system exists, so no new infrastructure required. 	 Current conveyance is provided in street side ditch primarily on the west side of 93rd. Project to include curb and gutter where 93rd is currently unimproved. Roadside planters to be incorporated and sized based on the catchment area draining to the north end of the road to Avery. 	 New project opportunity area following Workshop. Project extends on the west side of 93rd Avenue to SW Umiat St. and on the east side to SW Tonopah St (one inlet will need to be removed in front of 20232 SW 93rd) 	x		
18	Green Parking Lot (approx. 18725 SW Boones Ferry Rd)	Hedges Creek	 Water Quality Capacity (bank overtopping) 	 City GIS WQ retrofit evaluation 	X	 Potential WQ retrofit. Reported flooding of lot due to proximity to Hedges Creek and floodplain. Flooding due to stream capacity issue and not to be addressed by Master Plan. Vegetated swale (unmaintained) already exists adjacent to Hedges Creek; collecting parking lot runoff. Parking lot properties are considered public but are governed by a separate board that oversees improvements. 	 Per site visit, there are several locations where existing planters could be retrofit for additional WQ treatment. Would require relocation of inlet and potentially lose a parking stall depending on facility sizing needs. 	 New project opportunity area following Workshop. Area is already being treated by a water quality facility. Maintenance of the swale is recommended. Follow up from City in December 2017 indicates the need for board approval to retrofit core area parking will present an implementation challenge. No dedicated project need now. 			X

						Table 3-1. City of Tualatin Stormwater Pro	ject Opportunities		
SW Project Opportunity Area ID	Location	Basin/ Waterbody	Problem/ Project Category	Source	Water Quality (WQ) Retrofit Opportunity	Problem/Project Area Description	Preliminary Project Concepts and Observations (per site visits)	Additional Data Collection/City Input (following Project Development Workshop)	Project DevelopmentProjectProgrammaticNoNeedActivityProject
19	Yellow Parking Lot (Seneca and 84फ)	Hedges Creek	• Water Quality	• WQ retrofit evaluation	x	 Potential WQ retrofit. Parking lot properties are considered public but are governed by a separate board that oversees improvements. 	 Per site visit, there are several locations where the existing planters could be retrofit for WQ treatment. Would require relocating inlet and potentially losing a parking stall depending on facility sizing needs. There are light poles in the planters. 	 New project opportunity area following Workshop. Follow up from City in December 2017 indicates the need for board approval to retrofit core area parking will present an implementation challenge. No dedicated project need now. 	x
20	Juanita Pohl Parking Lot	Hedges Creek	Water Quality	WQ retrofit evaluation	x	 Potential WQ retrofit at City-owned, parking lot. Significant impervious surface area and limited existing WQ treatment. 	• Per site visit, there are several locations where the existing islands that could be retrofit for WQ treatment. Would require relocation of inlet and potentially lose a parking stall depending on facility sizing needs.	 New project opportunity area following Workshop. 	x
21	White Parking Lot	Hedges Creek	• Water Quality	WQ retrofit evaluation	x	 Potential WQ retrofit. Parking lot properties are considered public but are governed by a separate board that oversees improvements. 	 Per site visit, parking lot currently drains to middle ditch/swale that could be retrofit to provide significant treatment. Some light grading, soil augmentation and planting would be needed. Existing inlets would need to be removed. 	 New project opportunity area following Workshop. Follow up from City in December 2017 indicates the need for board approval to retrofit core area parking will present an implementation challenge. No dedicated project need now. 	x
22	Community Park Parking Lot	Hedges Creek	Water Quality	Site Visit	x	 Potential WQ retrofit at City-owned, parking lot. Significant impervious surface area and limited existing WQ treatment. 	 Per site visit, there are several locations where the existing islands that could be retrofit for WQ treatment. Would require relocation of inlet and potentially lose a parking stall depending on facility sizing needs. 	 New project opportunity area following Workshop. 	x
23	Blue Parking Lot (Boones Ferry Rd and Tualatin Rd)	Hedges Creek	 Water Quality Capacity (bank overtopping) 	 City GIS WQ retrofit evaluation 	х	 Potential WQ retrofit. Reported flooding of lot due to proximity to Hedges Creek and floodplain. Flooding due to stream capacity issue and not to be addressed by Master Plan. Properties are considered public but are governed by a separate board that oversees improvements. 	 Hedges Creek floods the parking lot during routine rain events. Per site visit, standing water onsite and parking lot is at grade with Hedges Creek. Not a recommended opportunity to retrofit for WQ. 	 New project opportunity area following Workshop. Follow up from City in December 2017 indicates the need for board approval to retrofit core area parking will present an implementation challenge. No dedicated project need now. 	X
24	City Operations Yard	Hedges Creek	Water Quality	• WQ retrofit evaluation	x	 Potential WQ retrofit at City-owned, municipal property. Significant impervious surface area. 	 Per site visit, the parking lot adjacent to Herman Road currently has WQ treatment. The parking lot adjacent to the building does not, and access was limited. Little opportunity for WQ retrofit at this location. 	 New project opportunity area following Workshop. No recommended project per follow up site visits. 	x
25	Jurgens Park Parking Lot	Tualatin River	Water Quality	Site Visit	x	Potential WQ retrofit at City-owned, parking lot.	• Per site visit, there is little opportunity for a water quality retrofit due to catch basin placement. The northern portion of the parking area is already paved with porous pavers.	 New project opportunity area following Workshop. No recommended project per follow up site visits. 	x
26	Hedges Creek at SW 106 th Ave and Willow Str	Hedges Creek	Erosion Control	Stream Assessment		 Active stream bank erosion occurring adjacent to, upstream, and downstream of an exposed sanitary manhole. Separate evaluation conducted by the Park Department (Hedges Creek Stream Assessment, February 2018) also observed active erosion in vicinity. 	 Limited upstream flow control results in high runoff velocities that appear to have eroded the stream channel. Results of the Stream Assessment (Section 5 and TM3 of the SMP) outline specific observed conditions in reach. 	 New project opportunity area following Workshop. Project scope and cost information to be based on recommendations outlined in the Hedges Creek Stream Evaluation, February 2018. Ongoing vegetation maintenance program needs. 	x X

	Table 3-1. City of Tualatin Stormwater Project Opportunities												
SW Project Opportunity Area ID	Location	Basin/ Waterbody	Problem/ Project Category	Source	Water Quality (WQ) Retrofit Opportunity	Problem/Project Area Description	Preliminary Project Concepts and Observations (per site visits)	Additional Data Collection/City Input (following Project Development Workshop)	Project Need	roject Developme Programmatic Activity	ent No Project		
City wide	Repair and Replacement Program	City wide	 Capacity/ Infrastructure Need Maintenance/ Condition Assessment 	Staff Questionnaire		 Select storm lines and infrastructure throughout City may need more frequent maintenance to ensure function. There is no proactive pipe or structure replacement program. 	 Development of repair and replacement program for infrastructure (pipes and structures) requiring increased maintenance frequency. Include proactive infrastructure replacement. 	 Programmatic activities to be included in Master Plan and rate evaluation. May require multiple programmatic activities. 		X			
City wide	Public WQ Facility Maintenance	City wide	 Maintenance/ Condition Assessment Water Quality 	Staff QuestionnaireWQ retrofit evaluation		 City staff has been receiving complaints from homeowners unaware that a public WQ facility is near their residence. Re-engineering and/or retrofit of existing WQ facilities may be required. 	 Develop a program to review/investigate existing system design and function. 	 Programmatic activities to be included in Master Plan and rate evaluation. 		x			
City wide	Vegetation Management	City wide	Water QualityMaintenance	Stream Assessment		• Excessive invasive vegetation reported along stream reaches throughout the City.	 Develop a program to remove invasive/replace/restore vegetation along stream channels. Results of the Stream Assessment (Section 5 and TM3 of the SMP) outline specific observed conditions in reach. 	Programmatic activities to be included in Master Plan and rate evaluation.		x			





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City of Tualatin

Date: April 2019 Project: Project 149233

Stormwater Project Opportunity Areas

Section 4

Storm System Capacity Evaluation

Stormwater conveyance is the primary function of the City's stormwater infrastructure. This section outlines the H/H system modeling approach and results for select areas of the city that were used to inform observed capacity limitations and develop project solutions.

System modeling needs were identified as part of the project needs identification effort (Section 3.1.2) and reflect targeted areas of the city requiring hydraulic modeling to analyze existing and future system capacity. Capital project recommendations were developed for each modeled area after verifying capacity limitations and assessing project alternatives. A total of six capital project recommendations stemmed from results of the H/H modeling effort.

The system capacity evaluation is described in additional detail in TM2 and in TM3, included in this SMP as Appendix C and Appendix D, respectively. Model results and figures related to the capital project development are included in this SMP as Appendix E.

4.1 Modeling Approach

H/H modeling was conducted for targeted areas of the city with known capacity limitations and where flooding is frequently observed. This targeted modeling approach was executed to focus resources on specific areas of the city where additional information is needed to quantify system flooding and develop project solutions.

H/H modeling was predominately conducted in the downstream portions of the stormwater collection system that exhibit high flow but are relatively flat. A few areas do not discharge/outfall freely due to high tailwater conditions, resulting in backwater of the conveyance system and flooding. The City does not require detention for new and redevelopment, so as development occurs, there is typically an increase in stormwater flow and runoff volume, and as a result, existing infrastructure capacity may be insufficient to convey the increase in stormwater runoff.

For this SMP, the following modeling approach was used to evaluate stormwater conveyance capacity:

- 1. Compile a list of known and suspected problem areas and evaluate which areas will require modeling to inform corrective measures (see Section 3.1.2)
- 2. Review available data (via GIS, as-builts, etc.) to identify data gaps and data required for model development and to inform survey needs
- 3. Conduct field survey work to supplement data gaps in the City's GIS for the targeted portions of the City's stormwater conveyance system
- 4. Delineate subbasins and develop a citywide hydrologic model to estimate stormwater runoff generated for existing and future development conditions
- 5. Develop targeted or system-specific hydraulic models
- 6. Validate modeled flooding using anecdotal information (photographs, City records)
- 7. Verify capacity constraints and identify potential sources or causes
- 8. Use the validated hydraulic models to simulate alternative conveyance system design and develop potential solutions to capacity problems.

Brown AND Caldwell

4.2 Planning Criteria and Design Standards

Planning criteria related to the analysis of the City's stormwater collection system are documented in the City's Public Works Standards (PW) Standards (2013), the CWS Design and Construction Standards (2007), and the CWS LIDA Handbook (2009).

Planning criteria and design standards are used to identify system capacity limitations and establish the basis of design for water quality and capacity-related projects. A summary of applicable planning criteria and design standards is provided in Table 4-1. Please note that some deviation from established design standards occurs on a case-by-case basis, particularly where slope or pipe cover design constraints exist.

Table 4-1. Drainage Standards and Design Criteria										
Criteria	Source	Value								
Water Quality Facility Design	PW Standards (206.8)	Design to requirements of CWS Design and Construction Standards and CWS LIDA Handbook. Specific to the PW Standards, facilities are required to have 4' or 6' vinyl coated chain link fencing.								
Water Quantity Facility Design	PW Standards (206.8) CWS Design and Construction Standards	Design to requirements of CWS Design and Construction Standards. Match pre- and post-development flow for the 2-, 10-, and 25-yr, 24-hr storm events.								
Pipe, Culvert Design Storm ^a	PW Standards (206.3)	Design to the 25-yr storm event. Surcharge during the 25-yr is not permissible. $^{\mbox{\tiny b}}$								
Open Channel and Ditch Design Storm	PW Standards (206.3)	Design to the 25-yr storm event. Surcharge during the 25-yr is not permissible. $^{\circ}$								
Pipe Size	PW Standards (206.4)	10 " minimum diameter for pipe from catch basins to the main in the public ROW.12 " minimum diameter for mains in the public ROW.								
Manning's Roughness	PW Standards (Table 206-8)	Varies by material and shape.								
Pipe Material	PW Standards (206.4)	Concrete, PVC, ductile iron, and aluminum spiral rib pipe.								
Pipe Cover	CWS Design and Construction Standards	Table 5-2, varies by pipe material.								
Structure Spacing	PW Standards (206.4)	250' maximum for 10" pipe; 400' maximum for 12" pipe.								
Manhole Size	PW Standards (206.6)	48" diameter minimum.								

a. The City's PW standards reference the rational method for conveyance design. Santa Barbara Urban Hydrograph (SBUH) was an approved equivalent as discussed with the City during the July 28, 2016, meeting.

b. Per discussion with City staff, surcharge is acceptable for capital project design.

c. Due to the consequence of failure (potential road washout), capital project design for culverts used the 100-year peak flow.

In conjunction with the reissued NPDES permit, CWS is in the process of updating its Design and Construction Standards. CWS released updated standards in April 2017 to address the size of development that requires water quality treatment (impervious area threshold) and the prioritization of LIDA and green infrastructure (GI) facilities to provide treatment. Additional updates were finalized in April 2019 to establish strategies and priorities for addressing effects of hydromodification. These updates have not affected the City's design of capital projects under this SMP.

Additional discussion of stream erosion in accordance with hydromodification risk is provided in Section 5.



4.3 Hydrologic Model Development and Results

A citywide hydrologic model was developed using XP-Storm Water Management Model (XPSWMM) version 2016.1. Within the model, the SBUH method was used to estimate hydrology. The input parameters for the SBUH method include subbasin areas, impervious percentages, pervious curve numbers, and time of concentration. The hydrology routine in XPSWMM converts rainfall into stormwater runoff as a function of the design storm parameters (e.g., volume and intensity of rainfall); subbasin characteristics including topography, land use, vegetation, and soil types.

The hydrology modeling effort, particularly the delineation of subbasin areas, considered locations where the hydrology input is needed for the hydraulic model, such as at system junctions, changes in system slope, or locations where there are changes in conveyance pipe or channel size.

Hydrologic model results are tabulated in TM2 (Appendix C). Results are displayed by subbasin as the maximum flow for each design storm, the change in peak flow, and the percent increase in peak flow between the existing and future development conditions. Overall, the hydrologic model results show minimal to no increases in future flows for subbasins that are fully developed, such as in the Nyberg Creek and Tualatin River (direct) watersheds. The largest increases in flow are in subbasins with larger amounts of vacant land, such as in the Hedges Creek watershed.

4.4 Hydraulic Model Development and Results

There are six Stormwater Project Opportunity Areas where hydraulic models were developed as part of this SMP:

- 1. Stormwater Project Opportunity Area 1, Martinazzi Avenue at Tualatin-Sherwood Road
- 2. Stormwater Project Opportunity Area 4, Manhassat Drive
- 3. Stormwater Project Opportunity Area 5, Boones Ferry Road at Tonka Road
- 4. Stormwater Project Opportunity Area 7, Herman Road
- 5. Stormwater Project Opportunity Area 9, Sagert Street at the Shenandoah Apartments
- 6. Stormwater Project Opportunity Area 10, Mohawk Apartments at Warm Springs Road

Five of the Stormwater Project Opportunity Areas (Nos. 4, 5, 7, 9, and 10) were identified during the project needs identification effort. Additional hydraulic modeling was initiated in July 2018 to evaluate lower Nyberg Creek and the contributing stormwater collection system east of Martinazzi Avenue (Stormwater Project Opportunity Area 1). Modeling efforts focused on capacity and backwater effects of Nyberg Creek on stormwater infrastructure (Lower Nyberg Creek System).

Due to proximity and connectivity of the proposed modeled system, three of the areas (Nos. 5, 9, and 10) were combined into one hydraulic model system (Upper Nyberg Creek System).

Hydraulic model extents, including contributing subbasins, are shown on Figure 4-1 at the end of this section.

4.4.1 Hydraulic Model Development

XPSWMM was used to simulate the hydraulic performance of the select pipe and open-channel systems to calculate peak flows, water surface elevations, and velocities for established design storms. The hydraulic model extents were established upstream and downstream of the identified problem areas to verify the extent and severity of the problem location and develop potential alternatives to correct or mitigate the deficiency.

One-dimensional (1D) XPSWMM hydraulic models were developed based on existing geographic information system (GIS) data provided by the City, field survey collected as part of this master



planning effort, and site visits. A two-dimensional (2D) XPSWMM model was developed for the Lower Nyberg Creek System, from Martinazzi Avenue east to Nyberg Lane, based on Light Detection and Ranging (LiDAR), field observations from stream walks, aerial photos, and survey data.

A description of each modeled system is provided below:

- Manhassat Drive System: The Manhassat Drive system includes Stormwater Project Opportunity Area 4. The City frequently responds to flooding of the open channel system, starting from Tualatin-Sherwood Road to Manhasset Drive. Based on field reconnaissance, feedback from City staff, and initial system review in GIS, the open channel system is capacity limited. The hydraulic model for the Manhassat Drive system includes the culvert under Tualatin-Sherwood Road and the piped and open channel system running north to the outfall into Hedges Creek.
- Herman Road System: The Herman Road system includes Stormwater Project Opportunity Area 7. City staff identified this area during completion of the stormwater surveys as frequently flooding. Based on field reconnaissance, feedback from City staff, and initial system review in GIS, the primary drainage issues include undersized drainage infrastructure and flat grade along Herman Road. The south side of Herman Road does not have a stormwater collection system, which results in standing water on the roadway. The hydraulic model for the Herman Road system includes the piped and open channel conveyance along Herman Road between Southwest Teton Avenue and Southwest Tualatin Road, as well as the open channel/piped system between Herman Road and the outfall at Sweek Pond.
- Upper Nyberg Creek System: The Upper Nyberg Creek system includes Stormwater Project Opportunity Areas 5, 9, and 10. All three areas were identified due to frequent flooding and the need for further assessment. Collectively, transport of sediment and gravel in this system, combined with the relatively flat grade of the system, results in reduced capacity of the stormwater collection system and backwater and flooding effects. The hydraulic model is extensive and includes the open channel system along the railroad tracks west of Boones Ferry Road, the piped drainage system on Boones Ferry Road, the culverts discharging east under Boones Ferry Road, the open channel system flowing east from Boones Ferry Road to Martinazzi Avenue, and the open channel and piped systems discharging north to Nyberg Creek from Seminole Trail Warms Springs Street.
- Lower Nyberg Creek System: The Lower Nyberg Creek system includes Stormwater Project Opportunity Area 1 and extends along Nyberg Creek from Martinazzi Avenue to Nyberg Lane. Both 1D and 2D modeling approaches were used to evaluate flooding extents, potential causes of flooding and comprehensively assess how modifications to Nyberg Creek influences upstream stormwater system The Upper Nyberg Creek model 1D model was extended to include the Nyberg Creek channel from Martinazzi Avenue to the culvert outfall at Nyberg Lane and portions of the stormwater collection system along Tualatin-Sherwood Road and Martinazzi Avenue. The 1D and 2D models are linked in XPSWMM and simulated as a single model of the channel and floodplain.

For the Manhassat, Herman Road, and Upper Nyberg Creek System, existing condition hydrology for the 25-year storm event was used to initially evaluate the capacity of the modeled systems and validate model results. Model results were compared to anecdotal flooding reports and City photographs taken during the December 2015 storm event (for the Manhasset Drive system). Model validation information did not include specific flows or water surface elevations at structures within each of the hydraulic model areas. Therefore, model refinements instead of a model calibration were performed by adjusting hydraulic input parameters based on field observations to match reported flooding.

No recent model validation or calibration data were available for the Lower Nyberg Creek System.



Both existing and future condition hydrology were applied to the validated hydraulic model. This process enables the existing infrastructure to be assessed for future capacity needs.

4.4.2 Capacity Evaluation Results

The hydraulic model results showed minimal to no increases in future flows for the modeled areas that are fully developed. As expected, the largest projected flow increases were seen in areas with existing vacant lands. The hydraulic model results confirmed the flooding problem areas/capacity-limited areas as reported by City staff and provided additional information about potential sources of the problems.

Detailed hydraulic modeling results (tables and figures) are provided in Appendix C for the Manhassat, Herman Road, and Upper Nyberg Creek System. Hydraulic modeling results are provided for the Lower Nyberg Creek System in Appendix D.

A summary of the hydraulic modelling results by modeled system is provided below. Table 4-2 summarizes the general modeled flooding locations, the potential source of the capacity deficiencies, and whether a capital project was developed to address the flooding.

- Manhasset Drive System: The hydraulic model shows extensive flooding during the 2-year design storm in the stormwater system along Manhasset Drive, especially along the open channel portion where the open channel cross sections are non-symmetrical and limited in capacity. Proper open channel maintenance, including debris removal and regular mowing of channel vegetation, may alleviate some flooding; however, the channel is still undersized for the contributing flow. Because pipes further downstream (north of Manhassat Drive) experience surcharging they do not meet City design standards; however, the maximum water elevations are not above manhole rim elevations.
- Herman Road System: The hydraulic model shows extensive flooding in the open channel/culvert system along Herman Road between SW Teton Avenue and SW Tualatin Road. The open channel system north of Herman Road is further restricted by the two culverts across Herman Road. These culverts have a non-traditional layout, likely due to the ground clearance required beneath the railroad and have a negative or backslope. To the east, the parallel culverts south of the intersection of Tualatin Road and Herman Road begin surcharging at the 2-year event. Figures 4-3 and 4-4 show the extent of modeled flooding by conduit.
- Upper Nyberg Creek System: The hydraulic model shows widespread system flooding during the 2-year and 10-year design storms. One prevalent location of flooding is the open channel system along the railroad tracks west of Boones Ferry Road (19417 SW Boones Ferry Road). The open channel is overtopping, and the downstream pipes are surcharging, resulting in flooding of nearby businesses. Flow bypassing the system is discharging to Boones Ferry Road via overland flow, consistent with the flow patterns reported by city staff. Sediment accumulation further restricts conveyance across the parallel culverts at Boones Ferry Road.

Additional area experiencing surcharge and flooding is the pipes north of Seminole Trail between Tillamook Court and Martinazzi Avenue, starting at the 10-year event. Modeling did not indicate flooding of the open channel system, but because any system upsize would impact the open channel, capital project development must include a comprehensive review of project needs in this area. Finally, the pipes near the intersection of SW Boones Ferry Road and SW Warm Springs Street and the intersection of SW Warm Springs Street and SW Tonka Street are surcharging beginning at the 10-year event.

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• Lower Nyberg Creek System: The hydraulic model shows systemic flooding along Martinazzi Avenue and Tualatin-Sherwood Road. The flooding is due to the low elevation of roadways and parking lots, low gradient conveyance systems and the low gradient in the Nyberg Creek itself.

As described in TM3 (Appendix D), larger regional events result in widespread flooding along Martinazzi Avenue from Nyberg Creek to Tualatin-Sherwood Road due to the backwater effects of the Tualatin River on Nyberg Creek. More frequent, nuisance flooding (evaluated based on a 5-year, 24-hour design storm) still occurs along Martinazzi Avenue and Tualatin-Sherwood Road, but is the result of limited capacity of the collection system to convey flow as opposed to backwater conditions.

Table 4-2. Capacity Evaluation Result Summary and Capital Project Development Approach											
Modeled System	General Location	Conduit	Surcharging/ Flooding Scenario	Source of Capacity Deficiency	Capital Project Development (Y/N) ^a						
		Link32.1	Existing 10-yr								
		Link34.1	Existing 10-yr								
		322603	Existing 2-yr								
		322638.1	Existing 2-yr	Existing culverts are undersized and have							
	Open channel/culvert	333704.1	Existing 2-yr	minimal slope. Multiple transitions from	V CID O						
	Herman Road	333705.1	Existing 2-yr	open channel to a piped system lead to	I - CIF O						
		333706.1	Existing 2-yr	high energy losses.							
		333707.1	Existing 2-yr								
Herman		334080.1	Existing 2-yr								
Road System		Link33.1	Future 2-yr								
System	Culvert across Herman Road	322643	Existing 2-yr	Culvert has minimal slope and nearby pipes show unusual change in inverts. Culvert is surcharging but not flooding. Follow up survey with detailed design recommended.	N						
	Dual culvert south of intersection of Tualatin Road and Herman Road	322618	Existing 2-yr	Culvert has minimal slope. Culvert is surcharging but not flooding.	N						
	Stormwater system at intersection of Tualatin Road and Herman Road	268371	Future 25-yr	Pipes is surcharging but not flooding. Refined hydrology during project design may refine project need.	N						
		Link9	Existing 2-yr								
		Link10.1	Existing 2-yr								
	Open channel along	Link11.1	Existing 2-yr	Open channel is undersized and not							
Manhasset	Manhasset Drive	Link12.1	Existing 2-yr	properly maintained.	T - CIP I						
Drive		Link13.1	Existing 2-yr								
System		Link14.1	Existing 2-yr								
	Piped system downstream	266695	Existing 2-yr								
	of open channel on	266697	Existing 2-yr	Existing pipes are surcharging but not flooding due to minimal slope	Y - CIP 1						
	Manhasset Drive	268265	Existing 2-yr								
		Link91									
Lower	Piped system along	Link102		Nyberg Creek is surcharged to the outfall at							
Nyberg	Martinazzi Avenue and	Link103	Existing 5-yrb	Martinazzi Avenue. Backwater conditions	N						
System	Tualatin-Sherwood Road	Link93.1]	flooding.							
-		Link100									

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	Table 4-2. Capacity	Evaluation R	esult Summary and	l Capital Project Development Approach	I
Modeled System	General Location	Conduit	Surcharging/ Flooding Scenario	Source of Capacity Deficiency	Capital Project Development (Y/N) ^a
		Link99			
		Link98			
		Link94			
		Link 136			
		Link74			
		267573_1			
		267573_2			
		267573_3			
		Link97			
		Link134			
		Link135			
		Link86			
		Link89			
	Open channel and pipe system behind Oil Can Henry's including junction of outfalls directly west of	Link36	Existing 2-yr		
		Link43.1	Existing 2-yr	Rock/gravel accumulation is limiting	
		Link80	Existing 2-yr	control and maintenance.	
	Boones Ferry Road	277225	Future 2-yr		
		268293	Existing 10-yr	Existing open channels and pipes are	
	Piped system on Boones	322832	Existing 10-yr	undersized for the contributing drainage	V 01D0
	Ferry Road near Warm	268296.1	Existing 25-yr	area. This system receives overland flow from the open channel behind Oil Can	Phase 3
	Springs Street	267215	Future 10-yr	Henrys. System rerouting may help alleviate	
		268297.1	Future 25-yr	flooding.	
Upper	Piped system at	264286	Existing 10-yr	Existing pipes have minimal slope and are	
Nyberg Creek System	Intersection of Warm Springs Street and Tonka Street	265109	Existing 2-yr	undersized. System rerouting may alleviate flooding.	Y – CIP 2, Phase 2
System		267910	Existing 10-yr	Existing pipes are undersized for	
	Piped system between	267951	Existing 10-yr	contributing drainage area. Pipes are	N
	Street	264521	Future 10-yr	upstream of reported Sandalwood project opportunity area.	IN
	Sandalwood open channel	Link31	-	No flooding in model; however, flooding was reported during the December 2015 storm event. Channel is incised.	Y – CIP 3
		Link32	-	Open channel is not flooding in the model;	
	Open channel behind Mohawk Apartments	Link 33	-	however, flow is being restricted at the downstream ditch inlet, which has large hydraulic losses.	Y - CIP 4 and CIP 2, Phase 1

a. Capital projects are detailed in Section 7. Capacity deficiencies associated with system surcharging were not prioritized for project development (see Section 7.3).

b. The 5-year design storm was evaluated for this reach to reflect nuisance flooding. Significant instream channel modifications (widening or regrading) is needed to alleviate flooding.



4.5 Capital Project Development

Based on the system capacity analysis, project alternatives were identified and evaluated to address modeled capacity issues. For some locations, multiple system configurations and sizing were tested to develop the preferred conceptual solution. Project alternatives were discussed with the City during the project development workshop (Section 3.2).

The preferred system configuration was developed into a capital project concept and a preliminary cost established based on the improvements required. For the Manhassat and Herman Road systems, one capital project was developed to address each system deficiency. Because the Upper Nyberg Creek System covered a large area and multiple stormwater project opportunities, a total of five capital projects were developed. Capital project fact sheets that included a project description, project considerations, and preliminary costs are included in Appendix A.

- Manhassat Storm System Improvements (CIP 1). This project addresses flooding due to an undersized conveyance channel and pipe system. This location is associated with Stormwater Project Opportunity Area 4.
- Nyberg Creek Stormwater Improvements (CIP 2). This project addresses undersized pipe pipes and ongoing maintenance issues along Boones Ferry Road, Warm Springs Street, and Martinazzi Avenue. This large project is split into three phases. This location is associated with Stormwater Project Opportunity Area 5.
- Sandalwood Water Quality Retrofit (CIP 3). This project addresses erosion and capacity concerns related to an open channel conveyance system. Water quality features are also incorporated. This location is associated with Stormwater Project Opportunity Area 9.
- Mohawk Apartment Stormwater Improvements (CIP 4). This project addresses limited capacity and system condition concerns and helps eliminate downstream flooding. This location is associated with Stormwater Project Opportunity Area 10.
- Herman Road Storm System (CIP 5). This project adds infrastructure to address frequent flooding. This location is associated with Stormwater Project Opportunity Area 7.
- Boones Ferry Railroad Conveyance Improvements (CIP 7). This project addresses ongoing maintenance issues, flooding, and backwater conditions along railroad ROW. This location is associated with Stormwater Project Opportunity Area 5.





2,250

0

4,500

🗆 Feet

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City of Tualatin

Date: April 2019

Project: Project 149233

Model System Overview

Section 5 Stream Assessment

Tributary stream channels to the Tualatin and Willamette rivers are an important element of the overall stormwater collection and conveyance system in the city. Stream channels provide conveyance and storage of water and sediment and provide habitat for aquatic and terrestrial species.

This section outlines results of the stream assessment conducted for select stream reaches in the city to inform project, program, and policy recommendations. Stream assessment needs were identified as part of the project needs identification effort (Section 3.1.3), to evaluate stream reaches observed to have erosion, invasive vegetation and hillslope instability. The stream assessment is described in additional detail in TM4, included in this SMP as Appendix F.

A total of three capital project recommendations stemmed from results of the stream assessment effort. Program and policy recommendations were also proposed to protect and proactively benefit the stream system.

5.1 Stream System Overview

The City of Tualatin's geography and topography are unique. While the city is located adjacent to the Tualatin River, much of the city drains to smaller tributary streams, including Nyberg Creek, Saum Creek and Hedges Creek. The City is in the downstream, lower portion of the Tualatin River watershed, approximately five miles from its confluence with the Willamette River. As such, topography is relatively flat and tributary stream channels have low gradient and are relatively well connected to the surrounding floodplain. There are extensive wetlands that compose much of the Hedges Creek and Nyberg Creek stream corridors.

Below is a brief description of Tualatin River and five tributary stream channels in the city, including ownership characteristics and description of the associated drainage basins:

- The Tualatin River is located along the northwestern border of the City. Relatively limited city
 area directly discharges to it, and the contributing drainage area is composed of low-density
 residential and open space. Backwater conditions from the Tualatin River routinely affect
 stormwater drainage for property near the river, resulting in standing water and flooding on
 parking lots and roadways.
- Cummins Creek is in the northwest part of the city and is a tributary to Rock Creek and the Tualatin River. The contributing drainage is predominately industrial with some open space (wetland) areas. Cummins Creek is considered privately owned.
- Hedges Creek drains the majority (44 percent) of the city area, and its watershed is almost exclusively located in the city. Much of the waterbody is considered privately owned, including large areas owned by the Wetlands Conservancy. Contributing land use is predominately industrial and low-density residential. Hedges Creek is considered highly modified due to extensive, historic development activities with limited stormwater management that occurred in the watershed.

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- Nyberg Creek crosses I-5 and is the primary receiving water for much of the commercial development areas along I-5 and Tualatin-Sherwood Road. Contributing land use is commercial, industrial and low-density residential. Nyberg Creek has extensive wetland complexes and on-going beaver activity. Like Hedges Creek, ownership is a combination of private (Wetlands Conservancy) and public (City and the Oregon Department of Transportation).
- Saum Creek is in the southeastern portion of the City. Contributing land use is low-density residential and open space. There are significant greenways and natural areas along the lower (downstream) portion of the stream channel, which helps limit encroachment and direct impacts to the channel resulting from development. Ownership is a combination of private and public (City).
- Basalt Creek runs north-south in the southern portion of the City. Much of the contributing land use is low-density and rural residential, but with pending adoption of the Basalt Creek Concept Plan concept plan, future development is anticipated to impact the contributing land use and stream condition. Ownership is currently private and public (City).

5.2 Objectives

The stream assessment focused on direct observations gained from conducting stream walks along priority reaches of Saum, Nyberg, and Hedges creeks. Objectives of the stream assessment were to:

- Provide a baseline assessment of existing physical stream conditions
- Identify existing problem areas, such as locations of channel instability or excessive erosion that may impact private or public infrastructure
- Assess the potential for changes and impacts to the stream channel
- Recommend capital, operational, maintenance or other solutions for issues identified

Objectives of the stream assessment were developed to support continued evaluation of stream channel conditions in the city. Information collected as part of this assessment should be referenced and used during future inspection efforts to help assess improvements and degradation.

5.3 Methodology

City staff identified nine priority reaches in the city based on ownership, history of staff or citizen complaints/concerns, and potential for additional stream flow due to new or redevelopment activities. Figure 5-1 at the end of this section identifies specific stream reaches investigated.

Stream walks were conducted between September 11, 2017, and September 15, 2017. A total of 10 reaches were evaluated, including all nine priority reaches plus Hedges Creek Reach 3A, an optional reach associated with Stormwater Project Opportunity Area 8 (see Table 3-1). A total of 23,225 linear feet of stream and riparian corridor was evaluated.

During the stream walks, photographs were taken to document stream characteristics and condition. Physical and biological stream conditions were noted and mapped and included:

- General vegetation condition, including presence of native and non-native vegetation
- In-stream and hillslope erosion processes (incision, aggradation and hillslope failures)
- Approximate bankfull stream channel widths and depths, measured at appropriate intervals when conditions change
- General aquatic habitat conditions (pools, riffles, large woody debris, flow)
- Location of stormwater outfalls, pipes and groundwater seeps
- Potential pollution sources

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- General in-stream sediment distribution throughout the stream channel
- Wildlife activity (presence of beaver dams)

Photo logs and stream reach summary sheets were developed to identify cross section and physical condition characteristics for each reach at the time of the stream walk.

5.4 Findings and Results

Observations made during the stream walks were used to qualitatively identify current stream channel deficiencies and potential strategies for improvement. A detailed summary of stream channel condition by reach is provided in Appendix F. General reach characteristics are provided in Table 5-1.

	Table 5-1. Summary of Stream Reach Conditions											
Stream	Reach	Length (ft)	Average Gradient (%)	Average Valley Width (ft)	Contributing City Drainage Area (ac)	Contributing Existing Impervious (%)	Contributing Future Impervious (%)	Difference (%)				
Saum	1	6,775	0.6	100-200	493	34	42	8				
	2	4,950	0.4	150-175	460	37	44	7				
	3	600	1.1 (upstream) 3.0 (downstream)	75-100	367	37	44	7				
	1	950	<0.1	300-400	816	46	57	11				
Nyberg	2	2,100	0.1	500-650	607	41	57	16				
	3	1,400	0.3	30-60	399	36	57	21				
	1	2,250	0.8	75 - 125	2,340	48	58	10				
	2	1,900	0.2	125-250	754	41	51	10				
Hedges	3A	1,740	<0.1	~150	608	36	47	11				
	3B	560	3.7	~50	138	40	50	10				

5.4.1 Vegetation

Stream reaches were found to contain significant amounts of invasive, non-native vegetation such as reed canary grass, Himalayan blackberry, jewel weed, and English Ivy within their riparian corridor. Invasive vegetation was observed in almost every investigated stream reach, although some reaches were heavily impacted. Invasive vegetation can limit native vegetation growth and constrain flow capacity and beneficial habitat. Evidence of beaver activity was prevalent as well.

Reaches did show a distinct lack of trash in and around the channel, which is positive and noteworthy given its urban/suburban setting.

5.4.2 Riparian Condition

Wide riparian corridors surround many of the stream channels. Preservation of wide riparian corridors and connection to floodplain is important, especially for low-gradient streams like those in the City because these reaches require space to maintain meandering characteristics and a stable channel form. This finding is positive and noteworthy given the urban/suburban setting.

The upstream/headwater stream reaches investigated were generally steeper and had more confined channels. There is very little in-channel or floodplain storage capacity in these areas to dissipate flows. Riparian vegetation in these areas is also limited. Riparian vegetation provides



channel stability and slope stability through water interception, water uptake, and soil reinforcement from roots. A limited riparian buffer combined with a steeper gradient makes these stream channels more susceptible to channel stability issues (see Section 5.4.3).

5.4.3 Channel Erosion and Incision

Stormwater runoff, particularly in urban areas, has the potential to impact stream conditions. Increases in impervious areas through development and redevelopment can alter runoff conditions and increase the timing and magnitude of flows to stream channels. Increased flow can alter stream channel conditions and result in flooding, bank erosion, bed incision, sediment production, and other impacts, commonly referred to as hydromodification. Physical stream channel conditions (i.e., riparian width, stream channel gradient, and channel confinement from development or topographic conditions) were documented and considered in conjunction with observed bank and bed erosion.

Instances of bed and bank erosion were most prevalent in the headwater stream reaches evaluated (e.g., Hedges Creek Reach Nos. 3A and 3B), which are exposed to the first effects of high flows conveyed from surrounding residential neighborhoods during rain events.

The future potential for bed and bank erosion can be observed in conjunction with the potential for development (and associated increases in impervious surface area) (Table 5-1). Upstream reaches, specifically in Nyberg Creek and Hedges Creek, are relatively narrow and show a greater potential for increases in runoff from impervious surface areas. Policies related to flow control may be warranted for select stream reaches to mitigate impacts of increased stormwater runoff.

5.5 Additional Investigations

Independent from the stream assessment conducted for this SMP, the City's Parks Department conducted a supplemental assessment of Hedges Creek from SW Ibach Street to SW 105th Avenue (Hedges Creek Stream Assessment, February 2018). Hedges Creek Reach Nos. 3A and 3B are included in this evaluation effort. In addition, this supplemental assessment extended west along the southern Hedges Creek tributary, adjacent to SW Ibach Street.

Potential project needs were identified and prioritized along Hedges Creek. Findings from this supplemental assessment generally corresponded with findings from the stream assessment where locations overlapped.

City staff reviewed the findings and qualified the identified stormwater project needs from this supplemental assessment, and selected project needs to include as part of this SMP.

5.6 Capital Project and Program Development

Findings from the stream assessment and supplemental Hedges Creek Stream Assessment were used to identify stormwater project and program needs. Identification of stormwater project needs was isolated to reaches under City ownership.

In addition, the City may consider policies to mitigate stormwater flow associated with new and redevelopment, particularly in headwater stream reaches with observed erosion and downcutting. The City may also consider beaver management efforts to maintain in-channel conveyance capacity and address localized flooding issues resulting from beaver activity.



5.6.1 Capital Project Needs

Three capital project needs were verified in conjunction with the stream assessment. Two locations were originally identified during preliminary stormwater project planning (Section 3.0) as Stormwater Project Opportunity Areas. Capital project fact sheets that include a project description, project considerations, and preliminary costs are included in Appendix A.

- Blake Street Culvert Replacement (CIP 6). This project addresses an undersized culvert and failing headwall along Hedges Creek. The stream assessment identified headwall deterioration and bank erosion due to the culvert's orientation. This location is associated with Stormwater Project Opportunity Area 8 and was also identified as a project need in the supplemental Hedges Creek Stream Assessment.
- Saum Creek Hillslope Repair (CIP 19). This project replaces a degraded outfall pipe and repairs the hillslope failure near the outfall. The stream assessment confirmed the perched outfall location and evaluated stream bank conditions immediately upstream and downstream of the outfall. This location is associated with Stormwater Project Opportunity Area 3.
- Hedges Creek Stream Repair (CIP 20). This project includes an outfall extension, bioengineered slopes, streambed fill, vegetation restoration and construction of a retaining wall to address observed instream channel erosion and protect infrastructure. This location was identified as a project need in the supplemental Hedges Creek Stream Assessment.

5.6.2 Program Needs

Results from the collective stream assessment efforts and preliminary project planning (Section 3.0) support the need for an annual program to conduct vegetation management along stream corridors. Efforts would be targeted at: 1) invasive vegetation removal, 2) planting and irrigation (as necessary) 3) installation of native riparian plants, and 4) ongoing inspections to refine future maintenance needs and compare overall stream channel conditions against results from this baseline evaluation.

Results from the stream assessment efforts prioritized the following reaches for vegetation management activities (Table 5-2). Cost assumptions related to the program efforts are detailed in Section 7.

	Table 5-2. Priority Locations for Vegetation Management									
Stream	Reach Approximate Location Description Invasive Vegetation				Ownership					
Saum	3	200	Upstream of SW Blake Street near a recent restoration project	Reed canary grass, Himalayan Blackberry	City					
Nyberg	3	1,400	Entire reach	Reed canary grass	City (approximately 300' private)					
	1	500	Tualatin Community Park	Reed canary grass	City					
Hodgos	2	1,900	Entire reach	Reed canary grass, Himalayan Blackberry	City					
neuges	Southern Tributary 200		Locations C, D, and F identified in the supplemental Hedges Creek Stream Assessment	Not specified	City					

5.6.3 Policy Considerations

The following policy considerations may be incorporated into future updates to the Tualatin Public Works Construction Code, Tualatin Municipal Code (Title 03), or addressed through internal directives.



5.6.3.1 Detention/Flow Control Stormwater Design Standard

In April 2019, CWS adopted updated Design and Construction Standards with updated language in Chapter 4: Runoff Treatment and Control². Updated language incorporates new design requirements related to water quantity and hydromodification control and builds on previous efforts from 2017 (see Section 3.2). New and redevelopment greater than 12,000 square feet of impervious surface will be required to conduct a Hydromodification Assessment and implement strategies commensurate with the receiving water Hydromodification Risk Level, Development Class, and Project Size.

Results from this stream assessment effort and additional investigations conducted by the City appear consistent CWS's published Hydromodification Risk Levels for receiving waters, which identify upper Hedges Creek and Saum Creek as moderate or high risk for hydromodification.

The City currently implements CWS's Design and Construction Standards for water quality. The City should consider adopting the updated CWS Design and Construction Standards, including standards that address water quantity control and hydromodification, in accordance with areas identified as experiencing channel erosion and incision.

5.6.3.2 Beaver Management Activities

The stream assessment effort identified significant beaver activity along investigated reaches. Beavers provide many benefits to stream ecology and habitat, but in urban areas, beaver activity can result in localized flooding and backwater effects in stream channels.

Beavers are classified as "Protected Furbearers" in Oregon, and thus excluded from take (Oregon Administrative Rule 498.012) (Portland 2010). The ODFW encourages public and private landowners to first use beaver exclusion and habitat modification techniques to minimize beaver activity in locations that are susceptible to impacts from beaver activity.

The City may choose to implement/codify beaver management techniques to selectively encourage/discourage beaver activity based on the characteristics of their stormwater drainage systems, topography and vegetation. Management techniques for consideration include:

- Selective planting: Encourage/discourage beaver activity through planting of preferred plant species. To minimize or deter beaver activity, avoid use of alder, birch, cottonwood, willow, and other preferred deciduous plants in riparian restoration projects and use non-desirable plant species, including Sitka spruce, elderberry, cascara, and osoberry, as they are not preferred food plants for beavers.
- Fencing/tree barriers: Install fencing to isolate one or groups of trees from beaver foraging. Fencing should be 2 to 4 feet high. Install fencing around inlets of culverts or spillways to prevent beavers from blocking inlets.
- Tree painting: Paint the bottom (2 feet to 4 feet) of trunk with latex paint/sand mixture.
- Flood/Flow Control: Install a flexible pond leveler (a pipe through the beaver dam) to control
 water levels. Beaver dam removal can also be conducted to lower water levels, but this activity is
 time intensive and generally only a temporary solution.

² On November 12, 2019, CWS Board of Directors adopted the most recent amendments to the CWS' Design and Construction Standards. Such amendments included updates to standard engineering details, pump station standards, and minor changes to text for clarity. Implementation policies referenced in this Plan for development projects were adopted in April 2019 and remain in effect.





Section 6

System Maintenance and Programmatic Assessment

This SMP includes projects and programs intended to support the City's long-term asset management efforts and supplement existing maintenance activities.

This section outlines maintenance-related project and program needs stemming from review of the City's current maintenance activities and costs, site visits, and staff feedback during a programmatic activity workshop. Project needs are considered a one-time planning and cost effort, whereas program activities are continuous and require annual funding. A detailed condition assessment of City infrastructure was not performed as part of this SMP, but activities to protect and preserve existing assets are proposed, based on the condition of the City's stormwater collection, conveyance, and treatment systems.

A total of six capital project recommendations are associated with condition or maintenance-related deficiencies. Additionally, four program strategies are proposed to maintain City infrastructure and/or provide ongoing water quality benefits.

6.1 Maintenance Overview

Maintenance is a necessary requirement for the long-term health and stability of the City's stormwater program. This includes the maintenance of piped conveyance systems, open-channel conveyance system, stormwater structures (manholes, catch basins, etc.), water quality facilities, outfalls and natural systems, and other elements of the stormwater system. Neglected systems perform at a lower level than maintained systems, and it is typically more expensive to fix a neglected system than to conduct preventive maintenance. Maintenance is recommended to be a priority for all elements of the City's stormwater system.

The City contracts out and internally conducts scheduled (routine) and unscheduled maintenance activities on stormwater infrastructure and facilities throughout the City. Many maintenance activities and frequencies are specified in conjunction with CWS's watershed-based NPDES permit. As a coimplementor of the NPDES permit, the City conducts and reports on maintenance activities annually for permit compliance.

Table 6-1 provides an overview of the City's current maintenance activities and obligations, along with an average estimate of staff time to perform the maintenance activity. Based on current NPDES annual reporting, the City can meet most maintenance targets, but public water quality facility maintenance is one area of needed improvement.



Table 6-1. City Maintenance Activities									
Activity	Frequency required	Annual Target ª	Annual Effort ^a	Meeting target? (Y/N)	Staff/Division				
TV inspection	8-year cycle	57,000 ft	57,000 ft	Y	Storm Division or contract				
Pipeline cleaning	6-year cycle	75,000 ft	75,000+ ft	Varies	Storm Division				
Ditch inspection/cleaning					Storm Division				
CB cleaning (with sumps)	Annual	1,200	1,200	Y	Storm Division				
CB cleaning (without sumps)	Annual	1,600	1,600	Y	Storm Division				
Water quality MH cleaning	2x/year	126 (based on 63 MH)	140+	Y	Storm Division				
MH cleaning					Storm Division				
Street sweeping	12x/year	150 curb miles	150+ mi	Y	Storm Division or contract				
Public water quality facility inspections ^b	4x/year	1,200 (based on 300 facilities)	1,200+	Y	Engineering				
Public WQ facility maintenance	As needed			N	Contracted via Parks or Storm Division				
Private WQ facility inspections ^b	25%/year	68	80+	Y (need for improved system tracking)	Engineering				

a. Values provided are approximate based on the asset inventory documented per the CWS NPDES 2015-16 annual report.

b. Updated per email from Shawn Strasser 10/6/17.

6.2 **Programmatic Activity Workshop**

On April 19, 2018, City and BC staff met to review the City's existing stormwater maintenancerelated efforts and discuss general stormwater program needs. Discussion included the City's current funding allocations for maintenance-related activities. A summary document was distributed to staff summarizing the City's asset inventory (from GIS) and maintenance obligations as detailed in CWS's effective SWMP. The goal of the workshop was to define additional programmatic efforts to include in this SMP, along with a dedicated annual funding commitment, to improve upon the City's current programs to protect and preserve assets.

Stormwater project needs identification (Section 3.1) efforts resulted in the identification of three citywide maintenance-related program needs, which formed the basis for discussion of programmatic activities. These citywide needs included:

- Repair and replacement program
- Public water quality facility maintenance program
- Vegetation management program

Current, dedicated funds to support maintenance related activities are limited and do not include a reserve to support variable system maintenance or replacement needs. Relevant program cost information based on the City's 2018-2019 budget is listed in Table 6-2 below.



Table 6-2. Existing Program Funding (2018-19)								
Relevant Activity	Annual Budget	Staff/Division						
Repair of Stormlines/MH/CBs	\$19,400	Storm Division						
Line Repairs to System	\$25,000	Storm Division						
CCTV Inspection	\$53,530	Storm Division or contract						
Retrofit CBs (CWS requirement)	\$45,500 ª	Storm Division						
Contract Landscape Services at 72 sites (reflects water quality facilities but also general landscaping needs)	\$108,300 ^b	Contracted via Parks or Storm Division						

a. For 2018-19, the annual \$45,500 was doubled to account for unspent funds in 2017-18.

b. Assume \$25,000 of annual budget is reserved for facility maintenance.

Program activities are defined and described below with respect to conveyance system condition deficiencies, and public/private water quality facilities. Program needs related to vegetation management were previously defined in conjunction with the stream assessment results (see Section 5.6.2).

6.2.1 Conveyance System Condition Deficiencies

A stormwater system condition assessment requires review of available, current stormwater system information to identify areas of failure, pending or imminent failure, and areas that are rapidly deteriorating.

Much of the City's infrastructure was constructed in the last 30 years in conjunction with private development trends. As such, the City's stormwater infrastructure (pipe and structures) should have several decades of service life remaining; however, pipe age is not currently tracked in the City's GIS. CCTV of the City's stormwater infrastructure is conducted to address NPDES permit requirements, but detailed evaluation of the CCTV results has not occurred. A condition assessment of buried stormwater infrastructure to confirm remaining service life has also not been conducted to date.

As part of this SMP effort, the City is looking to identify pipe and structure replacement needs and plan for long-term asset replacement, repair, and rehabilitation. Development of a repair and replacement (R/R) program is a critical component of this effort. An R/R program begins by establishing baseline condition data to track and address pipe and structure condition moving forward.

The City wishes to establish separate programs (and annual funding mechanisms) for R/R to address pipes and structures. These programs should first assess and track infrastructure health in conjunction with current CCTV inspections to establish a baseline condition assessment. Pipe and structure R/R can follow as needed. These programs are described further in Section 6.3.2.

6.2.2 Public/Private Water Quality Facility Inspection and Maintenance

In accordance with requirements of the CWS NPDES permit, there is increased emphasis on methods for improving stormwater quality. One method is through the tracking, inspection, and maintenance of existing public and private stormwater treatment facilities to ensure that function of these facilities is preserved.

Development of this SMP included a detailed look at existing public water quality facility conditions. The project needs assessment (Section 3.0) identified five project opportunities where the function of the stormwater treatment facilities was compromised. Based on site inspections, these locations require facility restoration as opposed to just maintenance. Restoration efforts include vegetation management and removal (including trees), sediment removal and regrading, installation of



amended soil to support plant growth, and rehab/replacement of inlet or outlet structures. These restoration needs are addressed with capital projects, as detailed in Section 6.3.1.

Preliminary project planning efforts also identified that ongoing (routine) public water quality facility maintenance does not regularly occur. Maintenance is conducted on an as-needed basis as time and funding allow. The City contracts out most of the stormwater facility maintenance activities, which can result in delays. The City regularly inspects facilities in accordance with efforts documented in Table 6-1. Recent inspection efforts identified the following priority locations that require maintenance to ensure functionality, although a stand-alone capital project need was not identified at this time:

- Lakeridge Terrace Facility Maintenance. Facility (pond) was constructed in 2001 to serve a 48-lot subdivision. Maintenance needs include sediment removal (facility and outlet structure), tree removal, and replanting.
- Gertz Swale Redesign. Facility was constructed in 2003. Stormwater currently short-circuits the facility and results in erosion. Maintenance needs include re-grading the facility, vector management, and installation of an impermeable membrane.
- Shasta Trail Swale Maintenance. Facility was constructed in 2004. Stormwater currently shortcircuits the facility and results in erosion and discharge to neighboring property. Maintenance needs include re-grading the facility, vector management, and installation of an impermeable membrane.
- **Green Lot Swale Maintenance.** Facility was constructed in 2005. Maintenance needs include regrading the facility, sediment removal, and vegetation management (removal and replanting)

As part of this SMP effort, the City identified the need for a program (and annual funding mechanism) for continual public water quality facility maintenance. The program can be used to conduct both routine maintenance activities and support larger system restoration or redesign needs. Efforts should prioritize facilities identified through annual inspection efforts, including those priority locations listed above.

In addition, in conjunction with CWS's updated Design and Construction Standards, a lower impervious area development threshold for meeting design standards will result in more private water quality facility installations. The City wishes to expand its private stormwater facility inspection program to include low impact development applications (LIDA) on single family residential sites. This programmatic



Figure 6-1. Example of buried outlet control structure at the Green Lot Swale (photo courtesy of City of Tualatin)

activity would be supported by an increase in staffing as opposed to an annual funding mechanism.

6.2.3 Water Quality Facility Retrofits

Per requirements of the CWS NPDES permit, another method for improving stormwater quality focuses on expanding of water quality treatment through the ongoing identification of water quality retrofit opportunities. Such efforts directly address current NPDES permit requirements related to the development and implementation of a retrofit strategy and the need for increased stormwater pollutant load reduction.



Water quality opportunity areas and water quality projects have been identified as part of the project planning process (Section 3.1.1). Additional project reconnaissance efforts conducted by the City and CWS (see Appendix I) identified the following additional retrofit opportunity locations, although a stand-alone capital project need was not identified at this time:

- Boones Ferry Road and Iowa Street (Green Street installation).
- Boones Ferry Road across from Logan Lane (Green Street installation).
- **125th Avenue to Herman Road** (Public-Private Partnership for a water quality facility installation during redevelopment).
- SW 95th Avenue at SW Tualatin-Sherwood Road (Public-Private Partnership for a water quality facility installation during redevelopment or a Green Street installation).
- SW Teton Road and SW Herman Road Intersection (regional facility).
- SW Nyberg Street at SW 65th Avenue (rehabilitation of an existing water quality facility).

As part of this SMP effort, the City also identified a need for an annual program to validate and construct opportunistic water quality retrofits, as additional opportunity areas are likely to be identified throughout the duration of this SMP's implementation. Such retrofits may include larger-scale regional facilities or installing green streets in conjunction with transportation improvement projects. Efforts should prioritize project opportunities identified through annual inspection efforts, including those priority locations listed above.

6.3 Capital Project and Program Development

Findings from the maintenance assessment, in conjunction with the programmatic activity workshop and supplemental site visits, were used to identify stormwater project and program needs in support of improved and proactive system maintenance.

6.3.1 Capital Project Needs

Six capital projects, originally identified during the project needs assessment (Section 3.1) and as Stormwater Project Opportunity Areas, were developed to address condition-related deficiencies with piped stormwater infrastructure and priority maintenance deficiencies with public water quality facilities.

Capital project fact sheets including project descriptions, project considerations, and preliminary costs are included in Appendix A.

- Water Quality Facility Restoration-Venetia (CIP 13). This project includes restoring a failing public water quality facility. Project activities include clearing brush and vegetation, removing sediment and regrading, installing amended soils, and replanting. This location is associated with Stormwater Project Opportunity Area 2.
- Water Quality Facility Restoration-Piute Court (CIP 14). This project includes restoring a failing public water quality facility. Project activities include installing a maintenance access road, clearing brush and vegetation, removing sediment and regrading, installing amended soils, replanting with a temporary irrigation system, and replacing the outlet structure. This location is associated with Stormwater Project Opportunity Area 11.
- Water Quality Facility Restoration-Sequoia Ridge (CIP 15). This project includes restoring a failing public water quality facility. Project activities include clearing trees and vegetation, removing sediment and regrading, installing amended soils, installing energy dissipation, replanting with a temporary irrigation system, and replacing the outlet structure. This location is associated with Stormwater Project Opportunity Area 12.



- Water Quality Facility Restoration-Sweek Drive Pond (CIP 16). This project includes restoring a failing public water quality facility. Project activities include clearing trees and vegetation, removing sediment, installing amended soils, installing an upstream water quality manhole, replanting with a temporary irrigation system, and installing an outlet control structure. This location is associated with Stormwater Project Opportunity Area 13.
- Siuslaw Water Quality Facility Retrofit (CIP 17). This project includes replacing 450 feet of failing stormwater pipe and adds water quality treatment at the outlet. This location is associated with Stormwater Project Opportunity Area 6.
- Water Quality Facility Restoration–Waterford (CIP 18). This project includes restoring a failing public water quality facility. Project activities include clearing vegetation, removing sediment and regrading, installing amended soils, replanting with a temporary irrigation system, and relocating and replacing the outlet control structure. This location is associated with Stormwater Project Opportunity Area 14.

6.3.2 Program Needs

Results from the project needs assessment (Section 3.1) and maintenance assessment indicate annual programs are needed to proactively address maintenance-related deficiencies.

Cost assumptions related to these programs are detailed in Section 7.

- **Pipe Repair and Replacement Program.** Establishes an annual funding mechanism for pipe R/R. Initial dedicated funds can support development of a baseline condition assessment, including review of existing CCTV in accordance with defined evaluation metrics, coding, and scoring. The National Association of Sewer Service Companies provides a consistent and standard evaluation process for pipes and underground structure conditions. Annual program cost obligations, in addition to staff resources, have been established.
- Structure R/R Program. Establishes an annual funding mechanism for structural facility (catch basins, ditch inlets, flow control structures, and manholes) R/R. Initial dedicated funds can support development of a baseline condition assessment. Annual program cost obligations, in addition to staff resources, have been established.
- Public Water Quality Facility Maintenance Program. Establishes an annual funding mechanism to conduct routine maintenance (vegetation removal, sediment removal) and restorative maintenance (sediment and regrading, addition of amended soils, replanting, new infrastructure) for public water quality facilities. Immediate needs should be based on annual inspection efforts. Annual program cost obligations, in addition to staff resources, have been established.
- Public Water Quality Retrofit Program. Establishes an annual funding mechanism expand water quality treatment throughout the City. Efforts would focus on rehabilitating or retrofitting existing public water quality facilities to promote additional infiltration and/or flow management, planning activities in support of regional water quality retrofit facility installations, and installation of green streets in conjunction with transportation improvement projects. Efforts may include developing a dedicated program, responding to public inquiries, preliminary facility sizing, and detailed design/construction. Annual program cost obligations have been established.
- Single Family LIDA Inspection Program. Dedicates staff resources to expand the existing private water quality facility inspection program to single-lot/single family LIDA applications. Annual staff resources have been established.



Section 7 Capital Improvement Plan

This section summarizes the capital project and program recommendations identified throughout the master planning process. Project and program recommendations stem from the water quality assessment (summarized in Section 3.1.1), capacity evaluation (Section 4), stream assessment (Section 5), and maintenance assessment (Section 6).

A total of 21 capital projects were identified to address current and future needs related to water quality, capacity/flooding, system condition and repair, maintenance, and stream health. Six program recommendations to address R/R, system maintenance, and ongoing water quality retrofits were also identified.

7.1 Summary of Recommended Actions

Projects, programs and policy recommendations in this SMP are proposed to improve and enhance drainage infrastructure and water resources throughout the city, as summarized by the following recommended actions:

- Implement identified system capacity improvements (i.e., reconfiguration, rerouting, upsizing) to manage more frequent, nuisance system flooding.
- Increase water quality treatment throughout the city by expanding treatment area coverage through water quality retrofits and enhancing the level of treatment provided.
- Conduct proactive maintenance of the City's stormwater infrastructure. Utilize system condition data currently collected (i.e., stormwater facility inspections, CCTV) to evaluate needs and priorities.
- Consider the topographic limitations and flat grade of the City's conveyance network with regards to system maintenance activities. Sediment removal and vegetation management are key maintenance needs to ensure conveyance capacity, and an increase in maintenance activities may be warranted for select areas of the system.
- Continue coordination with CWS to ensure updates to the City's TDC and PW Standards are in line with regulatory drivers and protect stream health.
- Ensure timely implementation of capital projects and programs by establishing updated funding mechanisms and rates. Additional funding is needed to adequately manage the drainage system as material costs increase, flows increase, and the drainage system deteriorates with age and use.

7.2 Capital Project Recommendations

Table 7-1 summarizes the final capital projects list. Figure 7-1, at the end of this section provides an overview of project locations throughout the city. Project fact sheets are provided in Appendix A and include a project description, summary of design considerations, an overview figure, and cost summary.



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	Table 7-1. City of Tualatin Stormwater Capital Project Summary											
							Tetel			Project T	iming	Associated
CIP #	Project Name	Project Summary	Project Objectives	Location	Basin/ Waterbody	Project Description	Estimated Cost	SDC Eligible Cost	WQ Retrofit	High Priority (2019-2029)	Lower Priority (Future)	SW Project Opportunity Area ID
1	Manhasset Storm System Improvements	Project addresses flooding due to undersized channel and pipe system near Tualatin-Sherwood Road to Manhasset Drive.	Increases System Capacity (Flood Control)	Manhasset Dr (near 10550 SW Manhasset Dr)	Hedges Creek	 Pipe the existing open channel conveyance and upsize select pipe segments. Replaces the existing 1,050 linear feet (LF) of open channel and 180 LF of 21-inch-diameter pipe with 1,230 linear feet (LF) of 30-inch-diameter pipe. Replaces the existing 750 LF of 27-inch-diameter pipe from Manhasset Drive to the outfall to Hedges Creek with 750 LF of 36-inch-diameter pipe. Includes landscaping, nine new manholes and a new outfall to Hedges Creek. 	\$1,581,000	\$237,000			x	4
2	Nyberg Creek Stormwater Improvements	Project addresses under sized pipes and ongoing maintenance issues near Nyberg Creek between Boones Ferry Road and Martinazzi Avenue.	 Increases System Capacity (Flood Control) Increases WQ Treatment (Retrofit) 	Boones Ferry Rd (19417 SW Boones Ferry Rd)	Nyberg Creek	 Upsize undersized pipe segments, relocating StormFilter catch basin units, and rerouting stormwater flow. Project is broken up into three phases due to costs: Phase 1: Install a new trunkline down Martinazzi Avenue from Mohawk Street to Nyberg Creek. Phase 2: Install a 48-inch pipe along Warm Springs Street and a new outfall to Nyberg Creek. Phase 3: Upsize storm system along Boones Ferry Road and divert flow to the new system on Warm Springs Street 	Phase 1: \$1,523,000 Phase 2: \$1,252,000 Phase 3: \$637,000	Phase 1: \$289,000 Phase 2: \$238,000 Phase 3: \$121,000	x	X (Phase 1)	X (Phases 2 and 3)	5
3	Sandalwood Water Quality Retrofit	Project addresses erosion and capacity concerns related to an open channel conveyance system.	 Addresses Erosion Increases WQ Treatment (Retrofit) 	Sagert St Shenandoah Apts (Sandalwood)	Nyberg Creek	 Regrade the existing open channel conveyance. Install planting for enhanced WQ treatment. Widen and regrade the existing open channel conveyance, resulting in a 10' wide by 220' long swale. Install outfall protection and check dams. Install a new ditch to prevent debris accumulation. Replace existing ditch inlet with a manhole and connect to new ditch. 	\$107,000	\$25,000	x		x	9
4	Mohawk Apartments Stormwater Improvements	Project addresses limited capacity system at Mohawk Apts to eliminate downstream flooding.	 Increases System Capacity (Flood Control) Addresses Maintenance Need 	Mohawk Apartments	Nyberg Creek	 Install 1,000 LF of CCTV video inspection to determine/ verify the pipe condition, location, material and size. Install three manholes along the pipe alignment for maintenance access. 	\$295,000	\$59,000			x	10
5	Herman Road Storm System	Project addresses areas of frequent flooding due to limited grade and a lack of drainage infrastructure.	Increases System Capacity (Flood Control)	Herman Rd	Hedges Creek	 Install 110 LF of 30-inch-diameter pipe Install 960 LF of 36-inch-diameter pipe Install 10 manholes, 4 connections to existing stormwater pipes/culverts, and 12 catch basins with an associated 420 LF of 12-inch inlet leads. 	\$1,023,000	\$276,000		x		7
6	Blake St. Culvert Replacement	Project addresses undersized culvert and failing rock wall due to erosive flows.	 Increases System Capacity (Flood Control) Addresses Erosion 	Curves at Blake/105th and 108th	Hedges Creek	Replace the existing culvert with an 84-inch culvert, along the natural stream alignment.	\$552,000	\$121,000		x		8
7	Boones Ferry Railroad Conveyance Improvements	Project addresses ongoing maintenance issue, flooding and backwater conditions.	 Addresses Maintenance Need Increases System Capacity (Flood Control) Addresses Erosion 	RR Culvert behind former Oil Can Henrys		 Install large rock along the railroad ballast. Upsize downstream pipe to increase flow capacity and improve maintenance access. Remove existing gravel and ballast material along 150 ft of the open conveyance channel. Install Class 100 rip-rap along the railroad ballast to reduce the potential for material transport. Install a new ditch inlet to minimize hydraulic losses at the upstream end of the pipe. Replace 480 LF of 36-inch-diameter pipe with 42-inch-diameter pipe. Install a 72-inch manhole along pipe alignment for improved maintenance access. Install a new outfall to the open channel area directly west of Boones Ferry Road. Add rip-rap for energy dissipation. 	\$515,000	\$108,000			X	5
8	89 th Avenue Water Quality Retrofit	Project adds pretreatment/ WQ treatment for Hedges Creek wetland and addresses requirement of the NPDES Permit	Increases WQ Treatment (Retrofit)	89th Ave/Tualatin- Sherwood Rd Stormwater Outfall	Hedges Creek	 Install a Contech CDS hydrodynamic separator (Model CDS3025) with a treatment flow rate of 2.4 cfs. Install 50 LF of 24-inch-diameter pipe and 100 LF of 48-inch-diameter pipe. 	\$262,000	-	x		X	15

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	Table 7-1. City of Tualatin Stormwater Capital Project Summary											
										Project Tir	ning	Associated
CIP #	Project Name	Project Summary	Project Objectives	Location	Basin/ Waterbody	Project Description	Total Estimated Cost	SDC Eligible Cost	WQ Retrofit	High Priority (2019-2029)	Lower Priority (Future)	SW Project Opportunity Area ID
9	125th Court Water Quality Retrofit	Project adds pretreatment/ WQ treatment for Hedges Creek wetland and addresses requirement of the NPDES Permit.	Increases WQ treatment (Retrofit)	125th to Herman Rd	Cummins Creek	 Install a Contech™ CDS hydrodynamic separator (Model CDS3025), with a treatment flow rate of 2.4 cfs. Install 50 LF of 24-inch-diameter pipe and 50 LF of 36-inch-diameter pipe to support connections to existing infrastructure. 	\$206,000	\$74,000	X		x	16
10	93ª Avenue Green Street	Project addresses WQ retrofit objectives of the NPDES Permit through a pilot green street project.	Increases WQ treatment (Retrofit)	93rd Ave	Nyberg Creek	 Install stormwater planters (with an underdrain and overflow) to treat approximately 15,000 sf of impervious surface from the roadway, sidewalks and property frontage along the unimproved right-of-way. Install 550 LF of curb and gutter along 93rd Avenue to direct stormwater runoff to the WQ facilities. Connect outlets of the WQ facilities to existing stormwater infrastructure on 93rd Avenue. 	\$224,000	-	х		x	17
11	Juanita Pohl Water Quality Retrofit	Project adds WQ treatment in a parking area that discharges to Hedges Creek.	Increases WQ treatment (Retrofit)	Juanita Pohl Parking Lot	Hedges Creek	 Regrade existing landscape islands to install raingardens for WQ treatment. Excavate and regrade landscape areas and back fill with drain rock and amended soils to support the WQ facility installation. Install of check dams to minimize potential erosion. Install curb and curb cuts to serve as inlets to the facilities and associated piping to connect the facility overflows to downstream structures (i.e., manholes). Plant the facility with native vegetation suitable for a WQ facility. Minor repaving of parking stalls near the facilities. 	\$156,000	-	x	X		20
12	Community Park Water Quality Retrofit	Project adds WQ treatment in a parking area associated with the Tualatin Community Park.	Increases WQ treatment (Retrofit)	Community Park	Hedges Creek	 Regrade existing landscape islands to install raingardens for WQ treatment. Excavate and regrade the landscape areas and back fill with drain rock and amended soils. Address existing utilities, light pole, signage, etc. Install curb and curb cuts to serve as inlets to the facilities and associated piping to connect the facility overflows to downstream structure (i.e., manhole). Plant the facility with native vegetation suitable for a WO facility. 	\$158,000	-	X	X		22
13	Water Quality Facility Restoration - Venetia	Project restores a failing WQ facility.	 Addresses maintenance need Improves WQ 	Venetia WQ Facility Failing (Lee between 56th and 57th)	Saum Creek	 Restore a public WQ facility. Clear trees and large brush growing in the swale. Remove accumulated sediment along swale bottom, regrade and replace with amended soils and mulch. Replant facility with native vegetation suitable for a WQ facility. 	\$65,000	-		X		2
14	Water Quality Facility Restoration – Piute Court	Project restores a failing WQ facility.	 Addresses maintenance need Improves WQ 	Piute Ct. WQ Facility	Saum Creek	 Restore a public WQ facility. Install 100 LF gravel access road in the easement located between homes on Piute Court. Remove accumulated sediment and invasive vegetation, regrade the existing facility, and add amended soils and mulch. Replant the bottom and sides of facility with riparian/wetland vegetation. Add temporary irrigation. Install an energy dissipation pad at the pond inlet. Replace the existing ditch inlet with an outfall control structure. Install a WQ manhole upstream of the facility in Piute Court. 	\$104,000	-		X		11
15	Water Quality Facility Restoration – Sequoia Ridge	Project restores a failing public WQ facility.	 Addresses maintenance need Improves WQ 	Sequoia Ridge WQ Facility	Saum Creek	 Restore a public WQ facility. Clear all cottonwood trees and other vegetation from the facility. Remove accumulated sediment and invasive vegetation and add amended soils. Replant the bottom and sides of facility with riparian/wetland vegetation suitable for a stormwater pond. Add temporary irrigation. Install energy dissipation pad at pond inlet. Redesign the outlet control structure to have functional low flow pipe and high flow overflow. Remove the current cap and install an overflow plate. 	\$83,000	-		X		12

	Table 7-1. City of Tualatin Stormwater Capital Project Summary											
							-			Project Tin	ning	Associated
CIP #	Project Name	Project Summary	Project Objectives	Location	Basin/ Waterbody	Project Description	Total Estimated Cost	SDC Eligible Cost	WQ Retrofit	High Priority (2019-2029)	Lower Priority (Future)	SW Project Opportunity Area ID
16	Water Quality Facility Restoration – Sweek Drive Pond	Project restores a failing public WQ facility.	 Addresses maintenance need Improves WQ 	Sweek Dr. WQ pond	Hedges Creek	 Restore a public WQ facility. Install a new outlet control structure to better utilize storage. Clear all cottonwood trees and other vegetation from the facility. Remove accumulated sediment and invasive vegetation and add amended soils. Replant the bottom and sides of the facility with native vegetation suitable for a stormwater pond. Add temporary irrigation. Install a WQ manhole upstream of the pond to minimize sediment loading. Install an energy dissipation pad at the pond inlet and outlet. 	\$103,000	-		X		13
17	Siuslaw Water Quality Facility Retrofit	Project replaces failing infrastructure and adds WQ treatment.	 Addresses maintenance need Increases WQ treatment (Retrofit) 	Alsea/BF Rd 99th/Siuslaw Greenway	Hedges Creek	 Replace stormwater conveyance system from Boones Ferry to the outfalls at the existing greenway. Install 350 LF of 30-inch-diameter pipe and 100 LF of 48-inch-diameter pipe. Install a flow splitter/WQ manhole. Install or replace 3 catch basins, 2 manholes, and the installation of 5 check dams/energy dissipation. Grade the existing open channel conveyance to serve as a 15-ft-wide by 500-ft-long bioswale. 	\$454,000	\$104,000	x		X	6
18	Water Quality Facility Restoration - Waterford	Project restores a failing public WQ facility.	 Addresses maintenance need Improves WQ 	Waterford WQ Facility	Hedges Creek	 Restore a public WQ facility. Clear invasive and unwanted vegetation from the facility. Excavate and regrade as needed to maximize WQ function and restore to original design. Remove accumulated sediment and replace with amended soils. Replant the swale and bottom and sides of the pond facility with native vegetation suitable for a swale and WQ pond. Add temporary irrigation. Relocate and replace the outlet control structure to the edge of pond for improved maintenance access. Replace inlet rip rap for increased energy dissipation. Install two WQ/flow splitter manholes upstream of facility to minimize sediment loading. 	\$180,000	-		X		14
19	Saum Creek Hillslope Repair	Project replaces infrastructure that is in poor condition and addresses existing slope instability.	 Addresses maintenance need Addresses erosion 	Recent outfall retrofit (Blake St at Saum Creek)	Saum Creek	 Replace the storm pipe from Makah Ct. to the outfall and outfall reconstruction and extension to the stream channel. Conduct hillslope rehabilitation (rock buttresses or import new fill material) in conjunction with the pipe and outfall replacement to incorporate energy dissipation and be minimize future erosion and slope instability. 	\$171,000	-		x		3
20	Hedges Creek Stream Repair	Project addresses instream channel erosion and threatened public infrastructure.	Addresses erosion	SW 106 th Ave and Willow Street at Hedges Creek	Hedges Creek	 Site 'N': Install an outfall extension, bioengineered slopes, streambed fill and vegetation restoration. Site 'M': Install an open channel excavation, stream bed fill, and installation of a retaining wall. 	\$327,000	-		X		N/A
21	Nyberg Creek Water Quality Facility	Project adds regional WQ treatment.	Increases WQ treatment (Retrofit)	Warm Springs Street at City- owned parcel adjacent to Nyberg Creek	Nyberg Creek	 Clear invasive and unwanted vegetation; excavate and grade City-acquired property to support facility installation. Install low flow bypass structure, 485 LF of 12-inch diameter pipe, and 275 LF of 24-inch-diameter pipe on Warm Springs Street between Martinazzi Avenue and the facility. Install 4 manholes, 3 catch basins, and inlet leads along Warm Springs Street. Install an approximately 1-acre tiered WQ facility with beehive overflows. A maintenance access road will also be needed. Install a flow control structure and debris forebay in the WQ facility and a high-flow bypass channel around the facility. Install a new open channel conveyance to outfall at Nyberg Creek. 	\$2,037,000	\$265,000	x	X		N/A

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7.2.1 Integrated Project Development

Integrated project development refers to the selection and design of capital projects to address multiple objectives. Project objectives are reflected in Table 7-1 and include:

- Increase system capacity (flood control)
- Address erosion
- Increase water quality treatment (retrofit)
- Improve water quality
- Address maintenance need

Projects identified to improve water quality are associated with existing site or facility modifications/restoration to address a pollutant source issue or improve treatment function and are, therefore, not considered a retrofit.

This SMP used an integrated approach for project identification and development efforts, starting with the initial identification of project needs and Stormwater Project Opportunity Areas and then the consolidation of Stormwater Project Opportunity Areas into single, multi-objective project concepts where possible (Section 3).

An integrated project development approach was specifically used during the water quality opportunity assessment (Section 3.1.1). Capacity and maintenance-related project needs were prioritized when considering opportunities for water quality enhancement and retrofit. As project concepts were developed and refined, continued opportunities for water quality elements were considered and incorporated. Integrated project examples that reflect the combination of capacity and water quality include CIP 2, Nyberg Creek Stormwater Improvements; CIP 3, Sandalwood Water Quality Retrofit; and CIP 17, Siuslaw Water Quality Facility Retrofit.

The maintenance assessment also recognized that certain capacity-related deficiencies may also be addressed through maintenance-related activities. Integrated project examples reflecting capacity and maintenance related project needs include CIP 4, Mohawk Apartment Stormwater Improvements; and CIP 7, Boones Ferry Railroad Conveyance Improvements.

7.2.2 Sizing and Design Assumptions

Capital project sizing and design assumptions were based on the type of improvement proposed. Sizing and design assumptions generally followed the City's Public Works Standards and/or CWS's Design and Construction Standards (2012) or LIDA Handbook (2009).

Project concepts are reflective of an approximate 10% design level. Conceptual layout and design considerations are included in the project fact sheets (Appendix A).

- **Capacity Projects**. Projects to construct new conveyance infrastructure or replace existing conveyance infrastructure were developed following the City's PW Standards. All capacity projects in this SMP were sized for the 25-year, 24-hour design event. Although system surcharging is not permissible per the City's design standards, given the flat grade of much of the existing City infrastructure, system surcharging was deemed permissible for capital projects.
- Water Quality Projects. Water quality projects were generally designed according to CWS's LIDA Handbook. Proprietary system vendors were contacted to verify sizing where proprietary treatment systems were proposed (i.e., CIP Nos. 2, 8, and 9). As select retrofit projects could not be reasonably sized within area constraints to manage the full water quality treatment flow/volume, facility sizing was based on maximizing water quality treatment within the available area (i.e., CIP 21).

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 New Infrastructure. Several projects require new infrastructure in locations where no storm system exists. Conceptual layouts are illustrated in the project fact sheets (Appendix A) and reflect new infrastructure proposed in the public ROW only; however, detailed design must consider/allow for potential utility conflicts and realignment needs. Survey will be required to verify elevations and locations. Final design may require additional structures, an alternate alignment due to conflicts, or deeper or shallower pipes than assumed for the conceptual project design.

7.2.3 Cost Assumptions

Project costs are based on the total capital investment necessary to complete a project (i.e., engineering through construction). Costs are based on the proposed layout and general design assumptions as documented in the project fact sheets (Appendix A).

Unit prices for construction elements are based on recent bid tabs and previous local stormwater master planning efforts, adjusted for 2018 based on a historical cost index. The current RS Means *Book for Site Work and Landscaping* was referenced for material costs not previously identified. Cost estimates presented in this SMP are AACE Class 5 Conceptual Level or Project Viability Estimates. Actual costs may vary from these estimates between -50 percent to +100 percent, although changes to design may result in cost differences outside of this anticipated range.

Preliminary cost estimates were based on the unit cost information for construction elements plus a 30 percent construction contingency and multipliers to account for mobilization/demobilization, traffic control and utility relocation, and erosion control. Engineering and permitting costs (15 to 35 percent) and construction administration costs (10 percent) were applied as a general percentage to the total construction cost with contingencies. The range in engineering and permitting costs were based on the anticipated permitting level of effort, including whether in-water work is anticipated, which would warrant environmental permitting efforts in conjunction with Section 404 of the CWA. For planning purposes, costs were rounded to the nearest \$1,000.

Land acquisition and easement costs were not included in the estimates, as most projects are located on City property or within the City right-of-way.

Appendix G includes the unit cost table developed for this SMP and the planning-level cost estimates for each project. Staffing resource assumptions to implement these projects are described in Section 8.1.1.

7.3 Program Recommendations

Six program needs were identified to address water quality, stream health, system maintenance, and asset management of stormwater infrastructure.

During the programmatic activity workshop (Section 6.2), City staff reviewed cost assumptions associated with implementing the proposed programs. Program costs vary based on existing City funding levels and coverage or extent of activity anticipated. Table 7-2 summarizes the resulting program cost summary, accounting for the City's current annual funding obligations.



Table 7-2. Programmatic Activities and Cost Estimates								
Program Activity	Current Annual Obligation ^a	Proposed Program Cost	Project Duration Assumptions	Additional Program Funding (annual) ^b				
Pipe R/R Program	\$25,000	\$125,000	100-years	\$100,000				
Structure R/R Program	\$19,400	\$120,000	100-years	\$100,000				
Public WQ Facility Maintenance Program	\$25,000	\$150,000	Ongoing	\$125,000				
Public WQ Facility Retrofit Program	N/A	\$75,000	Ongoing	\$75,000				
Stream Vegetation Management	N/A	\$100,000	Ongoing	\$100,000				
Single Family LIDA Inspection Program	N/A	N/A	10-year	N/A				

a. Refer to Table 6-2.

b. Based on subtraction of the current annual obligation. Assumes that the current annual obligation will be maintained in the future.

Cost assumptions by program are detailed below. Staffing resources to implement these proposed programs are described in Section 8.1.2.

• Pipe R/R Program. Cost assumptions were based on replacing 486,000 LF of public storm line over a 100-year planning period (i.e., 1 percent of pipes replaced annually). Pipe replacement costs assumed a consistent size distribution as the current inventory. Present worth analysis indicated an annual cost between \$1 million and \$1.25 million would be required; however, due to ongoing pipe replacement efforts and unknowns related to lifespan, the City opted to allocate approximately 10 percent of the annually calculated amount (\$125,000) for budgeting purposes. The additional annual allocation was \$100,000, assuming a current annual allocation of \$25,000.

Efforts should first establish a baseline system condition from current CCTV results. R/R efforts should be prioritized based on condition assessment and reported deficiencies.

- Structure Repair and Replacement Program. Cost assumptions were based on replacing or restoring public catch basins, ditch inlets, flow control structures, and manholes over a 100-year planning period (i.e., 1 percent of structures replaced annually). Replacement costs assumed consistent facility distribution as reflected in the City's current asset inventory. Restoration costs assumed a lump sum of \$2,000 per structure. Present worth analysis indicated an annual cost between \$140,000 to \$240,000 would be required; however, due to ongoing structure replacement efforts and unknowns related to lifespan, the City opted to allocate 50 percent of the maximum annually calculated amount for budgeting purposes (\$120,000). The additional annual allocation is \$100,000, assuming a current annual allocation of approximately \$20,000.
- Public Water Quality Facility Maintenance Program. Cost assumptions considered both routine (minor) and restorative needs for public water quality facilities. Typical extensive/restorative facility maintenance ranges from \$75,000 to \$100,000 (based on cost estimates developed for projects as part of this Plan). Routine maintenance efforts can vary (assume \$50,000). The total annual allocation proposed is \$150,000. The additional annual allocation is \$125,000, assuming a current annual allocation of \$25,000.

Efforts should prioritize facilities currently identified by staff as requiring maintenance (see Section 6.2.2).

• **Public Water Quality Retrofit Program.** Costs are based on anticipated annual efforts to identify potential retrofit opportunities annually, respond to public inquiries, conduct preliminary facility sizing, and provide oversight of detailed design/construction. Funds may be used internally or contracted externally. The total proposed annual allocation is \$75,000 and should prioritize

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locations currently identified by staff or additional retrofit opportunities identified by CWS during their review of this Plan (see Section 6.2.3 and Appendix I).

- Stream Vegetation Management Program. Cost assumptions were based on removing 0.5 acres of invasive vegetation per year at a unit cost of \$4.60/square foot (sf). The total proposed annual allocation is \$100,000. Funds may be used internally or contracted externally.
- Single-Family LIDA Inspection Program. Costs assumed an expanded number of private stormwater facility inspections (10 additional facilities with a 10 percent annual increase). Staff resources are required, and a proposed annual fund allocation is not included.





Section 8 Implementation

This SMP includes a financial evaluation to determine rate adjustments required to implement projects and programs identified in this Plan.

This section provides an overview of staffing needs, project prioritization, operational costs and established levels of service (LOS) reflected in the stormwater utility rate and SDC evaluation. This section also summarizes results of the rate evaluation.

8.1 Staffing Analysis

The City's public works department includes seven FTEs in engineering and six FTEs in operations that currently support stormwater project and program needs. Current staffing levels are considered adequate to support existing commitments, project obligations, and program implementation, but an increase in staff resources is needed to implement capital projects and programs proposed under this SMP.

Appendix H, Table H-1 summarizes the comprehensive results of the staffing analysis for purposes of informing the financial evaluation. Staffing needs for capital projects were incorporated directly into the project cost, while staffing needs for programs were estimated for each individual program. A total of 0.6 FTEs (administration, engineering and maintenance staff) is required to implement all projects identified in this SMP over a 10-year implementation period. A total of 0.4 FTEs is required to implement proposed programs over the next 10-year implementation period. If the City intends to implement only priority projects over the next 10-year implementation period, a total of 0.7 FTEs is required to implement priority projects and all proposed programs (see Section 8.2 for discussion of priority project needs).

8.1.1 Capital Project Staffing Assumptions

For capital projects, additional staffing needs are anticipated to support capital project administration, project management, and the ongoing maintenance of new assets. Staffing estimates to support capital projects were based solely on the conversion of the construction administration cost to an FTE based on an annual salary (cost) equivalent of \$150,000. The total FTE estimate to implement capital projects was then converted to an annual staff allocation based on a 10-year implementation period. Construction administration costs are estimated at 10 percent of the capital expense subtotal (see Appendix G for detailed cost estimates by project).

For reference purposes only, Table H-1 also includes an estimate of maintenance staff time, based on the new infrastructure proposed with the capital project, to support the capital project implementation. Although maintenance staff time was accounted for with the staffing calculation for capital projects described above, it is recognized that select capital projects may require maintenance outside of the City's current maintenance obligations and frequencies to ensure optimum performance, while other capital projects that include replacing existing infrastructure may not require additional maintenance activities, as the existing infrastructure would already be maintained.

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Table 8-1 summarizes the maintenance-related cost assumptions used to summarize the estimated maintenance staff needs. The City does not currently track maintenance activities or log maintenance staff hours in time sheets or as part of an asset management program; therefore, maintenance staff time assumptions were based on typical rates and confirmed with City staff. Maintenance staffing resource needs are calculated in hours and converted to an FTE, based on a typical FTE workload of 2,080 hours.

Table 8-1. Maintenance Staff Time Summary							
Maintenance Activity	Average Time Calculation	Maintenance Frequency					
Pipe/open channel conveyance cleaning	20'/hour	Annual					
Outfall debris removal	4 hours/outfall	Annual					
Catch basin maintenance	1 hour/facility	Annual					
Water quality facility (swale) maintenance	20'/hour	Annual					
Water quality facility (StormFilter or CDS) maintenance	6 hours/facility	Annual					
Water quality facility (planter or raingarden) maintenance	50 square feet/hour	Annual					
Water quality facility (WQ manhole) maintenance	1 hour/facility	Biannual					
Water quality facility inspections	1 hour/facility	Quarterly					

Please note that engineering and permitting costs (estimated between 15 and 35 percent of the capital expense subtotal) were included in the capital project cost estimates but not reflected in the staffing costs. The City currently assumes that all engineering and permitting activities will be contracted, so additional staff time to perform engineering and permitting services is not reflected in the staffing analysis.

8.1.2 Program Staffing Assumptions

For select programs, there may also be an increase in engineering and/or maintenance staff needs; however, there are many considerations that would influence staffing levels.

Program-specific estimates of additional engineering and maintenance staff resource needs are listed in Table 8-2 and have been summarized in Appendix H, Table H-1. In general, maintenance and R/R programs require additional engineering staff to evaluate and identify project locations and needs, review maintenance/CCTV records, and contract needed repairs. Additional maintenance staff resources are needed to expand condition assessment efforts to structures.

Costs for implementing an expanded public water quality facility maintenance program, public water quality facility retrofit program, and vegetation management program are estimated as a lump sum that may be spent either on contracted or internal support. Thus, additional staff resources are limited to engineering support, and additional maintenance needs have not been separately identified. Implementing an expanded water quality facility inspection program for single-family LIDA is a staff activity, and the cost is solely accounted for in the staffing analysis.



	Table 8-2. Annual Program Staffing Needs									
Program Activity	Proposed Program Cost ª	Additional Funding Need ª	Additional Staffing Resources (Engineering)	Additional Staffing Resources (Maintenance)						
Pipe R/R Program	\$125,000	\$100,000	 0.10 FTE (review and evaluate pipe based on CCTV results, identify additional CCTV needs, PM and contract repairs). Design and construction to be contracted per proposed program 	N/A						
Structure R/R Program	\$19,400	\$100,000	 0.10 FTE (review and evaluate structures based on condition assessment, PM and contract repairs). Design and construction to be contracted per proposed program funding. 	0.10 FTE (vactor in support of inspections, site prep, and coordination).						
Public WQ Facility Maintenance Program	\$25,000	\$125,000	 0.05 FTE (identify and document maintenance needs, PM and contract management). Design and construction to be contracted per proposed program funding. 	N/A (efforts to be contracted)						
Public WQ Facility Retrofit Program	N/A	\$75,000	N/A	N/A						
Stream Vegetation Management	N/A	\$100,000	N/A	N/A (efforts to be contracted)						
Single Family LIDA Inspection Program	N/A	N/A	0.05 FTE (conduct additional inspections assuming 10% annual increase).	N/A						

a. Refer to Table 7-2.

8.2 Project Prioritization

Project prioritization is an important component of the stormwater master planning process and can provide direction in terms of sequencing projects in accordance with City objectives.

The prioritization process was initiated during the programmatic activity workshop (Section 6-2). Example prioritization criteria and scoring methods (qualitative versus quantitative) were provided to City staff to guide their internal process. The City opted to focus prioritization efforts on defining priority projects to be funded over the next 10-year implementation period and not on numeric scoring and specific ranking of projects. Over time, the City may choose to add numeric scoring metrics or weighting factors to refine projects for scheduling or to place more emphasis on specific criteria as new project needs are identified and added to the capital improvement program. Table 8-3 summarizes the general prioritization criteria provided and used by the City as part of its prioritization process.



Table 8-3. Prioritization Criteria									
Critoria	Scoring Definition								
Gillena	High (H)	Lower (L)							
Flooding Issue/ Safety Concern	 Addresses an area of known or significant capacity deficiency or erosion potential. Was identified as flooding during existing conditions per targeted hydraulic modeling. 	No reported flooding concerns or safety issues associated with project location.							
WQ Improvement	 Project significantly improves water quality and wildlife habitat. Project many be classified as a retrofit per CWS. 	Project moderately improves or doesn't improve water quality and wildlife habitat.							
Maintenance	 Project will reduce existing maintenance needs or complaints. Project provides increased longevity for facility function. 	Occasional maintenance needs or complaints occur in this area.							
Concurrence	 Project is required or a prerequisite for other budgeted or inter- jurisdictional projects. 	Project is stand-alone and does not affect implementation of other City projects.							
Special Interest	• Project has City Council, City staff, or public interest/motivation.	Project has no public driver or interest.							

City staff independently evaluated projects in conjunction with prioritization guidelines and criteria and determined those highest priority projects for implementation over the next 10 years. A summary of capital projects and costs, including an indication of those priority projects, is provided in Table 8-4.

Table 8-4. Capital Project Costs and Priorities								
Priority Project	CIP Number	CIP Name	Cost Estimates					
	1	Manhassat Storm System Improvements	\$1,581,000					
X (Phase 1)	2	Nyberg Creek Stormwater Improvements (Phases 1-3)	\$3,412,000					
	3	Sandalwood Water Quality Retrofit	\$107,000					
	4	Mohawk Apartments Stormwater Improvements	\$295,000					
X	5	Herman Road Storm System	\$1,023,000					
X	6	Blake St Culvert Replacement	\$552,000					
	7	Boones Ferry Railroad Conveyance Improvements	\$515,000					
	8	89th Avenue Water Quality Retrofit	\$262,000					
	9	125th Court Water Quality Retrofit	\$206,000					
	10	93rd Avenue Green Street	\$224,000					
Х	11	Juanita Pohl Water Quality Retrofit	\$156,000					
Х	12	Community Park Water Quality Retrofit	\$158,000					
Х	13	Water Quality Facility Restoration - Venetia	\$65,000					
Х	14	Water Quality Facility Restoration - Piute Court	\$104,000					
Х	15	Water Quality Facility Restoration - Sequoia Ridge	\$83,000					
X	16	Water Quality Facility Restoration - Sweek Drive Pond	\$103,000					
	17	Siuslaw Water Quality Facility Retrofit	\$454,000					
X	18	Water Quality Facility Restoration - Waterford	\$180,000					
X	19	Saum Creek Hillslope Repair	\$171,000					
X	20	Hedges Creek Stream Repair	\$327,000					
X	21	Nyberg Water Quality Retrofit	\$2,037,000					
		Total	\$12,015,000					
		Total (Priority projects only)	\$6,482,000					

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8.3 Level of Service

Developing the stormwater rate evaluation requires the City to determine a level of service consistent with the expectations of the City's stormwater program and ratepayers.

Using project cost information, program cost information, and estimated operational funding expenditures, City staff identified the proposed LOS for stormwater-related services. The proposed LOS assumes construction of priority capital projects within a 10-year timeframe. Program expenditures are funded at recommended levels (see Table 7-2). Staffing needs are identified based on implementing priority projects only and all program elements. Operational costs were provided by City staff and account for vehicle replacement needs and rehabilitation of the City's operations building.

Table 8-5. Current and Recommended Level of Service (Criteria)		
Criteria	Current LOS	Recommended LOS
Capital Project Implementation		
Stormwater Project Implementation (CIPs)	Implement stormwater capital projects in conjunction with City's 2017-2021 Capital Improvement Plan	Implement priority stormwater capital projects per this SMP in a 10-year planning window
Program Implementation (Annual Cost)		
Pipe R/R	Maintain current funding for repair needs	Expand repair efforts into an R/R program.
Structure R/R	Maintain current funding for repair needs	Expand repair efforts into an R/R program.
Public WQ Facility Maintenance Program	Conduct or contract out minor maintenance needs.	Expand maintenance program to include routine and restorative efforts.
Public WQ Facility Retrofit Program	N/A	Add program
Stream Vegetation Management	N/A	Add program
Equipment/Operational Costs (Annual Cost)		
Vehicle/Equipment Replacement a	Variable	Assume annual funding to replace vehicles (cost share with sanitary)
Operations Building Rehabilitation b	N/A	\$50,000
Staffing (associated with priority capital projects and programs) (FTE)		
Staffing (engineering)	Maintain existing staffing resources	Increase engineering staffing resources by 0.52 FTE to support priority projects and programs.
Staffing (maintenance)	Maintain existing staffing resources	Increase maintenance staffing resources by 0.24 FTE to support priority projects and programs.

a. The vactor truck replacement is budgeted at \$310,000 in FY 2019/20. Following FY 2019/20, vehicle replacement is budgeted at \$75,000/year.

b. Annual cost provided by City.

8.4 Funding Evaluation

In conjunction with development of this Plan, a review of the City's stormwater utility rate and SDC was conducted. Documentation of the financial evaluation is provided in a separate TM.



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Section 9 References

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Section 10 Limitations

This document was prepared solely for City of Tualatin in accordance with professional standards at the time the services were performed and in accordance with the contract between City Tualatin and Brown and Caldwell dated April 14, 2016. This document is governed by the specific scope of work authorized by City of Tualatin; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by City of Tualatin and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.



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Appendix A: CIP Fact Sheets



Use of contents on this sheet is subject to the limitations specified at the end of this document.


Project Identifier	CIP #1
Project Name	Manhasset Storm System Improvements
Detailed Location	Manhasset Drive
Model File	HE_MA_ALT05.xp
Contributing Drainage Area	41.4 acres
Estimated Existing /Future Impervious %	64.0%/73.4%
Project Objective(s)	Increases System Capacity (Flood Control)
Project Background	•

City staff and residents have reported frequent flooding of the open conveyance channel between private properties from Tualatin-Sherwood Road to Manhasset Drive. Stormwater flows have exceeded the capacity of the channel, overtopping the banks of the channel and impacting adjacent parking lots and structures.

During a site visit in June 2016, debris from nearby properties was found in the channel. Curbs separating the channel and surrounding private property had been removed, allowing additional stormwater to enter the channel. Flow is further restricted due to large hydraulic losses associated with the ditch inlet at the end of Manhasset Drive and the shallow slope of the pipes downstream to the outfall at Hedges Creek.

The current conveyance system consists of 1,050 linear feet (LF) of open channel, 180 LF of 21-inch-diameter pipe and 750 LF of 27-inch-diameter pipe.

Hydraulic modeling of the system confirms the channel and pipe system is undersized for the contributing drainage area.

Project Description

This project addresses localized flooding by piping the existing open channel conveyance and upsizing select pipe segments.

This project replaces the existing 1,050 LF of open channel and 180 LF of 21-inch-diameter pipe with 1,230 linear feet (LF) of 30-inch-diameter pipe. The project replaces the existing 750 LF of 27-inch-diameter pipe from Manhasset Drive to the outfall to Hedges Creek with 750 LF of 36-inch-diameter pipe to reduce potential flooding during the 25-year design storm event.

The project also includes landscaping, the installation of nine manholes (five along the open channel alignment will have grated lids), and a new outfall to Hedges Creek.

Design Considerations

- Only planning-level hydraulic calculations have been performed to identify conceptual sizing. For design, detailed topographic survey and hydraulic analysis is needed to determine the appropriate invert elevations and pipe diameters to maintain necessary cover depth in this flat terrain.
- Due to the shallow grade of the proposed pipe in the lower portions of the installed system, sediment accumulation may present a maintenance issue and will require regular attention to ensure proper drainage and to prevent flooding.

Planning-level Cost Estimate	
Capital Expense Total (including contingency)	\$ 1,171,000
Engineering and Permitting (25%)	\$ 293,000
Administration (10%)	\$ 117,000
Capital Project Implementation Cost Total*	\$ 1,581,000

*Planning level cost estimates estimated in 2018 dollars, rounded to the nearest thousand. The rounded total cost is based on nonrounded subtotals.



Image 1. Observed flooding of drainage ditch during December 2015 storm



Image 2. Grated inlet and rock lined channel at downstream end of drainage ditch



Image 3. Contributing drainage area



Project Identifier	CIP #2
Project Name	Nyberg Creek Stormwater Improvements
Detailed Location	Nyberg Creek between Boones Ferry Road and Martinazzi Avenue
Model File	NY_ALT06.xp
Contributing Drainage Area	443.2 acres
Estimated Existing / Future Impervious %	47.4%/56.4%
Project Objective(s)	Increases System Capacity (Flood Control), Increases Water Quality Treatment (Retrofit)
Project Background	·

City staff and the public have identified routine flooding along Boones Ferry Road. The affected area, from Boones Ferry Road to Martinazzi Avenue, is relatively flat, contains aging infrastructure, and requires frequent maintenance to remove accumulated sediment. Gravel and railway ballast debris transported from the nearby railroad open conveyance channel (see CIP #7) accumulates in this portion of the storm system.

Hydraulic modeling of the system confirms that undersized pipes near the intersections of Warm Springs Street and Boones Ferry Road and Warm Springs Street and Tonka Street contribute to roadway flooding. Two StormFilter catch basin units located on Boones Ferry Road, north of Warm Springs Street, are located at a roadway sag and regularly clog due to accumulated sediment, which also contributes to roadway flooding.

Project Description

This project alleviates localized flooding between Boones Ferry Road and Martinazzi Avenue by upsizing undersized pipe segments, relocating StormFilter catch basin units, and rerouting stormwater flow from select areas away from locations experiencing routine flooding.

Due to the significant cost and extent of the project, the project has been broken into three phases. Phase 1 includes installation of a new trunkline down Martinazzi Avenue from Mohawk Street to Nyberg Creek. Phase 2 includes installation of a 48-inch pipe along Warm Springs Street and a new outfall to Nyberg Creek. Phase 3 includes upsizing the existing storm system along Boones Ferry Road and diversion of flow to the new system on Warm Springs Street. Phases should be constructed in consecutive order.

Detailed activities by phase are listed below:

Phase 1

Phase 1 must first be constructed to redirect approximately 51 acres of contributing drainage area from areas prone to flooding at Warm Springs Street and Tonka Street. This phase is also recommended prior to implementation of CIP #4 (Mohawk Apartments Stormwater Improvements). This phase includes the following:

- Disconnection of the existing stormwater system from the south at Mohawk Street.
- Replacement of existing infrastructure on Martinazzi with 1500 LF of 24-inch pipe from existing node 263397 (CIP system naming is 263397_NY-0290) to existing node 270963.
- Installation of 9 manholes and 8 catch basins along Martinazzi Avenue. 440 LF of 12-inch inlet leads are also reflected in the cost estimate for the connection of new and existing catch basins.
- Construction of a new outfall to Nyberg Creek east of the bridge crossing with Martinazzi Avenue.

It is recommended that Phase 1 be completed in conjunction with the anticipated repair of the sanitary sewer system along this section of roadway to minimize disturbance and costs.

Phase 2

Phase 2 increases capacity of the stormwater system down Warm Springs Street to support redirection of flow from Boones Ferry Road. This phase includes the following:

- Installation of 800 LF of 48-inch pipe down Warm Springs Street from existing node 270971 to new outfall (CIP system naming is Node569) to route flow west to east.
- Installation of 4 manholes and 5 connections to existing infrastructure for the new pipe down Warm Springs Street.
- · Construction of a new outfall to Nyberg Creek, northeast of the intersection of Tonka Street and Warm Springs Street.

Phase 3

Phase 3 reflects infrastructure modifications necessary to connect to new infrastructure installed during Phase 2. Hydraulic modeling shows that the four pipe sections on the east side of Boones Ferry Road south of Warm Springs Street are under capacity. This phase includes the following:

- Replacement of 250 LF of 30-inch pipe with 250 LF of 36-inch pipe from 262848 to 262844 and replacement of 75 LF of 36-inch pipe with 75 LF of 42-inch pipe from 262844 to a new manhole at the intersection of Boones Ferry Road and Warm Springs Street.
- Replacement of 60 LF of 18-inch pipe across Boones Ferry Road with 60 LF of 24-inch pipe.
- Installation of 6 manholes down Boones Ferry Road.
- Removal and replacement of the two existing StormFilter units on Boones Ferry Road with sumped catch basins. Sumped catch basins are recommended due to the high sediment load this area experiences.
- Installation of at least two StormFilter catch basins further south on Boones Ferry Road (see potential locations indicated in Figure 3). These new StormFilter units should treat a contributing drainage area equal to or larger than the drainage area associated with the removed units. The units shall be configured in an offline orientation to tie into existing infrastructure. 150 LF of 12-inch inlet leads are also reflected in the cost estimate for the connection of new StormFilter catch basins.

Design Considerations

- Construction phasing should follow the phase schedule outlined above and consider project concurrence in conjunction with other CIPs (i.e., CIP #4, CIP #7).
- Detailed downstream analysis of the Nyberg Creek system is in progress. Proposed outfall locations were identified based on
 observed capacity in the open channel system and conceptual-level hydraulic modeling.
- A preliminary hydraulic model of proposed infrastructure and system modifications demonstrates a significant decrease in flooding for events up to the 25-year design storm.
- Only planning level calculations have been performed to identify conceptual layout and system sizing. Detailed topographic survey is needed to determine appropriate invert elevations and verify pipe diameters to maintain necessary cover and convey the design event.

Planning-level Cos	st Estimate	
	Capital Expense Total (including contingency)	\$ 1,051,000
	Engineering and Permitting (35%)	\$ 368,000
Phase 1	Administration (10%)	\$ 105,000
	Capital Project Implementation Cost Total*	\$ 1,523,000
	Capital Expense Total (including contingency)	\$ 863,000
	Engineering and Permitting (35%)	\$ 302,000
Phase 2	Administration (10%)	\$ 86,000
	Capital Project Implementation Cost Total*	\$ 1,252,000
	Capital Expense Total (including contingency)	\$ 472,000
	Engineering and Permitting (25%)	\$ 118,000
Phase 3	Administration (10%)	\$ 47,000
	Capital Project Implementation Cost Total*	\$ 637,000
Total	Capital Project Implementation Cost Total*	\$ 3,412,000

*Planning level cost estimates estimated in 2018 dollars, rounded to the nearest thousand. The rounded total cost is based on nonrounded subtotals.



Figure 1. Construction details of Phase 1



Figure 2. Construction details of Phase 2



Figure 3. Construction details of Phase 3



Project Identifier	CIP #3
Project Name	Sandalwood Water Quality Retrofit
Detailed Location	Sagert Street and Martinazzi Avenue
Model File	N/A
Contributing Drainage Area	37.6 acres
Estimated Existing/Future Impervious %	43.3%/53.3%
Objective(s) Addressed	Addresses Erosion; Increases Water Quality Treatment (Retrofit)

The Sandalwood Condominiums have a piped stormwater system that outfalls to a 220-foot-long open channel conveyance on the north side of the property. The conveyance channel discharges to a ditch inlet (260393) adjacent to Sagert Street.

City staff identified erosion and capacity concerns related to the open channel conveyance system. This project site was also identified during a water quality retrofit evaluation as a potential stormwater treatment facility retrofit. The open channel conveyance system experienced flooding in December 2015, likely due to debris from a nearby tree clogging the ditch inlet. During a site visit in June 2016, incision and bank sloughing were observed, especially near the upstream end of the open channel.

Project Description

This project addresses erosion concerns by regrading the existing open channel conveyance and adding plantings for enhanced water quality treatment.

This project includes widening and regrading of the existing open channel conveyance to increase capacity and minimize erosion along its banks. The resulting 10' wide by 220' long swale will include amended soils and vegetation enhancement to improve water quality treatment function and enhance visual appeal.

The outfall to the channel will be reinforced with rip rap to dissipate the energy as the stormwater exits the upstream collection system. Check dams will be installed to reduce velocities and enhance water quality treatment through the system.

A new ditch inlet will be installed, twenty feet south of its current location, to prevent debris accumulation. The existing ditch inlet (260393) will be replaced with a manhole and 20 LF of 30-inch pipe will connect the new ditch inlet to the manhole. The manhole may be installed with a grated lid to act as an emergency overflow.

- Facility sizing and design is based on the Clean Water Services Low Impact Development Approaches (LIDA) Handbook and should be referenced for design guidelines on water quality swales.
- Final swale alignment should consider potential grading impacts to the existing trees.
- Only planning level calculations have been performed to identify conceptual layout and sizing. For design, detailed topographic survey is needed to determine the extent of grading required and appropriate invert elevations to maintain necessary slope and convey the design event.

Planning-level Cost Estimate	
Capital Expense Total (including contingency)	\$ 79,000
Engineering and Permitting (25%)	\$ 20,000
Administration (10%)	\$ 8,000
Capital Project Implementation Cost Total*	\$ 107,000

*Planning level cost estimates estimated in 2018 dollars, rounded to the nearest thousand. The rounded total cost is based on nonrounded subtotals.



Image 1. Incision and sloughing in the open channel



Image 2. Tree debris clogging the ditch inlet at the downstream end of the open channel



Project Identifier	CIP #4
Project Name	Mohawk Apartments Stormwater Improvements
Detailed Location	8325 SW Mohawk Street
Model File	N/A
Contributing Drainage Area	8.9 acres ¹
Estimated Existing / Future Impervious %	49.1%/58.8%
Objective(s) Addressed	Increases System Capacity (Flood Control); Addresses Maintenance Need
	·

City staff identified the stormwater system through the Mohawk Apartments as capacity limited. The section of pipe from west of the intersection with Martinazzi Avenue and Mohawk Street to the open conveyance channel has an unknown alignment, condition, material and unverified size. The alignment shown on the figure above is an approximation based on the City's GIS data.

The existing ditch inlet (260409) downstream from the open channel is undersized during high flow events and bypasses down the adjacent embankment, causing flooding at the intersection of Tonka Street and Warm Springs Street and impacting downstream private properties along Warm Springs Street. The corrugated metal pipe downstream of the ditch inlet is in poor condition according to City staff and requires replacement.

Project Description

This project alleviates localized flooding and replaces aging and deteriorating infrastructure. Localized flooding is also addressed in part by CIP #2 (Nyberg Creek Stormwater Improvements).

This project includes 1,000 linear feet (LF) of CCTV video inspection to determine/ verify the pipe condition, location, material and size west of the intersection of Martinazzi Avenue and Mohawk Street to the existing open channel conveyance. Three manholes will be installed along this pipe alignment for maintenance access. This pipe will remain in service to convey drainage from the Todd Village Apartments.

¹ Contributing drainage area reflects disconnection of the upstream stormwater system at Sagert Street and routed down Martinazzi Avenue in accordance with the Nyberg Creek Stormwater Improvements (CIP # 2)

Downstream of the open channel, a new ditch inlet will be installed to replace the existing grated inlet. Limited earthwork and invasive vegetation removal will be conducted to regrade the channel and direct flow to the inlet. 170 LF of corrugated metal pipe will be removed and replaced with 170 LF of 36-inch-diameter HDPE pipe.

Design Considerations

- Project scheduling should consider the Nyberg System Improvements (CIP #2), as stormwater flows to this system will be reduced as part of that project due to disconnection and rerouting of the upstream stormwater conveyance pipe down Martinazzi Avenue.
- Easement acquisition has not been included in this cost estimate.
- Based on the results of the CCTV inspection, the section of pipe from Mohawk Street to the open channel may need to be replaced or rehabilitated with cure-in-place pipe lining or similar. This repair is not included in this cost estimate.
- Ongoing sediment removal and vegetation management is required to maintain capacity in the open channel system. Regular maintenance should be conducted.

Planning-level Cost Estimate	
Capital Expense Total (including contingency)	\$ 218,000
Engineering and Permitting (25%)	\$ 55,000
Administration (10%)	\$ 22,000
Capital Project Implementation Cost Total*	\$ 295,000

*Planning level cost estimates estimated in 2018 dollars, rounded to the nearest thousand. The rounded total cost is based on nonrounded subtotals.

Additional Project Information



Image 1. Grated inlet and open channel near Mohawk Apartments



Project Identifier	CIP #5
Project Name	Herman Road Storm System
Detailed Location	Herman Road between Teton Avenue and Tualatin Road
Model File	HE_HE_ALT01.xp
Contributing Drainage Area	42.6 acres
Estimated Existing/Future Impervious %	56.1%/71.3%
Objective(s) Addressed	Increases System Capacity (Flood Control)
Due is at De alvera un d	

The stormwater system along Herman Road receives runoff from 42.6 acres of industrial and medium density residential land use. The area is subject to frequent flooding due to limited grade and a lack of drainage infrastructure. Stormwater is conveyed via roadside ditches and open channels to culverts under the adjacent railroad right-of-way. The railroad culverts are deeper than the upstream and downstream infrastructure, creating a hydraulic constraint and backwater effects along the northern side of Herman Road.

City staff identified Herman Road as a future roadway widening project and drainage improvements are needed in conjunction with roadway design.

Hydraulic modeling of the existing conveyance system confirms that the elevation of the railroad culverts results in backwater effects and flooding of the open channel/ditch system along Herman Road. The existing ditches and culverts along Herman Road also appear to be undersized for the contributing drainage areas and design flows.

Project Description

This project provides guidance towards design of a stormwater collection and conveyance system associated with future Herman Road improvements.

This project includes installation of 110 linear feet (LF) of 30-inch-diameter pipe from existing node 322601 to the centerline of Herman Road and 960 LF of 36-inch-diameter pipe down Herman Road to collect and convey runoff from Herman Road and the surrounding contributing area, replacing the existing open channel/ditch conveyance system. Consideration of the final road vertical profile and pipe cover should be incorporated into the design. This project includes the installation of 10 manholes, 4 connections to existing stormwater pipes/culverts, and 12 catch basins with an associated 420 LF of 12-inch inlet leads.

To maximize slope and utilize the current pipe alignment under the railroad tracks, the existing culverts under the railroad will act as the low points for the new conveyance system.

Design Considerations

This project has been sized for the 25-year storm event. Due to the elevation of the railroad culverts, the proposed layout is anticipated to surcharge at the 2-year storm event.

Only planning-level hydraulic calculations have been performed to identify conceptual sizing. For design, detailed topographic survey and hydraulic analysis is needed to determine appropriate invert elevations and verify pipe diameters to maintain necessary cover and convey the design event.

Project design and construction to occur in conjunction with the roadway widening project. Water quality treatment for new and replaced impervious surface and asphalt resurfacing associated with the pipe installation is not reflected in project cost and will be addressed with roadway design.

Due to the shallow grade of the proposed pipe, sediment accumulation may present a maintenance issue and will require regular attention to ensure proper drainage to prevent flooding.

Planning-level Cost Estimate	
Capital Expense Total (including contingency)	\$ 758,000
Engineering and Permitting (25%)	\$ 189,000
Administration (10%)	\$ 76,000
Capital Project Implementation Cost Total*	\$ 1,023,000

*Planning level cost estimates estimated in 2018 dollars, rounded to the nearest thousand. The rounded total cost is based on nonrounded subtotals.





Image 1. Proposed pipe layout along Herman Road



Image 2. Ditch along the northern side of Herman Road



Project Identifier	CIP #6
Project Name	Blake Street Culvert Replacement
Detailed Location	Blake Street and 105 th Avenue
Model File	HE_BL_ALT02.xp
Contributing Drainage Area	414.0 acres
Estimated Existing/Future Impervious %	38.3%/46.8%
Objective(s) Addressed	Increases System Capacity (Flood Control); Addresses Erosion
Project Background	

The existing culvert under 105th Avenue is reported to be undersized by City staff. The upstream end is routinely blocked with debris. The culvert is located along Hedges Creek in a mostly residential neighborhood.

The existing layout of the stream channel creates 90-degree bends on either side of the culvert which are reinforced by rock and concrete walls to prevent bank erosion. The upstream rock wall is failing due to erosive flows impacting the road embankment. 105th Avenue is unimproved and a roadway widening, and improvement project is in the planning stages.

Project Description

This project provides guidance towards sizing and design of a replacement culvert at Blake Street and 105th Avenue associated with the future 105th Avenue roadway improvements.

The project will replace the existing culvert with an 84-inch culvert, sized to convey the 100-year design storm flow. The new culvert will be installed along the natural stream alignment, roughly a 45-degree angle under the road, to optimize the movement of water downstream, reduce hydraulic losses due to the 90-degree bends upstream and downstream of the culvert, decrease erosion potential, and reduce the potential for debris and sediment accumulation. Design and construction should occur with scheduled roadway improvements.

Only planning-level hydraulic calculations have been performed to identify conceptual sizing. For design, detailed topographic survey and hydraulic modeling is needed to verify culvert sizing and determine appropriate invert elevations to maintain necessary cover and convey the design event.

Local roadway drainage collection and water quality infrastructure design will be completed in conjunction with roadway improvements. The vertical curve of the current roadway alignment and elevation difference between the current roadway surface and the stream channel is not sufficient to provide cover for the proposed 84-inch replacement culvert.

Per Oregon Department of Fish and Wildlife feedback in 2017, this reach of Hedges Creek is not fish bearing and fish passage design is not necessary. However, agencies such as the Army Corps of Engineers, Division of State Land, and Department of Environmental Quality may have additional design and permitting requirements not reflected in the current project cost.

Planning-level Cost Estimate	
Capital Expense Total (including contingency)	\$ 381,000
Engineering and Permitting (35%)	\$ 133,000
Administration (10%)	\$ 38,000
Capital Project Implementation Cost Total*	\$ 552,000

*Planning level cost estimates estimated in 2018 dollars, rounded to the nearest thousand. The rounded total cost is based on nonrounded subtotals.

Additional Project Information



Image 1. Downstream end of culvert with rock/concrete wall for erosion prevention



Image 2. Upstream end of culvert



Project Identifier	CIP #7
Project Name	Boones Ferry Railroad Conveyance Improvements
Detailed Location	Boones Ferry Road and Warm Springs Road
Model File	NY_ALT06.xp
Contributing Drainage Area	160.0 acres
Estimated Existing/Future Impervious %	44.0%/53.1%
Objective(s) Addressed	Addresses Maintenance Need; Addresses Erosion; Increases System Capacity (Flood Control)

City staff identified the ditch inlet at the downstream end of the open conveyance channel that runs adjacent to the ODOT railroad right-of-way as an ongoing maintenance issue. A site visit conducted in December 2016 confirmed that gravel and railroad ballast materials are being transported from the open channel and deposited downstream.

City staff also identified flooding and backwater conditions at this location, which has impacted local businesses during large rainfall events. Hydraulic modeling of the open channel and piped system revealed that the pipe is undersized for the contributing drainage area. During the December 2016 site visit, it was confirmed that gravel and ballast material had accumulated in the pipe system and was beginning to fill culverts under Boones Ferry Road, further limiting capacity.

Project Description

This project addresses localized flooding and the need for frequent maintenance along the open conveyance channel adjacent to the ODOT right-of-way.

This project adds large rock along the railroad ballast to stabilize the channel and reduce transport of gravel material into the City's stormwater collection system. The downstream pipe will be upsized to increase flow capacity and improve maintenance access. Specific activities include:

- Remove existing gravel and ballast material along 150 ft of the open conveyance channel, directly upstream of the existing ditch inlet. Install Class 100 rip-rap along the railroad ballast to reduce the potential for material transport.
- · Install a new ditch inlet to minimize hydraulic losses at the upstream end of the pipe.
- Replace 480 LF of 36-inch-diameter pipe with 42-inch-diameter pipe.

• Install a 72-inch manhole along pipe alignment for improved maintenance access.

Install a new outfall to the open channel area directly west of Boones Ferry Road. Add rip-rap for energy dissipation.

Design Considerations

- · The open conveyance channel will require regular inspection and maintenance to prevent material transport.
- The pipe is city-owned but located partially on ODOT property and will require close coordination with ODOT and the railroad administration during construction.
- Only planning level hydraulic calculations have been performed to identify conceptual sizing. For design, detailed topographic
 survey and hydraulic analysis is needed to determine the appropriate invert elevations and pipe diameters to maintain
 necessary cover and convey the design event.

Planning-level Cost Estimate	
Capital Expense Total (including contingency)	\$ 356,000
Engineering and Permitting (35%)	\$ 124,000
Administration (10%)	\$ 36,000
Capital Project Implementation Cost Total*	\$ 515,000

*Planning level cost estimates estimated in 2018 dollars, rounded to the nearest thousand. The rounded total cost is based on nonrounded subtotals.

Additional Project Information



Image 1. Ditch inlet at downstream end of railroad open channel



Image 2. Accumulated ballast and debris upstream of culverts across Boones Ferry Road



Project Identifier	CIP #8
Project Name	89 th Avenue Water Quality Retrofit
Detailed Location	Outfall at 89 th Avenue
Model File	N/A
Contributing Drainage Area	28.9 acres
Estimated Existing/Future Impervious %	75.1%/75.2%
Objective(s) Addressed	Increases Water Quality Treatment (Retrofit)

This project was originally identified in the City of Tualatin's Capital Improvement Plan 2017-2021. The upstream stormwater collection system discharges to Hedges Creek wetland and has no water quality treatment. Clean Water Services' (CWS) National Pollutant Discharge Elimination System (NPDES) Stormwater Permit requires retrofit of stormwater systems in partner jurisdictions to provide water quality treatment.

The upstream stormwater conveyance system is relatively shallow with minimal slope. Additionally, the water surface elevation in the wetlands at the outfall is relatively high. Due to the limited drop through the conveyance system and the large contributing drainage area, few water quality treatment devices could be implemented. Contech's CDS hydrodynamic separator unit was selected due to its minimum drop requirements and ability to remove trash and coarse sediment from large contributing drainage areas.

Project Description

This project provides additional water quality treatment for the contributing drainage area to address water quality retrofit objectives referenced in CWS' NPDES permit.

This project includes installation of a Contech CDS hydrodynamic separator (Model CDS3025), with a treatment flow rate of 2.4 cfs. The facility will be installed in an offline configuration, which requires a flow splitter manhole upstream to direct low flows to the CDS unit. The project also includes the installation 50 LF of 24-inch-diameter pipe and 100 LF of 48-inch-diameter pipe to support connections to existing infrastructure and a new outfall structure.

- Easements may be required to optimize the layout and capture the largest possible drainage area. Easement acquisition is
 not included in this cost estimate.
- Contech was consulted to verify system sizing and pricing based on the contributing drainage area, proposed system configuration and available drop. Only planning level calculations have been performed to identify conceptual layout.
- Detailed topographic survey is needed to determine the appropriate invert elevations and verify pipe diameters to maintain necessary cover and convey the design event.

Planning-level Cost Estimate	
Capital Expense Total (including contingency)	\$ 209,000
Engineering and Permitting (15%)	\$ 31,000
Administration (10%)	\$ 21,000
Capital Project Implementation Cost Total*	\$ 262,000

*Planning level cost estimates estimated in 2018 dollars, rounded to the nearest thousand. The rounded total cost is based on nonrounded subtotals.



Image 1. Location of proposed water quality manhole







Image 3. Contributing drainage area



Project Identifier	CIP #9
Project Name	125th Court Water Quality Retrofit
Detailed Location	Outfall at 125 th Court
Model File	N/A
Contributing Drainage Area	29.3 acres
Estimated Existing/Future Impervious %	52.8%/71.8%
Objective(s) Addressed	Addresses Water Quality Treatment (Retrofit)
Project Background	

This project was originally identified in the City of Tualatin's Capital Improvement Plan 2017-2021. The upstream stormwater collection system discharges to the Hedges Creek wetland and has no water quality treatment. Clean Water Service's (CWS) National Pollutant Discharge Elimination System (NPDES) Stormwater Permit requires retrofit of stormwater systems in partner jurisdictions to provide water quality treatment.

The upstream stormwater conveyance system is relatively shallow with minimal slope. Additionally, the water surface elevation in the wetlands at the outfall is relatively high. Due to the limited drop through the conveyance system and the large contributing drainage area, few water quality treatment devices could be implemented. Contech's CDS hydrodynamic separator unit was selected due to its minimum drop requirements and ability to remove trash and coarse sediment from large contributing drainage areas.

Project Description

This project provides additional water quality treatment for the contributing drainage area to address water quality retrofit objectives referenced in CWS' NPDES permit.

This project includes installation of a Contech[™] CDS hydrodynamic separator (Model CDS3025), with a treatment flow rate of 2.4 cfs. The facility will be installed in an offline configuration, which requires a flow splitter manhole upstream to direct low flows to the CDS unit. The project also includes the installation of 50 LF of 24-inch-diameter pipe and 50 LF of 36-inch-diameter pipe to support connections to existing infrastructure.

- Contech TM was consulted to verify system sizing and pricing based on the contributing drainage area, proposed system configuration and available drop. Only planning level calculations have been performed to identify conceptual layout.
- Detailed topographic survey is needed to determine the appropriate invert elevations and verify pipe diameters to maintain necessary cover and convey the design event.

Planning-level Cost Estimate	
Capital Expense Total (including contingency)	\$ 165,000
Engineering and Permitting (15%)	\$ 25,000
Administration (10%)	\$ 16,000
Capital Project Implementation Cost Total*	\$ 206,000

*Planning level cost estimates estimated in 2018 dollars, rounded to the nearest thousand. The rounded total cost is based on nonrounded subtotals.







Image 3. Contributing drainage area



Project Identifier	CIP #10
Project Name	93 rd Avenue Green Street
Detailed Location	93 rd Avenue between Umiat Street and Sagert Street
Model File	N/A
Contributing Drainage Area	15,000 square feet
Estimated Existing/Future Impervious %	100%/100%
Objective(s) Addressed	Increases Water Quality Treatment (Retrofit)
Droject Deckground	

This project site was identified during a water quality retrofit evaluation as a potential green street pilot project to provide water quality treatment for 93rd Avenue between Umiat Street and Sagert Street.

This section of roadway is unimproved, and runoff is conveyed in roadside ditches before entering a 30-inch concrete stormwater pipe near the intersection of Sagert Street.

Project Description

This project provides additional water quality treatment for the contributing drainage area to address water quality retrofit objectives referenced in Clean Water Services' (CWS) National Pollutant Discharge Elimination System permit. This project features a green street to manage stormwater runoff on an unimproved roadway.

The proposed project includes the installation of stormwater planters to treat approximately 15,000 sf of impervious surface from the roadway, sidewalks and property frontage along the unimproved right-of-way. Due to the poor infiltration characteristics of the soils in this area, flow-through planters with an underdrain and overflow are specified. The graphic above shows potential locations for planters. Curb inlets are assumed at each planter location for purposes of the cost estimate, and the overflow will be piped to the existing conveyance system.

In conjunction with green street facilities, approximately 550 linear feet (LF) of curb and gutter will be installed along 93rd Avenue to direct stormwater runoff to the water quality facilities. The outlets of the water quality facilities will be connected to existing stormwater infrastructure on 93rd Avenue, which drains to a trunk line in Sagert Street.

- Facility sizing is based on the CWS Low Impact Development Approaches (LIDA) Handbook.
- Street improvements including sidewalk construction have not been included in this cost estimate. Installation of curb and
 gutter has been included in this cost estimate. It is assumed that green street facility installations will be conducted in
 conjunction with other roadway improvements.
- Public outreach may be needed to inform local resident and receive feedback regarding the right of way improvements and potential loss of street parking.
- Only planning level calculations have been performed to identify conceptual layout. For design, detailed topographic survey is needed to verify existing infrastructure, determine the appropriate invert elevations and verify facility sizing.

Planning-level Cost Estimate	
Capital Expense Total (including contingency)	\$ 166,000
Engineering and Permitting (25%)	\$ 42,000
Administration (10%)	\$ 17,000
Capital Project Implementation Cost Total*	\$ 224,000

*Planning level cost estimates estimated in 2018 dollars, rounded to the nearest thousand. The rounded total cost is based on nonrounded subtotals.



Image 1. Roadside ditches and unimproved roadway at the north end of 93rd Avenue



Image 2. Typical green street facility cross section



Project Identifier	CIP #11
Project Name	Juanita Pohl Water Quality Retrofit
Detailed Location	Juanita Pohl Center
Model File	N/A
Contributing Drainage Area	0.4 acres
Estimated Existing/Future Impervious %	100%/100%
Objective(s) Addressed	Increases Water Quality Treatment (Retrofit)
Project Background	

This project site was identified during a water quality retrofit evaluation as a potential site to provide treatment for the parking area associated with the Juanita Pohl Center. The parking area is City-owned with a large contributing impervious drainage area (approximately 15,500 sf) that is currently untreated and discharges directly into Hedges Creek.

Project Description

This project provides additional water quality treatment for the contributing drainage area (parking lot) to address water quality retrofit objectives referenced in Clean Water Services' (CWS) National Pollutant Discharge Elimination System permit.

The proposed project includes regrading existing landscape islands to install raingardens for water quality treatment. The existing landscape islands are currently covered with bark chips and not substantially planted with vegetation. Specific activities include:

- Excavation and regrading of the landscape areas and back filling with drain rock and amended soils to support the water quality facility installation.
- Installation of check dams to minimize potential erosion.
- Installation of curb and curb cuts to serve as inlets to the facilities and associated piping to connect the facility overflows to downstream structures (i.e., manholes).
- Plant the facility with native vegetation suitable for a water quality facility.
- Minor repaying of parking stalls near the facilities.

- Facility sizing is based on the CWS' Low Impact Development Approaches (LIDA) Handbook.
- Only planning level calculations have been performed to identify conceptual layout and sizing. Detailed topographic survey is needed to determine the appropriate invert elevations and optimum facility layout and configuration.

Planning-level Cost Estimate	
Capital Expense Total (including contingency)	\$ 116,000
Engineering and Permitting (25%)	\$ 29,000
Administration (10%)	\$ 12,000
Capital Project Implementation Cost Total*	\$ 156,000

*Planning level cost estimates estimated in 2018 dollars, rounded to the nearest thousand. The rounded total cost is based on nonrounded subtotals.



Image 1. Proposed location for water quality facility #1



Image 2. Proposed location for water quality facility #2



Project Identifier	CIP #12
Project Name	Community Park Water Quality Retrofit
Detailed Location	Tualatin Community Park
Model File	N/A
Contributing Drainage Area	0.6 acres
Estimated Existing/Future Impervious %	100 %/100%
Objective(s) Addressed	Increases Water Quality Treatment (Retrofit)
Project Background	

This project site was identified during a water quality retrofit evaluation as a potential site to provide treatment for the parking area associated with Tualatin Community Park. The parking area is City-owned with a large contributing impervious drainage area (approximately 25,000 sf) that is currently untreated and discharges directly into Hedges Creek.

Project Description

This project provides additional water quality treatment for the contributing drainage area (parking lot) to address water quality retrofit objectives referenced in Clean Water Services' (CWS) National Pollutant Discharge Elimination System permit.

The proposed project includes regrading existing landscape islands to install raingardens for water quality treatment. The existing landscape islands are currently covered with bark chips and not substantially planted with vegetation. Specific activities include:

- Excavation and regrading of the landscape areas and back filling with drain rock and amended soils to support the water quality facility installation.
- Address existing utilities, light pole, signage, etc.
- Installation of curb and curb cuts to serve as inlets to the facilities and associated piping to connect the facility overflows to downstream structure (i.e., manhole).
- Plant the facility with native vegetation suitable for a water quality facility.

- Facility sizing is based on the CWS' Low Impact Development Approaches (LIDA) Handbook.
- Only planning level calculations have been performed to identify conceptual layout and sizing. For design, detailed topographic survey is needed to determine the appropriate invert elevations and optimum facility layout and configuration.
- Two established trees are located within the footprint for water quality facility #2. One of the trees may need to be removed and replaced to make room for the treatment facility.

Planning-level Cost Estimate	
Capital Expense Total (including contingency)	\$ 117,000
Engineering and Permitting (25%)	\$ 29,000
Administration (10%)	\$ 12,000
Capital Project Implementation Cost Total*	\$ 158,000

*Planning level cost estimates estimated in 2018 dollars, rounded to the nearest thousand. The rounded total cost is based on nonrounded subtotals.



Image 1. Proposed location for Water Quality Facility #1



Image 2. Proposed location for Water Quality Facility #2



Project Identifier	CIP #13
Project Name	Water Quality Facility Restoration-Venetia
Detailed Location	Lee Street and 56 th Avenue
Model File	No modeling
Contributing Drainage Area	6.5 acres
Estimated Existing/Future Impervious %	42.2%/52.0%
Objective(s) Addressed	Addresses Maintenance Need; Improves Water Quality
Project Background	

This water quality facility receives residential and roadway stormwater drainage from residential development along Lee Street. The original facility design includes a meandering swale for water quality treatment. From the swale, stormwater discharges south directly to Saum Creek. A high flow bypass upstream of the swale controls stormwater flow rates to the swale.

This facility was reported in need of repairs by City staff, and due to access limitations, has not received regular maintenance. During a site visit in June 2016, overgrown vegetation was observed but the facility appeared functional. The overgrown vegetation appeared to have caused nuisance backwatering, which partially washed out an existing access path. The outfall is located at the southwest end of the swale but was not inspected due to a locked gate.

Project Description

This project restores the public water quality facility to its original function by removing accumulated sediment and overgrown vegetation, amending soils and replanting. This project also reestablishes an existing maintenance access.

Specific activities include:

- Clear the trees and large brush growing in the swale.
- Remove accumulated sediment along swale bottom, regrade and replace with amended soils and mulch.
- Replant facility with native vegetation suitable for a water quality facility.
- Verify that the water quality/flow splitter manhole upstream of the facility is operational and diverting the water quality design flow to the facility.

- Routine maintenance should be conducted to ensure proper functionality.
- Project design should confirm whether the flow splitter manhole needs to be repaired or replaced. Structure and pipe replacement costs are not assumed in the cost estimate.

Planning-level Cost Estimate	
Capital Expense Total (including contingency)	\$ 52,000
Engineering and Permitting (15%)	\$ 8,000
Administration (10%)	\$ 5,000
Capital Project Implementation Cost Total*	\$ 65,000

*Planning level cost estimates estimated in 2018 dollars, rounded to the nearest thousand. The rounded total cost is based on nonrounded subtotals.



Image 1. Overgrown swale as seen from Lee Street



Image 2. Alternate view of vegetation growing in swale



Project Identifier	CIP #14
Project Name	Water Quality Facility Restoration-Piute Court
Detailed Location	8187 Piute Court
Model File	No modeling
Contributing Drainage Area	28.5 acres
Estimated Existing/Future Impervious %	42.8%/52.7%
Objective(s) Addressed	Addresses Maintenance Need; Improves Water Quality

The water quality facility at the end of Piute Court receives residential stormwater drainage from development along Martinazzi Avenue and Iroquois Drive (not shown on map). Stormwater discharges to the facility from the west via a storm pipe from Piute Court. This facility was reported in need of repairs by City staff. During a site visit conducted December 2016, sediment accumulation was observed, and the facility was overgrown with invasive reed canary grass.

A field ditch inlet is located at the north end of the pond, which serves as the outlet control structure. It is believed to discharge east under Interstate 205, but staff were unable to verify the downstream point of discharge.

The City has an easement for maintenance access between homes on Piute Court, but there is currently no access road.

Project Description

This project restores the public water quality facility to its original function by removing accumulated sediment and overgrown vegetation, amending soils and replanting. This project also establishes a dedicated maintenance access road.

Specific activities include:

- Install a 100-foot-long gravel access road in the easement located between homes on Piute Court.
- Remove accumulated sediment and invasive vegetation, regrade the existing facility, and add amended soils and mulch.
- Replant the bottom and sides of facility with riparian/wetland vegetation. Add temporary irrigation.
- Install an energy dissipation pad at the pond inlet.
- Replace the existing ditch inlet with an outfall control structure.
- Install a water quality manhole upstream of the facility, in Piute Court, to reduce sediment load and minimize future maintenance needs.
Design Considerations

- The downstream point of discharge from the pond is currently unknown, and may require coordination with ODOT.
- Routine maintenance should be conducted to ensure proper functionality.
- Additional easements, property acquisition, and private property enhancements associated with installation of the access road (planting, fencing, etc.) is not reflected in the cost estimate.

Planning-level Cost Estimate	
Capital Expense Total (including contingency)	\$ 83,000
Engineering and Permitting (15%)	\$ 12,000
Administration (10%)	\$ 8,000
Capital Project Implementation Cost Total*	\$ 104,000

*Planning level cost estimates estimated in 2018 dollars, rounded to the nearest thousand. The rounded total cost is based on nonrounded subtotals.

Additional Project Information



Image 1. Invasive reed canary grass covers most of the bottom of the water quality facility



Image 2. Sediment deposition near outfall of stormwater system



Project Identifier	CIP #15
Project Name	Water Quality Facility Restoration-Sequoia Ridge
Detailed Location	Port Orford Street between SW 59th Terrace and SW 60th Avenue
Model File	No modeling
Contributing Drainage Area	21.7 acres
Estimated Existing/Future Impervious %	37.3%/50.8%
Objective(s) Addressed	Addresses Maintenance Need; Improves Water Quality
Project Background	

The water quality facility south of Port Orford Street receives residential stormwater drainage from the surrounding neighborhood. Stormwater discharges to the facility from the northwest and flows south directly into Saum Creek after treatment. The pond is designed to have a capacity of approximately 15,500 cubic feet of storage.

This facility was included as a project in the City's 2017-2021 Capital Improvement Plan and maintenance needs were confirmed by City staff. Mature cottonwood trees are currently growing within the footprint of the pond. During a site visit conducted in December 2016, the outlet control structure appeared clogged with vegetation and debris. No water was seen entering the structure via the low flow pipe and there is standing water in the facility. The outfall from the facility to Saum Creek appeared to be in good condition.

Project Description

This project restores the public water quality facility to its original function by removing accumulated sediment and overgrown vegetation, amending soils and replanting. This project also replaces the outlet control structure to allow the facility to discharge.

Specific activities include:

- · Clear all cottonwood trees and other vegetation from the facility.
- · Remove accumulated sediment and invasive vegetation and add amended soils.
- Replant the bottom and sides of facility with riparian/wetland vegetation suitable for a stormwater pond. Add temporary irrigation.

- Verify that the water quality/flow splitter manhole upstream of the facility is operational and diverting the water quality design flow to the facility. Remove sediment as needed.
- Install energy dissipation pad at pond inlet.
- Redesign the outlet control structure to have functional low flow pipe and high flow overflow. Remove the current cap and install an overflow plate in accordance with current CWS design standards.

Design Considerations

- · Routine maintenance should be conducted to ensure proper functionality.
- Project design should verify sizing of the outlet control structure including the low flow pipe. Pipe replacement has not been included in the cost estimate.
- Project design should confirm whether the flow splitter manhole needs to be repaired or replaced. Structure and pipe replacement costs are not assumed in the cost estimate.

Planning-level Cost Estimate	
Capital Expense Total (including contingency)	\$ 67,000
Engineering and Permitting (15%)	\$ 10,000
Administration (10%)	\$ 7,000
Capital Project Implementation Cost Total*	\$ 83,000

*Planning level cost estimates estimated in 2018 dollars, rounded to the nearest thousand. The rounded total cost is based on nonrounded subtotals.

Additional Project Information



Image 1. Large cottonwood trees in water quality facility



Image 2. Existing pond outfall control structure



Project Identifier	CIP #16
Project Name	Water Quality Facility Restoration-Sweek Drive Pond
Detailed Location	Sweek Drive and Tualatin Road
Model File	No modeling
Contributing Drainage Area	2.5 acres
Estimated Existing/Future Impervious %	41.5%/50.3%
Objective(s) Addressed	Address Maintenance Need; Improves Water Quality
Project Background	

The water quality facility south of Sweek Drive treats stormwater runoff from Sweek Drive and a portion of 90th Avenue. This facility appears to discharge freely, without a control structure, to the larger Sweek Pond, located directly to the east.

This facility was included as a project in the City's 2017-2021 Capital Improvement Plan and maintenance needs were confirmed by City staff. During a site visit conducted in December 2016, mature cottonwood trees and other vegetation were seen growing throughout the pond bottom.

Project Description

This project restores the public water quality facility to its original function by removing accumulated sediment and overgrown vegetation, amending soils and replanting. This project includes installation of an outlet control structure to better utilize storage.

Specific activities include:

- Clear all cottonwood trees and other vegetation from the facility.
- Remove accumulated sediment and invasive vegetation and add amended soils.
- Replant the bottom and sides of the facility with native vegetation suitable for a stormwater pond. Add temporary irrigation.
- Install a water quality manhole upstream of the pond to minimize sediment loading.
- Install an energy dissipation pad at the pond inlet
- Install a new outlet control structure and energy dissipation pad.

Design Considerations

• Routine maintenance should be conducted to ensure proper functionality.

Planning-level Cost Estimate	
Capital Expense Total (including contingency)	\$ 83,000
Engineering and Permitting (15%)	\$ 12,000
Administration (10%)	\$ 8,000
Capital Project Implementation Cost Total*	\$ 103,000

*Planning level cost estimates estimated in 2018 dollars, rounded to the nearest thousand. The rounded total cost is based on nonrounded subtotals.

Additional Project Information



Image 1. Vegetation and cottonwood trees growing in the water quality facility



Project Identifier	CIP #17
Project Name	Siuslaw Water Quality Retrofit
Detailed Location	Siuslaw Lane Greenway
Model File	N/A
Contributing Drainage Area	70.3 acres
Estimated Existing/Future Impervious %	39.4%/48.3%
Objective(s) Addressed	Addresses Maintenance Need; Increases Water Quality Treatment (Retrofit)

Project Background

The existing open channel conveyance system in the greenway along Siuslaw Lane receives residential stormwater drainage from nearby neighborhoods. Stormwater enters the open channel from Boones Ferry Road and discharges to a ditch inlet adjacent to 98th Avenue.

City staff identified this site during a water quality retrofit evaluation as a potential stormwater treatment facility retrofit. During a site visit in December 2016, sediment was observed near the two outfalls to the open channel. The corrugated metal pipes were also reported to be in poor condition and significant rust and corrosion was observed.

Project Description

This project replaces infrastructure that is in poor condition and provides water quality treatment in the form of a bioswale.

The stormwater conveyance system will be replaced from Boones Ferry to the outfalls at the existing greenway. This includes the installation of 350 LF of 30-inch-diameter pipe and 100 LF of 48-inch-diameter pipe. A flow splitter/water quality manhole will be installed along this alignment to minimize sediment loading to the new bioswale. The project also includes replacement of 3 catch basins, 2 manholes, and the installation of 5 check dams and energy dissipation at the outfall to the open channel.

The proposed project also includes grading the existing open channel conveyance to serve as a bioswale for water quality treatment. The resulting 15-ft-wide by 500-ft-long bioswale will include amended soils and vegetation enhancement to improve water quality treatment and enhance visual appeal.

Design Considerations

- Water quality facility sizing and design is based on the Clean Water Services Low Impact Development Approaches (LIDA) Handbook. The LIDA Handbook should be referenced for design guidelines on swales.
- · Routine maintenance should be conducted to ensure proper functionality.

- Final swale alignment and configuration must consider potential grading impacts to the existing trees and the paved walking path.
- Only planning level calculations have been performed to identify conceptual layout and sizing. Detailed topographic survey is needed to determine the extent of grading required, the existing size and elevation of the upstream collection system, and appropriate invert elevations to maintain necessary slope and convey the design event.

Planning-level Cost Estimate	
Capital Expense Total (including contingency)	\$ 336,000
Engineering and Permitting (25%)	\$ 84,000
Administration (10%)	\$ 34,000
Capital Project Implementation Cost Total*	\$ 454,000

*Planning level cost estimates estimated in 2018 dollars, rounded to the nearest thousand. The rounded total cost is based on nonrounded subtotals.

Additional Project Information



Image 1. Existing outfalls to Siuslaw Lane Greenway



Figure 1. Construction details of new infrastructure



Project Identifier	CIP #18
Project Name	Water Quality Facility Restoration-Waterford
Detailed Location	Palouse Lane and 94 th Terrace
Model File	No modeling
Contributing Drainage Area	19.4 acres
Estimated Existing/Future Impervious %	44.8%/54.6%
Objective(s) Addressed	Address Maintenance Need; Improves Water Quality
Project Background	·

The water quality facility located between Palouse Lane and Boones Ferry Road receives residential stormwater runoff from the surrounding neighborhood. Stormwater discharges to the facility from the south. Stormwater discharges from the facility to the west via a pipe under Boones Ferry Road. As-builts indicate the pond was designed to be approximately 4 feet deep with a bottom area of 2,500 square feet. The original design included a water quality swale around the pond perimeter to provide pretreatment of low flows. High flows discharge directly to the pond and bypass the swale.

This facility was included as a project in the City's 2017-2021 Capital Improvement Plan and maintenance needs were confirmed by City staff.

During a site visit in December 2016, accumulated sediment was found to have filled in the swale causing all water to bypass the swale. There is little/no vegetation present in the pond and swale. The outlet of the facility is in the middle of the pond, preventing maintenance during high water events.

Project Description

This project restores the public water quality facility to its original function by removing accumulated sediment and overgrown vegetation, amending soils and replanting. This project also relocates the outlet structure to improve maintenance access.

Specific activities include:

- Clear invasive and unwanted vegetation from the facility.
- Excavate and regrade as needed to maximize water quality function and restore to original design.
- Remove accumulated sediment and replace with amended soils.

- Replant the swale and bottom and sides of the pond facility with native vegetation suitable for a swale and water quality pond. Add temporary irrigation.
- · Relocate and replace the outlet control structure to the edge of pond for improved maintenance access.
- Replace inlet rip rap for increased energy dissipation.
- Install two water quality/flow splitter manholes upstream of facility to minimize sediment loading.

Design Considerations

- Routine maintenance should be conducted to ensure proper functionality.
- Project design should verify sizing and configuration of the flow control manholes and outlet control structure. Detailed topographic survey is needed to confirm appropriate invert elevations and pipe diameters. Inlet pipe replacement is not included in the cost estimate.
- Project design should evaluate sizing and configuration of the outlet control structure to optimize storage and mitigation of peak flow rates and the duration of flow to Hedges Creek. If enhanced flow control is provided, this project may qualify as a retrofit opportunity.

Planning-level Cost Estimate	
Capital Expense Total (including contingency)	\$ 144,000
Engineering and Permitting (15%)	\$ 22,000
Administration (10%)	\$ 14,000
Capital Project Implementation Cost Total*	\$ 180,000

*Planning level cost estimates estimated in 2018 dollars, rounded to the nearest thousand. The rounded total cost is based on nonrounded subtotals.

Additional Project Information



Image 1. Waterford water quality facility as seen from Palouse Lane



Project Identifier	CIP #19
Project Name	Saum Creek Hillslope Repair
Detailed Location	Blake Street at Saum Creek
Model File	N/A
Contributing Drainage Area	142.2 acres to Saum Creek/5.0 acres to outfall
Estimated Existing / Future Impervious %	39.4%/46.8%
Objective(s) Addressed	Addresses Erosion; Addresses Maintenance Need

Project Background

City staff and adjacent property owners identified the outfall into Saum Creek at Blake Street as an erosion and bank stability concern. City maintenance staff report severe bank erosion at this location. Site visits, including a field stream assessment in September 2017, revealed bank erosion along the unprotected bank slope and groundwater seepage along the bank itself. The outfall from Blake Street is perched approximately 7 feet above the creek bed. Bank failure was also observed approximately 100 feet downstream, suggesting the need for a geotechnical evaluation of the reach. Saum Creek itself appears stabilized due to a clay/hard pan layer which prevents downcutting at this location.

The cause of the bank failure is not clear. Stormwater pipe condition deficiencies have been reported upstream of the outfall, which could contribute to slope instability, depending on subsurface geologic conditions and preferential flow paths. The storm pipe and outfall require replacement due to structural deficiencies identified by City staff.

Project Description

This project replaces infrastructure that is in poor condition and allocates funding resources to investigate and address existing slope instability.

This project includes replacement of the storm pipe from Makah Ct. to the outfall and outfall reconstruction and extension to the stream channel. Hillslope rehabilitation will be conducted in conjunction with the pipe and outfall replacement to incorporate energy dissipation and minimize future erosion and slope instability. A lump sum of \$20,000 is reflected in the cost estimate for a geotechnical evaluation prior to design and construction, to evaluate hillslope rehabilitation options.

Potential rehabilitation and bank stabilization options include rock buttresses or the import of new fill material and horizontal plantings. These options are typical approaches to correcting typical bank failures. For planning-level cost estimation purposes,

installation of rock buttresses is proposed (Figure 1). However, upon geotechnical consultation and consideration of the final pipe and outfall design, bioengineering solutions may be feasible and/or appropriate (Figure 2).

Design Considerations

- Only planning level calculations have been performed to identify pipe size and hillslope reinforcement needs to determine a conceptual project cost.
- A geotechnical evaluation is recommended prior to detailed design to evaluate soil and groundwater conditions in this area and select a preferred design approach in consideration of site conditions and constraints.

Planning-level Cost Estimate	
Capital Expense Total (including contingency)	\$ 104,000
Geotechnical Engineering (LS)	\$ 20,000
Engineering and Permitting (35%)	\$ 37,000
Administration (10%)	\$ 10,000
Capital Project Implementation Cost Total*	\$ 171,000

*Planning level cost estimates estimated in 2018 dollars, rounded to the nearest thousand. The rounded total cost is based on nonrounded subtotals.

Additional Project Information



Image 1. Perched outfall from Blake Street with severe bank failure



Figure 1. Hillslope Rehabilitation Option - Rock Buttress



Figure 2. Hillslope Rehabilitation Option – Bioengineering with Brush Layering



Project Identifier	CIP #20
Project Name	Hedges Creek Stream Repair
Detailed Location	SW 106 th Ave and Willow Street at Hedges Creek
Model File	N/A
Contributing Drainage Area	32.7 acres to outfall
Estimated Existing/Future Impervious %	23.5%/29.3%
Project Objective(s)	Addresses Erosion
Due is at De alustra und	

Project Background

Site visits, including a field stream assessment in September 2017, identified active bank erosion in this stream reach vicinity and potential project needs. This project was also identified through a separate evaluation for the City Parks Department (Hedges Creek Stream Assessment, February 2018).

The outfall at the corner of SW Willow Street and SW 106th Ave discharges stormwater runoff to a tributary to Hedges Creek from upland residential development. Development in this area appears to be constructed with limited stormwater flow control, resulting in hydromodification along this tributary. Location 'M' was observed to have active erosion occurring adjacent to, upstream and downstream of an existing sanitary manhole. Location 'N' was not visited as part of the stream assessment but reflects similar erosion conditions as location 'M' with evidence of erosion at the pipe outfall. Observations for Location 'N' are documented in the separate evaluation for the City Parks Department.

Project Description

This project addresses instream channel erosion and threatened public infrastructure.

Corrective actions are referenced directly from the Hedges Creek Stream Assessment by others. Site 'N' activities include an outfall extension, bioengineered slopes, streambed fill and vegetation restoration. Site 'M' activities include open channel excavation, stream bed fill, and installation of a retaining wall.

Design Assumptions and Considerations

- Detailed design information related to the proposed corrective actions are included in the "Hedges Creek Stream Assessment, SW Ibach Street to SW 105th Avenue", February 2018, GreenWorks PC and OTAK, Inc.
- Costs summarized below were taken directly from the "Hedges Creek (SW Ibach Road to SW 105th Avenue) Stream Assessment, CIP Opinion of Construction Costs for Identified Sites", February 2018, GreenWorks PC and OTAK, Inc.
- Corrective actions employed along this reach should consider both protection of sanitary system infrastructure and channel and outfall stabilization to prevent further erosion.

Planning-level Cost Estimate Locations 'M and N'*		
Capital Expense Total (including contingency)	See referenced study	
Engineering and Permitting	See referenced study	
Project Administration	See referenced study	
Capital Project Implementation Cost Total (Location M)	\$ 147,000	
Capital Project Implementation Cost Total (Location N)	\$ 180,000	
Capital Project Total (Location M and N)	\$ 327,000	

*Planning level cost estimates based on "Hedges Creek (SW Ibach Road to SW 105th Avenue) Stream Assessment, CIP Opinion of Construction Costs for Identified Sites", February 2018, GreenWorks PC and OTAK, INC.

Additional Project Information



Image 1. Location 'M' exposed sanitary manhole and incised tributary



Image 2. Location 'N' outfall and channel erosion (photo provided by OTAK)



Project Identifier	CIP #21
Project Name	Nyberg Water Quality Retrofit
Detailed Location	Warm Springs Street east of Martinazzi Avenue at City-owned parcel adjacent to Nyberg Creek
Model File	N/A
Contributing Drainage Area	89.7 acres
Estimated Existing / Future Impervious %	55.1%/62.2%
Project Objective(s)	Increases Water Quality Treatment (Retrofit)
Project Background	

The City recently acquired property adjacent to Nyberg Creek and identified it as a water quality retrofit opportunity, due to the potential for treatment of a large contributing area with high pollutant load potential. Site reconnaissance including review of physical site conditions and potential conveyance system routing was conducted. A desktop GIS evaluation to assess environmental overlays and floodplain extents was also conducted.

Approximately 90 acres of contributing area can be routed to the facility via the existing storm pipe on Mohawk Street and pending construction of CIP #2, Phase 1 along Martinazzi Avenue.

The property is heavily vegetated with mature alder and cottonwood trees. Invasive vegetation dominates the site, specifically blackberries in the upper (higher) portion of the site and reed canary grass in lower portions of the site. Most of the property and proposed facility footprint is within the boundary of the 100-year floodplain and a delineated wetland (W4 per local wetlands inventory). Development of this site as a water quality facility will require federal and state permitting via a Joint Permit Application. Permitting requirements anticipated include an updated wetland delineation, wetland mitigation, and a FEMA norrise evaluation. Additional site-specific requirements may be identified during the permitting process by the Army Corps of Engineers and Oregon Department of State Lands (Agencies).

Project Description

This project provides water quality treatment for a large upstream, untreated contributing drainage area. The conceptual design was developed to maximize water quality treatment based on physical site conditions and available area within the City-acquired property. A 1.5-acre total footprint was identified per discussions with City staff. This area assumes approximately 1-acre for the water quality facility and the remaining 0.5-acres for adjacent site improvements and grading.

The project concept does not provide flow control or address instream channel improvements. Low flows (water quality flow) from contributing drainage area along Martinazzi Avenue will be diverted to the facility while higher flows will continue to be routed down Martinazzi Avenue to the outfall at Nyberg Creek. Total flow from subbasins NY-0230 and NY-0171 (along Warm Springs Street and Mohawk Street) will initially be routed to the facility, and peak flows will be routed around the facility to Nyberg Creek via a high flow bypass channel. Elements of the conceptual design reflected in the cost estimate include:

- · Installation of a low flow bypass structure at the intersection of Martinazzi Avenue and Warm Springs Street.
- Installation of 485 LF of 12-inch pipe on Warm Springs Street between Martinazzi Avenue and Mohawk Street.
- Installation of 275 LF of 24-inch pipe on Warm Springs Street between Mohawk Street and the facility.
- Installation of 4 manholes and 3 catch basins along Warm Springs. 100 LF of 12-inch inlet leads are also reflected in the cost estimate for the connection of new and existing catch basins.
- Installation of a flow control structure and debris forebay at the inlet to the facility. The flow control structure will include a high flow bypass channel around facility to discharge to Nyberg Creek.
- Installation of approximately 1 acre of a tiered water quality facility (i.e., raingarden) with beehive overflows and piped connections to the high flow bypass channel. 75 LF of 12-inch piping to connect beehive overflows within the facility to the bypass channel are also reflected in the cost estimate.
- Construction of new open channel conveyance to outfall to Nyberg Creek.

Design Considerations

- To capture and treat the maximum drainage area (90 acres) described in this CIP, it must be constructed concurrently or following CIP #2, Phase 1 (Nyberg Creek Stormwater Improvements). Alternatively, the facility could be designed to only treat stormwater conveyed along Warm Springs Street and Mohawk Street.
- An updated wetland delineation will be required to confirm wetland boundaries, mitigation requirements, and wetland condition.
- Actual treatment area and facility footprint to be determined during the preliminary design phase and may vary based on
 results from the updated wetland delineation.
- 1.5 acres of wetland mitigation is included in the cost estimate; actual mitigation area requirements will be determined by DSL during the permitting process. Wetland mitigation cost was based on a \$155,000 per acre price quoted by the Butler Mitigation Bank in the Tualatin Valley, dated March 2019.
- · Cost to acquire additional construction or maintenance easements are not included in the cost estimate.

Planning-level Cost Estimate		
Capital Expense Total (including contingency)	\$ 1,234,000	
Engineering and Permitting (35%)	\$ 432,000	
Administration (10%)	\$ 123,000	
Wetland Delineation (LS)	\$ 15,000	
Wetland Mitigation (LS)	\$ 233,000	
Capital Project Implementation Cost Total*	\$ 2,037,000	

*Planning level cost estimates estimated in 2018 dollars, rounded to the nearest thousand. The rounded total cost is based on nonrounded subtotals.





Image 1: Existing easement for site access



Image 2: Existing easement for site access, looking east



Image 3: Proposed location for water quality facility

Appendix B: Data Compilation and Preliminary Stormwater Project Development (TM1)





Technical Memorandum

6500 SW Macadam Avenue, Suite 200 Portland, OR 97239

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- Prepared for: City of Tualatin
- Project title: Stormwater Master Plan

149233 Project no.:

Technical Memorandum #1

Subject: Data Compilation and Preliminary Stormwater Project Development

April 24, 2017 Date:

To: Dominique Huffman, P.E., City Project Manager

From: Angela Wieland, P.E., BC Project Manager

Angela Wieland, P.E.

Prepared by:

Reviewed by:

Krista Reininga, P.E.

Limitations:

This document was prepared solely for City Tualatin in accordance with professional standards at the time the services were performed and in accordance with the contract between the City of Tualatin and Brown and Caldwell dated April 11, 2016. This document is governed by the specific scope of work authorized by City of Tualatin; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by the City of Tualatin and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

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Introduction

The City of Tualatin (City) is developing a stormwater master plan update to guide stormwater program and capital project decisions. The stormwater master plan (SMP) will address both water quantity and quality for constructed systems under the City's management. The master plan requires a clear understanding of existing and future runoff conditions across the city to identify long-term stormwater project needs.

This technical memorandum (TM1) has been developed to document the following:

- Data collection and compilation efforts to date,
- Stormwater planning criteria as identified through code review efforts, and
- Methods used to preliminarily identify stormwater project opportunities, including the water quality assessment to define water quality retrofit opportunity areas.

Through the data collection efforts, which included workshops with City staff and multiple site visits, a preliminary list of 16 stormwater project opportunities have been vetted and are anticipated for stormwater project development as part of the master planning effort.

Section 1 of this TM1 summarizes the data compilation efforts, specifically receipt of GIS data and review of various reports and studies. Section 2 outlines the criteria used for stormwater planning based on review of the Tualatin Development Code (TDC), Public Works Construction Code, and Clean Water Services (CWS) Design and Construction Standards. Section 3 outlines the process and results of the preliminary stormwater project identification efforts, which included stormwater system surveys, a water quality assessment, and site visits.

Section 1: Data Compilation and Review

In April 2016, BC provided a list of data needs to the City to initiate the master planning project effort. Data needs included GIS system information, background data and reports, City organizational information, stormwater surveys, maintenance program information and procedures, and additional financial information to support the sanitary and stormwater utility rate evaluations.

The project kick-off meeting was conducted on May 16, 2016. Data needs were discussed during the meeting and clarification was provided as necessary. BC's data request was primarily fulfilled over the course of four months (May through October 2016) as part of six separate data packages. Outstanding data needs (as of March 2017) are primarily related to financial information to support the sanitary rate evaluation. This delay is related to sanitary master planning schedule delays and changes related to the sanitary capital improvement project (CIP) total project cost. A summary of financial information in support of the rate evaluations is not included as part of this TM.

This section summarizes results of the data compilation and review efforts, specific for GIS system data and background reports and studies.

1.1 GIS System Data

GIS system data were provided in geodatabase format to BC as part of three data submittals: May 24, 2016, May 31, 2016, and August 4, 2016. GIS system data included shapefiles defining city limits, concept planning areas (future growth areas), waterbodies, taxlots, planning district coverage (zoning), impervious coverage, drainage basins, City-owned open space (parks, greenways, and natural areas), water quality facilities, and multiple natural resource overlay districts. Additional, individual shapefiles were provided to BC intermittently since August 2016 to address specific questions or to supplement previously provided information.



LIDAR and aerial photos were provided to BC on an external hard drive on June 14, 2016 and downloaded directly by BC.

Base map data including taxlots, soils, streams, and roadways/ right of way (ROW) were developed as a subset of METRO RLIS data and were provided by the City directly. BC did not process or obtain additional external information to support the data compilation effort unless identified to address an observed data gap.

BC independently reviewed the GIS data to identify applicable shapefiles for use in supporting system mapping, hydrologic analysis, and future hydraulic evaluations. Initial observations and data gaps were identified for discussion with the City. Proposed data assumptions and interpretations were documented.

Attachment A, Table A-1 summarizes GIS data received by date and outlines the initial observations, data gaps, and proposed data assumptions. Metadata or source data is summarized. Relevant fields to be used in the master planning efforts are indicated. Table A-1 was provided to the City in draft form to facilitate discussion of data gap resolution (see Section 1.1.2).

1.1.1 Preliminary Mapping

In conjunction with review of the GIS system data, BC prepared preliminary maps identifying project extents, major drainage basins and natural features, topography and soils, and stormwater drainage system features.

Preliminary mapping is included in Attachment B, Figures 1 through 3.

1.1.2 GIS Data Use Assumptions

BC met with the City on July 28, 2016 to review the initial GIS data summary and discuss gap resolution. Preliminary mapping was provided to facilitate discussion.

Table 1-1 summarizes the major data gaps and proposed resolutions. Detailed documentation of data gap resolution and data assumptions by topic is documented in Attachment A, Table A-1.

Table 1-1. GIS System Data Gaps and Assumptions			
Data Need	Data Gap	Data Resolution and Assumptions	
Land Use	No comprehensive land use coverage was available.	BC developed based on planning district coverage, developable lands coverage (vacant or infill), and undevelopable open space. See Section 2.3.	
Undevelopable Open Space Areas	Multiple open space layers were provided. Interpretation of overlay districts was needed to accurately characterize open spaces as developable or undevelopable.	BC developed based on areas designated as wetlands, NRPO, Wetlands Protection Areas (a subsect of the Wetland Protection District [WPD]), and City-owned parks, greenways, and natural areas. Development is permitted in the Wetland Fringe Area (WFA) and Sweek Pond Management Area, so these areas were excluded as part of the WPD.	
Concept Planning Areas	Planning district and developable (vacant) lands cover- age was only available for the Northwest and Southwest Concept Planning Areas. Input was needed to confirm how concept planning areas should be included in the project extents.	Concept planning areas were included in the project extents. The Basalt Creek Concept Planning Area was included in the hydrol- ogy modeling effort based on existing development coverage only.	
Drinking and Irrigation Wells	Well location information was not available and is neces- sary to obtain rule authorizations and complete a system assessment.	Work to assess rule authorizations and develop a system evalua- tion was deferred. No additional work is needed now.	

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1.2 Datum Conversion

As part of the GIS data review, BC conducted a cursory review of available storm system data. Storm system information (size, material, elevations) was provided in both a structure GIS layer and a pipe GIS layer. Missing data were observed in both layers. BC proposed addressing gaps in rim elevation data by supplementing existing data with rim elevations interpreted from LIDAR. However, use of LIDAR assumes consistent datums (NAVD 88) are being used.

To determine whether a different datum was reflected in the City's GIS, BC conducted an initial comparison of rim elevations from GIS with rim elevations interpreted from LIDAR (NAVD88 datum), and most rim information in GIS appeared to be inconsistent with elevations interpreted from LIDAR (see Figure 1-1). The average elevation difference of approximately 3 to 4 feet is consistent with the datum correction of 3.52 feet between NGVD 29 and NAVD 88.

In July 2016, a decision was made to convert the City's system information to the NAVD 88 datum. Thus, the City universally corrected their system elevation data by +3.52' to align more accurately with the NAVD 88 datum. The system information was updated and provided to BC in August 2016. A follow up review was conducted of the corrected rim elevation data (see Figure 1-2). Although some discrepancies existed, the corrected elevation data appeared more consistent with elevations interpreted from LIDAR. A decision was made to move forward with the corrected elevation data.



Figure 1-1: Original GIS Rim Elevation Comparison with LIDAR (July 2016)







1.3 Reports and Studies

The City's last stormwater master plan was completed in 1972. Identified capital improvement project needs are now outdated no longer reflective of current development activities, population growth, and regulatory drivers.

Throughout the last 10 years, the City has been one of the fastest growing communities in Oregon, which has prompted the need to invest in infrastructure and consider long range planning and policy decisions to support businesses and residential life. BC obtained copies of various planning-level reports and studies prepared since the last stormwater master plan to help inform areas of high growth potential and identify stormwater system deficiencies and needs. Reports and studies reviewed and considered for this master plan update are detailed in Table 1-2.

Table 1-2 Existing Stormwater Planning Documentation and Reports			
Report Date Summary and application to the SMP		Summary and application to the SMP	
Tualatin Drainage Plan Report	1972	Provides background information and historic basis for the need to update the SMP.	
Hedges Creek Wetlands Master Plan	2002	Provides stormwater management recommendations (culvert upsizing under Tuala- tin Road, sediment removal) related to the 29-acre Hedges Creek Wetlands.	
Bridgeport Area Stormwater Master Plan	2005	Provides stormwater system information and a subbasin delineation in the Bridge- port Development Area.	
Southwest Tualatin Concept Plan	2010	Provides guidance for industrial development in southwest Tualatin. Planning dis- trict/ zoning designation is available.	



Table 1-2 Existing Stormwater Planning Documentation and Reports			
Report Date		Summary and application to the SMP	
Basalt Creek Existing Conditions Report	2014	Provides surrounding land use and demographic information for the Basalt Creek Planning Area. Does not provide official planning district/ zoning designation or proposed transportation corridors.	

Section 2: Stormwater Basis of Planning

Design standards related to the sizing and design of stormwater infrastructure are described in the City of Tualatin Public Works Construction Code (PW Standards), dated February 2013. The City often defers to the Clean Water Services (CWS) Design and Construction Standards (2007) and the CWS LIDA Handbook (2009) for water quality and detention facility-specific sizing and design standards.

Additional planning guidelines used to develop the basis of planning for this SMP are described in the City of Tualatin Development Code (TDC) and the Tualatin City Charter, Chapter XI. The TDC, specifically Chapters 3, 5, 6, 7, 8, 71, and 72 define assumptions related to the planning district designations and open space designations that informed the development of land use coverage and hydrologic modeling assumptions for this project. The Tualatin City Charter, Chapter XI, documents protection of city-owned parks and open space and sets limitations on the use of public property for alternative purposes including stormwater management without an approving vote, if such use was not already in place.

Collectively, these documents compose the basis of planning criteria and assumptions used in development of the SMP.

Attachment A, Table A-2 includes a summary of code and additional background data reviewed to establish the stormwater basis of planning criteria.

2.1 Stormwater Regulatory Drivers

Regulatory drivers considered in the context of this SMP include Phase I National Pollutant Discharge Elimination System (NPDES) municipal separate storm sewer (MS4) permit requirements and regulatory drivers associated with the total maximum daily load (TMDL) program and 303(d) listings for receiving waters.

2.1.1 NPDES Permit Requirements

The City is a co-implementer on the CWS watershed-based NPDES permit, along with 12 other jurisdictions in Washington County, for management of stormwater runoff. CWS' NPDES permit was reissued in May 2016 after being administratively extended for seven years after the previous permit expired in 2009.

Implementation of CWS' NPDES permit is outlined in the CWS Stormwater Management Plan (SWMP). Stormwater activities or best management practices (BMPs) are outlined to address the elements of the permit:

- Illicit Discharge Detection and Elimination
- Industrial and Commercial Facilities
- Construction Site Runoff Control
- Education and Outreach
- Public Involvement and Participation
- Post-Construction Stormwater Management

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- Pollution Prevention for Municipal Operations
- Stormwater Management Facilities Operation and Maintenance Activities

Coordination efforts between co-implementers (including the City) and CWS are identified in the SWMP and outlined in more detail in intergovernmental agreements with CWS for specific permit elements. The City maintains IGAs with CWS for erosion and sediment control and system operation and maintenance.

In addition to the permit elements listed above, the reissued NPDES permit requires CWS and co-implementers to prepare a stormwater retrofit strategy, prepare a hydromodification assessment (to address instream channel erosion and modifications), conduct environmental monitoring activities, and develop TMDL pollutant load reduction benchmarks (see Section 2.1.2). These additional requirements will influence the City's stormwater program over the next permit term and will presumably result in increased focus and efforts on stormwater retrofits for water quality improvements, instream natural channel conditions and protection measures, and stormwater design standards to protect receiving waters from increases in pollutant discharge, peak flows, and increased flow duration.

2.1.2 TMDL and 303(d) Listings

The majority (approximately 97%) of the City discharges to the Tualatin River and tributaries. Major tributaries include Nyberg Creek, Hedges Creek, Cummins Creek and Saum Creek. Area along the northern portion of the City discharges north directly to the Tualatin River, whereas the tributaries generally run east-west across the City before discharging into the Tualatin River. The Tualatin River is a major tributary to the Willamette River.

The remainder (approximately 3%) of the City discharges to Basalt Creek, a tributary located in the southern portion of the City, which runs south to Coffee Lake Creek in the City of Wilsonville before discharging to the Middle Willamette River.

Water quality impairment and exceedance of water quality standards in the Willamette and Tualatin Rivers have prompted these rivers and corresponding tributaries to be placed on the State 303(d) list for various parameters of concern. TMDLs have then been developed to address specific sources of pollutant loading. CWS is identified as a discharge management agency (DMA) in the respective Tualatin Subbasin and Willamette Basin TMDLs, and the City is identified as a contributing municipality associated with CWS. As such, TMDL pollutant load reductions (in the form of TMDL benchmarks) are required as part of the CWS NPDES permit compliance and represent another regulatory driver promoting implementation of BMPs to reduce pollutant discharges in stormwater.

The Tualatin Subbasin TMDL was developed in 2001 and amended in 2012 to address various sources of pollutants including stormwater runoff from urbanized areas. Pollutants addressed in the TMDL include temperature, bacteria (*E. coli*), chlorophyll a and pH (total phosphorus is used as a surrogate measure), and DO (ammonia and settleable volatile solids are used as a surrogate measure). Pollutant load allocations are established by source and vary by stream reach and whether the discharge occurs to the tributary or mainstem.

The Willamette Basin TMDL was developed in 2006. Pollutants addressed in the TMDL include temperature, bacteria (*E.coli*), and mercury. Like the Tualatin Subbasin TMDL, pollutant load allocations are also established by source and vary based on the location of such discharge.

Additional water quality impairments relevant to the City are reflected on the effective (2012) 303(d) list for receiving waters within the City. Parameters of concern for the Tualatin River include ammonia, biological criteria, copper, iron, lead, and zinc. Parameters of concern for the Middle Willamette River include aldrin, biological criteria, DDT/DDE, dieldrin, iron, and polychlorinated biphenyls (PCBs). Such parameters represent additional targeted parameters for pollutant reduction with the City's stormwater program, as TMDLs are slated for development for these parameters in the future.



2.2 Design Standards and Criteria

BC reviewed both the City's PW Standards and the CWS Design and Construction Standards (2007) and the CWS LIDA Handbook (2009) to establish planning criteria relevant to the analysis of the City's stormwater system. Planning criteria will help identify where the system has capacity limitations and the basis for design of stormwater projects for water quality, condition improvements, and capacity. Assumptions specific to the development of land use and impervious percentages by land use are described in Section 2.3. Applicable design criteria are referenced in Table 2-1.

Table 2-1. Drainage Standards and Design Criteria			
Criteria	Source	Value	
Water Quality Facility Design	PW Standards (206.8)	Design to requirements of CWS Design and Construction Standards and CWS LIDA Handbook. Specific to the PW Standards, facilities are required to have 4' or 6' vinyl coated chain link fencing.	
Water Quantity Facility Design	PW Standards (206.8) CWS Design and Construction Standards	Design to requirements of CWS Design and Construction Standards. Match pre- and post-development flow for the 2-year, 10-year, and 25-year, 24-hour storm events.	
Pipe Design Storm	PW Standards (206.3)	Design to the 25-year storm event. Surcharge during the 25-year is not permissible. $^{1} \ \ $	
Pipe Size PW Standards (206.4)		10" minimum diameter for pipe from catch basins to the main in the public right-of-way12" minimum diameter for mains in the public right-of-way	
Manning's Roughness	PW Standards (Table 206-8)	Varies by material and shape	
Pipe Material	PW Standards (206.4)	Concrete, PVC, Ductile Iron, and Aluminum Spiral Rib Pipe	
Pipe Cover	CWS Design and Construction Standards	Table 5-2, varies by pipe material	
Structure Spacing	PW Standards (206.4)	250' maximum for 10" pipe; 400' maximum for 12" pipe	
Manhole Size	PW Standards (206.6)	48" diameter minimum	

1. The City's Public Works standards reference the rational method for conveyance design. SBUH was an approved equivalent as discussed with the City during the July 28, 2016 meeting.

In conjunction with their recently reissued NPDES Permit, CWS is undertaking a 3-year, phased approach to update their Design and Construction Standards. The phased approach is proposed to meet new permit requirements related to the: 1) impervious threshold for requiring treatment, 2) prioritization of low impact design approaches (LIDA) and green infrastructure (GI), and 3) strategies and priorities for addressing hydromodification impacts. CWS published their updated Design and Construction Standards to address items 1) and 2) on March 28, 2017 and the updates are scheduled to take affect April 22, 2017. Although most changes proposed now do not directly affect the design standards and criteria being used for the SMP, more significant updates are listed below for reference.

- Updated/ added definitions for LIDA, modify or modification (related to impervious surface), redevelopment,
- Requirements for water quality treatment for development activities that create or modify 1,000 square feet or greater impervious surface, including single family development on lots of existing record.
- Explicit provisions emphasizing use of LIDA and GI in Chapter 4 (Runoff Treatment and Control).
- Adjusted criteria for treatment of existing/ undisturbed impervious area when new/ modified impervious area is applied to a project site. These criteria replace former Table 4-1 of the 2007 CWS Design and Construction Standards.

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- Incorporation of a simplified sizing factor (6%) for sizing LIDA facilities (planters, raingardens) for water quality where onsite infiltration is >2 inches/ hour. This standard was previously in the LIDA Handbook.
- Incorporation of LIDA facility design criteria from the LIDA Handbook directly into the Design and Construction Standards.
- A summary of approved approaches (facilities) to meet water quality and water quantity criteria (new Table 4-1).
- Updated procedures for performance and corrective actions to adhere to the two-year warranty period for water quality or quantity facilities.

It should be noted that CWS will again be modifying their Design and Construction Standards to address hydromodification needs. The targeted timeframe for this phase of the modifications is April 2018.

2.3 Land Use and Impervious Coverage

As described in Section 1.1.2, land use coverage was not available for the City in GIS. Land use coverage is needed to hydrologically evaluate (model) the City and calculate associated stormwater runoff volumes and flows by subbasin. Both existing and future development conditions will be evaluated to identify where flows are expected to increase and inform CIP sizing.

2.3.1 Land Use Development

A preliminary land use coverage was developed based on established planning district boundaries, undevelopable open space areas, and vacant lands subject to future development. Following development of the preliminary land use coverage, BC met with City engineering and planning staff on August 26, 2016 to verify preferred land use categories, actual land use coverage, and impervious area assumptions by land use. Following the meeting, minor adjustments were made related to the institutional land use coverage, undevelopable open space, and vacant lands coverage based on actual site usage. The final land use coverage was verified on October 25, 2016 and is shown in Attachment B, Figure 4.

To develop the land use coverage, planning districts were consolidated into general land use categories. Roadway right-of-way (ROW) is incorporated into the planning district coverage, and therefore incorporated into the land use coverage. One exception is the Oregon Department of Transportation (ODOT) corridor, which was defined separately. Feedback from City staff during the August 26th meeting resulted in an expansion of the institutional land use coverage to include school and medical (hospital) facilities otherwise classified as a commercial planning district. Table 2-2 summarizes the consolidation of planning district boundaries into general land use categories.

Vacant lands were determined based on the City-provided GIS coverage of developable lands. Developable lands were categorized as vacant, infill, or redevelopable. To develop existing land use coverage, vacant lands were defined as those areas that are currently undeveloped and when developed, will increase in impervious surface (and associated runoff volume). Future land use coverage will exclude vacant lands and simulate only the underlining land use coverage. BC reviewed aerial imagery to verify the development condition of the vacant, infill, and redevelopable areas. From this review, areas classified as vacant and infill were used to define the vacant land use coverage. Although areas classified as redevelopable could result in increased impervious coverage when developed in the future, a conservative assumption was made to assume these areas are currently developed. Feedback from City staff refined the vacant lands coverage based on recent development activities.

Undevelopable open space areas were identified based on City-provided GIS coverage of City-owned parks, greenways, and natural areas; the City's Wetland Protection Area (WPA); wetlands (both significant and less significant), and the City's Natural Resource Protection Overlay (NRPO) District. Based on conditions outlined



in the TDC, these areas are unlikely to develop or change from their current site usage (imperviousness). Undeveloped open space areas excluded wetland fringe areas and area covered by the Sweek Pond Management Area, as these areas may be subject to future development.

City-owned parks, greenways, and natural areas are classified separately from the other undevelopable open space areas due to the additional impervious area (parking areas, paths, etc.) on these sites. City-owned parks, greenways, and natural areas are subject to the Tualatin City Charter, Chapter XI. These areas are public property and, per the Charter, may not be used or developed in a way that causes a major change in the properties use or function without a legal vote by the public. The City has interpreted this provision as limiting these areas from being developed, including being used to facilitate the installation of stormwater facilities. Feedback from City staff resulted in the inclusion of private open space areas (golf courses, parks) into this land use category.

Finally, the Basalt Creek planning area is located outside of the city limits but included as part of this SMP. Planning district coverage has not yet been established for this area. A separate land use category (Basalt Creek planning area) was established to reflect existing development conditions in this area. Future growth and development is expected, but the timeframe is unknown. For purposes of this SMP, future development conditions will not be evaluated or assessed hydrologically for this area.

Table 2-2. Land Use Categories and Impervious Percentages				
Planning District Designation	Modeled land use category	Impervious % (existing)	Impervious % (future)	
Low Density Residential	Low-density residential (LDR)	43	53	
Medium Low Density Residential	Medium density residential (MDD)	45	55	
Medium High Density Residential	mealum-density residential (MDR)	40	55	
High Density Residential	Uist density residential (UDD)	50	60	
High Density High Rise Residential	High-density residential (HDR)	50	60	
General Commercial		78	78	
Central Commercial				
Medical Commercial	Commercial (COM)			
Office Commercial				
Recreational Commercial				
General Manufacturing		74	74	
Light Manufacturing	In duratified (IND)			
Manufacturing Business Park	industrial (IND)	74	/4	
Manufacturing Park				
Institutional	Institutional (INS)	35	35	
	Vacant, developable (VAC) ^a	5	Consistent with the underlying land use designation.	
	Open Space (OSP), undevelopable – Parks, Greenways, Natu- ral Areas, Private ^b	5	5	
	Open Space (OSP), undevelopable – WPA, Setbacks, NRPO, Wetlands ^b	4	4	

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Table 2-2. Land Use Categories and Impervious Percentages												
Planning District Designation	Modeled land use category	Impervious % (existing)	Impervious % (future)									
	Transportation (ODOT Corridor)	46	46									
	Basalt Creek/ rural residential	7	7									

a. Vacant land use reflects area with new or infill development potential. Future development conditions assume development of vacant lands consistent with their associated planning district designation.

b. Open space land use reflects area with no foreseeable development potential.

2.3.2 Impervious Percentages by Land Use

Impervious coverage by land use was directly calculated using City-provided GIS coverage of impervious surface and supplemented with City-provided GIS coverage of building footprints and right-of-way. Final impervious percentages by land use category are reflected in Table 2-2.

Impervious surface information in GIS was available for most city area except for the low density residential planning district. Impervious surface coverage reflects building rooftop, pavement, and parking areas. The impervious surface coverage was combined with the right-of-way coverage to yield a total impervious area for each land use category (except the low density residential and the Basalt Creek categories). The percentage impervious was directly calculated from the impervious area and the total area for each land use.

For the low-density residential land use coverage, GIS coverage of the building footprints was combined with the right-of-way coverage to directly calculate the percentage impervious.

For the Basalt Creek planning area, aerial imagery was reviewed to estimate a percent impervious representative of existing land use conditions. Three tax lots were selected at random and the observed impervious surface areas (rooftop, parking areas, driveways) were digitized. The percentage impervious applied to the Basalt Creek planning area was calculated based on the digitized impervious area and the total area for the three tax lots.

For each residential (low-density, medium, density, and high density) land use category, aerial imagery was reviewed to spot check the calculated impervious percentages against observed development conditions. Small, distributed impervious surfaces (patios, decks, detached garages, driveways) specific to residential land use is often overlooked in the delineation of building footprint areas (as used for the low-density residential impervious calculations) or other impervious surfaces in GIS. For each land use category, five tax lots were selected at random and the impervious coverage was estimated and compared with the overall calculated impervious percentage. Results of the aerial verification effort did not result in changes to the impervious percentages based on direct calculations.

Due to the potential for redevelopment and infill amongst the residential land use categories, a separate future condition impervious percentage was defined for the low density, medium density, and high density residential land use categories. Each calculated impervious percentage (reflecting existing development conditions) was increased by 10 percentage points to account for added impervious surface area expected with redevelopment. This increase was made independent from the anticipated development of vacant land use.

The existing and future impervious percentages by land use were compared to values used by surrounding communities to ensure general regional consistency. The percentages were also compared with maximum lot densities defined by planning district in the TDC, which reflect the minimum landscaping requirements. Both comparisons did not result in changes to the impervious percentages estimated for this SMP.



Section 3: Preliminary Stormwater Project Identification

The City opted to develop their SMP using a collaborative approach with engineering, planning, and operations staff to initially assess known stormwater system problems and identify areas where infrastructure improvement, replacement, or retrofit is needed to address an issue. Preliminary stormwater project opportunities were identified through a combination of surveys (distributed to engineering and maintenance staff), a water quality retrofit evaluation, and workshops/ meetings/ site visits with City staff. Portions of the stormwater system that require a modeling approach to evaluate capacity limitations and project concepts were also identified. This overall process allows the City to focus resources and develop information for areas and projects likely to be prioritized in a capital improvement program.

Attachment A, Table A-3 summarizes the results of this collaborative effort including identified preliminary stormwater problem areas and project opportunity areas. Table A-3 includes site visit observations and notes and details related to project concepts and modeling needs.

3.1 Stormwater Surveys

BC provided a stormwater questionnaire to City engineering and maintenance staff in May 2016 to solicit feedback related to the condition and function of the stormwater system. Staff were asked to specifically identify and describe areas of the system that experience regular flooding, need infrastructure replacement, require frequent maintenance, need new infrastructure installed, and experience water quality problems. Staff were also asked to comment on what they consider top priority issues or projects to be addressed in the SMP.

Completed questionnaires, along with a separate GIS layer of stormwater trouble areas maintained by the City, were used to develop a list of preliminary stormwater problem areas. A total of 32 preliminary stormwater problem areas were identified and categorized as follows:

- Capacity (bank overtopping)
- Capacity (other)
- Maintenance
- Erosion
- Infrastructure Needs
- Infrastructure Replacement
- Water Quality

BC and the City reviewed the preliminary stormwater problem areas during a series of meetings from June to October 2016. Areas were qualified for follow-up site visits and/or consideration as a stormwater project opportunity area to be evaluated as part of the SMP. Stormwater problem areas identified based on capacity (bank overtopping) were generally excluded during this review, as stream capacity and natural system flooding was not evaluated as part of this SMP.

Table A-3 provides a comprehensive list of the preliminary stormwater problem areas as identified by City staff.

3.2 Water Quality Retrofit Evaluation

As a co-implementer on the CWS NPDES permit, retrofit of the stormwater system to improve water quality is a primary objective for this SMP. Stormwater retrofits, specifically the installation of water quality treatment in areas not otherwise treated, will be a focus for CWS over the next NPDES permit term and allows the City to aid in the reduction of TMDL and 303(d) pollutants to improve overall water quality conditions in the Tualatin and Willamette Basins.



Retrofit opportunities will focus on the use of low impact development approaches (LIDA) to the extent possible, consistent with CWS' proposed retrofit strategy. LIDA includes the use of raingardens, swales, and planters, which promote infiltration and runoff volume reduction in addition to treatment.

3.2.1 Methodology

BC evaluated opportunities to install water quality facilities or retrofits in conjunction with observed stormwater problem areas (as referenced in Section 3.1), documented capital improvement project needs (per City's 2017-2021 Capital Improvement Plan), and available public lands that would support installation of a stormwater treatment facility.

Aligning water quality retrofits with observed stormwater problem areas allows project concepts to be developed to address multiple objectives. Each preliminary stormwater problem area was discussed with City staff and potential project concepts identified to determine if water quality could be supported. As identified, project concepts were expanded to reflect the installation of new water quality facilities (i.e., raingarden, swale) in conjunction with conventional stormwater infrastructure (pipes, catchbasin) needs. Project concepts were also revised to incorporate redesign or reconfiguration of an existing water quality facility to improve treatment, retention or flow control.

The City's 2017-2021 Capital Improvement Plan included nine identified stormwater projects. Two of these projects qualify as a stormwater retrofit. These projects reflect treatment of large contributing drainage areas using a pretreatment manhole/ proprietary treatment technology to target trash and debris removal. Although use of a proprietary treatment technology is not CWS's preferred retrofit approach, these proposed projects are in a flat and fully developed area of the City with limited opportunity to use a surface-based LIDA. These two projects would meet CWS' outfall retrofit program objectives (CWS 2016 SWMP, Section 7.6). Thus, these two projects were maintained as a stormwater project opportunity for this SMP. It should be noted that the other seven stormwater projects identified in the Capital Improvement Plan are either in progress or already reflected as a preliminary stormwater problem area and being considered in this SMP.

Publicly owned properties, particularly those in a natural or park-like setting often provide opportunity to incorporate water quality treatment into a developed landscape. As described previously, the Tualatin City Charter, Chapter XI limits the use of publicly owned parks, greenways, and natural areas to be used outside of its original intent without a public vote. Therefore, City-owned property <u>not</u> subject to the Charter provisions were identified and evaluated as potential water quality retrofit opportunity areas. These areas included larger parcels without current treatment. Topographic and site usage constraints were considered in the identification of water quality retrofit opportunities, and the resulting, identified areas were generally larger, public parking areas or areas within the road right-of-way.

3.2.2 Results

A total of 15 water quality retrofit opportunities were identified, and 10 retrofit opportunities overlapped with preliminary stormwater problem areas. These water quality retrofit opportunity areas were included in site visits and evaluated as a potential stormwater project opportunity area.

Table A-3 lists identified water quality retrofit opportunities and incorporates the water quality retrofit element into proposed project concepts as applicable. Attachment B, Figure 5 maps the preliminary stormwater problem areas and water quality retrofit opportunities. Figure 5 also details public property considered for use in the water quality retrofit evaluation.



3.3 Site Visits

BC and City staff conducted two site visits to verify preliminary stormwater problem areas and water quality retrofit opportunities, one on June 29, 2016 and one on December 7, 2016. The site visits were used to verify and qualify the problem areas and retrofit opportunities as a stormwater project opportunity to be evaluated and costed in this SMP. The site visits were also used to explore preliminary project concepts.

Prior to each site visit, BC and City staff met to finalize site visit locations, the site visit schedule, and discuss any accessibility or access constraints. Maps were distributed detailing upstream and downstream conveyance. Site visits were documented via meeting minutes and photo logs.

For those locations identified as a problem area due to frequent maintenance needs, effort was made during the site visits to investigate potential sources of pollutant loading. Frequent maintenance needs were often the result of excessive sediment accumulation, debris accumulation, vegetative overgrowth, and backwater conditions. Although maintenance is routinely conducted by the City, select problem areas were identified for consideration as part of a city-wide programmatic stormwater project to proactively inspect and maintain infrastructure at an increased frequency.

3.4 Stormwater Project Opportunity Areas

Following the compilation of stormwater surveys and completion of the water quality retrofit assessment and site visits, a total of 16 stormwater project opportunity areas and two city-wide, programmatic efforts were identified. These areas/ efforts represent the City's initial stormwater project list to be developed and costed as part of the SMP.

Table A-3 identifies the stormwater project opportunity areas and city-wide programmatic efforts. Attachment B, Figure 6 maps the stormwater project opportunity areas and includes a summary of each area by project category(ies). Project categories are as follows:

- Maintenance/ Asset Management reflects areas experiencing more frequent maintenance needs that would be incorporated into a maintenance inspection and cleaning program.
- Maintenance refers to stormwater facilities requiring extensive, one time maintenance.
- Direct replacement refers to the direct replacement of infrastructure that is failing.
- Upsize infrastructure refers to the replacement and upsizing of infrastructure that is capacity limited.
- New infrastructure refers to the installation of new infrastructure, often in locations of pending or future development.
- Water quality retrofit refers to the installation of treatment or flow control to support water quality improvements.

Stormwater project opportunities may be added or removed during stormwater project development. Additionally, the stormwater project opportunity areas may be combined or broken down into phases as project concepts are refined. An upcoming stormwater project planning workshop will be held to discuss and refine these project concepts and opportunity areas.

3.4.1 Programmatic Opportunities

Two city-wide programmatic opportunities were identified to support ongoing assessment and maintenance of existing infrastructure and public water quality facilities. Identification of these activities as a programmatic opportunity means that an annual budget allocation (as opposed to a one-time budget allocation) would be needed to support these efforts. The preliminary project concepts are identified as follows:



- Public Infrastructure Improvements This program would include annual pipe inspections (CCTV inspections), targeted maintenance efforts for pipes and inlets (outside of the scheduled maintenance frequency), and an annual pipe replacement program to address condition deficiencies. Asset age is not currently documented in the City's GIS; however, the City may want to establish a system lifetime age and assume city-wide replacement of the piped infrastructure over a defined timeframe.
- 2. Public Water Quality Retrofits Most public water quality facilities manage runoff from subdivisions or other low density residential areas and are located adjacent to private residences (see Figure 5). Often the public is unaware these facilities exist. Citizen complaints are common and are related to system performance and sizing. The City is considering an ongoing program to review and reengineer existing public water quality facilities to ensure visibility and maximize performance.

3.4.2 Modeling Needs

Five stormwater project opportunity areas were identified where hydraulic modeling of the stormwater system would help inform observed capacity limitations and refine project concepts. These areas were reviewed with City staff on February 2, 2017 and the extent of hydraulic modeling and survey needs were verified. Detail related to the system modeling objectives and extent is outlined in Table A-3.

- 1. Stormwater Project Opportunity Area 4 Manhassat
- 2. Stormwater Project Opportunity Area 5 Boones Ferry Road at Oil Can Henrys
- 3. Stormwater Project Opportunity Area 7 Herman Road
- 4. Stormwater Project Opportunity Area 9 Sagert Street at the Shenandoah Apartments
- 5. Stormwater Project Opportunity Area 10 Mohawk Apartments

3.4.3 Next Steps

Stormwater project development will occur based on the preliminary project concepts outlined in Table A-3.

System survey was completed in April 2017 in support of the hydraulic modeling efforts. Hydraulic modeling for the identified project opportunity areas is scheduled to occur from April to June 2017.

City staff will participate in a project development workshop following completion of the hydraulic modeling efforts. The workshop will be used to review preliminary results from the hydraulic modeling effort and facilitate discussion of the proposed project concepts including programmatic and asset management project concepts. The outcome from this workshop will include a final stormwater project list for costing and inclusion in the SMP.

Section 4: References

City of Tualatin (City). 2016. Capital Improvement Plan 2017 to 2021.

Clean Water Services (CWS). 2016. Stormwater Management Plan

Oregon Department of Environmental Quality (DEQ). National Pollutant Discharge Elimination System (NPDES) Watershedbased Waste Discharge Permit. Issued to Clean Water Services. Effective May 31, 2016.

DEQ 303(d) database. http://www.deq.state.or.us/wq/assessment/rpt2012/search.asp#db. Accessed April 17, 2017.



Attachment A: Matrices

- Table A-1: GIS Data Review and Data Gaps
- Table A-2: Code and Background Data Review
- Table A-3: Stormwater Problem Areas and Project Opportunities



							Table A-1: 0	GIS Data Review and Data Gaps				
Initial Data Request	Source (Received From)	Date Received	Database Name (if applicable)	File Name	Feature Class	Data Type- Base or Storm	Layer Notes (from City)	Datum	Relevant Fields	Initial Observations and Identified Gaps	Outstanding Questions (per 7-28-16 and 8-24-16 mtgs)	Data Assumptions and Gap Resolution
								Base GIS Data				
City Limits	City of Tualatin	5/24/2016 and 8/4/2016	StormMasterPlan.gbd and StormMasterPlan_Additional_D ata.gdb	CITY	polygon	Base	City limits	NAD_1983_HARN_StatePlane_Oregon _North_FIPS_3601_Feet_Intl	acres, status, shape_length, shape_area	All data is populated.	What is the date of the City limits file?	City provided an updated city limits shapefile on 8/4/16 reflecting July 2016 to use as the baseline.
												BC adjusted the baseline city limits in October 2016 per comments from City planning to add an omitted annexation from spring 2016.
UGB	City of Tualatin	5/24/2016	StormMasterPlan.gbd	UGB	polygon	Base	Tualatin's planning area boundary	NAD_1983_HARN_StatePlane_Oregon _North_FIPS_3601_Feet_Intl	area, perimeter, UGB, UGB ID, acres, shape ST area, shape ST length, shape length, shape area	All data is populated. No concept planning areas defined. Boundary does appear to include SW Industrial area, however it is not specifically identified as such.	What concept planning areas should be reflected in the MP? - NW Tualatin Concept Plan (2005) - SW Tualatin Concept Plan (2010) - Basalt Creek Concept Plan (2016)	Concept planning areas to be shown conceptually and included in the subbasin delineation and current condition hydrologic calculations only. City provided planning area shapefile reflecting
	City of	5/24/2016	StormMasterPlan.gbd	parcels	polygon	Base	Subset of May 2016 Metro RLIS release	NAD 1983 HARN StatePlane Oregon	Area. Owner. Owner Address. BLDG	All data is populated. Not clipped to the UGB		concept planning area delineation on 8/4/16 (see "other data" rows at end of table). BC to clip to UGB.
Taxlots	Tualatin	0,21,2010		purceio	polygon	5400		_North_FIPS_3601_Feet_Intl	SQFT, a_t_acres, landuse, lat, lont, gis_acres, shape_length, shape_area	(Tualatin's planning area boundary).		
	City of Tualatin	5/24/2016	StormMasterPlan.gbd	FUNC_CLASS_F	line	Base	Tualatin's functional classification for future collectors and arterials	NAD_1983_HARN_StatePlane_Oregon _North_FIPS_3601_Feet_Intl	Street_name, type, class, shape_length	All data is populated. Clipped to UGB.	Do the future collectors and arterials extend to the UGB? Outside UGB?	No additional future collector delineation within or outside of UGB. Use data as available.
-	City of Tualatin	5/24/2016	StormMasterPlan.gbd	FUNC_CLASS	line	Base	Tualatin's functional classification for existing collectors and arterials	NAD_1983_HARN_StatePlane_Oregon _North_FIPS_3601_Feet_Intl	street_name, functional class name, functional class code, owner, shape_length	All data is populated. Clipped to city limits.		BC to use unclipped regional collector and arterial data from Metro.
Roads and Roadway Classifications	City of Tualatin	5/24/2016	StormMasterPlan.gbd	FREEWAYS	line	Base	Subset of RLIS freeways layer	NAD_1983_HARN_StatePlane_Oregon _North_FIPS_3601_Feet_Intl	I street name, ftype, length	All data is populated.	Does City have ODOT ROW?	To the extent ODOT area appears to drain to City system, BC will delineate subbasins accordingly. For mapping purposes, subbasins composed primarily of ODOT area will be shown as "outside of study area". City provided ROW shapefile on 8/4/16 (see
	City of Tualatin	8/4/2016	StormMasterPlan_Additional_D ata.gdb	ROW		Base	Polygon file of ROWs.			Includes both ODOT and city, possibly county. Extends beyond City limits and UGB.		below). BC to use ROW shapefile to define ODOT ROW and County ROW that are not specifically modeled unless the City's subbasin
Existing Land Use or Impervious Coverage	City of Tualatin	5/31/2016 and 7/21/2016	StormMasterPlan_2.gdb and DevelopableLands.shp	DevelopableLand	polygon	Base	Shows net developable land within Tualatin. This layer was derived from Metro's Regional Vacant Lands inventory (2011) using local knowledge to correct errors of omission and commission. Currently updated through 2015. Land deemed "constrained" was removed from the inventory and the remainder categorized into the following categories: vacant, infill and redevelopable. Lands currently considered "developed" are not included in this dataset. 7/7/16 - Constrained lands were defined as 100-year floodplain, floodway, NRPO, 50-foot buffer on all streams and wetlands, steep slopes. Constrained lands were built using the RLIS stm_line layer and could be rebuilt using the also-provided "Streams" layer. 7/7/16 - Developable land is categorized - Vacant, Redevelopable, Infill, Null - What do these mean, which should we use to reflect land that is undeveloped and can develop? (BC to spot check against aerials). Net vacant land within Tualatin. Parcels deemed entirely vacant (no noticeable improvements) regardless of size are included as well as the vacant portions of parcels greater 1/2 acres.Net infill land within Tualatin, OR. Vacant portions of parcels totaling less than 1/2 acre. Land	NAD_1983_HARN_StatePlane_Oregon _North_FIPS_3601_Feet_Intl	Dev_type, Shape_area	Does not indicate ownership of the ROW. City did not provide existing land use coverage. Land use coverage will have to be developed using developable lands. Vacant lands appear to be empty lots/fields which are available for development. Redevelopable lands often contain existing structures (parking lots, buildings, etc.) or require fill/grading (e.g. the old quarries in the SW Industrial Area). Only 7 areas identified as infill, mostly small parcel and generally vacant.	Should constrained lands be removed based on the Streams layer as opposed to the stm_line layer? In the designation of vacant and redevelopable lands, confirm the difference in how these lands were assigned? Should a vacant land use classification be used for all developable land categories (including infill) or only those large parcel new developments?	delineation extends. BC/ City staff met with planning on August 24, 2016 to confirm land use assumptions. Based on outcome from meeting, BC created a land use coverage based on their planning districts, undevelopable open space, and developable lands deemed vacant. See specific designations described below. Vacant lands (excluding those defined as redevelopable) to be used to define lands developing into a future land use.

							Table A-1: C	GIS Data Review and Data Gaps				
Initial Data Request	Source (Received From)	Date Received	Database Name (if applicable)	File Name	Feature Class	Data Type- Base or Storm	Layer Notes (from City)	Datum	Relevant Fields	Initial Observations and Identified Gaps	Outstanding Questions (per 7-28-16 and 8-24-16 mtgs)	Data Assumptions and Gap Resolution
Existing Land Use or Impervious Coverage (continued)	City of Tualatin	5/31/2016	StormMasterPlan_2.gdb	impervious	polygon	Base	Impervious surface mapping for commercial & industrial land, schools, churches and multi-family sites	NAD_1983_HARN_StatePlane_Oregon _North_FIPS_3601_Feet_Intl	Type, Shape_area	All data is populated. No impervious surface mapping for residential planning districts.	Per TDC Chapter 5, a buildable density is provided per residential planning district in code but not an impervious percentage. How should density be equated to an impervious percentage? Should mapped impervious be used to develop impervious percentages rather than local data?	Impervious percentage by planning districts are not available. The City wishes to calculate them. Literature values are not preferred. Based on outcome from August 24, 2016 meeting, BC directly calculated impervious percentage by planning district using impervious coverage information where available. For the low density residential planning district (where mapped impervious coverage is not available), impervious percentages were calculated based on 1) rooftop and roadway coverage and 2) building density for residential planning districts. BC used aerials to truth check impervious coverage for residential planning districts. BC proposed impervious percentages by land use category for existing and future model development.
Zoning	City of Tualatin	5/24/2016	StormMasterPlan.gbd	PLANDIST	polygon	Base	Tualatin's planning districts. Tualatin is a "one map" city.	NAD_1983_HARN_StatePlane_Oregon _North_FIPS_3601_Feet_Intl	CZONE, CLASS, ACRES, Zone Name, Shape_Length, Shape_Area	All data is populated. Existing and future land use to be based on zone name designation. Classes of land use include Residential, Commercial, Industrial, and Institutional. Zone names include: Central Commercial, General Commercial, General Commercial, General Commercial, Industrial, and Institutional, Zone names include: Central Commercial, General Manufacturing, High Density Residential, Institutional, Light Manufacturing, Low Density Residential, Manufacturing Business Park, Manufacturing Park, Medical Commercial, Medium High Density Residential, Office Commercial, Recreational Commercial, Vacant (Infill, Vacant, Redevelopable) Parks, Open Space, and Natural Area	Have planning district coverages been established for concept planning areas? Does the City have impervious assumptions by planning district that include roads?	Land use categories based on consolidated planning districts. Categories include Industrial, Commercial, Institutional, High Density Residential, Medium Density Residential, Low Density Residential. Refined planning district (zoning) coverage not available for all concept planning areas. Existing land use based on vacant and open space designation to be used in existing hydrologic calculations. Basalt Creek concept planning area to be modeled based on existing impervious coverage (per aerials). Institutional land use coverage refined during meeting with planning on August 24 to include schools and hospitals.
Topographic	City of Tualatin	5/24/2016	StormMasterPlan.gbd	Contours_2ft	line	Base	Built by CWS primarily from 2014 LIDAR	NAD_1983_HARN_StatePlane_Oregon _North_FIPS_3601	elevation	All data is populated. Not clipped to the UGB (Tualatin's planning area boundary).		BC to clip to area surrounding UGB.
Contours	City of Tualatin	5/24/2016	StormMasterPlan.gbd	Contours_10ft	line	Base	Built by CWS primarily from 2014 LIDAR	NAD_1983_HARN_StatePlane_Oregon _North_FIPS_3601	elevation	All data is populated. Not clipped to the UGB (Tualatin's planning area boundary).		BC to clip to area surrounding UGB.
LIDAR	City of Tualatin	6/6/2016 and 6/14/16	LIDAR	LIDAR, subfolders (45122c6, 45122c7, 45122c8, 45122d6, 45122d7, 45122d8)	DEM	Base	Contains gridded LIDAR data for Tualatin and the surrounding area.	GCS_NAD_1983_2011. NAVD88 vertical datum	elevation	The 45122c7 grid omitted from initial data submittal. This data is in the NAVD88 vertical datum where most other stormwater structures are in NGVD 29.		
Basin Boundaries	City of Tualatin	5/24/2016	StormMasterPlan.gbd	strm_basin	polygon	Base	Major stream basins: Cummins Creek, Hedges Creek, Nyberg Creek, Saum Creek, Seely Ditch, Tualatin River. 7/7/16 - How were the basins delineated (automated, per HUC boundaries, etc.? The layer "strm_basin" is of unknown provenance with no documentation. Project should probably use the CWS basin data.	NAD_1983_HARN_StatePlane_Oregon _North_FIPS_3601_Feet_Intl	area, perimeter, basin, basin ID, basin name, acres, shape ST area, Shape ST length, shape length, shape area	All data is populated. Basin delineation varies from CWS basin delineation throughout the city.	Will the basin differences preclude our subbasin delineation efforts? Should one data source be relied on over another, given that the subbasin boundaries will be refined for modeling purposes?	Major basin and subbasin delineation is not considered accurate. BC to use CWS basin data to aid in new subbasin delineation effort for hydrologic analysis.
	BC/Clean Water Services City of	5/16/2016 6/6/2016	2015 6inch Air Photos	subbasins Multiple files received.	polygon	Base	Sub-basins generated from merging polygons in "subbasins.shp" from Clean Water Services, used to create project kick-off map Aerial photography from 2015. 6 inch resolution.	none	area_, perimeter, basin_id, bas_name, acres, shape_area N/A	All data is populated. Basins are smaller than strm_basin. Do not extend into concept planning areas. Full coverage within city limits. Few tiles in nearby		
Aerial Photos	Tualatin City of	5/24/2016	StormMasterPlan.gbd	Soils	polygon	Base	Subset of Metro RLIS layer	NAD_1983_HARN_StatePlane_Oregon	AREA, CODE, CLASS, county,	town of Sherwood are missing. Missing hydrologic soil group (A, B, C, D) for all soils.	What does the class field represent? What	BC to use NRCS soil information to develop GIS
Soils	Tualatin							_INDITE_FIPS_3601_FEET_INTI	LASS.	translate to soil reports.	lades die Code field represent?	coverage by hydrologic soll type. Gaps in hydrologic soll group coverage to be
										File is not clipped to planning area.		interpreted from surrounding soil type.

							Table A-1: G	IS Data Review and Data Gaps				
Initial Data Request	Source (Received From)	Date Received	Database Name (if applicable)	File Name	Feature Class	Data Type- Base or Storm	Layer Notes (from City)	Datum	Relevant Fields	Initial Observations and Identified Gaps	Outstanding Questions (per 7-28-16 and 8-24-16 mtgs)	Data Assumptions and Gap Resolution
	City of Tualatin	5/24/2016	StormMasterPlan.gbd	waterbodies	polygon	Base	Subset of layer created by Metro and Watershed Sciences from LIDAR data. Layer overlaps with streams layer.	NAD_1983_HARN_StatePlane_Oregon _North_FIPS_3601_Feet_Intl	WB number, type, sub-area, source create date, created by, modification date, modifier, modification source, notes, shape ST area, Shape ST length, shape length, shape area	, Reflect major waterbodies. Sub-area is completely blank (null), all modification details are blank (null). No names are given, even for major water bodies such as Lake Oswego.	Should this layer be used for any reason?	Layer will not be used in mapping.
Streams and Water Bodies	City of Tualatin	5/24/2016	StormMasterPlan.gbd	streams	line	Base	Subset of layer created by Metro and Watershed Sciences from LIDAR data. This layer has better positional accuracy, but it has not been released on RLIS. 7/7/16 - Should this layer be used versus the stm_line? The layer "streams" is quite a bit better in terms of positional accuracy and is better registered with the aerial photography, LIDAR and contour data we've provided. I'd recommend using this layer over Metro's stm_line	NAD_1983_HARN_StatePlane_Oregon _North_FIPS_3601	segment number, WS_ID, IN_Metro, Hydro ID, Is_Piped, pipe ID, pipe SRC, NHD code, FCODE_DESC, name, LLID, HUC12 LIDAR, subarea, source, create date, modification date, modifier, modification source, motes, type, period, shape length	817 of 3391 streams are missing LLID.		BC to use this layer to define and map waterbodies in the City.
	City of Tualatin City of	5/24/2016 5/24/2016	StormMasterPlan.gbd StormMasterPlan.gbd	Ponds stm_line	polygon line	Base Storm	Areas of year-round ponded or standing water within Tualatin. Overlaps with some wet ponds in public water quality facilities. Streams, Subset of Metro RLIS layer	NAD_1983_HARN_StatePlane_Oregon _North_FIPS_3601_Feet_Intl NAD_1983_HARN_StatePlane_Oregon	NAME, Shape_Length,Shape_Area Length, shape_length	a 21 of 29 are missing names. All data is populated	Is missing information due to the fact no pond names exist?	Layer will not be used in mapping.
Parks and Open Space Mapping	Tualatin City of Tualatin	5/24/2016	StormMasterPlan.gbd	Parks_Greenways_Nat ural_Areas	polygon	Base	All city-owned parks, greenways and natural areas. Some overlap with WPD and NRPO.	North_FIPS_3601_Feet_Intl NAD_1983_HARN_StatePlane_Oregon _North_FIPS_3601_Feet_Intl	NAME, ACRES, TYPE, Shape_Length, Shape_Area	All data is populated	Are these areas assumed to be undevelopable? Are the greenways and natural areas included in shapefile designated as significant? How may parks and greenways by used to support stormwater management? (see City	Areas represent undevelopable open space for purpose of land use coverage. Include in open space land use coverage. Additional discussion and legal interpretation of city charter required to verify how/ if public open space may be used for stormwater management.
	City of Tualatin	5/24/2016	StormMasterPlan.gbd	WPD	polygon	Base	Tualatin's Wetland Protection District. Sweek Pond Management Area and Wetlands Fringe Areas are identified in shapefile.	NAD_1983_HARN_StatePlane_Oregon _North_FIPS_3601_Feet_Intl	area, perimeter, WPD, WPD ID, type acres, shape ST area, shape ST length, Shape length, shape area	, All data is populated. Per Chapter 71, development may occur within the WPD in areas defined as Sweek Pond Management Area (SPMA) and Wetland Fringe	charter) Should this layer be used to define open space area (unlikely to develop or redevelop)?	Wetland Protection Area (WPA) only to be used in open space land use coverage. Most WPA already reflected in NRPO and wetland
Wetlands and Sensitive Areas	City of Tualatin	5/24/2016	StormMasterPlan.gbd	Wetlands	polygon	Base	1996 LWI updated through 2008 for any wetland fills, creation and delineations. 7/7/16 - Why aren't all wetlands covered by NRPO? Only certain "significant" wetlands are included in the NRPO. The criteria for this can be found in Tualatin Development Code Chapter 72: Natural Resource Protection Overlay District	NAD_1983_HARN_StatePlane_Oregon _North_FIPS_3601_Feet_Intl	area, perimeter, wet, wet ID, w_1, acres, shape ST area, Shape ST Length, shape length, shape area	29 missing area, 23 missing perimeter and WET (What is WET?), 25 missing w_1 (What is w_1?)	Should this layer be used to define open space area (unlikely to develop or redevelop)?	Assume all are undevelopable and include in open space land use coverage. Per meeting 8/24/16, less significant wetlands (outside of NRPO and included in this shapefile) should also be considered undevelopable.
	City of Tualatin	5/24/2016	StormMasterPlan.gbd	NRPO	polygon	Base	Tualatin's Natural Resource Protection Overlay Districts. 7/7/16 - Why doesn't it include parks and wetlands? How is this area managed and used by the City? Are there constraints on development or the installation of SW management facilities here? The definition of NRPO was provided in the layer's metadata. It is also available (in more depth) in Tualatin Development Code Chapter 72: Natural Resource Overlay District (NRPO)	NAD_1983_HARN_StatePlane_Oregon s _North_FIPS_3601_Feet_Intl	Acres, Resource Type, NPRO Class, Site Code, x_coord, y_coord, Resource Name, shape_length, shape_area	All data is populated. Coverage does not include parks and all wetlands. Per Chapter 72.060, minor public enhancements may be installed but no other significant development activity.	Should this layer be used to define open space area (unlikely to develop or redevelop)?	Use to supplement open space land use coverage.

	Table A-1: GIS Data Review and Data Gaps											
Initial Data Request	Source (Received From)	Date Received	Database Name (if applicable)	File Name	Feature Class	Data Type- Base or Storm	Layer Notes (from City)	Datum	Relevant Fields	Initial Observations and Identified Gaps	Outstanding Questions (per 7-28-16 and 8-24-16 mtgs)	Data Assumptions and Gap Resolution
	City of Tualatin	5/31/2016	StormMasterPlan_2.gdb	wr_v_pod_public	point	Base	Oregon Water Right Points of Diversion - Statewide point dataset published by Oregon Water Resources Department 7/7/16 - Per DH - We are going to assume DEQ's data is correct and ask that you use that data source (DH)	NAD_1983_Oregon_Statewide_Lambe rt_Feet_Intl	e use_code, use_code_description, rate_cfs, max_rate_cfs, acre_feet, acre_feet_est, max_acre_feet, source, tributary_to, streamcode	This data appears to reflect surface water diversions and not drinking water wells. Point shapefile. Contains many more fields than wr_v_pou_public.	How does the City want to address UIC rule authorization or UIC retrofits in the Master Plan?	Per 7-21-16 call, rule authorization activities associated with Phase 005 will not be conducted. UICs deemed a maintenance concern to be addressed with CIP development.
Drinking Water and Irrigation Wells	City of Tualatin	5/31/2016	StormMasterPlan_2.gdb	wr_v_pou_public	polygon	Base	Oregon Water Right Places of Use - Statewide polygonal dataset published by Oregon Water Resources Department	NAD_1983_Oregon_Statewide_Lambe rt_Feet_Intl	e snp_id, shape_area, use_code, use_code_description, remarks	This data appears to reflect surface water intakes. Polygon shapefile. What is pou_display, app_char, app_nbr, permit_char, permit_number, cert_nbr, claim_nbr?	See above.	
J	City of Tualatin	5/31/2016	StormMasterPlan_2.gdb	OR_Groundwater_DWS As_ORLAMBERT_Ver5_ 09JAN2015	polygon	Base	Drinking water source areas - Statewide polygonal dataset published by Oregon Department of Environmental Quality	NAD_1983_Oregon_Statewide_Lambe rt_Feet_Intl	e pws_id, Tinwsys_na, tinwsf_nam, src_label, epa_method, or_method, comments, area, perimeter, acres, actv_stat	Contains only major wells for the state of Oregon. Does not reference ASR wells. Two wells are located within Tualatin city limits for Tri-County Industrial Park with times of travel between 1 and 15 years. This data does not appear to reflect all drinking water wells. Unknown acronyms/abbreviations (tinwsys_is, fips_cnty, sens_zone)	See above.	
	City of Tualatin	5/24/2016	StormMasterPlan.gbd	BASALTCREEK_JURIS	polygon	Base	The Basalt Creek Concept Plan boundary is provided as a proposed approximate jurisdictional boundary. 7/7/16 - City will provide data once they have more accurate information to provide.	NAD_1983_HARN_StatePlane_Oregor _North_FIPS_3601_Feet_Intl	n acre, future_jurisdiction, shape_length, shape_area	All data is populated. Approximate road alignment and planning districts still required.	When will planning district and road information be made available?	No road or planning districts established. BC to move forward with subbasin delineation efforts and existing condition hydrologic calculations using current information/ aerial
	City of Tualatin	5/31/2016	StormMasterPlan_2.gdb	TroubledSpots	point	Base	Point dataset of locations prone to seasonal flooding; identified during "kick-off" meeting 7/7/16 - Will update and coordinate with ops for areas (DH)	NAD_1983_HARN_StatePlane_Oregor _North_FIPS_3601_Feet_Intl	n notes	Trouble spots as points with notes, but missing polygons to cover whole area of flooding issues. Mapped areas vary from identified hot spots and received surveys.	When will data be received? Have locations been internally vetted to ensure they are representative of storm system flooding and not floodplain inundation?	Verification of impervious. Shapefile used in the vetting and determination of stormwater problem areas and modeling needs (see Table A-3).
Other	City of Tualatin	8/4/2016	StormMasterPlan_Additional_D ata.gdb	TroubleAreas	polygon	Base	Polygon shapefile of identified trouble areas.			13 areas identified: -Nyberg Ln and Stafford Hills Club -Tualatin Sherwood Rd and Martinazzi Ave outfall south of Fred Meyers -Blake St east of Martinazzi - Outfall south from Dakota Chieftain greenway -Blake St east of Martinazzi - Outfall north of street -Behind Oil Can Henry's and Casa de Robles Apartments - adjacent to RR track -End of 125th Ct - east side (Caruso Products) -Greenspace between Boones Ferry Rd and Siuslaw Ln -Borland Rd south of Meridian Park Hospital -Herman Rd (between Tualatin Rd and Teton) -Sagert and 93rd Ave -Warm Springs St at Elks Club (8350 SW Warm Springs) -East side of 124th Ave north of Leveton Rd -End of SW Piute Ct Also contains brief descriptions of each problem area. Does not reflect Manhassat or Sandalwood (previously discussed).		Shapefile used in the vetting and determination of stormwater problem areas and modeling needs (see Table A-3).

							Table A-1: G	IS Data Review and Data Gaps				
Initial Data Request	Source (Received From)	Date Received	Database Name (if applicable)	File Name	Feature Class	Data Type- Base or Storm	Layer Notes (from City)	Datum	Relevant Fields	Initial Observations and Identified Gaps	Outstanding Questions (per 7-28-16 and 8-24-16 mtgs)	Data Assumptions and Gap Resolution
	City of Tualatin	8/4/2016	StormMasterPlan_Additional_D ata.gdb	building_footprints	polygon	Base	Contains footprints of buildings within city limits and a portion of SW Concept Plan Area.			Includes buildings from all land uses including residential. - 7524 total buildings identified. - 6108 are missing land use class. - 6050 are missing addresses		To be used in the calculation of impervious coverage by planning district.
Other (continued)	City of Tualatin	8/4/2016	StormMasterPlan_Additional_D ata.gdb	tualland	polygon	Base	City owned property			Contains types (Accessway, Greenway, Management Land, Natural Area, Park, Parking Lot, Public Storm Drainage, Right-of-way, Street Plug, Utility, Water Quality Facility, Water Reservoir) and property names.		To be used to help identify area with the potential to install stormwater treatment/ conveyance/ detention systems as part of CIP development.
	City of Tualatin	8/4/2016	StormMasterPlan_Additional_D ata.gdb	NW_Concept_Plan_Are	polygon	Base	Polygon file of NW Concept Planning Area.					To be used to define concept planning area boundary and project extents.
	City of Tualatin	8/4/2016	StormMasterPlan_Additional_D ata.gdb	SW_Concept_Plan_Are a	polygon	Base	Polygon file of SW Concept Planning Area.					To be used to define concept planning area boundary and project extents.
	City of Tualatin	4/3/2017	Tualatin_Land.gbd	Tualatin_Land	polygon	Base	Revised city-owned property			Updated version of tuallands. Changes include revisions to parks, greenways, and natural areas.		TBD. Currently used for the water quality assessment.
								Storm GIS Data				
	City of Tualatin	5/24/2016 and 8/4/2016	StormMasterPlan.gbd and StormMasterPlan_Additional_D ata.gdb	stormpt	point	Storm	Storm structures (e.g., manholes, catch basins, outfalls, etc.) & also contains UICs (Drywell=Yes) 7/7/16 - Rim elevations ranged from 300+ to 100+ - is that amount of drop expected? Are there areas/ features where	NAD_1983_HARN_StatePlane_Oregon _North_FIPS_3601_Feet_Intl	asset ID, asset type, sump, as built, WQ, IEO, IEIE, IEW, IEIN, IEIS, rim elevation, bottom elevation, depth, owner, jetbook, OP ID, dry well,	Asset types of interest are ditch inlet, catch basin, clean out, flow structure, culvert in, culvert out, manhole, outfall and UICs. Relevant fields include: RimElev. IEO, IEIE, IEIW, IEIN,	Does the City still wish for the NAVD88 datum to be used for the master plan? What time frame should be expected for	Missing rim elevations to be surveyed (if surveyor is obtaining other system information) or estimated from LIDAR.
Piped Storm Drainage System							datum issues may be expected? Yes, that range of rim elevations is to be expected. All elevations (when available) were taken from the relevant public works asbuilts. It is assumed that most of these were tied to NAVD27, but Tualatin's code allows for "any known datum" and the datum is often not specified in the asbuilts.		diversion	IEIS, Asset_id Attributes of interest include invert elevations in/out, bottom elevations or rim elevations. The 10 UICs are missing bottom elevations, and 1,670 culverts/MH/outfalls are missing IEOs, see "DataOverviewMap_34x44.mxd" for visual representation. Various structures are also missing RIM elevations.	making the datum correction? What does the field "Jetbook" refer to? Contains entries such as Blue-SD, Gray-SD, Red-SD, etc.	City provided converted data on 8/4/16. Converted data appears to have elevations 3.52' higher than previous data to align with the NAVD88 vertical datum. BC compared updated rim elevations to LIDAR. Results documented in TM1.
	City of Tualatin	5/24/2016 and 8/4/2016	StormMasterPlan.gbd and StormMasterPlan_Additional_D ata.gdb	stormli	line	Storm	Storn lines	NAD_1983_HARN_StatePlane_Oregon _North_FIPS_3601_Feet_Intl	a asset ID, storm line type, storm line material, diameter, length, slope, as built, upstream asset ID, downstream asset ID, upstream elevation, downstream elevation, owner, jetbook, shape length	Over 2,000 lines are missing either upstream or downstream elevations (inverts), see "DataOverviewMap_34x44.mxd" for visual representation. 201 pipes have missing/unknown storm line material. 197 pipes are missing diameters. Other missing elements that can be determined using inverts include: slope, length.	Does the City still wish for the NAVD88 datum to be used for the master plan? What time frame should be expected for making the datum correction?	City provided converted data on 8/4/16. Converted data appears to have elevations 3.52' higher than previous data to align with the NAVD88 vertical datum.
	City of Tualatin	5/24/2016	StormMasterPlan.gbd	ditches	line	Storm	Storm water conveyance ditches - THIS IS OUTDATED	NAD_1983_HARN_StatePlane_Oregon _North_FIPS_3601_Feet_Intl	n			Do not use.
Open Channel Drainage System	City of Tualatin	5/31/2016	StormMasterPlan_2.gdb	ditches	line	Storm	Storm water conveyance ditches. 7/7/16 - Is cross section information available? There is sometimes cross section information available in the asbuilt series the ditch has been captured from. IF such info would be helpful, we could search the asbuilts and provide those that are relevant.	NAD_1983_HARN_StatePlane_Oregon _North_FIPS_3601_Feet_Intl	n asset ID, asset type, as built, length ft, owner, shape ST length, shape length	All data is populated. No cross-sectional information, no elevation information.		BC to use LIDAR and field survey to develop channel cross sections for modeled portions of the system. As-built information to be provided by the City where available.
	City of Tualatin	8/5/2016	StormMasterPlan_Additional_D ata.gdb	Ditches		Storm	Storm water conveyance ditches.			Still missing cross-sectional data. Appears no changes have been made from previously received shapefile.		_
Public Water Quality Facilities	City of Tualatin	5/24/2016	StormMasterPlan.gbd	wq_fac	polygon	Storm	Tualatin's public water quality facilities. 7/7/16 - Is area served delineated? Current delineation reflects footprint area The area served has not been delineated, but could derived for most of the facilities assuming the "area served" would be more-or-less the subdivision platt it came from.	NAD_1983_HARN_StatePlane_Oregon _North_FIPS_3601_Feet_Intl	asset ID, facility type, water quality facility name, acres served, as built, date completed, WQF number, WQF notes, X coordinate, Y coordinate, impervious surface, address, shape length, shape area	Polygon file reflecting footprint. 33 missing acres served, 2 missing as built, 9 missing completion date, 8 missing WQF number, 42 missing WQF notes (others include notes about dimensions, volume, etc.), impervious surface attribute either "null" or "zero". No delineation of areas/acres served provided.	Is additional information available from CWS? Would the City be able to provide the drainage area of each public facility (in orde to evaluate retrofit potential for water quality).	Drainage areas for public facilities not readily available. May obtain from City following CIP workshop and identification of potential water quality CIPs/ retrofits. r City provided tualland GIS shapefile to distinguish all areas and facilities that may be considered for stormwater CIP development.
Private Water Quality Facilities	City of Tualatin	5/24/2016	StormMasterPlan.gbd	PWQF	point	Storm	Tualatin's private water quality facilities 7/7/16 - What does the field PWQF_GEO refer to? It's a Boolean attribute that indicates whether or not we have identified exactly where the private water quality facility is located on the parcel. We have some records of private water quality facilities but it is not known to us where they are exactly located (PWQF_GEO = 'No')	NAD_1983_HARN_StatePlane_Oregon _North_FIPS_3601_Feet_Intl	PWQF_ID, PWQD_TYPE, WQP_ID	Point file. Does not contain any information related to size/area served. 12 Missing WQP_ID, not sure if relevant.	What fields are used by the City to track active facilities and maintenance needs? Is this information available from CWS?	

				Table A-2: Code and Backg	round Data Review	
Initial Data Request	Data Received and Reviewed	Data Source	Date Received	Information Summary	Outstanding Questions (per 7-28-16 and 8-24-16 mtgs)	
List of stormwater-related CIPs	None Received			No data to date	Will we be receiving this data?	Update
	Two completed surveys and storm hot	City	6/2/2016	Survey - 1) Bert, included maintenance problem areas, and 2) Engineering Staff	Are there current stormwater CIPs that should be reflected in the MP? Should maintenance-related projects be included in CIP?	Current
	spot list	ony	0, 2, 2010			luonan
				Storm area hot spots list includes 12 locations (roads or intersections) and reference storm infrastructure (ditch		Problem study p
Completed staff survey, listing						study, p
drainage problem areas and water quality concerns – compiled by				Surveys included general area reference, but limited detail regarding scope and scale of problem. Some areas appear to be floodplain and natural system related instead of system capacity issues.		Mainter schedul
staff				Storm area hot spot locations and survey reference locations vary from mapped problem areas.		
				Current problem areas include areas currently being addressed with other projects (wetlands behind Fred Meyer) and general natural system/ floodplain flooding.		
	Manhasset Photos	City	6/2/2016	Manhasset system flooding from 12-8-15 storm event.	Are other system flooding photos available related to other problem areas?	Limited
						Photos
						during a
Photos/ information reflecting						Photos
observed system flooding or capacity deficiencies	Manhasset Survey and Easement	City	6/29/2016	Manhasset property survey (1971 and 1996).	Survey information is prior to current development. Are there more recent asbuilts, private	No addi
	Information			Manhasset area survey (1986 and 1989).		ιο ραυπ
				Ecompatinformation (UPC) and TI 100/200 Dated 1097 and 1005	Should private system modeling be conducted/ considered as part of the master plan? Only where problem area is leasted?	Survey of
				Lasement mornauon (073) and 12 100/200. Dated 1387 and 1383	provieni area is iocateu :	
City Organizational Chart	City Organization Chart 2015-16	City	6/2/2016	Organization chart provided at department head level. Phone directory also provided.		Points o
	City completed data needs list - direct	City	6/2/2016	Engineering 0.5 fte and Maintenance 2 fte	Is current staff available to support implementation of the MP and meet maintenance	Mainter
Stormwater program staffing	documentation				commitments?	unlikely
allocations					Is additional staff needed or warranted?	City stat
	City completed data needs list - direct	City	6/2/2016	WQF – inspections 1 every 4 years, 25% of facilities inspected each year (Bethany). See maintenance program	How does the city currently inspect/ensure inspection and maintenance of private water quality BMP/s2 Should this he a future consideration? Are public facilities inspected at came frequency?	Mainter
	documentation			report nom bert.	Bier St Should uns de a luttre consideration? Are public facilities inspected at same nequency?	Public fa
					The report refers to maintenance of vegetated facilities being contracted. Does the City want to take	once ev
Stormwater maintenance						No time
procedures, frequencies and					Does the City maintain a time sheet reporting system to track time spent with each activity?	
schedules (street sweeping, public water quality facility maintenance,					Is sweeping conducted by the City and is stormwater program budget spent on sweeping currently?	
private water quality facility inspection)						
• •						
	Collection System Maintenance Ouarterly Report	City	6/2/2016	Report identifies annual targets for pipeline cleaning, manhole maintenance, catch basin cleaning, TV inspections, water quality manhole cleaning, vegetated facility maintenance. filter maintenance, detention facility		Mainter
				maintenance, and sweeping.		

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I stormwater system information accounts for any known system improvements.

stormwater CIPs to be reviewed for potential inclusion in the MP. ed stormwater problem areas to be mapped and investigated during site visits.

m areas due to capacity deficiency, maintenance concern, or infrastructure need will require more focused possible survey, and possible hydraulic modeling.

nance related CIPs to be considered if proposed maintenance frequency or activity is outside current ile.

I photos of active flooding are available.

to be used to reference potential source of problem area. (BC staff took additional images of Manhassat a site visit with city staff on 6-29-16).

to be used to help validate system hydraulic models.

itional asbuilt information available. Data to be used to confirm drainage patterns and contributing area ic system.

data will supplement available information as required.

of contact

nance activities and frequencies are mandated by CWS. Maintenance staff is lean, but additional staff is y. City will likely contract out additional maintenance via CIP.

f allocations will inform staffing assessment as part of the financial evaluation.

nance responsibilities will be evaluated when considering additional staffing needs.

facilities include subdivisions and may be a focus of a retrofit program. Public facilities are inspected very four years. Maintenance obligations to be accounted for in staff evaluation.

e sheet reporting system. Staff evaluation to use average time/ activity referenced in other master plans.

nance responsibilities will be evaluated when considering additional staffing needs.

				Table A-2: Code and Backg	round Data Review	
Initial Data Request	Data Received and Reviewed	Data Source	Date Received	Information Summary	Outstanding Questions (per 7-28-16 and 8-24-16 mtzs)	
	Link provided: Tualatin Development Code (TDC) Chapter 14 - Drainage	City	6/2/2016	Defines 10 principal drainage basins. Major receiving waters are Tualatin River, Hedges Creek, Nyberg Creek, and Saum Creek.	Are their drainage improvements identified in any of the plans (Hedges Creek specifically) that haven't been installed/ implemented and should be considered?	NW and
	Plan and Surface water Management			References Tualatin Drainage Plan, NW Tualatin Concept Plan (2005), SW Tualatin Concept Plan (2010), and Hedges Creek Subbasin (HCP) Plan/ Hedges Creek Subbasin Strategies Report (1995). The Hedges Creek Plan includes stormwater management activities, facilities, and programs.	Should the NW and SW Tualatin Concept Plans be referenced for facility installations, stormwater drainage options? Are these proposed options currently reflected in the GIS?	Plans si
				HCS Plan requires onsite detention for new development in Hedges Creek Subbasin.		
				Section 14.040: Defines objectives for surface water management in Tualatin		
	TDC Chapter 03-05 - Soil Erosion, Surface Water Management, Water Quality Eacilities, and Building and	BC download	6/7/2016	3-05-050: Erosion control permit required for 500 sf land disturbance or slope > 20%	Should regional detention be sized to match the 2, 10, 25, and 100 year predevelopment flow per PW Stds or sized per CWS Stds only up to 25 yr?	Detention duration
	Sewers			downstream system, or SDCs. Downstream analysis required for min 0.25 mile downstream or point where contributing area is less that 10% total. Onsite facility required where identified downstream deficiency, identified regional detention, or located in Hedges Creek subbasin. IF downstream deficiency, match post development to predevelopment for the 2 through 100 wars there, otherwise, match 25 wars them.	Are regional detention areas (as referenced in 3-05-200) identified and should be considered under this MP?	Regiona exist.
				3-05-240: Detention sizing per King County Surface Water Design Manual. For SFR, assume each lot contributes	Are there additional, documented water quality sizing guidelines we should consider? CWS has not	2,640 s Water q
				2,640 sf impervious.	yet established/ publicized updated online/ offline flow through standards (analysis has shown current standards adequate for offline).	
				3-5-310, 350, 350, 430: Water quality treatment required for all development except construction of one of two family dwellings. Design standard is 0.36"/4 hours with average return period of 96 hours. Phosphorus performance standard of 65% removal. No water quality facility placement in existing or created wetlands unless mitigation action approved by city (only location exemption identified).		
	TDC Chapter 5 - Residential Planning Growth	BC download	7/14/2016	Provides plan densities per acre for medium/ multi family residential planning districts.	Are there any changes that are anticipated future changes the plan districts?	Perland
				Defines development type in each residential planning district.	Should manufactured home parks be considered low density residential for land use purposes as defined in Section 5.040? Maximum density in this category is 6.4 units/ acre - what density range should be used here?	Density
Stormwater Ordinance(s) and other applicable municipal code					Medium low density includes condos, townhouses, duplexes, and other multi-family dwellings - should density range of 10 units/ acre be maintained?	
and development code sections, link or hardcopy	TDC Chapter 6 - Commercial Planning Districts	BC download	7/25/2016	Defines the various commercial planning district designations.	For existing land use, should all commercial be grouped together?	Per land impervi
						Per land to be cla
	TDC Chapter 7 - Manufacturing Planning Districts	BC download	7/25/2016	Defines the various industrial/ manufacturing planning district designations.	For existing land use, should all manufacturing be grouped together?	Per land togethe
						Per land impervi
	TDC Chapter 8 - Public, Semi-Public, and Misc. Land Use	BC download	7/25/2016	Defines the miscellaneous land uses in the City that do not fit into residential, commercial or industrial land use classifications. Includes government offices, utility facilities, schools, churches and retirement homes.	Should schools, churches, retirement homes and hospitals be categorized similarly? Currently only one institutional planning district parcel - should these be included? Currently they are reflected in LD residential and medium density residential.	Per land to be cl
	TDC Chapter 71 - Wetland Protection District	BC download	7/25/2016	Defines established wetland protection district (WPD). WPD includes three subdistricts - 1) the Wetland Protected Area (WPA), which contains marshes and wetlands protected by chapter; 2) Sweek Pond Management Area, which contains Sweek Pond and adjacent area; and 3) the wetlands fringe area (WFA), which contains the balance of land contained in WPD and what is now or will be subject to development and usage.	Should the entire WPD be considered preserved or protected for purposes of defining an open space land use coverage? Should only the WPA and SPMA be reflected?	Only the
				Permanent structures need to be set back 40' from WPA.		
				Development is permitted in WFA per planning district designation. Utilities, habitat protection, gardens, parking, etc. are permitted in Sweek Pond Management Area. No permanent structures in WPA.		
	TDC Chapter 72 - Natural Resource Protection Overlay District	BC download	7/25/2016	Designates significant natural resources, which excludes artificially created wetlands but includes greenways and natural areas. Area overlaps with the WPD in some cases. The purpose of the area as defined is to provide	Should the NRPO be considered an area for stormwater management or should it be limited to the greenways and natural areas within the NRPO?	The NRI
				sufficient area for stormwater runoff to reduce flood hazards and enhance water quality. Section 72.060 - Through a development review process, the city may allow use of greenways and natural areas for storm drainage purposes		Meeting charter manage
				Section 72.150 - Modifications for Storm Drainage Improvements - this chapter does not prevent the City from altering, enlarging, piping or modifying a creek channel in the NRPO District upon a finding that such modification is necessary.		

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d SW Concept Planning areas to be included in project area extents.

should be referenced for applicable design criteria as necessary. No anticipated CIPs stem from the plans.

ion standards are per CWS (up to 25 year). Potential change to CWS standards in the future (flow on/ continuous simulation analysis for facility design) but not to be included in CIP sizing at this time.

al detention may be considered in the Hedges Creek subbasin or other areas where capacity limitations

sf EDU is correct.

quality design standards are per CWS.

d use meeting (8-24-16), manufactured home parks are considered low density residential.

y ranges for all residential development to be used to validate impervious assumptions by land use.

Ind use meeting (8-24-16), density and landscape requirements for overlay districts to be used to validate rious assumptions by land use.

d use meeting (8-24-16), commercial planning district designation to be reviewed. Hospitals and schools lassified as institutional land use.

Id use meeting (8-24-16), industrial and manufacturing planning district designations to be grouped er.

In duse meeting (8-24-16), density and landscape requirements for overlay districts to be used to validate rious assumptions by land use.

d use meeting (8-24-16), commercial planning district designation to be reviewed. Hospitals and schools lassified as institutional land use.

e wetland protection area (WPA) to be identified as undevelopable open space land use.

RPO to be considered undevelopable open space area.

ng with City attorney did not occur to verify assumptions of the charter. Although indicated in code, the r prohibits use of greenways, natural areas, and City-owned parks from being used for stormwater gement if that was not the intended use.

				Table A-2: Code and Backg	round Data Review	
Initial Data Request	Data Received and Reviewed	Data Source	Date Received	Information Summary	Outstanding Questions	
	Tualatin City Charter	City	6/2/2016	Chapter XI - Protection of City Owned Parks and Open Space.	Does the City interpret these guidelines as preventing installation of surface water quality or	Meeting
				Purpose: Prevent transfer, sale, vacation or major change in the use of city parks without approving vote. To preserverecreational value from incompatible and non-park development.	detention features in a park? Is the list of protected parks, natural areas, greenways included in the Charter up to date?	charter p manager
Stormwater Ordinance(s) and other applicable municipal code and development code sections,				Definition (Major Change): Change in use of a park from a recreation or preservation use to a non-park use unrelated to public recreation or preservation.		The char
link or hardcopy (continued)				Approval by Voters: Required if the city wants to "cause, undertake, or allow any development or construction that causes a major change in the use of the park or some part thereof".		
				Designated parks (12), natural areas, and greenways are listed.		
	Link provided: Public Works Construction Code (February 2013)	City	6/2/2016	Chapter 206 Storm Drainage Design - Use rational method for sizing pipe. Runoff coefficients and rainfall intensity provided.	Are these design criteria accurate?	Use for c
				Table 206-1: Provides associated zone designation and residential swelling density per planning district designation.		030 01 0
				Section 206.3: Conveyance system to be designed for 25 year storm event. Surcharge during 25 year event not permitted		
City-specific Stormwater Design Standards (aside from those				Section 206.4.00: Minimum public system pipe size is 12" diameter. Maximum of 400' between structures.		
referenced in municipal code) for stormwater treatment, detention,				Section 206.6.00: Minimum 48" diameter manhole.		
and/or conveyance, link or hardcopy				Section 206.8.00: Design of surface water quality and detention facilities to CWS Design and Construction Standards (2007). Swale side slope limited to 4:1. 4' or 6' fencing required for all facilities; 12' Portland Cement access road required		
	CWS Design and Construction Standards (2007)	BC download	4/29/2016	4.03.4 - Water quantity facilities to be designed to match pre and post development flow for 2, 10, and 25 year.	Are there preferred treatment or detention systems or approaches?	Undergro
				4.05 - Defines impervious area requiring treatment for redevelopment sites.	What are the appropriate rainfall depths?	Per CWS
				4.06 - Defines water quality facility design standards (by facility)		CWS des
				5.06 - Minimum pipe slope shall provide min velocity of 2.5 fps.		
	CWS LIDA Handbook (2009)	BC download	4/29/2016	Provides additional design guidelines for LIDA facilities including use of sizing factors for select facilities	Are there other applicable ICAs for inspection and plan review of stormwater facilities?	Use desi
Copy of IGA(s) with Clean Water Services for related stormwater		ony	0, 2, 2010	Inspection of properties for compliance with rules, enforcement, and review of erosion plan revisions (within 10 days). District summarizes work accomplished and invoices the City. The City collects fees, reviews plans submitted with development proposal, issues permits and forwards permits and plans to District. City pays District 100% of actual costs.		
program implementation						
	Stormwater Annual Report, 2013- 2014 reporting year	City	6/2/2016	Summarizes District and City's responsibility related to stormwater management. Co implementers required to inspect 25% of private water quality facilities annually.	Does the City have responsibility related to illicit discharge investigations or is there an IGA with the District?	LIDA is a
					E LIDA required or promoted by the Dictrict for use in the City?	Mainten
					is the required of promoted by the district for use in the City?	
Most recent annual report to CWS						
	Basalt Creek Concept Plan and joint	BC download	4/26/2016	Describes proposed boundary and planning district delineations	Has the boundary been finalized?	Boundar
	meeting with Wilsonville materials				Are planning district delineations available for planning purposes in GIS? Are there roadway	included
	Bridgeport Area Stormwater Master	BC download	4/26/2016	Details the storm drainage system and water quality facility installation for the Bridgeport area.	alignments available in GIS? Maps are available online currently. Has the water quality facility been installed? Does it provide detention benefit? Is there asbuilts?	Martin p
Other Information	Plan (2005) Tualatin Drainage Plan Report (1972)	BC download	4/26/2016	1972 Storm Drainage Master Plan		Backgro
	Public Water Quality Facility Asbuilts	City	1/9/2017	Provides design detail for select water quality facilities.		Use to de
	Hedges Creek Wetlands Master Plan	City	3/2/2017	Provides project recommendations (culvert upsizing under Tualatin Road, sediment removal) related to the 29- acre Hedges Creek Wetlands.		Use to in

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with City attorney did not occur to verify assumptions of the charter. Although indicated in code, the prohibits use of greenways, natural areas, and City-owned parks from being used for stormwater ment if that was not the intended use.

rter should be used as guidelines regulating stormwater facility placement.

conveyance system sizing.

CS/SBUH method (as used in SWMM) is acceptable for pipe design (variance from current city code).

ound detention systems are not preferred.

6 (Detail 1280) 2 year = 2.5", 10 yr = 3.45", 25 yr = 3.9", 100 = 4.5"

sign standards shall be used for the sizing of specific water quality and detention facilities.

ign standards for the sizing of specific facilities. tional IGAs provided.

a preferred treatment approach per new NPDES MS4 permit.

ance responsibilities will be evaluated when considering additional staffing needs.

ry has been finalized but no established future roadways or planning district coverage. Area to be I in the MP. Existing land use only to be evaluated.

rovided boundary of concept planning areas in GIS via 8/4/16 data submittal. ort MP subbasin delineation used to define subbasins for this MP effort.

und material only.

efine maintenance or redesign concepts for CIP development.

nform Natural Resource investigation efforts.

							Table A-3: Stormwater Problem Areas and Project 0	Opportunities				
Preliminary Stormwater Problem Area ID	WQ Retrofit Opportunity	Stormwater Project Opportunity Area ID	Location Name	Basin/ Waterbody	Source	Problem Description	Problem/ Project Area Summary	Site Visit Summary (per 6-29-16 and 12-7-16 site visits)	Project Category	Preliminary Project Concept	Modeling (Y/N)	Modeling Data Needs
1			Nyberg Ln (near Browns Ferry Park)	Nyberg Creek	City GIS	Capacity (bank overtopping)	Frequent flooding of road. Source unclear - Tualatin R or Nyberg Creek. Low road profile and undersized culvert under Nyberg Ln that floods Stafford Hills Club. Flooding due to backwater conditions. Per 6/29/16 mtg - not a MP issue.	Not required	N/A	Not required	N	
2			Martinazzi Ave (near Tualatin-Sherwood Rd)	Nyberg Creek	Questionnaire- Staff City GIS	Capacity (pipe grade) Maintenance	Subject to over curb flooding in heavy rain events. Originally considered backwater issue. Current HEC modeling project with CWS to remove sediment and improve capacity in Nyberg Creek.	12/7/16 - Windshield survey conducted. Backwater influences from Nyberg Creek. See Opportunity Area #5 - High flow bypass down Martinazzi to Izzy's Pond (12"). Low flow pipe (42") discharges to downstream end of culvert under Martinazzi and is almost fully submerged. This attributes to sediment accumulation in the pipe down	Maintenance/ Asset Managemer	Pipe replacement (parallel pipe) t or reconfiguration/ rerouting. More frequent maintenance	No, however modeling of Opp Area #5 may extend down to this location as needed	
3		1	Tualatin Sherwood Ave (near Martinazzi Ave)	Nyberg Creek	Questionnaire- Bert City GIS	Capacity (pipe grade) Maintenance	Pipe inspection confirms existing 42" pipe full of sediment. Flat pipe. Per 6/29/16 mtg - not a MP issue, but per recent findings should be included.	Martinazzi.		program (larger asset management program).	N	
4		2	Venetia Water Quality Facility Failing WQF (Lee between 56th and 57th)	Saum Creek	City GIS	Maintenance	The existing access path is partially washed out. The swale is mostly overgrown with large bushes and trees that need to be removed. It is unclear what the swale looks like underneath. Likely some regrading, replanting of the entire swale will be needed. Highflow bypass outfall should be checked and repaired as needed.	6/29/16 - Facility appeared overgrown but functional. No gate access to inspect inlet and outlet configuration. Limited maintenance access. Steeper grade and observed high flow bypass.	Maintenance	Inclusion in larger water quality facility maintenance CIP.	N	
5		3	Recent outfall retrofit (Blake St at Saum Creek)	Saum Creek	City GIS	Maintenance (Debris accumulation) Erosion	Outfall installation approximately 2010. Problem area #1: Pipe under Blake (not replaced in 2010) has flat grade and high water in winter. Problem area #2: Outfall north of Blake (separate pipe system) experiences bank erosion (citizen complaints)	 6/29/16 - Outfall south of Blake appears functional. Some invasives identified and two large rocks in flow path result in sediment accumulation (may be intentional to e divert flow). Problem areas not specifically looked at. 12/7/16 - Significant bank erosion in the vicinity of the outfall(Problem area #2) and the creek appears to be down cutting though may be stable now due to observed clay/hard pan layer. The bank is steep and appears to be reasonably unstable and erosive. Further erosion could impact the adjacent home. The upstream system inspected previously (6-29-16) and is in good order. Culvert inlet under Blake may be undersized and cause some backwater upstream. 	Direct Replacement	CIP needed to retrofit existing outfall into creek and minimize erosion of the channel, which is hanging out over the creek and exposed.	N	
6	x		Blue Lot (Boones Ferry Rd and Tualatin Rd)) Hedges Creek	City GIS Water Quality Eval	Capacity (bank overtopping)	Flooding of lot due to proximity to Hedges Creek and floodplain. Flooding due to stream capacity issue. Per 6/29/16 mtg - flooding not a MP issue	g Not required	New Infrastructure/ W0 Retrofit	Use of LID onsite may qualify as a retrofit per CWS retrofit strategy.	n N	
7	x		Green Lot (approx. 18725 SW Boones Ferry Rd)	Hedges Creek	City GIS Water Quality Eval	Capacity (bank overtopping)	Flooding of lot due to proximity to Hedges Creek and floodplain. Flooding due to stream capacity issue. Per 6/29/16 mtg - flooding not a MP issue	g Not required	New Infrastructure/ Wo Retrofit	Use of LID onsite may qualify as a retrofit per CWS retrofit strategy.	N	
8			Jurgens City Park	Tualatin River	City GIS	Capacity (bank overtopping)	Path floods due to stream capacity issue. Per 6/29/16 mtg - flooding not a MP issue	Not required	N/A	Not required	N	
9	x	4	Manhasset Dr. (near10550 SW Manhasset Dr)	Hedges Creek	Questionnaire- Bert Storm Area Hot Spots City GIS Stormwater CIP Water Quality Eval	Capacity	Frequent flooding of drainage channel between private properties from T- S Rd to Manhasset. Photos and background data received from City. WQ Opportunity - adjacent undeveloped land that has transportation and warehouse land draining to it	6-29-16 - Private property flooding reported. Drainage channel has limited capacity, especially if private property or area south of T-S Road discharges to it. Observed debris accumulation. Ditch along Manhasset is unmapped and drainage area to the ditch is unclear.	Upsize Infrastructure WQ Retrofit	CIP needed to alleviate private property flooding. MP effort to conduct detailed study of contributing area and flow patterns.	Y	No asbuilts exist with collection information. Requires survey of private collection system inputs and open channel. Improvement possibly a closed system. Model from culvert under Tualatin-Sherwood Rd, through open channel between the private properties, to closed system discharge to Hedges Creek.

							Table A-3: Stormwater Problem Areas and Project O	Opportunities				
Preliminary Stormwater Problem Area ID	WQ Retrofit Opportunity	Stormwater Project Opportunity Area ID	Location Name	Basin/ Waterbody	Source	Problem Description	Problem/ Project Area Summary	Site Visit Summary (per 6-29-16 and 12-7-16 site visits)	Project Category	Preliminary Project Concept	Modeling (Y/N)	Modeling Data Needs
10		5	Boones Ferry Rd (19417 SW Boones Ferry Rd)	Nyberg Creek	Storm Area Hot Spots City GIS	Debris accumulation Capacity	 Drainage ditch (behind Oil Can Henrys) and inlet frequently backed up due to debris accumulation. No system information currently in GIS. Unsure whether a maintenance issue or infrastructure issue. Per 10/31/16 call - Site visit required to confirm something can/ should be done here. Per 11/22/16 email - Low area along Boones Ferry has ponding, possibly due to inlet capacity. Nyberg Creek is piped behind the buildings to the west which may also be contributing to the issue behind Oil Can Henry's. 	 12/7/16 - This area may be the largest systematic problem area in the city. Problem area begins at the inlet along the railroad behind Oil Can Henry's and ends at the crossing of Martinazzi Ave. Some connectivity with Opportunity Area #12. The inlet along the RR is a maintenance issue, gravel is transported and redeposited down the system. StormFilter catchbasins along Boones are located at the sag, and clog due to filters being overwhelmed with sediment. Channel from Boones to Tonka is small, incised and overwhelmed during large s events. The conveyance system in the vicinity of Tonka, Warm Springs and Boones does not appear to be efficient and well laid out. Problem area #12 contributes to the flooding at Tonka and Warm Spring due to overland flow and carrying sediment down to the intersection. The channel from Tonka to Martinazzi needs to be reviewed/optimized for conveyance IE: does the Izzy's weir need to come out and will that facilitate drainage? Pipe system down Martinazzi from T-S road (Problem Area 1) accumulates sediment and discharges in vicinity. 	New Infrastructure	 CIP needed for source control and improved conveyance. Gravel barrier or netting at railroad ballast. Additional sediment control or more frequent maintenance may be needed to alleviate standing water of StormFilters. Rerouting SF to channel on E of Boones Ferry may improve conveyance. Inlets at the intersection of Tonka and Warm Springs should be rerouted for efficiency. Removal or reconfiguration of Izzy's Pond. 	Y	Requires survey of select infrastructure and possible open channel conveyance. Model to include Opp Area #10. Extents of model to be determined with City as most infrastructure modeled will need to be surveyed. Model proposed from inlet along the RR tracks to Boones Ferry, then east where system becomes an open channel. The open channel will be modeled to the outfall at Martinazzi Ave and include drainage from Opp Area #10 to the south.
11			Cummings Creek (125th Ct).	Cummins Creek	Questionnaire- Bert	Capacity (bank overtopping)	Problematic flooding due to vegetation accumulation in stream channel and beaver activity.	12/7/16 - Reported flooding due to low lying property in floodplain. Flooding potentially due to beaver dam mitigation and installation of chain link fence on upstream and downstream ends of footbridge, resulting in backwater effects. Some questions remain with respect to drainage system, discharge locations along SW 125th Court, but no project proposed for this area.	N/A	Not required.	N	
12	x	6	Alsea/BF Rd 99th/Siuslaw Greenway	Hedges Creek	Questionnaire- Bert Retrofit Assessment	Infrastructure Replacement Water Quality	Corrugated Pipe has the bottom rusted out. Ditch inlet. No apparent capacity deficiency, just a pipe replacement. WQ Opportunity- This long linear greenway may provide an opportunity for enhancement and water quality treatment of outfalls along the alignment	 12/7/16 - Pipe replacement due to condition. Scope may include replacement of parallel pipes (GIS indicates are concrete but are CMP) and downstream sediment trap/ water quality facility (swale). r • Sedimentation is currently an issue at this location • May regrade grassy swale (concerns with WQ plantings due to maintenance) to be a water quality retrofit. • City input whether a water quality feature at downstream end of parallel pipe system would impede use of greenway. 	Direct Replacement WQ Retrofit	CIP needed to replace pipe from Boones Ferry to manhole upstream of parallel pipes. Additional scope may include parallel pipes to outfall, outfall structure to capture sediment, and regrading of existing channel for water quality feature.	Hydrology only	
13			Borland Rd	Saum Creek	Questionnaire- Bert	Infrastructure Needs	Frequent flooding due to lack required drainage infrastructure. Inlet on south side of Borland does not discharge anywhere. Per 10/31/16 call - Area drains to a drywell and addressed as part of	Not required	N/A	Not required	N	
14	X	7	Herman Rd	Hedges Creek	Questionnaire- Bert Water Quality Eval	Infrastructure Needs Water Quality	Frequent flooding Lacks required drainage infrastructure Per 10/31/16 call - Recent traffic accident in proximity; desire to install piped/ below ground infrastructure. WQ Opportunity - Land SE corner of Herman Road and 95th may facilitate water quality treatment associated with Herman Road development	6-29-16 - Relatively flat grade. Half the road drains to roadside ditch and the other half to a ditch along railroad ROW. Stormwater improvements to be done in conjunction with roadway widening. City needs preliminary costs.	New Infrastructure	CIP needed to install additional conveyance infrastructure and possibly accommodate water quality.	Y	South side of road has no piped collection system or drainage facilities from 118th to Teton. From Teton east, the road needs full improvements. This area is very flat and there is no clear location to drain runoff. The model will extend from Teton to Tualatin Road and require verification of culvert elevations under railroad. Preferred discharge location(s) should be identified and coordinated with the City prior to modeling.
15			uranis reity/ victoria WOUUS	שונט אונטיי	Bert Stormwater CIP	Needs	Per 11/22/16 email - Outfalls have WQFs and no ongoing maintenance.	1100 TCYUNCU	N/ A	nor required	Ν	

							Table A-3: Stormwater Problem Areas and Project 0	opportunities				
Preliminary Stormwater Problem Area ID	WQ Retrofit Opportunity	Stormwater Project Opportunity Area ID	Location Name	Basin/ Waterbody	Source	Problem Description	Problem/ Project Area Summary	Site Visit Summary (per 6-29-16 and 12-7-16 site visits)	Project Category	Preliminary Project Concept	Modeling (Y/N)	Modeling Data Needs
16	x		93rd Ave	Nyberg Creek	Questionnaire- Bert Water Quality Eval	Infrastructure Needs	Unimproved roadway lacks required drainage infrastructure. Per 10/31/16 call - Outfall improvement may be needed.	 12/7/16 - Reported need to install drainage system on unimproved roadway. Street update could provide treatment in the form of roadside planters or green street for much of the street up to Avery Street. Street needs sidewalk, curb/gutter, etc. Current conveyance is provided in street side ditch primarily on the west side of 93rd. 	WQ Retrofit	GIS indicates collection system exists so no new infrastructure required. CIP to install green street or develop a green street program may be developed (see City-wide public infrastructure opportunity).	N	
17		8	Curves at Blake/105/108th	Hedges Creek	Questionnaire- Bert	Infrastructure Needs	Lacks required drainage infrastructure Per 10/31/16 call - Potential for two projects; one is to upsize culvert under Blake (fish passageable) and two is to add roadway drainage. City is currently in planning stages for roadway update but no budget for project yet. Culvert alignment may play a role in design and cost estimate	 12/7/16 - No collection system. Current drainage from Coquille and 105th is an open channel ditch to culvert inlet. Stream channel experiences 90-degree bends on both sides of culvert. Culvert replacement may need to be fish passable, culvert is undersized, currently a 36" or 42". Existing roadway embankments are steep and drainage updates are needed for the roadway. City input related to culvert orientation and points of discharge needed. 	New Infrastructure	CIP needed to address roadway drainage and culvert crossing. The roadway improvement extents to be verified by City (Moratoc to 108th). The culvert design will incorporate a sizing and length based on the hydrology and ideal alignment. Per 1/25/17 - 0DFW feedback indicates culvert likely not need to be fish passageable.	Hydrology only	
18			Sagert Farms	Saum Creek	Questionnaire- Bert	Infrastructure Needs	Development is currently occurring and area not to be reflected with MP. Two water quality ponds installed. Downstream analysis conducted to verify no impacts.	Not required	N/A	Not required	N	
19			Nyberg Wetlands	Nyberg Creek	Questionnaire- Bert	Capacity (bank overtopping)	Current City-initiated modeling effort in conjunction with CWS and Wetlands Conservancy.	Not required	N/A	Not required	N	
20			Fred Meyer	Nyberg Creek	Questionnaire- Bert Storm Area Hot Spots	Capacity (bank overtopping)	Backwater and heavy sediment load reduces capacity in Nyberg Creek, causing it to overtop its banks. Current City-initialed modeling effort with CH. Per 6/29/16 mtg - do not include in MP.	Not required	N/A	Not required	N	
21	X	9	Sagert St Shenandoah Apts (Sandalwood)	Nyberg Creek	Storm Area Hot Spots Water Quality Eval	Erosion (Channel incision) Capacity	Reported flooding during Oct and Dec 2015 storms. Concerns over erosion and channel incision. No mapped drainage ditch.	6-29-16 - Limited pipe cover on inlet pipe. Channel is incised and sloughing observed. Flooding may be due to debris from above tree limiting capacity in ditch inlet. Possible opportunity for water quality project, water quality facility.	Upsize Infrastructure WQ Retrofit	CIP needed to address channel downcutting. WQ and detention should be incorporated into this project if possible (project location is upstream of Opp Area #10).	Y	Model will extend from Seminole to Sagert. This model may be incorporated into the models for Opp areas #5 and #10.
22			Marquis 100 acre regional facility	Nyberg Creek	Questionnaire- Staff	Water Quality	Water quality concerns related to stormwater Per 11/22/16 email - Not a problem area due to recent WQF install.	Not required	N/A	Not required	N	
23	X	City wide	Public infrastructure improvements	Citywide	Questionnaire- Staff	Infrastructure Needs Water Quality Maintenance	Storm lines and infrastructure throughout City.	Not required	Direct Replacement Maintenance/ Asset Management WQ Retrofit (Green streets)	Development of an asset management/ maintenance related project for infrastructure requiring increased maintenance t frequency; proactive pipe replacement; and green street pilot program. Areas and scope to be defined during CIP workshop.	N	
24			Riverhouse bridge		Questionnaire- Staff	Infrastructure Needs	Outdated infrastructure that may require replacement. Also includes culvert on lot to the east in the floodplain. Per 11/22/16 email - Problem was washed out culvert on private lot. Not a problem area.	Not required	N/A	Not required	N	

							Table A-3: Stormwater Problem Areas and Project C	pportunities				
Preliminary Stormwater Problem Area ID	WQ Retrofit Opportunity	Stormwater Project Opportunity Area ID	Location Name	Basin/ Waterbody	Source	Problem Description	Problem/ Project Area Summary	Site Visit Summary (per 6-29-16 and 12-7-16 site visits)	Project Category	Preliminary Project Concept	Modeling (Y/N)	Modeling Data Needs
25		10	Mohawk Apts	Nyberg Creek	Storm Area Hot Spots	Capacity Maintenance	Field ditch inlet backs up and accumulates debris on public property. Close proximity to problem area #5.	 12/7/16 - Conveyance capacity issue also affecting Opp area #5. Inlet behind Mohawk Apts is overwhelmed and water flows overland through adjacent property and causes flooding at Tonka and Warm Springs. Just a few feet of freeboard is currently available prior to overtopping at the inlet, and a grate structure is installed on top of the inlet. This may be an inlet capacity issue, a pipe capacity issue or the combination of the two. City is unaware of any easements that are in place that may facilitate correcting the issue. Corrective action may include piping the current open channel, updating the inlet, or increasing downstream pipe capacity. City to see whether existing easement continues upstream. 	New Infrastructure	CIP needed to alleviate overland flow affecting surrounding properties. May include closed conveyance for open channel system through apartments.	Y	Include with Opp Area 5 modeling effort. Model to extend from
26			Lake Blake		Storm Area Hot Spots	Maintenance	Field ditch inlet. Per 11/22/16 email - Likely same location as problem area #3. Not a standalone problem area.	Not required	N/A	Not required	N	
27			124th Ave at Leventon Dr.	Cummins Creek	Storm Area Hot Spots	Maintenance	Field ditch inlet backs up and accumulates debris.	12/7/16 - Maintenance issues at existing inlet on private property. Inlet doesn't appear to receive road drainage. Invasive vegetation prevents drainage. May include as part of an ongoing maintenance CIP.	Maintenance/ Asset Management	Development of an asset management/ maintenance related CIP for increased maintenance frequency or proactive pipe replacement to be discussed during CIP workshop (see City-wide public infrastructure opportunity).	N	
28		11	Piute Ct	Saum Creek	Storm Area Hot Spots	Maintenance	Public water quality facility is failing. No adequate access road. Sediment accumulation. The location of discharge is unknown.	 12/7/16 - WQ facility maintenance required and installation of access road. Limited easement between homes to install access road but existing access along backside of facility and reported existing road overgrown. City to verify whether existing road alignment (currently overgrown) can be used as an access road from Martinazzi. 	New infrastructure Maintenance	CIP to include facility regrading with sediment removed and replantings. The outfall structure should be inspected. The discharge location is unknown but likely on ODOT ROW. Need to establish maintenance access. Existing easement available between two houses on Piute Ct.	Ν	
29	X		Facility next to C and E Rentals	Hedges Creek	Site Visit Water Quality Eval	Unknown	Ownership and functionality of existing stormwater facility is not known. Per 10/31/16 call - Not a City issue. Property belongs to Washington County. Remove from problem area list, but may be potential water quality opportunity area.	Not required. Per City, ownership is Washington County.	N/A	Do not consider at this time.	N	
30		12	Sequoia Ridge Water Quality Facility	Saum Creek	Stormwater CIP	Maintenance	Maintenance needed and malfunctioning outlet structure.	 12/7/16 - This facility has had little to no maintenance over the years. Large cottonwood trees need to be removed, full replanting, outfall structures need to be re-viewed and updated as needed. Due to the standing water its assumed there is little to no beneficial vegetation Outlet structure appears to have a capped low flow pipe so pond design may have included an underdrain. 	Maintenance	Inclusion in larger water quality facility maintenance CIP.	N	
31		13	Sweek Dr. water quality pond	Hedges Creek	Stormwater CIP	Maintenance	Maintenance needed due to sediment accumulation and tree growth.	 12/7/16 - This facility has had little to no maintenance over the years. Large cottonwood trees need to be removed, full replanting, outfall structures need to be re-viewed and updated as needed. 	Maintenance	Inclusion in larger water quality facility maintenance CIP.	Ν	
32	x	14	Waterford Water Quality Facility	Hedges Creek	Stormwater CIP Water Quality Eval	Maintenance Water Quality	Maintenance needed due to sediment build up and limited access to outlet structure. Original design had a WQ swale graded around the pond for preliminary treatment and then the swale discharged into the pond. The swale no longer exists and needs to be regraded into the facility, ther is likely sediment build up in the pond that needs to be removed. The existing outlet structure in the pond needs to be removed and replaced along the side of the pond to facilitate access.	 12/7/16 - This facility has had little to no maintenance over the years. Original design reported to properly function 15+ years ago. No vegetation is visible and the original design included a swale graded around the pond for pretreatment, prior to entering the pond. The swale currently does not receive any water and is not functional. Full replanting of vegetation is needed. Outfall structures need to be relocated and reviewed so that maintenance can be performed during high water events as needed. The inlet riprap needs to be replaced. 	Maintenance WQ Retrofit	Update system design to incorporate detention and water quality improvements. Redesign system to relocate outfall structure and replace inlet structure.	Hydrology only	

Table A-3-Stormwater Problem Areas and Preliminary Project Opportunities

							Table A-3: Stormwater Problem Areas and Project	Opportunities				
Preliminary Stormwater Problem Area ID	WQ Retrofit Opportunity	Stormwater Project Opportunity Area ID	Location Name	Basin/ Waterbody	Source	Problem Description	Problem/ Project Area Summary	Site Visit Summary (per 6-29-16 and 12-7-16 site visits)	Project Category	Preliminary Project Concept	Modeling (Y/N)	Modeling Data Needs
	X	City wide	Public Water Quality Retrofit	Citywide	Water Quality Eval	Water Quality	City staff has been receiving complaints from homeowners unaware that public water quality facility is located in close proximity to their residenc Re-engineering and/or retrofit of existing water quality facilities may be required.	e.	Maintenance WQ Retrofit	Develop a program to review/ investigate existing system design and function. To be discussed during CIP workshop.	Ν	
	X	15	89th Ave/Tualatin-Sherwood Rd Stormwater Outfall	Hedges Creek	Stormwater CIP Water Quality Eval	Water Quality	Water quality manhole installation to prevent debris from discharging in wetlands. CWS retrofit program driver.	to 12/7/16 - Limited opportunity for green infrastructure or any facility with drop requirement. Water surface elevation in adjacent wetlands, which is the outfall for this system, prohibits use of any facility with large internal drop requirement.	New Infrastructure/ W0 Retrofit	Per review of CWS Permit and SWMP, appears to be viable as an outfall retrofit project.	Ν	
	X	16	125th to Herman Rd	Cummins Creek	Stormwater CIP Water Quality Eval	Water Quality	Water quality treatment facility/ manhole installation to treat 143 ac contributing area with no upstream treatment. CWS retrofit program driver.	 12/7/16 - Limited opportunity for green infrastructure or any facility with drop requirement. Water surface elevation in adjacent wetlands, which is the outfall for this system, prohibits use of any facility with large internal drop requirement. Identifying the catchment for a proposed vortex device sizing remains the challenge due to the railway along south side of SW Herman Road and its impact on the catchment areas. City input needed on drainage patterns in proximity of railway. 	New Infrastructure/ W0 Retrofit	Per review of CWS Permit and SWMP, appears to be viable as an outfall retrofit project.	N	
	х		City Operations Yard	Hedges Creek	Water Quality Eval	Water Quality	Potential water quality retrofit at City-owned, municipal property. Signinficant impervious surface area. No existing treatment.	Pending	New Infrastructure/ WO	Use of LID onsite may qualify as a retrofit per CWS retrofit strategy.	Ν	
	x		White Parking Lot	Hedges Creek	Water Quality Eval	Water Quality	Potential water quality retrofit at City-owned, parking lot. Signinficant impervious surface area. No existing treatment.	Pending	New Infrastructure/ W0 Retrofit	Use of LID onsite may qualify as a pretrofit per CWS retrofit strategy.	N	

Attachment B: Maps

Figure 1: Project Area Overview
Figure 2: Topography and Soils
Figure 3: Stormwater System Overview
Figure 4: Land Use
Figure 5: Water Quality Assessment
Figure 6: Stormwater Project Opportunity Areas





Legend

	Streams
	Major Drainage Basins
	Open Space - Parks/Greenways/Natural Areas/Private*
	Open Space - WPA/Setbacks/NRPO/Wetlands
	Transportation (ODOT Corridor)
!	SW Concept Plan Area
	NW Concept Plan Area
	Basalt Creek Plan Area
	City Boundary
Apri	l 2017
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Athey Creek

Figure 1

Project Area Overview



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4,500

🗆 Feet

2,250

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City of Tualatin

Date: March 2017 Project: Project 149233

Topography and Soils





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Stormwater Master Plan

Date: March 2017 Project: Project 149233

2,250 4,500 n 🗆 Feet 1. Projection: NAD 1983 State Plane Oregon North (feet)

Land Use



.e	g	e	1	a	

	Ditches
	- Storm Lines
╋	Preliminary Stormwater Problem Area
	WQ Retrofit Opportunity
	Outfall
•	Public Water Quality Facility
	Public Water Quality Facility (Residential)
	City Property - Buildable
	City Property - Parks, Greenways, and Natural \ensuremath{Areas}^*
\square	Vacant
	Transportation (ODOT Corridor)
[]	Basalt Creek Plan Area
	City Boundary
	UGB



Stormwater Project Opportunity Area ID	Location Name	Project Category		
1	Martinazzi Ave (near Tualatin- Sherwood Rd)	Maintenance/Asset Management		
2	Venetia Water Quality Facility	Maintenance		
3	Recent Outfall Retrofit (Blake St. at Saum Creek)	Direct Replacement		
4	Manhasset Dr. (near 10550 SW Manhasset Dr.)	Upsize Infrastructure Water Quality Retrofit		
5	Boones Ferry Rd. (19417 SW Boones Ferry Rd.)	New Infrastructure		
6	Alsea/BF Rd 99 th /Siuslaw Greenway	Direct Replacement Water Quality Retrofit		
7	Herman Rd.	New Infrastructure Water Quality Retrofit		
8	Curves at Blake/105/108th	New Infrastructure		
9	Sagert St. – Shenandoah Apts (Sandalwood)	Upsize Infrastructure Water Quality Retrofit		
10	Mohawk Apts	New Infrastructure		
11	Piute Ct.	New Infrastructure Maintenance		
12	Sequoia Ridge Water Quality Facility	Maintenance		
13	Sweek Dr. Water Quality Pond	Maintenance		
14	Waterford Water Quality Facility	Maintenance Water Quality Retrofit		
15	89 th Ave/Tualatin-Sherwood Rd Stormwater Outfall	New Infrastructure Water Quality Retrofit		
16	125 th to Herman Rd.	New Infrastructure Water Quality Retrofit		
City Wide	Public Infrastructure Improvements	Direct Replacement Maintenance/Asset Management Water Quality Retrofit		
City Wide	Public Water Quality Retrofit	Maintenance Water Quality Retrofit		







City of Tualatin Stormwater Master Plan

Date: March 2017 Project: Project 149233

0	2,250	4,500

Notes: 1. Projection: NAD 1983 State Plane Oregon North (feet)

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Stormwater Project Opportunity Areas

Figure 6
Appendix C: Hydrology and Hydraulic Modeling Methods and Results (TM2)





Technical Memorandum

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T: 503.977.6607 F: 503.244.9095

- Prepared for: City of Tualatin
- Project Title: Stormwater Master Plan

Project No.: 149233

Technical Memorandum 2 (updated)

Subject: Hydrology and Hydraulic Modeling Methods and Results

Original: September 8, 2017

Updated: September 7, 2018

To: Kim McMillan, P.E., City Project Manager

From: Angela Wieland, P.E., Matt Grzegorzewski Ryan Retzlaff

Prepared by:

Date:

Rvan Retzlaff

Reviewed by:

Angela Wieland, P.E.

Limitations:

This document was prepared solely for City of Tualatin in accordance with professional standards at the time the services were performed and in accordance with the contract between City of Tualatin and Brown and Caldwell dated April 11, 2016. This document is governed by the specific scope of work authorized by City of Tualatin; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by City of Tualatin and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

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Section 1: Introduction

The City of Tualatin (City) is developing a stormwater master plan to guide future surface and stormwater program decisions. The master plan will address both water quantity and quality issues for the constructed and natural systems under the City's management. The master plan requires a clear understanding of existing and future runoff conditions across the city to identify long-term stormwater project needs.

This technical memorandum (TM2) has been developed to document the methodology used for modeling city-wide hydrology and hydraulics in specific areas of concern. Section 2 of TM2 outlines applicable stormwater design standards and criteria used to evaluate the performance of the storm drainage system. Section 3 outlines hydrologic model development. Section 4 outlines hydraulic model development, and Section 5 outlines results of the modeling efforts and proposed locations for the development of capital projects (CP).

The hydrology model was developed to evaluate peak flows generated by all subbasins within the city for existing and anticipated future development conditions. The hydrologic modeling results show that peak flows are expected to remain constant in watersheds such as Nyberg Creek and the Tualatin River where most land area is currently built to maximum zoning allowances. The most significant flow increases are anticipated in the Hedges Creek watershed due to significant vacant lands slated for future industrial development.

The hydraulic model results show flooding in several open channel and piped systems starting at a 2-year design storm event. Specific flooding locations include the open channel along the north side of Herman Road west of SW Tualatin Road, the railroad ditch behind Oil Can Henry's, and the open channel system along Manhasset Drive. Capital projects will be needed to address system flooding.

Section 2: Stormwater Design Standards and Criteria

Brown and Caldwell (BC) conducted a review of the City's Public Works (PW) Standards and the Clean Water Services (CWS) Design and Construction Standards (2007) and the CWS Low Impact Development Approaches (LIDA) Handbook (2009) to establish planning criteria relevant to the analysis of the City's stormwater system. Planning criteria were used to identify where the system has capacity limitations and as the basis for design of stormwater projects for water quality, condition improvements, and capacity.

Applicable planning criteria are referenced in Table 1.



Table 1. Drainage Standards and Design Criteria										
Criteria	Source	Value								
Water Quality Facility Design	PW Standards (206.8)	Design to requirements of CWS <i>Design and Construction Standards</i> and CWS <i>LIDA Handbook</i> . Specific to the PW Standards, facilities are required to include 4 foot or 6 foot vinyl coated chain link fencing.								
Water Quantity Facility Design	PW Standards (206.8) CWS <i>Design and Construction Standards</i>	Design to requirements of CWS <i>Design and Construction Standards</i> . Match pre- and post-development flow for the 2-, 10-, and 25-year, 24-hour storm events.								
Pipe Design Storm	PW Standards (206.3)	Design to the 25-year storm event. Surcharge during the 25-year is not permissible. ^a								
Pipe Size	PW Standards (206.4)	10-inch minimum diameter for pipe from catch basins to the main line in the public right-of-way.12-inch minimum diameter for mains in the public right-of-way.								
Manning's Roughness	PW Standards (Table 206-8)	Varies by material and shape.								
Pipe Material	PW Standards (206.4)	Concrete, PVC, Ductile iron, and aluminum spiral rib pipe.								
Pipe Cover	CWS Design and Construction Standards	Table 5-2, varies by pipe material.								
Structure Spacing	PW Standards (206.4)	250 feet maximum for 10-inch pipe; 400 feet maximum for 12-inch pipe.								
Manhole Size	PW Standards (206.6)	48-inch-diameter minimum.								

a. The City's PW standards reference the rational method for conveyance design. Santa Barbara Urban Hydrograph (SBUH) was an approved equivalent as discussed with the City during the July 28, 2016 meeting.

For additional details on the City's design standards and criteria, see Section 2.2 of *TM* #1: Data Compilation and Preliminary Stormwater Project Development (TM1) dated April 24, 2017.

Section 3: Hydrologic Model Development

The hydrologic model was developed using XP-Storm Water Management Model (XPSWMM) version 2016.1. Within the model, the Santa Barbara Urban Hydrograph (SBUH) method was used to estimate hydrology. The necessary parameters for the SBUH method include subbasin areas, impervious percentages, pervious curve numbers, and times of concentration. The hydrology routine in XPSWMM converts rainfall into stormwater runoff based on design storm parameters (e.g., volume and intensity of rainfall) and subbasin characteristics such as topography, land use, vegetation, soil types and SBUH subbasin parameters described above.

This section includes detailed descriptions of the methodology used in determining each of the hydrology model input parameters.

3.1 Subbasin Delineation

The purpose of the subbasin boundary delineation is to refine major watershed boundaries into smaller subbasins to reflect specific catchment areas within the city.

Watershed boundaries for six major watersheds were provided by the City as a geographic information system (GIS) shapefile: Hedges Creek, Nyberg Creek, Saum Creek, Cummins Creek, Tualatin River, and Seely Ditch. These larger watershed boundaries are defined based on topography and conveyance system routing.

The watershed boundaries were refined in GIS based on outfall locations, with areas ranging between 56 and 2,918 acres. These watersheds were then divided up into smaller subbasins using a combination of contours, streets, tax lots, and conveyance infrastructure such as pipes, ditches, culverts, and open channels. Subbasins are generally smaller in the more densely urbanized areas where the pipe network is more complex. Smaller subbasins were also delineated in areas where hydraulic modeling was proposed



(see Section 4.1). Subbasin boundary questions were addressed using as-built records, GIS invert data, and City staff knowledge of the existing drainage system. A total of 256 subbasins were defined, ranging in size from 0.4 to 777.7 acres with an average area of 38.1 acres. The watershed and subbasin boundaries are shown in Attachment C, Figure 1.

Each subbasin was assigned a name in conjunction with the City-provided watershed name (e.g., NY for Nyberg Creek) and numbering associated with location in the subbasin. The numbering begins at 0010 near the outfall and increase in increments of 10 moving upstream. Subbasin names are shown in Attachment A, Table A-1.

Larger subbasins were delineated in the outer areas of the city and in rural/agricultural areas that have not yet developed. Many of these larger subbasins drain away from City infrastructure and include: CU-0010, CU-0020, CU-0030, SA-0120, SA-0140, SA-Offsite1, SA-Offsite2, SA-Offsite3, SA-Offsite4, SA-Offsite5, TU-Offsite1, and TU-Offsite2. Additionally, portions of the transportation corridor along I-5 are isolated from City infrastructure by topography or physical features. Subbasins in these areas were delineated separately and named with the extension "-ODOT." Hydrologic model results from subbasins that are not contributing to city infrastructure are highlighted in gray in Attachment A, Table A-1.

Subbasin areas were calculated in GIS and are also provided in Attachment A, Table A-1.

3.2 Time of Concentration

Due to the number of subbasins, a modified, streamlined methodology was used to calculate time of concentration. The traditional approach of calculating time of concentration requires overland flow, shallow concentrated flow, and channel or pipe flow times to be calculated individually and added together, as shown in equation (1). The streamlined method is described below and includes application of general assumptions for the overland flow and shallow concentrated flow time components and calculating average pipe flow variables and applying them to all subbasins to determine the pipe flow times.

(1) Tc = Overland flow time (min) + Shallow concentrated flow (min) + Pipe/ channel flow (min)

The first step involves estimating the longest pipe flow path within each subbasin. Twenty subbasins were selected at random and the longest pipe flow path to the outlet was measured for each of them. A linear regression shown in equation (2), was developed based on the measured values and applied to the remaining subbasins to calculate an approximate pipe flow path. In the regression equation, subbasin area in acres is the independent variable (x), and longest pipe flow length is the dependent variable (y). This method was used to save time and is nearly as accurate as estimating the length of pipe flow within each subbasin.

(2) $Y = 43.411x + 413.91 (R^2 = 0.81)$

Average pipe slope was calculated for each subbasin based on LiDAR data. The maximum and minimum surface elevations within each subbasin were identified in GIS and used to approximate an average pipe slope for each subbasin. To check the validity of these values, pipe slope was manually calculated for 20 subbasins based on available invert data in GIS. The average of the manually calculated pipe slopes was found to be 40 percent less than the average of the slopes calculated using the maximum and minimum surface elevations. Thus, a 40 percent correction factor was applied to all calculated pipe slopes.

Pipe flow velocities were calculated using Manning's equation. Calculations assumed a 12-inch-diameter concrete pipe (n = 0.014) flowing at maximum discharge (93 percent full). Table 2 shows the calculated pipe flow velocities for slopes ranging from 0.5 percent to 6 percent. Average pipe slopes were rounded to the nearest 0.5 percent to estimate pipe flow velocities for calculating pipe flow times.

The channel or pipe flow times were directly calculated for each subbasin using the pipe flow velocities per Table 2 and the calculated longest flow path.



To account for the overland flow component of the time of concentration calculation, 5 minutes was assumed for sheet flow. No additional time was assumed for shallow concentrated flow due to the relatively large percentage of impervious surface in the City. From this information, the total time of concentration was calculated for all subbasins.

Table 2. F	Pipe Flow Velocities
Slope, percent	Velocity, feet per second
0.5	3.2
1	4.5
1.5	5.5
2	6.4
2.5	7.2
3	7.8
3.5	8.5
4	9.1
4.5	9.6
5	10.1
5.5	10.6
6	11.1
0.5 1 1.5 2 2.5 3 3.5 4 4.5 5 5.5 6	3.2 4.5 5.5 6.4 7.2 7.8 8.5 9.1 9.6 10.1 10.6 11.1

Fourteen subbasins were identified as having a substantial amount of open space or vacant lands and minimal pipe network so the streamlined methodology described above did not apply. For these subbasins, the traditional method of calculating time of concentration was used to more accurately estimate the overland flow and shallow concentrated flow times.

The traditional method required identifying the longest flow path lines in GIS and dividing the path into sheet flow, shallow concentrated flow, and pipe/ open channel flow lengths. The maximum sheet flow length was set to 150 feet. The shallow concentrated flow length was calculated based on the remaining flow path length needed to reach an open channel conveyance. The flow length and slope of the open channel conveyance was directly measured in GIS, and the average open channel velocity was estimated using the following equation (3) where k is the velocity factor dependent on the channel bottom, and s is the measured slope of the channel in ft/ft. Grassed waterways have a velocity factor k of 15.

(3) $v = k\sqrt{s}$

The time of concentration calculated for all subbasins ranged from 5.8 to 183 minutes with an average of 14.2 minutes. Attachment A, Table A-1 includes the calculated time of concentration values for each subbasin.

3.3 Existing Land Use Conditions

The City provided GIS data representing City planning districts, developable lands, parks, open spaces, and natural areas. Through coordination with the City, BC developed general land use classes by consolidating planning districts and merging the planning districts with developable lands and (undevelopable) open spaces.

Developable lands were categorized as vacant, infill, or re-developable. Upon analysis of aerial imagery, it was determined that areas classified as vacant and infill are currently undeveloped and development will lead to a significant increase in impervious coverage and associated runoff volume. Thus, vacant land use



coverage consists of vacant and infill areas. Re-developable areas are already developed consistent with their planning district designation and were assigned land use based on their consolidated planning district designation. Undevelopable open space included City-owned parks, greenways, and natural areas, the Wetland Protection Area (WPA), wetlands, and the Natural Resource Protection Overlay (NRPO) District.

The Oregon Department of Transportation (ODOT) corridor along Interstate 5, Interstate 205, and Highway 99W was defined separately as a transportation land use coverage as these areas are fully developed and impervious coverage is not expected to change.

For additional detail on the development of land use coverage, refer to Section 2.3.1 of TM1. Existing land use coverage is shown in Attachment C, Figure 2.

3.4 Future Land Use Conditions

To represent future land use conditions, all vacant lands defined under existing condition land use was assumed to be developed in accordance with the City's underlying planning district designation. Future conditions land use is also reflected in Attachment C, Figure 2.

3.5 Impervious Coverage

Impervious coverage by land use was directly calculated using City-provided GIS coverage of impervious surface and supplemented with City-provided GIS coverage of building footprints and right-of-way. The calculated impervious percentages by land use were verified using aerial imagery and compared to impervious percentages used by surrounding communities.

Due to the potential for redevelopment and infill amongst the residential land use categories, a separate future condition impervious percentage was defined for the low density, medium density, and high density residential land use categories. Each calculated impervious percentage (reflecting existing development conditions) was increased by 10 percentage points to account for added impervious surface expected with redevelopment. This increase was made independent from the anticipated development of vacant land use.

Existing and future impervious percentages by land use are shown in Table 3. For additional detail on the impervious coverage calculations, refer to Section 2.3.2 of TM1.

Table 3. Modeled Land Use Categories and Impervious Percentages											
Modeled Land Use	Existing Impervious Percentage	Future Impervious Percentage									
Low-density residential	43	53									
Medium-density residential	45	55									
High-density residential	50	60									
Institutional	35	35									
Industrial	74	74									
Commercial	78	78									
ODOT Corridor	46	46									
Basalt Creek/Rural Residential	7	7									
Open Space (Parks/Greenways/Natural Areas)	5	5									
Open Space (WPD/NRPO/Wetlands)	4	4									
Vacant	5	Consistent with underlining planning district designation									



An area-weighted average impervious coverage by subbasin was calculated for both existing and future conditions based on the contributing land use and associated impervious percentage. The existing and future impervious percentage for each subbasin is shown in Attachment A, Table A-1.

3.6 Curve Number

Curve numbers are dimensionless numbers defined by the hydrologic soil group and land cover and are required for use in the SBUH hydrology method.

Runoff curve numbers for pervious areas were estimated from typical runoff curve number tables provided in the Soil and Conservation Service (SCS) Technical Release 55, titled *Urban Hydrology for Small Watersheds* (SCS 1986). Curve number values are shown in Table 4 and were selected based on hydrologic soil group and associated land use description for the pervious portions of each subbasin.

Aerial imagery was used to select a representative pervious land use description. Fair condition open space was used for primarily developed subbasins and fair-condition woods-grass combination was used for primarily undeveloped subbasins. Hydrologic soil group coverage is shown in Attachment C, Figure 3. Area-weighted pervious curve numbers were then directly calculated for each subbasin.

Table 4. Runoff Curve Numbers for Urban Areas											
Land use descriptions	Curve numbers for hydrologic soil group										
Land use descriptions	Α	В	С	D							
Open space (lawns, parks, golf courses, cemeteries, etc.)											
Good condition (grass cover >75%)	39	61	74	80							
Fair condition (grass cover 50–75%)	49	69	79	84							
Poor condition (grass cover <50%)	68	79	86	89							
Paved parking lots, roofs, driveways, etc.	98	98	98	98							
Woods-grass combination:											
Poor condition	57	73	82	86							
Fair condition	43	65	76	82							
Good condition	32	58	72	79							

A curve number of 98 was assumed for impervious areas.

3.7 Design Storms

Design storms are precipitation patterns typically used to evaluate the capacity of storm drainage systems and design capital improvements for the desired level of service.

Design storms used for this study included the 2-, 10-, and 25-year recurrence interval 24-hour events. The rainfall depths were taken from CWS' *Design & Construction Standards*, Standard Detail Drawing No. 1280. The rainfall distribution for these design storms was based on a SCS Type IA, 24-hour distribution, which is applicable to western Oregon, Washington, and northwestern California.

Table 5 lists the design storm rainfall depths used in the hydrology model.



Table 5. Design Storm Depths											
Design storm event	Rainfall depth, inches										
2-year, 24-hour	2.50										
10-year, 24-hour	3.45										
25-year, 24-hour	3.90										

Section 4: Hydraulic Model Development

To evaluate flood hazards and capacity limitations of stormwater infrastructure, the XPSWMM computer model was used to simulate the hydraulic performance of select pipe and open-channel systems to calculate peak flow, water surface elevation, and velocities within the modeled infrastructure for select design storms.

This section includes a summary of the hydraulic modeled areas and input parameters used to characterize the hydraulic conditions of the modeled system.

4.1 Modeling Areas

As described in TM1, a total of five stormwater project opportunity areas were identified as those that would benefit from a hydraulic modeling assessment:

- 1. Stormwater Project Opportunity Area 4 Manhasset
- 2. Stormwater Project Opportunity Area 5 Boones Ferry Road at Oil Can Henry's
- 3. Stormwater Project Opportunity Area 7 Herman Road
- 4. Stormwater Project Opportunity Area 9 Sagert Street at the Shenandoah Apartments
- 5. Stormwater Project Opportunity Area 10 Mohawk Apartments

These project opportunity areas were identified based on City and stakeholder reported flooding and the need for additional information to understand the potential cause of flooding. Hydraulic assessment of these areas will also help with development of project concepts and CIPs. The hydraulic model extents were discussed and verified with City staff on February 2, 2017. Due to proximity and connectivity of the proposed modeled system, three of the project opportunity areas (5, 9, and 10) were combined into one hydraulic model areas are described in detail below and an overview is provided in Attachment C, Figure 4.

4.1.1 Herman Road System

City staff identified this area during completion of the stormwater surveys (see TM1) as frequently flooding. The drainage system along the north side of Herman Road is characterized by ditches and culverts, which drain south under the road and adjacent railroad through two culverts. South of the railroad is an open channel that conveys all runoff to the east before discharging into Sweek Pond.

Based on field reconnaissance, feedback from City staff, and initial system review in GIS, the primary drainage issues include undersized drainage infrastructure and flat grade along Herman Road. The south side of Herman Road does not have a stormwater collection system, which results in standing water on the roadway.

The hydraulic model for the Herman Road system includes the piped and open channel conveyance along Herman Road between Southwest Teton Avenue and Southwest Tualatin Road, as well as the open channel/piped system between Herman Road and the outfall at Sweek Pond. Attachment C, Figure 5 shows the hydraulic modeling extents specific for the Herman Road system.



4.1.2 Manhasset Drive System

The City frequently responds to flooding of the open channel system, starting from Tualatin-Sherwood Road to Manhasset Drive. This area was also identified as having frequent flooding during completion of stormwater surveys. The Manhassat Drive system receives stormwater from the area south of Tualatin-Sherwood Road. A culvert under Tualatin-Sherwood Road discharges north to the open channel system, which runs between private industrial properties before entering a ditch inlet and pipe to Hedges Creek.

Based on field reconnaissance, feedback from City staff, and initial system review in GIS, the open channel system is capacity limited. The channel is larger and steeper in the southern (upstream) portion and becomes shallower flatter in the northern (downstream) portion. During a site visit on June 29, 2016, BC and City staff observed a large amount of debris and lawn clippings in the channel as well as portions of the curb and larger rocks, which further limit capacity and indicate the need for ongoing maintenance. The stormwater conveyance system downstream of the open channel system is very flat but appears to have adequate capacity as no flooding has been reported.

The hydraulic model for the Manhassat Drive system includes the culvert under Tualatin-Sherwood Road and the piped and open channel system running north to the outfall into Hedges Creek. Attachment C, Figure 6 shows the hydraulic modeling extents specific for the Manhassat Drive system.

4.1.3 Nyberg Creek System

The Nyberg Creek system includes stormwater project opportunity areas 5, 9, and 10. These areas were combined into a single hydraulic model to provide a more comprehensive assessment of the problem areas and downstream system impacts. All three of these stormwater project opportunity areas were identified due to frequent flooding issues and the need for further assessment.

Stormwater project opportunity area 5 is associated with the open channel system along the railroad tracks behind the former Oil Can Henry's (19417 SW Boones Ferry Road). The open channel is adjacent to a railroad ballast, and gravel and rock from the ballast is dislodged and transported to a 36-inch pipe that daylights prior to discharge under Boones Ferry Road via a parallel culvert. The gravel and rock occlude the outlet and pipe under Boones Ferry Road, causing backwater conditions and flooding at Oil Can Henry's. During a site visit on December 8, 2016, it was observed that the pipe under Boones Ferry Road was more than 50 percent filled with sediment. Attachment D includes photographs of the rocky open channel system and the transition to the piped system. Additionally, water quality along Boones Ferry Road is being managed with StormFilter catchbasins located at a sag in Boones Ferry Road. The StormFilter catchbasins do not appear to be functioning, possibly due to the high sediment and gravel loads, which result in standing water in the roadway.

Stormwater project opportunity areas 9 and 10 are associated with two open channel segments in Sandalwood (area 9) and in the Mohawk Apartments property (area 10), which experience significant erosion and flooding. The open channel at Sandalwood is experiencing severe incision, which prevents runoff from being effectively discharged to the downstream ditch inlet and pipe system. Water ponds in this area and is not adequately conveyed. The open channel at the Mohawk Apartments is also ineffective at discharging to the downstream ditch inlet, and thus, flow overtops the banks causing overland runoff through private property. Downstream from the Mohawk Apartments site, the piped conveyance system in Tonka Street and Warm Springs Street does not appear to be laid out in an efficient manner, which further contributes to the observed capacity deficiencies.

The hydraulic model includes the open channel associated with stormwater project opportunity area 5, the piped the drainage system on Boones Ferry Road, the culverts discharging east under Boones Ferry Road, and the open channel system flowing east from Boones Ferry Road to Martinazzi Avenue. The model terminates at the Martinazzi Avenue culvert where a free outfall has been included as the model's boundary



condition. The open channel system between Boones Ferry Road and Martinazzi Avenue is the upstream portion of Nyberg Creek. The open channel and piped systems associated with stormwater project opportunity areas 9 and 10 discharge north to Nyberg Creek and are also included. Attachment C, Figure 7 provides an overview of the Nyberg Creek system that was modeled.

4.2 Conveyance Naming Convention

Storm structures, including manholes, catch basins, ditch inlets, outfalls, tees, flow structures, and clean outs, are identified in the City's GIS database by their asset ID, a six-digit number ranging from 123539 to 335465. The storm conduits also use a similar naming convention. The six-digit asset IDs for conduits range from 164640 to 335463.

The names of nodes (storm structures, typically manholes) and links (pipes or open channel conduits) assigned in the hydraulic models are consistent with the City's naming convention. Based on field survey results, and to accommodate flow routing and other modeling needs, links or nodes were added that did not previously exist in the City's GIS database. For these added features, the default XPWMM naming convention was used (e.g., Link43, Node68).

4.3 Datum

To verify the vertical datum reflected in the City's GIS data, BC conducted a comparison of rim elevations from the GIS with rim elevations interpreted from LIDAR, which uses the North American Vertical Datum of 1988 (NAVD88). The average rim elevation interpreted from LiDAR was consistently 3.5 feet higher than the City-provided rim elevations. This is consistent with the datum correction of +3.52 feet between National Geodetic Vertical Datum of 1929 (NGVD29) and NAVD88. Based on this observation, it was assumed that most of the City's GIS data provided in their original June 2016 data package used the NGVD29 vertical datum.

In July 2016, the City corrected their system elevation data to match the NAVD88 vertical datum and provided updated stormwater system information in GIS to BC. The hydraulic modeling assumes consistent use of the NAVD88 vertical datum.

4.4 Survey Needs

After determining the extent of areas to be modeled for each stormwater project opportunity area (see Section 4.1), missing invert elevations and pipe diameters within these general extents were identified from GIS. A total of 77 structures required field survey.

CESNW performed the survey work in April, 2017 and obtained the missing data necessary for modeling. Survey results were delivered in the form of a computer-aided design (CAD) file and an Excel spreadsheet. After converting the data from CAD to GIS, BC staff incorporated the updated elevations into the GIS database. The updated GIS data were exported to XPSWMM for use in the hydraulic model.

4.5 Hydraulic Input Parameters

Hydraulic input parameters include conduit (pipe or open channel) name, upstream (US) and downstream (DS) node information (name, invert elevation, rim elevation), conduit length, conduit slope, conduit shape, and pipe diameter. The following sections describe the model input parameters that were required for development of the hydraulic models.

Attachment B, Table B-1 Hydraulic Model Results, includes all conduit and node data applicable to each system model.



4.5.1 Node Data

Model nodes include manholes, catch basins, outfalls, and other junction points as defined in the City's GIS or developed based on changes in conduit direction, slope, or cross section configuration (for open channels).

The upstream and downstream node names for each conduit were assigned based on the naming convention provided by the City's GIS. Nodes in the hydraulic model that also include model hydrologic input information were renamed with the nomenclature NodeName_SubbasinName (e.g. 261567_NY-0530).

The rim elevation at each node location was assigned based on the City's GIS. Several rim elevations were missing in the City's GIS database and values were estimated based on LiDAR data. Field survey included the collection of rim elevations for structures where rim elevations were inconclusive from LiDAR.

Upstream and downstream invert elevations were extracted from node and conduit data in GIS. If invert information was missing or conflicting between the node and conduit attribute data, the invert data were collected via field survey as described in Section 4.4.

4.5.2 Conduit Data

Modeled conduits include pipes, culverts, and open channels. The length of each modeled conduit was originally provided in the City's GIS. Because conduits were extended or combined with other segments as necessary to ensure continuity in the system, revised conduit lengths were directly calculated using GIS.

Conduit slopes were calculated in XPSWMM using the upstream and downstream node invert elevations and refined segment lengths.

Pipe diameters were obtained from the City's GIS or collected during field survey. For pipes where pipe diameters were not provided in GIS or could not be field-verified during the survey work, the diameter was assumed to be the same size as the pipe segment immediately upstream. This assumption provides a conservative estimate of hydraulic system capacity. Pipes were assumed to be circular in shape.

Most open channel cross-sections were obtained by field survey. Open channels segments not surveyed or used for flow routing purposes were assumed to be trapezoidal in shape with dimensions approximated based on measurements obtained during field visits or via aerial imagery.

Manning's roughness coefficient "n" is dependent on the surface material of pipes and open channels. All modeled pipes were concrete and assigned a roughness coefficient of 0.014. A roughness coefficient range of 0.027 to 0.045 was assigned to open-channel conduits based on field observations from aerial imagery. Open channels lined with shorter vegetation and dirt had lower roughness while open channels lined with large rocks and thick vegetation had values of Manning's "n" up to 0.045.

4.5.3 System Routing

Only select portions of the City's conveyance system were hydraulically modeled to evaluate system flooding. To account for upstream subbasins that do not directly enter the modeled conveyance system but still contribute runoff to the modeled system, a simplified system routing was used. A simple pipe network was incorporated into the hydraulic model to mimic the upstream conveyance system and route flow downstream to the modeled system.

This approach was used for the Nyberg Creek model area (see Attachment C, Figure 4). The simple pipe network geometry is based on available GIS information and invert elevations as available and assumes a constant pipe slope based on surface elevations. The hydraulic model results for the simple pipe networks and simplified routing are included in Attachment B, Table B-1 for reference only. These results should not be considered in the assessment of system flooding or CP development.



Section 5: Model Refinement and Results

XP-SWMM was used to simulate the 2-year, 10-year, and 25-year, 24-hour design events for current and future development conditions. Results of the hydrologic and hydraulic model simulations are tabulated in Attachment A, Table A-1 (for hydrology) and Attachment B, Table B-1 (for hydraulics).

5.1 Model Refinement

The hydrologic and hydraulic models were developed and initial model results were compared to Cityreported flooding locations, field observations, and City photographs taken during the December 2015 storm events (for the Manhasset Drive system). Model validation information was anecdotal and general in nature, and did not include specific flows or water surface elevations at structures within each of the hydraulic model areas. Therefore, model refinements instead of a model validation were performed by comparing initial model results with reported flooding areas and adjusting hydraulic input parameters based on field observations to match reported flooding.

The Herman Road system was refined following site visits by BC staff and additional feedback from City staff. The geometry of culverts under the rail road and select ditches and culverts on the north side of the road were refined. In addition, the contributing drainage area for subbasin HE-0090 was decreased from 19.04 acres to 5.00 acres based on discussion of drainage patterns with City staff (Attachment C, Figure 5). Subbasin HE-0900 is primarily composed of the Tualatin Country Club golf course and does not contribute to the Herman Road system. Please note the subbasin delineation was not adjusted, only the area contributing to the Herman Road system from subbasin HE-0900.

For the Manhasset Drive system, to better match reported flooding and photo documentation, several adjustments were made to the hydraulic model. The Manning's roughness coefficient of the open channels was refined to more closely align with the observed conditions. Values vary from 0.03 to 0.08 based on field observations. A short link was added (Link13) with a roughness value of 0.08 to represent a highly-obstructed portion of the open channel system where debris and lawn clippings were observed during the site visit. The addition of Link13 also extended the steeper upstream segment to reflect existing topography, as surveyed cross sections are often extrapolated and do not always align with specific grade break locations. Finally, the contributing drainage area for subbasin HE-0500 (Attachment C, Figure 6) was decreased from 4.93 acres to 1.54 acres based on as-built drawings provided by the City. Please note the subbasin delineation was not adjusted, only the area contributing to the Manhasset Drive system from subbasin HE-0500.

For the Nyberg Creek system, to better match reported flooding in the proximity of Oil Can Henry's (area 5) and Mohawk Apartments (area 10), the entrance and exit loss coefficients at ditch inlets in both locations were set to 1.0 to reflect reduced hydraulic efficiency in the transition from open channel to piped system. Link84 was added to the downstream end of the open channel by Oil Can Henry's to represent the steep concrete chute before the system daylights west of Boones Ferry Road. The Manning's roughness coefficients of the open channels were refined based on observed condition to represent the gravel and rock subgrade, with values ranging from 0.04 and 0.05. Sediment, as a hydraulic model parameter, was added to the downstream piped system to mimic observed conditions where rock and gravel have filled the pipe and outlet.

5.2 Hydrologic Model Results

The hydrologic model results show minimal to no increases in future flows for subbasins that are fully developed, such as in the Nyberg Creek and Tualatin River watersheds. The largest increases in flow were in subbasins with large amounts of vacant land, such as in the Hedges Creek watershed.



Results of the hydrologic simulations for all events and subbasins are tabulated in Attachment A (Table A-1). Results are displayed as maximum flows within each subbasin for each design storm. Attachment A, Table A-1 also provides the change in peak flow and percent increase between the existing and future conditions flows for each subbasin.

5.3 Hydraulic Model Results

The hydraulic model results show minimal to no increases in future flows for the modeled areas that are fully developed. As expected, the largest projected flow increases were seen in areas with existing vacant land. The model results confirm the flooding problem areas/ capacity limited areas as reported by City staff, and they provided additional information about potential sources of the problems.

Hydraulic modeling results are tabulated in Attachment B, Table B-1. Results are displayed as the maximum water surface elevation and maximum peak flows for existing and future conditions for each modeled conduit.

5.3.1 Initial Identification of Flooding Problems

Based on the hydraulic model results summarized in Attachment B, Table B-2, flooding in the piped system was identified when the theoretical maximum capacity of the conduit was exceeded and surcharging occurred. In the open channel system, flooding was identified when the maximum water surface elevation at any modeled node was equal to or greater than the ground elevation of the node, which implies that flow is overtopping the bank.

In areas where flooding occurs and stormwater would exit a pipe or overtop an open channel, the model was configured to ensure no system losses, and that all water exiting the system would be routed back into the system immediately downstream of the flooded location. This modeling approach more accurately simulates real-world channel and pipe conditions and eliminates water loss from the system. Links used to model this process are highlighted in gray in Attachment B, Table B-1, as they are not actual system conduits and instead were used to inform the identification of flooded areas.

The design storm and scenario where the model indicates flooding is identified in Attachment B, Table B-1.

5.3.2 Summary of Flooding Problems

Table 6 summarizes the general modeled flooding locations, the potential source of the capacity deficiencies, and preliminary CIP recommendations. A summary of the hydraulic model results by system is described below.

5.3.2.1 Herman Road System

The hydraulic model shows extensive flooding in the open channel/culvert system along Herman Road between SW Teton Avenue and SW Tualatin Road. Attachment C, Figures 8 and 9 show the extent of system flooding by modeled conduit. The stormwater conveyance system is very flat and the open channel system and culverts appear to be undersized.

The open channel system north of Herman Road is further restricted by the two culverts across Herman Road. These culverts have a non-traditional layout, likely due to the ground clearance required beneath the railroad, and have a negative or backslope. To reduce flooding along the north side of Herman Road, the open channel system from conduit 322603 and 268054 could be piped. The culverts across Herman Road could be replaced to more freely discharge. Piping the open channel segments also provides flexibility for future road improvements and roadway widening.



To the east, the parallel culverts south of the intersection of Tualatin Road and Herman Road (conduit 322619 and 322618) begin surcharging at the 2-year event. While the model does not indicate flooding, these pipes do not meet City design standards.

5.3.2.2 Manhasset Drive System

The hydraulic model shows extensive flooding during the 2-year design storm in the stormwater system along Manhasset Drive, especially along the open channel portion. Attachment C, Figure 10 shows the extent of modeled flooding by conduit.

Channel velocity is high in the upstream portion of the open channel system where the slope is steeper and the channel is grassy (lower Manning's n). As the channel flattens and becomes rockier in the downstream portion of the system, the channel velocity decreases and water begins to pond. The open channel cross sections are also unsymmetrical and limited in capacity. Proper maintenance of the open channel, including removal of debris and regular mowing of vegetation in the channel, may alleviate some flooding; however, the channel is still undersized for the contributing flow. Due to limited easement within the surrounding areas, replacement of the open channel system with an adequately-sized piped system may reduce flooding.

Pipes further downstream (north of Manhassat Drive) experience surcharging and therefore do not meet City design standards; however, the maximum water elevations are not above rim elevations.

5.3.2.3 Nyberg Creek System

The hydraulic model shows widespread system flooding during the 2-year design storm. Attachment C, Figure 11 and 12 show the extent of modeled flooding by modeled conduit.

One prevalent location of flooding is the open channel behind Oil Can Henry's (19417 SW Boones Ferry Road). The open channel is overtopping and the downstream pipes (Link 36, Link 80) are surcharging, resulting in flooding of nearby businesses. In the hydraulic model, flooding is being routed to the system on Boones Ferry Road via links Overflow1 and Overflow2, consistent with the flow patterns reported by city staff. The ditch inlet at the end of the open channel also restricts flow. Based on field observations, sediment discharges to the inlet and is deposited in the downstream pipes, further restricting flow. Sediment is also deposited into the parallel culvert across Boones Ferry Road, which limits capacity beginning at the 10-year storm (see Attachment B, Table B-1). Modification of this inlet structure to increase hydraulic efficiency and conducting regular maintenance to remove accumulated sediment are needed to reduce flooding.

Additional system surcharging and minor flooding is also occurring in the pipes north of Seminole Trail between Tillamook Court and Martinazzi Avenue starting at the 10-year event. These pipes appear to be undersized for the 25-year design event and do not meet the City's design standard. This system is upstream of the reported flooding at Sandalwood (area 9). Although modeling did not indicate flooding of the open channel system, upsizing of the upstream pipes would impact the open channel so a comprehensive review of project needs in this area will be needed.

Additionally, the pipes near the intersection of SW Boones Ferry Road and SW Warm Springs Street and the intersection of SW Warm Springs Street and SW Tonka Street are surcharging beginning at the 10-year event. System rerouting, particularly the catch basins at the corner of SW Tonka St and SW Warm Springs Street directly north to Nyberg Creek and the catchbasins along SW Boones Ferry Road, may help alleviate the capacity issues.



	Table 6. Initial Flood Control Capital Improvement Projects													
Modeled System	General Location	Conduit	Flooding Scenario	Source of Capacity Deficiency	CIP Recommended?									
		Link32.1	Existing 10-yr											
		Link34.1	Existing 10-yr	-										
		322603	Existing 2-yr	-										
		322638.1	Existing 2-yr											
	Open channel/culvert system on	333704.1	Existing 2-yr	Existing culverts are undersized and have minimal slope. Multiple transitions from	v									
	north side of Herman Road	333705.1	Existing 2-yr	open channel to a piped system lead to high	Y									
		333706.1	Existing 2-yr											
Herman Road		333707.1	Existing 2-yr	_										
System		334080.1	Existing 2-yr	_										
-		Link33.1	Future 2-yr											
	Culvert across Herman Road	322643	Existing 2-yr	Existing pipe has minimal slope and nearby pipes show unusual change in inverts. Follow up survey recommended.	Y									
	Dual culvert south of intersection of Tualatin Road and Herman Road	322618	Existing 2-yr	Pipe has minimal slope. Culvert is surcharging but not flooding.	Y									
	Stormwater system at intersection of Tualatin Road and Herman Road	268371	Future 25-yr	Pipe is surcharging but not flooding. Refined hydrology during CP development may adjust project need.	Possibly									
		Link9	Existing 2-yr											
		Link10.1	Existing 2-yr											
	Open channel along Manhasset	Link11.1	Existing 2-yr	Open channel is undersized and not properly	N N									
	Drive	Link12.1	Existing 2-yr	maintained.	Ϋ́									
Manhasset Drive System		Link13.1	Existing 2-yr	_										
ojotom		Link14.1	Existing 2-yr											
		266695	Existing 2-yr	_										
	Piped system downstream of open channel on Manhasset Drive	266697	Existing 2-yr	Existing pipes are surcharging but not flooding due to minimal slope.	Y									
		268265	Existing 2-yr											



Table 6. Initial Flood Control Capital Improvement Projects												
Modeled System	General Location	Conduit	Flooding Scenario	Source of Capacity Deficiency	CIP Recommended?							
		Link36	Existing 2-yr	-								
	Open channel and pipe system behind Oil Can Henry's including	Link43.1	Existing 2-yr	Rock/gravel accumulation is limiting	v							
	junction of outfalls directly west of Boones Ferry Road	Link80	Existing 2-yr	control and maintenance.	T							
		277225	Future 2-yr									
		268293	Existing 10-yr	-								
	Piped system on Boones Ferry Road near Warm Springs Street	322832	Existing 10-yr	Existing open channels and pipes are								
		268296.1	Existing 25-yr	area. This system receives overland flow from	Y							
_		267215	Future 10-yr	System rerouting may help alleviate flooding.								
		268297.1	Future 25-yr									
Nyberg Creek	Piped system at intersection of	264286	Existing 10-yr	Existing pipes have minimal slope and are	, v							
System	Street	265109	Existing 2-yr	flooding.	Y							
		267910	Existing 10-yr	Existing pipes are undersized for contributing								
	Piped system between Seminole Trail and Sagert Street	267951	Existing 10-yr	drainage area. Pipes are surcharged but not flooding. System is upstream of reported	Y							
		264521	Future 10-yr	Sandalwood project opportunity area.								
	Sandalwood open channel	Link31	-	No flooding in model; however, flooding was reported during the December 2015 storm event. Channel is incised.	Y							
		Link32	-	Open channel is not flooding in the model;								
	Open channel behind Mohawk Apartments	Link 33	-	however, flow is being restricted at the downstream ditch inlet, which has large hydraulic losses.	Y							



Section 6: References

City of Tualatin. 2013. Public Works Standards, Section 206.

Clean Water Services. 2007. Stormwater and Grading Design Standards. March 2017.

Soil Conservation Service (SCS). 1986. Urban Hydrology for Small Watersheds, Technical Release 55. June.



Attachment A: Hydrology Model Results



Table A-1: Hydrology Model Results																		
	_	Time of	Existing	Future		Existing Land Use					Future Land Use			Use	Future Land Use			
Basin ID	Area	Concentration	Impervious	Impervious	Pervious	Maxi	mum Flo	w (cfs)	Maxi	Maximum Flow (cfs)			Increase in Maximum Flow (cfs)			Percent Increase in Maximum Flow (%)		
	(acres)	(minutes)	Percentage	Percentage	CN	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr	
Basalt Creek																		
BA-0010	226.9	63.6	10	12	73	10.68	26.88	36.14	11.22	27.80	37.26	0.54	0.92	1.12	5.1	3.4	3.1	
BA-0020	127.4	62.7	15	15	76	9.23	20.44	26.64	9.23	20.44	26.64	0.00	0.00	0.00	0.0	0.0	0.0	
BA-0030	32.1	8.5	41	51	79	9.15	16.03	19.42	10.44	17.54	21.00	1.29	1.51	1.57	14.1	9.4	8.1	
BA-0040	20.3	8.9	34	47	78	4.90	9.05	11.13	5.99	10.37	12.52	1.09	1.32	1.40	22.1	14.6	12.5	
BA-0050	22.0	7.5	37	49	72	4.26	8.49	10.65	5.48	10.04	12.32	1.22	1.56	1.67	28.7	18.4	15.7	
BA-0060	21.2	7.6	34	44	78	5.33	9.73	11.94	6.12	10.70	12.95	0.79	0.96	1.02	14.8	9.9	8.5	
BA-0070	39.9	46.8	43	52	75	5.58	10.56	13.10	6.76	12.06	14.71	1.18	1.50	1.61	21.1	14.2	12.3	
Cummins Creek																		
CU-0010	175.4	46.8	5	5	79	14.78	33.24	43.12	14.78	33.24	43.12	0.00	0.00	0.00	0.0	0.0	0.0	
CU-0020	123.3	35.0	22	25	78	15.69	31.98	40.41	16.46	33.00	41.52	0.77	1.02	1.11	4.9	3.2	2.8	
CU-0030	57.4	15.8	16	21	81	11.10	21.44	26.70	11.87	22.43	27.76	0.76	0.98	1.06	6.9	4.6	4.0	
CU-0040	73.5	23.8	58	63	80	21.55	35.23	41.81	22.93	36.74	43.34	1.38	1.51	1.54	6.4	4.3	3.7	
CU-0050	16.2	8.4	61	70	79	6.00	9.68	11.45	6.72	10.45	12.22	0.72	0.77	0.77	12.0	7.9	6.7	
CU-0060	57.1	13.8	65	72	80	20.97	33.29	39.17	22.72	35.12	40.99	1.74	1.83	1.83	8.3	5.5	4.7	
CU-0070	34.8	10.8	47	59	80	10.85	18.35	22.00	12.58	20.30	24.01	1.73	1.95	2.00	16.0	10.6	9.1	
CU-0080	28.5	9.3	73	73	79	12.20	18.70	21.78	12.20	18.70	21.78	0.00	0.00	0.00	0.0	0.0	0.0	
CU-0090	21.4	8.1	68	74	79	8.68	13.59	15.92	9.33	14.25	16.58	0.65	0.66	0.66	7.4	4.9	4.2	
CU-0100	33.9	12.0	64	66	75	11.32	18.66	22.20	11.76	19.15	22.70	0.44	0.49	0.50	3.9	2.6	2.3	
CU-0110	10.5	8.2	68	74	77	4.12	6.53	7.67	4.46	6.88	8.02	0.34	0.35	0.35	8.2	5.4	4.6	
CU-0120	10.3	7.2	28	74	79	2.49	4.61	5.68	4.52	6.94	8.09	2.03	2.33	2.41	81.4	50.4	42.5	



Table A-1: Hydrology Model Results																	
		Time of	Existing	Future	Pervious	Exis	ting Land	d Use	Fut	ure Land	Use	Exi	kisting Land Use		Future Land Use		
Basin ID	Area	Concentration	Impervious	Impervious		Maxi	Maximum Flow (cfs)			Maximum Flow (cfs)			Increase in Maximum Flow (cfs)			Percent Increase in Maximum Flow (%)	
	(acres)	(minutes)	Percentage	Percentage	CN	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr
Hedges Creek																	
HE-0010	4.2	6.2	75	75	82	1.96	2.97	3.44	1.97	2.97	3.45	0.01	0.01	0.01	0.4	0.2	0.2
HE-0020	6.8	6.6	8	14	80	1.31	2.62	3.29	1.44	2.78	3.47	0.13	0.16	0.18	9.5	6.2	5.3
HE-0030	10.1	7.6	65	74	82	4.27	6.61	7.73	4.61	6.98	8.09	0.34	0.37	0.36	8.0	5.5	4.7
HE-0040	3.7	6.7	65	70	80	1.51	2.39	2.80	1.60	2.48	2.90	0.09	0.10	0.10	5.8	4.1	3.4
HE-0050	8.7	7.4	25	29	78	1.85	3.57	4.44	1.99	3.75	4.63	0.14	0.18	0.19	7.6	5.0	4.3
HE-0060	35.5	30.6	41	50	80	7.27	12.93	15.73	8.27	14.12	16.98	1.00	1.19	1.25	13.7	9.2	7.9
HE-0070	6.5	7.6	41	49	81	2.08	3.52	4.23	2.28	3.75	4.46	0.20	0.23	0.23	9.5	6.4	5.5
HE-0080	12.5	7.9	43	47	81	4.03	6.81	8.16	4.24	7.04	8.40	0.20	0.23	0.24	5.0	3.4	2.9
HE-0090	19.0	39.4	43	53	80	3.66	6.43	7.79	4.21	7.07	8.46	0.54	0.64	0.67	14.8	10.0	8.6
HE-0100	7.4	7.2	43	53	79	2.21	3.82	4.61	2.52	4.18	4.99	0.32	0.37	0.38	14.3	9.6	8.2
HE-0110	11.3	7.4	48	57	79	3.58	6.07	7.28	4.02	6.57	7.80	0.44	0.50	0.52	12.4	8.3	7.1
HE-0120	5.4	7.0	47	57	80	1.79	2.99	3.58	2.02	3.26	3.86	0.23	0.26	0.28	13.1	8.8	7.7
HE-0130	9.6	8.1	74	74	83	4.46	6.69	7.74	4.46	6.69	7.74	0.00	0.00	0.00	0.0	0.0	0.0
HE-0140	10.5	7.6	27	74	79	2.52	4.66	5.74	4.59	7.02	8.18	2.08	2.36	2.45	82.4	50.7	42.6
HE-0150	3.3	7.1	74	74	84	1.58	2.36	2.73	1.58	2.36	2.73	0.00	0.00	0.00	0.0	0.0	0.0
HE-0160	22.0	10.1	68	73	79	8.80	13.77	16.13	9.27	14.25	16.61	0.47	0.48	0.48	5.3	3.5	3.0
HE-0170	23.9	10.4	61	62	81	9.13	14.49	17.05	9.20	14.57	17.13	0.07	0.08	0.08	0.8	0.5	0.5
HE-0180	22.2	12.2	31	37	78	4.85	9.14	11.31	5.35	9.76	11.97	0.50	0.62	0.66	10.2	6.8	5.8
HE-0190	10.6	8.2	37	37	79	2.81	5.04	6.15	2.81	5.04	6.15	0.00	0.00	0.00	0.0	0.0	0.0
HE-0200	19.6	8.8	76	76	81	8.88	13.36	15.47	8.88	13.36	15.48	0.00	0.00	0.00	0.0	0.0	0.0
HE-0210	9.3	7.1	74	74	80	4.12	6.31	7.34	4.12	6.31	7.34	0.00	0.00	0.00	0.0	0.0	0.0
HE-0220	19.1	8.8	39	46	81	5.67	9.81	11.83	6.23	10.45	12.50	0.55	0.65	0.67	9.8	6.6	5.7
HE-0230	8.4	7.4	55	64	81	3.11	5.03	5.95	3.40	5.34	6.28	0.30	0.32	0.33	9.5	6.3	5.6
HE-0240	22.8	9.2	73	74	80	9.85	15.06	17.52	9.98	15.19	17.65	0.13	0.13	0.13	1.3	0.9	0.7
HE-0250	15.4	7.8	71	71	81	6.69	10.25	11.95	6.69	10.25	11.95	0.00	0.00	0.00	0.0	0.0	0.0

Table A-1: Hydrology Model Results																	
		Time of	Existing	Future		Existing Land Use				Future Land Use			sting Land	Use	Fi	uture Land Use	
Basin ID	Area	Concentration	Impervious	Impervious Percentage	Pervious	Maximum Flow (cfs)			Maximum Flow (cfs)			Increase in Maximum Flow (cfs)			Percent Increase in Maximum Flow (%)		
	(acres)	(minutes)	Percentage		CN	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr
HE-0260	15.4	7.3	49	49	82	5.42	8.90	10.58	5.44	8.92	10.60	0.02	0.02	0.02	0.4	0.2	0.2
HE-0270	24.9	8.9	69	74	82	10.66	16.36	19.06	11.11	16.82	19.51	0.46	0.46	0.45	4.3	2.8	2.4
HE-0280	15.8	7.9	74	74	82	7.13	10.79	12.53	7.13	10.79	12.53	0.00	0.00	0.00	0.0	0.0	0.0
HE-0290	16.9	8.5	74	74	81	7.54	11.43	13.26	7.54	11.43	13.26	0.00	0.00	0.00	0.0	0.0	0.0
HE-0300	17.2	7.7	43	53	79	5.17	8.92	10.75	5.89	9.75	11.62	0.72	0.83	0.86	14.0	9.3	8.0
HE-0310	14.8	7.1	43	53	80	4.63	7.89	9.49	5.24	8.58	10.20	0.60	0.69	0.71	13.0	8.7	7.5
HE-0320	25.8	10.7	45	54	81	8.35	13.97	16.70	9.27	15.00	17.75	0.92	1.03	1.05	11.0	7.3	6.3
HE-0330	22.0	8.2	41	51	80	6.58	11.36	13.70	7.44	12.36	14.73	0.86	0.99	1.03	13.1	8.7	7.5
HE-0340	16.4	7.9	48	57	79	5.26	8.88	10.65	5.85	9.55	11.33	0.59	0.67	0.69	11.2	7.5	6.4
HE-0350	21.2	9.0	71	74	80	9.03	13.89	16.18	9.27	14.12	16.42	0.24	0.24	0.24	2.6	1.7	1.5
HE-0360	39.0	12.8	35	46	78	9.05	16.69	20.51	10.70	18.71	22.65	1.65	2.02	2.14	18.3	12.1	10.4
HE-0370	52.1	18.9	59	60	79	16.32	26.69	31.68	16.48	26.87	31.86	0.16	0.17	0.18	1.0	0.7	0.6
HE-0380	20.1	9.8	74	74	81	8.85	13.42	15.58	8.85	13.42	15.58	0.00	0.00	0.00	0.0	0.0	0.0
HE-0390	40.4	13.0	74	74	80	16.74	25.62	29.81	16.74	25.62	29.81	0.00	0.00	0.00	0.0	0.0	0.0
HE-0400	42.1	13.3	48	58	79	12.31	21.06	25.34	14.03	23.03	27.37	1.72	1.97	2.03	14.0	9.3	8.0
HE-0410	30.4	14.0	51	52	82	9.97	16.40	19.50	10.17	16.62	19.72	0.19	0.22	0.22	2.0	1.3	1.1
HE-0420	29.0	10.1	52	56	79	9.44	15.78	18.86	9.89	16.29	19.38	0.45	0.51	0.53	4.8	3.2	2.8
HE-0430	10.4	8.2	24	24	80	2.42	4.53	5.58	2.42	4.53	5.58	0.00	0.00	0.00	0.0	0.0	0.0
HE-0440	11.5	7.4	56	72	80	4.15	6.77	8.03	4.97	7.65	8.94	0.82	0.89	0.91	19.7	13.1	11.3
HE-0450	44.0	12.0	58	73	80	15.45	25.07	29.69	18.37	28.16	32.79	2.92	3.09	3.10	18.9	12.3	10.4
HE-0460	19.3	8.3	60	60	80	7.33	11.73	13.83	7.33	11.73	13.83	0.00	0.00	0.00	0.0	0.0	0.0
HE-0470	6.4	7.6	70	70	81	2.78	4.28	4.99	2.78	4.28	4.99	0.00	0.00	0.00	0.0	0.0	0.0
HE-0480	2.6	6.9	74	74	80	1.14	1.75	2.03	1.14	1.75	2.03	0.00	0.00	0.00	0.0	0.0	0.0
HE-0490	4.8	6.9	68	74	79	1.98	3.10	3.63	2.10	3.23	3.77	0.13	0.14	0.14	6.5	4.5	3.8
HE-0500	4.9	6.6	74	74	79	2.17	3.34	3.89	2.17	3.34	3.89	0.00	0.00	0.00	0.0	0.0	0.0
HE-0510	22.7	9.2	58	74	79	8.13	13.22	15.66	9.80	14.98	17.43	1.67	1.77	1.77	20.5	13.4	11.3

	Table A-1: Hydrology Model Results Time of Existing Evisting Existing Land Use Future Existing Land Use																
		Time of	Existing	Future		Exis	ting Land	l Use	Fut	ure Land	Use	Exi	sting Land	Use	Fi	iture Land Use	
Basin ID	Area	Concentration	Impervious	Impervious	Pervious	Maxi	mum Flo	w (cfs)	Maxii	mum Flov	w (cfs)	Increase i	n Maximum	1 Flow (cfs)	Percent Incre	ase in Maximu	m Flow (%)
	(acres)	(minutes)	Percentage	Percentage	CN	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr
HE-0520	30.9	10.3	47	71	80	9.83	16.55	19.81	13.00	19.99	23.30	3.18	3.45	3.49	32.3	20.8	17.6
HE-0530	23.9	73.1	31	31	78	2.52	4.87	6.10	2.52	4.87	6.10	0.00	0.00	0.00	0.0	0.0	0.0
HE-0540	70.6	17.9	45	62	76	16.30	29.44	36.00	21.50	35.61	42.44	5.20	6.17	6.44	31.9	21.0	17.9
HE-0550	64.8	16.9	56	73	79	20.22	33.38	39.74	24.87	38.38	44.78	4.65	5.00	5.05	23.0	15.0	12.7
HE-0560	39.7	96.0	15	61	77	2.52	5.40	6.96	5.80	9.80	11.77	3.29	4.40	4.81	130.7	81.3	69.2
HE-0570	12.9	10.1	58	58	69	3.37	6.04	7.37	3.37	6.04	7.37	0.00	0.00	0.00	0.0	0.0	0.0
HE-0580	46.2	42.3	30	74	79	6.56	12.54	15.59	12.61	19.66	23.00	6.05	7.12	7.41	92.1	56.7	47.5
HE-0590	19.9	8.3	56	74	78	6.84	11.31	13.47	8.54	13.13	15.30	1.70	1.82	1.83	24.8	16.1	13.6
HE-0600	12.6	7.1	65	74	79	4.97	7.88	9.28	5.53	8.50	9.90	0.56	0.62	0.62	11.3	7.9	6.7
HE-0610	42.7	11.9	50	56	75	11.32	20.07	24.41	12.40	21.37	25.77	1.09	1.30	1.36	9.6	6.5	5.6
HE-0620	37.6	62.1	12	27	80	3.65	7.48	9.47	4.67	8.83	10.96	1.02	1.36	1.49	27.8	18.1	15.8
HE-0630	30.1	14.0	71	71	73	10.48	16.90	19.99	10.48	16.91	19.99	0.00	0.00	0.00	0.0	0.0	0.0
HE-0640	25.0	10.6	74	74	72	9.51	15.11	17.79	9.51	15.11	17.79	0.00	0.00	0.00	0.0	0.0	0.0
HE-0650	24.0	9.4	22	72	81	5.70	10.55	12.99	10.39	15.87	18.45	4.70	5.32	5.47	82.5	50.4	42.1
HE-0660	14.5	45.0	26	46	79	1.84	3.62	4.53	2.59	4.57	5.56	0.74	0.96	1.03	40.3	26.4	22.7
HE-0670	11.0	7.7	73	74	76	4.50	7.03	8.24	4.53	7.06	8.27	0.03	0.03	0.03	0.7	0.5	0.4
HE-0680	32.5	11.8	53	68	77	9.90	16.82	20.20	12.20	19.39	22.82	2.30	2.57	2.62	23.2	15.3	13.0
HE-0690	18.9	8.7	34	46	76	4.21	7.98	9.88	5.20	9.20	11.18	0.99	1.23	1.30	23.5	15.4	13.2
HE-0700	34.6	12.1	10	30	80	6.26	12.58	15.82	8.55	15.49	18.95	2.29	2.91	3.13	36.5	23.2	19.8
HE-0710	23.0	31.1	29	66	79	3.74	7.12	8.85	6.53	10.45	12.32	2.78	3.33	3.48	74.4	46.7	39.3
HE-0720	63.4	16.7	61	72	78	20.64	33.65	39.90	23.76	36.99	43.27	3.12	3.35	3.37	15.1	10.0	8.5
HE-0730	18.4	7.8	61	63	79	6.88	11.07	13.08	7.07	11.27	13.28	0.19	0.20	0.21	2.7	1.9	1.6
HE-0740	141.9	29.4	11	39	76	12.91	30.39	39.79	23.88	45.54	56.52	10.97	15.15	16.74	85.0	49.9	42.1
HE-0750	145.8	22.6	59	73	78	41.19	68.44	81.64	49.77	77.82	91.14	8.59	9.38	9.51	20.9	13.7	11.6
HE-0760	21.9	8.6	73	73	78	9.18	14.21	16.59	9.20	14.22	16.61	0.02	0.02	0.02	0.2	0.1	0.1
HE-0770	64.6	13.4	59	73	78	20.99	34.72	41.36	25.45	39.56	46.25	4.47	4.84	4.89	21.3	13.9	11.8

	Table A-1: Hydrology Model Results Time of Evisting Enture Existing Land Use Future Land Use Existing Land Use																
		Time of	Existing	Future		Exis	ting Land	d Use	Fut	ure Land	Use	Exi	sting Land	Use	Fu	iture Land Use	
Basin ID	Area	Concentration	Impervious	Impervious	Pervious	Maxi	mum Flo	w (cfs)	Maxii	mum Flov	v (cfs)	Increase i	n Maximum	n Flow (cfs)	Percent Incre	ase in Maximu	m Flow (%)
	(acres)	(minutes)	Percentage	Percentage	CN	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr
HE-0780	35.0	10.9	66	66	79	13.31	21.13	24.87	13.31	21.13	24.87	0.00	0.00	0.00	0.0	0.0	0.0
HE-0790	40.8	11.6	66	68	79	15.46	24.51	28.82	15.81	24.87	29.18	0.34	0.36	0.37	2.2	1.5	1.3
HE-0800	38.4	10.4	58	63	79	13.38	21.87	25.96	14.36	22.94	27.05	0.98	1.07	1.09	7.3	4.9	4.2
HE-0810	10.1	6.8	44	49	79	3.03	5.24	6.33	3.26	5.51	6.60	0.23	0.27	0.27	7.4	5.1	4.3
HE-0820	26.0	9.0	41	50	80	7.59	13.18	15.93	8.58	14.34	17.13	0.99	1.16	1.20	13.1	8.8	7.5
HE-0830	72.0	13.2	22	42	77	12.70	25.63	32.28	17.98	32.35	39.49	5.28	6.72	7.21	41.6	26.2	22.3
HE-0840	15.3	8.3	43	53	79	4.51	7.82	9.45	5.16	8.58	10.23	0.65	0.76	0.78	14.4	9.7	8.3
HE-0850	17.8	8.6	43	53	79	5.22	9.06	10.95	5.98	9.94	11.86	0.76	0.88	0.91	14.5	9.7	8.3
HE-0860	14.3	6.5	38	47	79	3.94	7.00	8.51	4.45	7.61	9.15	0.52	0.62	0.64	13.1	8.8	7.6
HE-0870	51.4	11.1	32	50	72	8.24	17.36	22.10	12.34	22.67	27.83	4.10	5.31	5.73	49.8	30.6	25.9
HE-0880	16.7	7.0	38	47	79	4.68	8.26	10.03	5.27	8.96	10.76	0.59	0.70	0.73	12.6	8.5	7.3
HE-0890	4.4	5.9	41	50	79	1.31	2.26	2.73	1.48	2.46	2.95	0.17	0.20	0.22	13.1	9.0	8.0
HE-0900	36.4	9.3	24	29	77	6.70	13.52	17.02	7.50	14.55	18.14	0.79	1.03	1.12	11.8	7.6	6.6
HE-0910	16.1	7.0	36	44	77	4.01	7.35	9.02	4.57	8.03	9.74	0.56	0.68	0.72	13.8	9.2	7.9
HE-0920	25.1	8.5	43	53	64	3.38	7.67	9.94	4.77	9.54	11.99	1.39	1.87	2.05	41.2	24.4	20.7
HE-0930	7.7	7.0	39	48	72	1.55	3.05	3.82	1.89	3.48	4.28	0.34	0.43	0.46	21.8	14.1	12.1
HE-0940	9.1	6.7	41	50	77	2.43	4.35	5.31	2.80	4.80	5.78	0.38	0.45	0.47	15.5	10.4	8.9
HE-0950	9.6	8.1	40	50	75	2.25	4.20	5.18	2.67	4.71	5.72	0.42	0.51	0.54	18.5	12.2	10.5
HE-0960	16.1	7.6	42	52	71	3.25	6.38	7.98	4.06	7.41	9.09	0.81	1.03	1.10	25.0	16.1	13.8
HE-0970	2.8	6.0	39	48	65	0.38	0.86	1.11	0.51	1.04	1.31	0.13	0.18	0.20	35.4	21.0	17.9
HE-0980	17.7	29.8	31	37	78	2.87	5.50	6.84	3.21	5.95	7.33	0.35	0.46	0.49	12.1	8.3	7.1
HE-0990	18.2	7.8	42	51	64	2.42	5.52	7.16	3.35	6.78	8.54	0.93	1.26	1.38	38.6	22.8	19.3
HE-1000	15.5	7.8	43	53	75	3.91	7.13	8.74	4.64	8.01	9.67	0.73	0.88	0.93	18.6	12.4	10.6
HE-1010	16.1	7.6	43	53	80	4.90	8.43	10.16	5.57	9.20	10.96	0.67	0.77	0.80	13.6	9.1	7.8
HE-1020	23.3	7.8	42	51	78	6.57	11.57	14.04	7.55	12.72	15.24	0.98	1.15	1.20	14.9	9.9	8.5
HE-1030	25.8	7.8	43	53	75	6.48	11.82	14.49	7.73	13.34	16.09	1.26	1.52	1.60	19.4	12.9	11.0

	Table A-1: Hydrology Model Results Time of Evicting Evicting Existing Land Use Future Evicting																
		Time of	Existing	Future		Exis	ting Land	d Use	Fut	ure Land	Use	Exi	sting Land	Use	Fi	uture Land Use	
Basin ID	Area	Concentration	Impervious	Impervious	Pervious	Maxi	mum Flo	w (cfs)	Maxir	mum Flov	v (cfs)	Increase i	n Maximun	n Flow (cfs)	Percent Incre	ase in Maximu	m Flow (%)
	(acres)	(minutes)	Percentage	Percentage	CN	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr
HE-1040	11.0	6.5	37	47	72	2.05	4.14	5.21	2.58	4.83	5.96	0.54	0.69	0.75	26.2	16.7	14.3
HE-1050	14.2	6.9	36	48	78	3.68	6.66	8.15	4.41	7.54	9.07	0.73	0.88	0.92	19.9	13.2	11.3
HE-1060	17.1	7.3	40	47	53	0.64	2.81	4.05	1.26	3.76	5.14	0.63	0.95	1.09	98.4	34.0	26.8
HE-1070	89.0	18.0	38	44	59	5.01	15.84	21.97	7.49	19.74	26.38	2.48	3.91	4.41	49.4	24.7	20.1
HE-1080	19.4	7.5	45	55	66	3.29	6.86	8.71	4.37	8.27	10.24	1.08	1.41	1.53	32.9	20.6	17.6
Nyberg Creek																	
NY-0010	7.1	6.9	5	5	76	0.87	2.06	2.69	0.88	2.06	2.69	0.00	0.00	0.00	0.2	0.1	0.1
NY-0020	1.1	6.2	6	6	77	0.15	0.34	0.44	0.15	0.34	0.44	0.00	0.00	0.00	0.0	0.0	0.2
NY-0030	30.3	40.2	13	46	80	3.63	7.38	9.33	6.06	10.49	12.66	2.43	3.11	3.33	67.0	42.1	35.7
NY-0040	18.8	8.7	37	58	75	4.21	7.97	9.87	6.06	10.22	12.24	1.85	2.25	2.37	44.0	28.2	24.0
NY-0050	49.1	10.4	30	32	79	11.66	21.53	26.48	11.91	21.85	26.82	0.25	0.32	0.34	2.2	1.5	1.3
NY-0060	2.8	6.2	78	78	79	1.29	1.95	2.26	1.29	1.95	2.26	0.00	0.00	0.00	0.1	0.0	0.0
NY-0070	7.4	6.7	50	58	79	2.45	4.10	4.91	2.72	4.42	5.24	0.27	0.31	0.33	11.2	7.6	6.8
NY-0080	47.1	10.3	24	29	79	10.14	19.35	24.00	11.03	20.48	25.22	0.89	1.13	1.21	8.8	5.8	5.0
NY-0090	39.9	9.2	52	61	79	13.22	22.05	26.33	14.74	23.74	28.06	1.51	1.69	1.73	11.5	7.7	6.6
NY-0100	10.4	6.4	45	52	73	2.49	4.61	5.68	2.87	5.09	6.19	0.39	0.48	0.51	15.6	10.4	8.9
NY-0110	18.5	7.8	70	71	76	7.38	11.63	13.65	7.46	11.71	13.73	0.08	0.09	0.09	1.1	0.7	0.6
NY-0120	23.3	7.4	44	54	80	7.23	12.36	14.86	8.20	13.46	16.00	0.97	1.10	1.14	13.3	8.9	7.7
NY-0130-0D0T	9.7	6.8	46	46	79	3.09	5.24	6.29	3.09	5.24	6.29	0.00	0.00	0.00	0.0	0.0	0.0
NY-0140	20.3	7.4	60	75	79	7.62	12.25	14.47	9.03	13.78	16.02	1.41	1.52	1.56	18.5	12.4	10.7
NY-0150	11.0	7.0	43	49	80	6.96	11.94	14.37	7.50	12.57	15.03	0.54	0.63	0.65	7.8	5.3	4.5
NY-0150-0D0T	11.7	7.0	46	46	80	3.74	6.34	7.60	3.74	6.34	7.60	0.00	0.00	0.00	0.0	0.0	0.0
NY-0160	24.1	9.9	66	66	82	11.51	17.86	20.87	11.51	17.86	20.87	0.00	0.00	0.00	0.0	0.0	0.0
NY-0160-0D0T	3.9	9.9	46	46	82	1.28	2.13	2.55	1.28	2.13	2.55	0.00	0.00	0.00	0.0	0.0	0.0
NY-0170-0D0T	30.4	11.4	46	46	80	9.27	15.77	18.93	9.27	15.77	18.93	0.00	0.00	0.00	0.0	0.0	0.0
NY-0180	26.5	9.1	44	54	79	7.84	13.55	16.35	8.97	14.86	17.70	1.13	1.31	1.35	14.4	9.6	8.3

	Table A-1: Hydrology Model Results Time of Evicting Euture Time of Evicting Euture Existing Land Use Future Land Use																
		Time of	Existing	Future		Exis	ting Land	d Use	Fut	ure Land	Use	Exi	sting Land	Use	Fi	uture Land Use	
Basin ID	Area	Concentration	Impervious	Impervious	Pervious	Maxi	mum Flo	w (cfs)	Maxii	mum Flov	v (cfs)	Increase i	n Maximun	n Flow (cfs)	Percent Incre	ase in Maximu	m Flow (%)
	(acres)	(minutes)	Percentage	Percentage	CN	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr
NY-0190	20.1	8.0	43	53	79	5.93	10.28	12.41	6.78	11.27	13.44	0.85	0.99	1.03	14.4	9.6	8.3
NY-0200	11.5	8.4	72	72	81	5.01	7.66	8.90	5.01	7.66	8.90	0.00	0.00	0.00	0.0	0.0	0.0
NY-0210	22.1	12.2	70	70	82	9.21	14.12	16.44	9.21	14.13	16.45	0.00	0.00	0.00	0.0	0.0	0.0
NY-0220	20.1	11.7	67	70	82	8.19	12.68	14.80	8.42	12.91	15.03	0.23	0.23	0.23	2.8	1.8	1.6
NY-0230	29.6	8.1	78	78	80	13.54	20.36	23.60	13.55	20.37	23.61	0.01	0.01	0.01	0.1	0.1	0.0
NY-0240	2.8	6.0	57	57	80	1.04	1.68	1.99	1.04	1.68	1.99	0.00	0.00	0.00	0.0	0.0	0.0
NY-0250	2.2	6.9	71	71	82	0.99	1.51	1.75	0.99	1.51	1.75	0.00	0.00	0.00	0.0	0.0	0.0
NY-0260	2.8	6.1	71	72	81	1.27	1.94	2.26	1.28	1.95	2.27	0.01	0.01	0.01	1.0	0.7	0.6
NY-0270	2.9	5.9	75	76	79	1.30	1.99	2.31	1.31	2.00	2.33	0.02	0.02	0.02	1.2	0.9	0.7
NY-0280	6.5	6.4	59	66	80	2.46	3.97	4.70	2.66	4.20	4.93	0.20	0.23	0.23	8.1	5.7	4.9
NY-0290	8.9	6.6	49	59	79	2.90	4.89	5.85	3.29	5.33	6.32	0.39	0.44	0.47	13.3	9.0	8.0
NY-0300	4.1	6.4	47	56	79	1.30	2.21	2.66	1.47	2.41	2.87	0.17	0.20	0.21	13.0	8.9	7.9
NY-0310	9.4	6.5	39	57	79	2.67	4.71	5.71	3.41	5.56	6.62	0.74	0.86	0.91	27.5	18.2	15.9
NY-0320	2.5	6.1	45	55	79	0.76	1.31	1.57	0.87	1.43	1.71	0.11	0.13	0.13	13.9	9.6	8.4
NY-0330	2.3	6.0	45	55	79	0.72	1.24	1.49	0.82	1.36	1.62	0.10	0.12	0.13	13.9	9.7	8.5
NY-0340	4.1	6.3	44	54	79	1.24	2.14	2.57	1.42	2.34	2.79	0.18	0.20	0.22	14.1	9.5	8.5
NY-0350	15.6	7.8	43	53	79	4.62	8.00	9.66	5.28	8.77	10.46	0.66	0.77	0.80	14.3	9.6	8.3
NY-0360	13.1	7.6	43	53	79	3.89	6.74	8.14	4.44	7.39	8.81	0.56	0.65	0.67	14.3	9.6	8.2
NY-0370	1.0	6.2	76	76	83	0.49	0.74	0.86	0.49	0.74	0.86	0.00	0.00	0.00	0.0	0.0	0.0
NY-0380	0.6	6.3	76	76	82	0.29	0.43	0.50	0.29	0.43	0.50	0.00	0.00	0.00	0.0	0.0	0.0
NY-0390	0.4	7.2	75	75	83	0.19	0.29	0.33	0.19	0.29	0.33	0.00	0.00	0.00	0.0	0.0	0.0
NY-0400	1.5	6.5	78	78	83	0.73	1.09	1.26	0.73	1.09	1.26	0.00	0.00	0.00	0.0	0.0	0.0
NY-0410	1.6	5.8	48	58	82	0.56	0.91	1.09	0.62	0.99	1.16	0.06	0.07	0.07	11.0	7.8	6.6
NY-0420	22.0	8.2	45	55	81	7.10	11.96	14.33	7.98	12.96	15.35	0.89	1.00	1.03	12.5	8.4	7.2
NY-0430	40.6	11.6	42	53	79	11.24	19.69	23.85	13.09	21.86	26.11	1.85	2.17	2.26	16.5	11.0	9.5
NY-0440	32.9	10.6	39	52	79	9.01	15.90	19.30	10.72	17.91	21.39	1.71	2.01	2.09	19.0	12.6	10.8



	Table A-1: Hydrology Model Results Existing Land Use Existing Land Use																
		Time of	Fxisting	Future		Exis	ting Land	l Use	Fut	ure Land	Use	Exi	sting Land	Use	Fu	iture Land Use	
Basin ID	Area	Concentration	Impervious	Impervious	Pervious	Maxi	mum Flo	w (cfs)	Maxii	mum Flov	w (cfs)	Increase i	n Maximum	n Flow (cfs)	Percent Incre	ase in Maximu	m Flow (%)
	(acres)	(minutes)	Percentage	Percentage	CN	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr
NY-0450	22.3	8.0	48	58	81	7.44	12.42	14.83	8.35	13.43	15.86	0.91	1.01	1.03	12.2	8.1	7.0
NY-0460	26.1	9.0	43	53	80	8.10	13.80	16.57	9.15	14.99	17.81	1.05	1.20	1.24	13.0	8.7	7.5
NY-0470	15.9	7.9	42	52	80	4.86	8.34	10.04	5.50	9.07	10.80	0.64	0.73	0.76	13.1	8.8	7.5
NY-0480	14.7	7.7	40	49	79	4.20	7.37	8.93	4.75	8.02	9.60	0.55	0.65	0.67	13.1	8.8	7.6
NY-0490	15.6	7.8	41	51	79	4.47	7.82	9.47	5.11	8.57	10.25	0.64	0.75	0.78	14.3	9.6	8.2
NY-0500	25.5	9.0	40	51	79	7.13	12.55	15.22	8.28	13.90	16.64	1.15	1.36	1.41	16.2	10.8	9.3
NY-0510	21.3	8.5	45	55	82	7.11	11.85	14.15	7.93	12.77	15.09	0.82	0.92	0.94	11.6	7.8	6.6
NY-0520	18.6	7.6	52	54	81	6.75	10.97	13.00	6.89	11.13	13.16	0.14	0.16	0.16	2.1	1.4	1.2
Oswego Creek																	
OS-Offsite1	56.1	19.8	74.6	74.6	70.2	17.97	29.04	34.36	17.97	29.04	34.36	0.00	0.00	0.00	0.0	0.0	0.0
Rock Creek																	
R0-0010	76.5	18.8	52	63	79	21.50	36.37	43.63	24.85	40.17	47.52	3.35	3.79	3.89	15.6	10.4	8.9
R0-0020	147.4	25.6	27	72	72	14.61	34.08	44.56	42.28	69.10	82.01	27.67	35.02	37.45	189.4	102.8	84.0
Saum Creek																	
SA-0010	11.6	6.4	28	34	75	2.17	4.38	5.51	2.46	4.76	5.92	0.29	0.38	0.41	13.4	8.7	7.5
SA-0020	7.2	5.9	38	46	78	1.96	3.50	4.26	2.22	3.81	4.60	0.26	0.31	0.34	13.1	8.8	7.9
SA-0030	12.7	6.7	18	22	79	2.62	5.12	6.39	2.79	5.34	6.63	0.17	0.22	0.24	6.6	4.3	3.7
SA-0040	3.8	5.8	42	52	79	1.13	1.95	2.36	1.28	2.14	2.56	0.16	0.19	0.20	13.9	9.8	8.5
SA-0050	22.2	7.4	43	53	79	6.49	11.30	13.66	7.45	12.41	14.81	0.95	1.11	1.15	14.7	9.8	8.4
SA-0060	11.0	6.3	26	35	79	2.58	4.81	5.94	2.94	5.27	6.42	0.36	0.45	0.48	14.1	9.4	8.1
SA-0070	19.8	7.7	39	50	77	5.04	9.17	11.22	6.07	10.40	12.52	1.02	1.23	1.29	20.3	13.4	11.5
SA-0080	30.9	8.7	31	37	79	7.69	14.05	17.23	8.35	14.86	18.09	0.67	0.82	0.86	8.7	5.8	5.0
SA-0090	6.5	6.2	42	52	79	1.92	3.33	4.03	2.19	3.65	4.37	0.27	0.32	0.34	14.0	9.5	8.5
SA-0100	9.5	6.8	43	53	79	2.84	4.91	5.92	3.25	5.39	6.42	0.41	0.48	0.49	14.5	9.7	8.4
SA-0110	21.7	7.9	37	51	79	5.90	10.50	12.78	7.11	11.93	14.28	1.22	1.44	1.50	20.6	13.7	11.7
SA-0120	41.7	10.8	23	28	78	8.17	16.06	20.09	8.88	16.98	21.09	0.72	0.93	1.00	8.8	5.8	5.0

	Table A-1: Hydrology Model Results Time of Evicting Evicting Existing Land Use Future Land Use Evicting Land Use																
		Time of	Existing	Future		Exis	ting Lanc	l Use	Fut	ure Land	Use	Exi	sting Land	Use	Fi	uture Land Use	
Basin ID	Area	Concentration	Impervious	Impervious	Pervious	Maxi	mum Flov	w (cfs)	Maxii	mum Flov	w (cfs)	Increase i	n Maximun	n Flow (cfs)	Percent Incre	ase in Maximu	m Flow (%)
	(acres)	(minutes)	Percentage	Percentage	CN	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr
SA-0130	17.3	7.1	24	28	78	3.63	7.04	8.77	3.88	7.36	9.11	0.25	0.32	0.34	6.8	4.5	3.9
SA-0140	19.5	8.3	23	29	78	4.02	7.82	9.76	4.52	8.46	10.44	0.50	0.64	0.69	12.4	8.2	7.1
SA-0150	23.1	8.0	30	36	78	5.37	10.05	12.41	5.93	10.75	13.15	0.56	0.70	0.74	10.4	7.0	6.0
SA-0160	51.0	10.5	37	45	79	11.99	21.39	26.06	13.51	23.22	27.97	1.52	1.82	1.91	12.7	8.5	7.3
SA-0170-0D0T	54.8	14.2	46	46	78	14.66	25.70	31.13	14.66	25.70	31.13	0.00	0.00	0.00	0.0	0.0	0.0
SA-0180	10.4	6.4	38	46	79	2.92	5.15	6.25	3.27	5.57	6.70	0.36	0.42	0.44	12.2	8.2	7.1
SA-0190	7.9	6.6	42	52	81	2.57	4.33	5.18	2.87	4.67	5.55	0.30	0.34	0.37	11.6	7.9	7.1
SA-0200	20.7	8.4	43	53	79	6.10	10.57	12.77	6.98	11.59	13.82	0.88	1.02	1.05	14.4	9.6	8.2
SA-0210	11.7	6.8	39	48	76	2.90	5.33	6.54	3.37	5.91	7.15	0.48	0.58	0.61	16.4	10.9	9.4
SA-0220	26.7	9.1	38	47	74	5.67	10.90	13.55	6.73	12.24	14.98	1.06	1.34	1.43	18.7	12.3	10.5
SA-0230	22.3	7.5	37	42	55	0.83	3.67	5.29	1.37	4.50	6.24	0.54	0.84	0.95	65.4	22.8	18.0
SA-0240	28.4	9.3	37	40	60	2.08	6.17	8.43	2.51	6.81	9.15	0.43	0.64	0.72	20.9	10.3	8.5
SA-0250	14.5	6.7	42	53	59	1.38	3.64	4.87	2.25	4.86	6.22	0.88	1.22	1.35	63.7	33.4	27.7
SA-0260	21.7	7.5	42	51	73	4.81	9.15	11.34	5.86	10.46	12.74	1.05	1.31	1.40	21.9	14.3	12.3
SA-0270	8.8	6.8	36	53	69	1.34	2.92	3.75	2.11	3.92	4.83	0.77	1.00	1.08	57.0	34.2	28.9
SA-0280	26.0	8.6	42	51	61	2.77	6.93	9.17	4.09	8.76	11.19	1.32	1.82	2.02	47.7	26.3	22.0
SA-0290	47.0	36.9	15	16	76	4.22	9.57	12.45	4.35	9.76	12.66	0.13	0.19	0.21	3.1	2.0	1.7
SA-Offsite1	115.3	21.4	7	7	76	10.49	26.06	34.48	10.49	26.06	34.48	0.00	0.00	0.00	0.0	0.0	0.0
SA-Offsite2	21.0	7.1	8	8	76	2.79	6.39	8.30	2.81	6.42	8.33	0.02	0.03	0.03	0.8	0.5	0.4
SA-Offsite3	718.9	122.1	7	7	70	21.84	50.21	68.45	21.84	50.21	68.45	0.00	0.00	0.00	0.0	0.0	0.0
SA-Offsite4	777.7	183.0	7	7	73	27.14	57.12	74.84	27.14	57.12	74.84	0.00	0.00	0.00	0.0	0.0	0.0
SA-Offsite5	576.2	159.7	8	9	76	30.51	64.30	83.28	30.51	64.30	83.28	0.00	0.00	0.00	0.0	0.0	0.0
SA-Offsite5-0D0T	98.6	159.7	46	46	76	8.67	15.72	19.30	8.67	15.72	19.30	0.00	0.00	0.00	0.0	0.0	0.0



	Table A-1: Hydrology Model Results Time of Evicting Euture Existing Land Use Future Land Use																
		Time of	Existing	Future		Exis	ting Land	d Use	Fut	ure Land	Use	Exi	sting Land	Use	Fi	uture Land Use	
Basin ID	Area	Concentration	Impervious	Impervious	Pervious	Maxi	mum Flo	w (cfs)	Maxii	num Flov	v (cfs)	Increase i	n Maximum	Flow (cfs)	Percent Incre	ase in Maximur	n Flow (%)
	(acres)	(minutes)	Percentage	Percentage	UN	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr
Tualatin River																	
TU-0010	18.2	7.0	10	11	73	1.70	4.53	6.06	1.78	4.64	6.19	0.08	0.12	0.13	4.8	2.5	2.1
TU-0020	23.9	7.5	40	50	73	5.25	10.02	12.43	6.32	11.35	13.85	1.07	1.34	1.43	20.4	13.4	11.5
TU-0030	45.1	10.1	41	50	77	11.70	21.03	25.67	13.33	23.00	27.73	1.63	1.96	2.06	13.9	9.3	8.0
TU-0040	9.8	7.5	41	50	79	2.86	4.98	6.02	3.19	5.37	6.43	0.33	0.39	0.41	11.6	7.8	6.7
TU-0050	41.2	9.7	43	53	71	8.28	16.19	20.22	10.37	18.83	23.05	2.08	2.64	2.82	25.2	16.3	14.0
TU-0060	9.4	7.5	5	5	77	1.24	2.85	3.71	1.24	2.85	3.71	0.00	0.00	0.00	0.0	0.0	0.0
TU-0070	5.3	5.9	40	50	80	1.59	2.75	3.33	1.81	3.01	3.60	0.22	0.26	0.28	13.7	9.5	8.3
TU-0080	34.6	9.4	39	49	74	7.51	14.33	17.78	9.11	16.33	19.91	1.60	2.00	2.13	21.3	13.9	12.0
TU-0090-0D0T	12.7	7.1	46	46	80	4.11	6.94	8.31	4.11	6.94	8.31	0.00	0.00	0.00	0.0	0.0	0.0
TU-0100	38.3	11.3	71	72	80	15.85	24.43	28.48	16.05	24.62	28.68	0.19	0.20	0.19	1.2	0.8	0.7
TU-0110	2.2	6.3	23	28	77	0.44	0.87	1.09	0.48	0.92	1.14	0.04	0.05	0.05	8.6	5.6	4.9
TU-0120	19.9	7.7	33	40	78	4.95	9.08	11.14	5.48	9.73	11.83	0.53	0.65	0.69	10.7	7.2	6.2
TU-0130	11.8	6.6	76	76	79	5.26	8.05	9.37	5.26	8.05	9.37	0.00	0.00	0.00	0.0	0.0	0.0
TU-0140	51.9	18.9	64	66	75	15.63	25.87	30.82	16.11	26.42	31.38	0.48	0.55	0.56	3.1	2.1	1.8
TU-0150	6.4	7.1	78	78	79	2.91	4.41	5.12	2.91	4.41	5.12	0.00	0.00	0.00	0.0	0.0	0.0
TU-0160	22.0	10.1	78	78	74	9.12	14.10	16.45	9.12	14.10	16.45	0.00	0.00	0.00	0.0	0.0	0.0
TU-0170	6.8	6.8	56	56	76	2.20	3.71	4.45	2.20	3.71	4.45	0.00	0.00	0.00	0.0	0.0	0.0
TU-0180	21.8	10.0	63	63	73	7.13	11.91	14.23	7.13	11.91	14.23	0.00	0.00	0.00	0.0	0.0	0.0
TU-0190	50.0	18.5	60	61	77	14.74	24.61	29.39	15.02	24.92	29.71	0.27	0.31	0.32	1.9	1.3	1.1
TU-0200	39.3	9.9	6	6	76	4.25	10.51	13.87	4.25	10.51	13.87	0.00	0.00	0.00	0.0	0.0	0.0
TU-0210	39.2	9.9	67	67	79	15.40	24.27	28.48	15.40	24.27	28.48	0.00	0.00	0.00	0.0	0.0	0.0
TU-0220	56.9	12.5	5	5	76	5.61	14.23	18.89	5.61	14.23	18.89	0.00	0.00	0.00	0.0	0.0	0.0
TU-0230	25.6	9.6	73	73	79	10.88	16.72	19.49	10.88	16.72	19.49	0.00	0.00	0.00	0.0	0.0	0.0
TU-0240	8.3	6.7	78	78	78	3.79	5.76	6.69	3.79	5.76	6.69	0.00	0.00	0.00	0.0	0.0	0.0
TU-0250	123.1	35.0	37	44	81	23.87	42.46	51.76	26.42	45.61	55.08	2.55	3.15	3.32	10.7	7.4	6.4

						Table A	- 1: Hyd i	rology N	lodel Re	esults							
Basin ID	Area	Time of Concentration	Existing Impervious	Future Impervious	Pervious	Exis Maxi	ting Land mum Flo	d Use w (cfs)	Fut Maxii	ure Land mum Flov	Use v (cfs)	Exi Increase i	sting Land n Maximun	Use n Flow (cfs)	Fu Percent Incre	uture Land Use case in Maximu	m Flow (%)
	(acres)	(minutes)	Percentage	Percentage	CN	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr	2-yr	10-yr	25-yr
TU-0260	72.6	23.6	31	38	82	16.23	28.92	35.20	17.74	30.73	37.11	1.51	1.82	1.91	9.3	6.3	5.4
TU-0270	23.1	9.3	43	53	79	6.71	11.65	14.08	7.68	12.78	15.25	0.97	1.13	1.17	14.5	9.7	8.3
TU-0280	20.5	8.0	43	53	79	6.06	10.51	12.69	6.93	11.52	13.74	0.87	1.01	1.04	14.3	9.6	8.2
TU-0290	3.8	6.3	42	53	81	1.23	2.07	2.49	1.39	2.26	2.68	0.16	0.18	0.19	12.7	8.8	7.7
TU-0300	15.7	7.9	15	17	80	3.28	6.35	7.92	3.41	6.52	8.10	0.13	0.17	0.18	4.0	2.7	2.3
TU-0310	64.5	14.7	39	52	79	16.25	28.98	35.29	19.40	32.71	39.18	3.15	3.73	3.90	19.4	12.9	11.0
TU-0320	36.8	12.4	28	34	79	8.22	15.36	18.96	9.01	16.35	20.02	0.79	0.99	1.05	9.7	6.4	5.6
TU-0330	35.4	9.5	40	46	79	9.87	17.36	21.06	10.75	18.41	22.15	0.88	1.05	1.09	8.9	6.0	5.2
TU-0340	27.7	9.9	39	48	79	7.66	13.49	16.36	8.65	14.66	17.59	0.99	1.17	1.22	12.9	8.7	7.5
TU-0350	42.9	10.9	44	57	79	12.36	21.43	25.89	14.75	24.19	28.74	2.39	2.76	2.85	19.3	12.9	11.0
TU-0360	26.7	8.6	48	58	79	8.37	14.21	17.07	9.52	15.53	18.41	1.16	1.31	1.35	13.8	9.2	7.9
TU-0370	40.5	10.0	48	54	79	12.39	21.15	25.43	13.41	22.32	26.64	1.01	1.17	1.21	8.2	5.5	4.7
TU-0380	9.0	7.4	65	69	79	3.52	5.59	6.58	3.72	5.79	6.79	0.19	0.21	0.22	5.5	3.7	3.3
TU-Offsite1	400.6	97.7	5	5	68	10.54	24.79	34.90	10.54	24.79	34.90	0.00	0.00	0.00	0.0	0.0	0.0
TU-Offsite2	307.6	76.7	6	6	79	21.09	45.82	59.17	21.18	45.96	59.33	0.09	0.14	0.16	0.4	0.3	0.3

Note: Subbasins that do not drain to city infrastructure are highlighted in gray.


Attachment B: Hydraulic Model Results



												Table	B-1. Hydrau	ulic Model P	arameters ar	nd Results														
		-		_	-	Node	Name	Invert Ele	vation (ft)	Ground Ele	evation (ft)	Existing 2 y Surface El	rr Max Water levation (ft)	Future 2 y Surface E	yr Max Water Elevation (ft)	Existing 1 Surface	0 yr Max Water Elevation (ft)	Future 10 y Surface E	r Max Water levation (ft)	Existing 25 Surface E	o yr Max Water Elevation (ft)	Future 25 yr Surface Ele	Max Water vation (ft)	2 yr Max Flo	ow (cfs)	10 yr Max	Flow (cfs)	25 yr Max	x Flow (cfs)	
Link ID	Length (ft)	Shape	Diameter/Hei ght (ft)	Slope (%)	Design Flow (cfs)	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	Existing	Future	Existing	Future	Existing	Future	When Hydraulically Deficient
Herman Road Syste	em																													
267853 268054	105.1 60 5	Circular	2.0	0.6 25	15.9 5 0	262914 262138 HF-0120	322610_HE-0080 270931	123.72 127 44	123.12 125 ዓበ	131.59 129 44	127.16 129 14	124.84 127 ۹۹	124.05 126 15	124.94 128.04	124.11 126 19	125.35 128 24	124.39 126 ዓዓ	125.47 128 34	124.44 127 በዓ	125.63 128 56	124.52 127 17	125.80 129.01	124.57 127 25	6.7 1 8	7.6 2.0	11.5 3.0	12.6 3 3	13.9 3 7	14.9 3 9	
268371	55.7	Circular	2.0	0.4	12.6	262922	262914	124.12	123.90	130.53	131.59	125.29	124.84	125.39	124.94	125.83	125.35	125.96	125.47	126.18	125.63	126.38	125.80	5.8	6.5	9.8	10.7	11.8	12.8	Future 25-yr
268372	131.0	Circular	1.0	0.9	3.2	262918_HE-0090	262914	126.13	124.92	128.62	131.59	126.51	125.30	126.54	125.33	126.65	125.44	126.68	125.47	126.71	125.63	126.75	125.80	1.0	1.1	1.7	1.9	2.0	2.2	
268384	174.9	Circular	2.0	0.4	13.3	262545	262922	124.92	124.22	128.65	130.53	125.98	125.29	126.08	125.39	126.54	125.83	126.69	125.96	127.04	126.18	127.33	126.38	5.8	6.5	9.9	10.7	11.9	12.8	Eviatian 2 va
322603	108.8 380.4	Circular	1.5	0.3	5.6	322601_HE-0160 322608	HE-0150 322610 HE-0080	127.31	126.95	131.06	129.95	130.36	128.91	130.54	128.93	132.61	129.10	132.87	129.12	133.94	129.17	134.23 126.53	129.19	8.8 12.0	9.3 13.3	13.8 14.1	14.2 14.1	16.1	16.6	Existing 2-yr
322620	51.1	Circular	2.0	1.7	27.8	322615	322613	124.99	124.10	127.99	128.23	125.99	125.98	126.27	126.26	126.71	126.64	126.78	126.69	126.83	126.72	126.90	126.77	2.9	3.2	5.1	5.7	6.1	6.6	8 / .
322621	40.9	Circular	2.0	-3.1	36.7	322613	322614	122.95	124.20	128.23	128.14	125.98	125.97	126.26	126.24	126.64	126.56	126.69	126.58	126.72	126.60	126.77	126.62	2.9	3.1	5.0	5.7	6.1	6.5	
322638.1	49.5	Circular	1.0	0.3	1.9	322625	322630	125.26	125.09	128.26	128.09	127.63	126.46	127.69	126.67	127.82	127.29	127.87	127.51	127.89	127.59	127.97	127.75	4.5 8 3	4.5	4.5	4.5	4.5	4.5 25.4	Existing 2-yr
322639	76.9	Circular	1.0	0.1	0.9	322625	322630	124.80	127.05	123.20	127.74	126.00	127.30	126.27	126.47	127.32	127.24	126.78	127.47	126.81	127.56	126.89	127.72	-1.6	-1.9	-2.3	-2.6	-2.7	-2.9	
322641	43.5	Circular	2.0	2.2	61.8	322627	322634	124.72	123.78	127.72	128.15	126.14	126.09	126.47	126.38	127.24	126.97	127.47	127.13	127.56	127.18	127.72	127.29	11.0	13.0	17.7	20.4	21.3	22.8	
322642	52.4	Circular	2.0	0.6	33.8	322634	322637	123.00	122.66	128.15	127.86	126.09	126.03	126.38	126.29	126.97	126.70	127.13	126.76	127.18	126.79	127.29	126.83	11.0	13.0	17.7	20.4	21.3	22.8	Evictin - 2
322043 3333707 flood	46.9	Trapezoidal	1.0	0.6	31./	322037	333701 HE-0140	124.06	123.99	127.86	128.99	126.03	125.99	126.29	120.25	126.70	128.61	120.76	128.66	128.79	126.49	128.82	120.49	9.5	10.1	15.3	20.4	21.3 18.0	18.6	Existing 2-yr
333704.1	12.6	Circular	0.8	0.3	1.1	333700	333699	125.88	125.84	128.88	128.84	128.33	128.27	128.38	128.32	128.48	128.42	128.53	128.47	128.55	128.49	128.59	128.53	2.2	2.2	2.2	2.2	2.2	2.2	Existing 2-yr
333704_flood	12.6	Trapezoidal	1.0	0.3		333700	333699	127.88	127.84	128.88	128.84	128.33	128.27	128.38	128.32	128.48	128.42	128.53	128.47	128.55	128.49	128.59	128.53	12.1	14.6	19.9	22.8	23.7	26.6	P 1 1 1 -
333705.1 333705.flood	34.5	Circular	0.8	0.3	1.1	333701_HE-0140	333700	125.99	125.88	128.99	128.88	128.45	128.33	128.51	128.38	128.61	128.48	128.66	128.53	128.68	128.55	128.73	128.59	1.9	1.9	1.9	1.9	1.9	1.9	Existing 2-yr
333706.1	46.9	Circular	0.8	0.4	1.2	333702	333701_HE-0140	126.16	125.99	129.16	128.99	128.58	128.45	128.61	128.51	128.73	128.61	128.76	128.66	128.79	128.68	128.82	128.73	1.5	1.3	1.5	1.2	1.5	1.2	Existing 2-yr
333707.1	49.2	Circular	0.8	0.0	1.2	333703	333702	126.32	126.16	129.32	129.16	128.73	128.58	128.75	128.61	128.87	128.73	128.89	128.76	128.93	128.79	128.95	128.82	1.4	1.3	1.4	1.2	1.5	1.1	Existing 2-yr
333707_flood	49.2	Trapezoidal	1.0	0.3	1 2	333703	333702	128.32	128.16	129.32	129.16	128.73	128.58	128.75	128.61	128.87	128.73	128.89	128.76	128.93	128.79	128.95	128.82	9.3	9.8	15.1	15.6	17.8	18.3	Existing 2 vr
334080_flood	52.0	Trapezoidal	1.0	0.3	1.2	333699	334081	123.84	127.66	128.84	128.66	128.27	127.07	128.32	128.04	128.42	127.87	128.47	127.94	128.49	127.90	128.53	128.05	11.1	13.6	19.0	2.0	2.0	25.8	LAISUNG 2-Yr
335317	21.7	Circular	2.0	-6.5	53.6	322614	322612	122.70	124.10	128.14	127.10	125.97	125.96	126.24	126.23	126.56	126.51	126.58	126.52	126.60	126.52	126.62	126.52	2.8	3.1	5.0	5.7	6.1	6.5	
Link32.1	185.2	Trapezoidal	1.5	0.3		HE-0150	333703	126.95	126.32	129.95	129.32	128.91	128.73	128.93	128.75	129.10	128.87	129.12	128.89	129.17	128.93	129.19	128.95	10.4	10.8	14.3	14.5	15.7	15.8	Existing 10-yr
Link32_1000	185.2	Trapezoidal	2.0	0.3		334081	322625	128.95	128.32	129.95	129.32	128.91	128.73	128.93	128.75	129.10	128.87	129.12	128.89	129.17	128.93	129.19	128.95	12.8	14.9	1.8	2.1	21.3	3.5 22.9	Future 2-vr
Link33_flood	119.5	Trapezoidal	1.0	0.3		334081	322625	127.66	127.26	128.66	128.26	127.67	127.63	127.74	127.69	127.87	127.82	127.94	127.87	127.96	127.89	128.03	127.97	0.0	0.5	1.9	2.8	3.2	4.5	
Link34.1	110.5	Trapezoidal	2.0	0.3		322630	322627	125.09	124.72	128.09	127.72	126.46	126.14	126.67	126.47	127.29	127.24	127.51	127.47	127.59	127.56	127.75	127.72	12.7	15.2	19.7	21.1	21.0	21.7	Existing 10-yr
LINK34_TIOOD	110.5	Trapezoidal	2.0	0.3		322630	322627	127.09	126.72	128.09	127.72	126 14	126 14	126.47	126.47	127.289	127.235	127.509	127.474	127.588	127.56	127.748	127.72	-1.6	-1.9	-2.4	-2.6	-2.7	-2.9	
Link36	12.6	Trapezoidal	2.0	7.2		270931	322615	125.90	124.99	129.14	127.99	126.15	125.99	126.19	126.27	126.99	126.71	127.13	126.78	127.17	126.83	127.25	126.90	1.8	2.0	-11.4	11.2	10.5	-15.3	
Link37	230.8	Trapezoidal	2.0	0.1		322615	322626	124.99	124.80	127.99	127.80	125.99	126.00	126.27	126.27	126.71	126.71	126.78	126.78	126.83	126.81	126.90	126.89	-1.4	-1.5	-2.6	-3.4	-3.3	-3.7	
Link38	316.7	Natural	2.0	0.0		322632_HE-0130	322612	123.99	124.10	126.49	127.10	125.99	125.96	126.25	126.23	126.49	126.51	126.49	126.52	126.49	126.52	126.49	126.52	14.5 14.8	16.2	21.3	22.3	23.0	23.7	Future 2-vr
Link39_flood	358.0	Trapezoidal	1.0	0.5		322612	322608	126.10	124.37	127.10	127.87	125.96	125.94	126.23	126.21	126.51	126.52	126.52	126.52	126.52	126.53	126.52	126.53	0.0	0.4	1.2	1.2	1.2	1.2	ruture 2-yr
Link40	425.0	Natural	3.5	0.1		322610_HE-0080	Node567	122.66	121.99	127.16	126.43	124.05	123.60	124.11	123.68	124.39	124.03	124.44	124.09	124.52	124.19	124.57	124.25	21.7	23.3	31.8	33.1	35.4	36.6	
Link41	425.0	Natural	4.0	0.1	97.2	Node567	Node568	121.99	121.39	126.43	126.39	123.60	123.15	123.68	123.25	124.03	123.67	124.09	123.75	124.19	123.87	124.25	123.95	21.1	22.8	30.8	32.2	34.4	35.7	
Link42 Link43	414.9	Circular	4.0	0.0	8.4	270939 HE-0060	260389	121.32	121.20	127.32	123.12	123.14	123.07	123.24	123.17	123.50	123.39	123.75	123.07	123.87	123.79	123.94	123.87	22.3	32.6	46.2	49.0	53.3	56.0	
Link44	156.4	Circular	4.0	0.2	126.2	260389	271095	121.00	120.65	127.86	124.65	122.52	121.78	122.60	121.83	122.94	122.07	123.01	122.11	123.10	122.18	123.16	122.22	29.6	32.6	46.2	49.0	53.3	56.0	
Link45	50.0	Natural	5.0	0.1	16 F	Node568	262143_HE-0070	121.39	121.32	126.39	127.32	123.15	123.14	123.25	123.24	123.67	123.66	123.75	123.75	123.87	123.87	123.95	123.94	20.9	22.8	30.6	32.0	34.2	35.5	
Link40 Link47	99.5	Circular	2.0	0.5	14.9	262910 HE-0100	262545	125.52	125.02	130.52	128.65	126.58	125.98	126.67	126.08	127.11	127.11	127.26	127.20	127.66	127.00	128.04	127.33	5.8	6.5	9.9	10.7	11.9	12.8	
Manhasset Drive Sy	/stem																													
266695	132.0	Circular	1.8	-0.5	10.4	259248	262763_HE-0480	132.70	133.40	139.25	138.78	136.12	134.99	136.72	135.17	138.48	135.92	136.72	135.17	138.67	136.16	138.76	136.22	10.6	12.5	16.0	16.4	16.6	16.8	Existing 2-yr
266695	47.4 194.1	Circular	1.8 2.3	4.0 0.2	29.0 11.6	262001 262765 HE-0470	259248 271161	129.88	129.56	135.43	132.06	130.80	130.12	132.22	130.72	133.09	131.20	132.22	130.72	133.23	131.22	133.26	130.70	14.3	12.5	21.7	21.8	22.6	22.8	Existing 2-vr
267387	102.0	Circular	2.5	1.1	40.5	261974_HE-0510	262060_HE-0500	157.90	156.75	160.40	159.25	159.22	157.63	159.40	157.72	159.95	158.99	159.40	157.72	160.02	159.25	160.20	159.25	8.1	9.8	14.3	16.3	15.7	17.4	
268265	149.3	Circular	2.3	0.1	10.5	262763_HE-0480	262764	133.20	133.00	138.78	137.99	134.99	134.18	135.17	134.28	135.92	134.93	135.17	134.28	136.16	135.18	136.22	135.22	11.7	13.6	17.5	17.6	17.8	18.0	Existing 2-yr
268266 Link10.1	407.7 200.0	Circular Natural	2.3 0.6	0.7 3.1	23.7	262764 Node278	202705_HE-0470 Node280	132.80 153.54	129.98 147.30	137.99 155.66	135.43 149.00	134.02 154.76	131.93 148.17	134.19 154.79	132.22 148.21	134.93 154.87	133.09 148.30	134.19 154.79	132.22 148.21	135.18 154.87	133.23 148.31	135.22 154.87	133.26 148.31	5.5	13.b 5.5	17.5 11.6	13.6	18.U 5.5	18.1 5.5	Existing 2-vr
Link10_flood	200.0	Trapezoidal	1.0	3.3		Node278	Node280	154.66	148.00	155.66	149.00	154.76	148.17	154.79	148.21	154.87	148.30	154.79	148.21	154.87	148.31	154.87	148.31	3.3	4.9	8.5	10.2	10.7	10.7	
Link11.1	160.0	Natural	0.8	2.1		HE-0490	262001	141.34	137.96	143.14	139.76	142.29	138.63	142.32	138.64	142.43	140.10	142.32	138.64	142.44	140.29	142.44	140.43	6.2	6.2	6.7	6.7	6.7	6.6	Existing 2-yr
Link11_flood Link12_1	160.0	Natural	1.0	2.1		HE-0490 Node280	262001 Node281	142.14 147 30	138.76 145.75	143.14 149.00	139.76 147.45	142.29 148 17	138.91 146.68	142.32	138.94 146 71	142.43 148.30	140.10 146.80	142.32	138.94	142.44	140.29	142.44	140.43 146.80	4.4	6.2 4.3	6.2	6.2	14.2	4.4	Existing 2-vr
Link12_flood	130.0	Trapezoidal	1.0	1.2		Node280	Node281	148.00	146.45	149.00	147.45	148.17	146.68	148.21	146.71	148.30	146.80	148.21	146.71	148.31	146.80	148.31	146.80	4.4	6.1	9.7	11.3	11.8	11.8	z y
Link13.1	20.0	Natural	0.7	1.2		Node281	Node282	145.75	145.51	147.45	147.21	146.68	146.40	146.71	146.44	146.80	146.53	146.71	146.44	146.80	146.54	146.80	146.54	2.0	2.0	4.4	6.1	2.0	2.0	Existing 2-yr
Link13_flood	20.0	Trapezoidal	1.0	1.2		Node281	Node282	146.45 145.51	146.21	147.45 147.21	147.21	146.68	146.44 142.20	146.71	146.47	146.80 146.53	146.56	146.71	146.47	146.80	146.57	146.80	146.57	7.0	8.7	12.2	13.9	14.4	14.4	Existing 2-vr
Link14 flood	330.0	Trapezoidal	1.0	1.3		Node282	HE-0490	146.21	142.14	147.21	143.14	146.40	142.29	146.44	142.32	146.53	142.45	146.44	142.32	146.54	142.44	146.54	142.44	5.2	6.9	10.5	12.2	12.7	12.7	LAISUNG 2-Yr
Link9	200.0	Natural	1.1	1.6		262060_HE-0500	Node278	156.75	153.54	159.25	155.66	157.63	154.76	157.72	154.79	158.99	154.87	157.72	154.79	159.25	154.87	159.25	154.87	8.8	10.5	5.2	6.9	16.2	16.2	Existing 2-yr
Nyberg Creek Syste	m	<i>c</i> :				000015	ANY 005-	400.5-	440	100.00	405.1-	42.1.1-	40.000			400	405	400	405.65	405	495.55	405.05	100.15							
264286 264288	237.6	Circular	1.5	0.2	4.5	262213 262214 NV-0270	NY-0250	120.20 127.82	119.70 120.30	125.08	126.15	124.18 128 17	124.06	124.69	124.58 124.60	125.08 128 34	125.75	125.08 128 34	125.93	125.08	126.08	125.08	126.15	2.5	2.5	-4.6	-5.2	-5.7 2 2	-5.9	Existing 10-yr
264517	120.0	Circular	1.8	1.5	18.0	263083_NY-0340	263084_NY-0330	211.00	209.19	215.65	214.60	212.14	210.10	212.25	210.20	214.57	211.94	215.65	212.79	215.65	212.82	215.65	212.84	9.7	11.1	16.7	17.5	17.5	17.6	
264521	238.9	Circular	1.8	1.6	18.6	263084_NY-0330	263085	209.09	205.28	214.60	208.46	210.10	206.28	210.20	206.38	211.94	207.60	212.79	208.00	212.82	208.02	212.84	208.03	10.4	11.9	17.9	18.8	18.9	18.9	Future 10-yr
264912	177.1	Circular	2.5	5.7	91.1	262947_NY-0310	262948_NY-0300	193.30	183.20	206.92	191.71	193.97	184.44	194.03	184.60	194.22	185.14	194.27	185.35	194.28	185.41	194.32	185.61	13.7	16.1	23.3	25.6	26.1	27.1	
264913	124.5	Circular	2.5 2.5	1.5 1.1	40.2 40.4	262946_N1-0300 262949	262949	181.90	182.00	191.71	192.00	183.23	181.68	183.38	181.83	183.89	182.27	184.07	182.41	184.13	182.45	184.24	104.24 182.53	15.0	17.6	25.5 25.5	28.0 28.0	28.7 28.7	30.0	
264915	29.5	Circular	2.5	2.0	54.2	262950	263397_NY-0290	180.30	179.70	189.27	187.40	181.68	180.52	181.83	180.59	182.27	180.83	182.41	180.91	182.45	180.94	182.53	180.98	15.0	17.6	25.5	28.0	28.7	30.0	
265109	16.3	Circular	1.0	0.0	0.1	262208_NY-0260	262213	120.20	120.20	124.78	125.08	124.20	124.18	124.71	124.69	125.18	125.08	125.18	125.08	125.21	125.08	125.21	125.08	1.3	1.3	1.9	2.0	2.3	2.3	Existing 2-yr

												Table	e B-1. Hydrau	lic Model Pa	rameters an	nd Results														
						Node	Name	Invert Ele	evation (ft)	Ground El	evation (ft)	Existing 2 Surface E	yr Max Water Ilevation (ft)	Future 2 yr Surface Ele	Max Water evation (ft)	Existing 10 Surface B) yr Max Water Elevation (ft)	Future 10 Surface E	yr Max Water Elevation (ft)	Existing 25 Surface E	o yr Max Water Elevation (ft)	Future 25 y Surface El	yr Max Water Ievation (ft)	2 yr Max	Flow (cfs)	10 yr Max	Flow (cfs)	25 yr Ma	x Flow (cfs)	
Link ID	Length (ft)	Shape	Diameter/Hei ght (ft)	Slope (%)	Design Flow (cfs)	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	Existing	Future	Existing	Future	Existing	Future	When Hydraulically Deficient
265110	24.9	Circular	3.0	16.5	251.0	262210_NY-0280	262209	130.60	126.50	136.53	133.15	131.46	127.49	131.54	127.68	131.83	128.50	131.97	129.10	132.12	129.72	132.29	130.17	20.3	23.4	34.2	37.4	39.2	41.1	•
265111 266998	207.7 142.0	Circular Circular	2.5 3.0	3.1 3.0	67.4 106.5	262209 260409	NY-0250 262210 NY-0280	126.30 135.09	119.80 130.90	133.15 140.51	126.15 136.53	127.49 136.11	124.06 131.73	127.68 136.21	124.58 131.80	128.50 136.51	125.75 132.00	129.10 136.60	125.93 132.05	129.72 136.63	126.08 132.12	130.17 136.65	126.15 132.29	20.2 17.9	23.4 20.8	34.1 30.3	37.3 33.3	39.1 34.5	41.1 36.3	
267215	83.8	Circular	3.0	0.7	52.1	262844	270971	125.20	124.61	132.63	127.61	127.20	125.52	127.40	125.73	128.60	127.01	129.04	127.07	129.43	127.14	129.97	127.20	27.5	32.0	47.8	53.1	57.9	63.3	Future 10-yr
267573_1	52.0	Circular	5.3	0.9	265.1	260399	Node588	114.33	113.88	123.85	123.85	116.51	116.10	116.62	116.21	116.85	116.47	116.88	116.49	116.92	116.55	116.93	116.57	88.9	97.6	113.9	115.2	116.6	117.4	
267573 3	45.0 15.0	Circular	5.3	0.9	265.2	Node589	270963	113.88	113.30	123.85	123.15	115.74	115.74	115.84	115.84	116.47	115.98	116.49	116.14	116.55	116.21	116.37	116.25	95.5 97.8	101.7	120.6	122.5	125.5	138.2	
267910	126.6	Circular	1.8	0.9	14.3	262152_NY-0350	263083_NY-0340	212.30	211.10	216.42	215.65	213.49	212.14	213.63	212.25	216.63	214.57	218.16	215.65	218.69	215.65	219.20	215.65	8.4	9.7	14.7	16.1	17.8	19.3	Existing 10-yr
267951	199.0	Circular	1.8	1.4	17.3	263085	271340_NY-0320	205.20	202.44	208.46	205.44	206.28	203.09	206.38	203.12	207.60	203.25	208.00	203.27	208.02	203.28	208.03	203.28	10.4	11.9	17.8	18.8	18.9	18.9	Existing 10-yr
267953	84.5 21.4	Circular	2.5	1.4	45.1	260393	262947_N1-0310 262844	200.00 126.70	193.90 126.40	203.34 135.44	132.63	200.64 129.06	194.46	129.37	194.50 127.96	131.22	194.63	132.11	194.65	133.06	194.66	134.34	194.66	27.5	32.0	47.8	20.1 53.1	20.4 57.9	63.3	Existing 10-vr
268295.1	119.7	Circular	2.5	5.5	89.7	262856	262847_NY-0370	138.10	131.46	147.25	138.76	139.24	132.77	139.36	132.95	139.88	134.24	140.78	136.10	143.52	137.76	144.74	137.87	27.1	31.5	47.2	52.4	57.1	62.5	
268295_flood	119.7	Trapezoidal	1.0	7.1	70.6	262856	262847_NY-0370	146.3	137.8	147.3	138.8													0.0	0.0	0.0	0.0	0.0	0.0	Eviatian 25 va
268296 flood	67.6	Trapezoidal	1.0	4.4	79.6	262847_NY-0370	262846	131.20	128.50	138.8	135.44												134.54	0.0	0.0	0.0	0.0	0.0	13.1	Existing 25-yr
268297.1	41.3	Circular	2.5	10.4	122.8	262848	262856	142.50	138.20	148.93	147.25	143.71	139.24	143.85	139.36	144.35	139.88	144.63	140.78	147.55	143.52	148.04	144.74	27.1	31.5	47.2	52.4	57.1	58.2	Future 25-yr
268297_flood	41.3	Trapezoidal	1.0	4.1	49.1	262848	262856	147.9	146.3	148.9	147.3												146.36	0.0	0.0	0.0	0.0	0.0	10.7	Euturo 2 ur
312461	52.4	Circular	3.0 1.0	6.1	48.1 8.2	312444 NY-0410	312445 NY-0400	124.00	139.90	127.95	120.72	143.29	125.40	143.30	140.10	143.34	140.16	143.35	140.17	143.37	120.72	129.70	140.20	46.6	0.6	0.9	1.0	1.1	1.2	Future 2-yr
322832	62.1	Circular	1.3	2.4	9.3	312443	322831	125.60	124.11	129.32	126.11	125.95	125.21	125.97	125.70	130.39	126.96	129.32	127.00	131.01	127.05	129.32	127.10	1.3	1.3	10.9	9.1	12.4	9.0	Existing 10-yr
333171	653.3	Circular	2.5	4.6	81.2	263397_NY-0290	333170	179.70	149.92	187.40	152.92	180.52	150.82	180.59	150.86	180.83	150.99	180.91	151.03	180.94	151.04	180.98	151.07	17.9	20.8	30.3	33.3	34.5	36.3	
Link31 Link32	93.0	Natural	2.5	8.0		333170	Node561	202.44 149.92	142.51	205.44 152.92	205.54 145.10	150.82	143.64	150.86	143.68	150.99	143.80	151.03	143.83	151.04	143.84	151.07	143.86	17.9	20.8	30.3	33.3	34.5	36.3	
Link33	93.0	Natural	2.0	4.3		Node561	260409	142.51	138.51	145.10	140.51	143.64	139.63	143.68	139.67	143.80	139.77	143.83	139.80	143.84	139.82	143.86	139.83	17.9	20.8	30.3	33.3	34.5	36.3	
Link34	186.3	Circular	3.5	0.2	42.8	NY-0250	270982_NY-0200	119.40	119.01	126.15	126.00	124.06	123.90	124.58	124.39	125.75	125.38	125.93	125.46	126.08	125.54	126.15	125.59	23.7	26.8	33.7	35.1	35.7	37.0	
Link35 Link36	456.0	Circular	3.0	2.7	102.2	335464	Node591	139.80	123.70	143.47	129.52	139.70	125.99	139.94	125.99	140.16	130.39	140.17	129.52	140.20	130.30	140.20	130.31	46.3	1.5 51.4	53.3	53.4	2.5 53.5	2.4 53.6	Existing 2-yr
Link37	40.0	Natural	2.0	1.3		270971	322831	124.61	124.11	127.61	126.11	125.52	125.21	125.73	125.70	127.01	126.96	127.07	127.00	127.14	127.05	127.20	127.10	27.5	31.9	47.7	53.0	57.8	63.3	0,
Link38	120.0	Natural	2.0	1.2		322831	277232	124.11	122.72	126.11	126.72	125.21	125.13	125.70	125.65	126.96	126.72	127.00	126.72	127.05	126.72	127.10	126.72	28.5	32.7	56.0	61.1	66.8	71.0	Evicting 2 vr
Link43 flood	1125.0	Trapezoidal	2.0	1.5		NY-0450	Node595	152.39	140.50	154.39	142.50	153.96	140.13	154.08	140.51	154.82	140.08	155.18	140.87	155.78	140.88	156.22	140.89	4.5	4.5	66.7	67.9	70.0	71.5	Existing 2-yr
Link49	115.0	Circular	5.0	1.3	208.2	NEW1	Node570	117.18	115.68	127.68	127.68	122.81	121.87	123.08	121.93	123.64	122.01	123.68	122.02	123.73	122.02	123.76	122.03	90.3	99.1	115.3	116.6	118.0	118.8	
Link60 Link61	280.0 1000.0	Trapezoidal Trapezoidal	1.5	1.0 1.0		NY-0520 NY-0510	NY-0510 NY-0450	165.05 162.19	162.19 151 99	166.55 163 70	163.70 154 39	165.52 162.90	162.90 153.96	165.53 162 93	162.93 154.08	165.68 163.14	163.14 154.82	165.68 163.16	163.16 155.18	165.74 163.25	163.25 155.78	165.75 163.28	163.28 156.22	6.7 13.6	6.9 14.6	11.0 22.6	11.1 23.7	13.0 26.6	13.1 27.7	
Link61	1200.0	Circular	3.0	1.5	74.9	NY-0470	NY-0460	182.73	165.16	187.73	170.16	184.02	165.55	184.12	165.58	184.51	165.69	184.62	165.72	184.75	165.76	184.88	165.78	20.3	23.3	35.7	39.2	43.3	47.0	
Link63	900.0	Trapezoidal	2.0	1.5		NY-0460	NY-0450	165.16	151.99	170.16	154.39	165.55	153.96	165.58	154.08	165.69	154.82	165.72	155.18	165.76	155.78	165.78	156.22	28.1	32.1	49.1	53.9	59.4	64.4	
Link67 Link68	1500.0 1150.0	Circular	3.0 3.0	2.6	99.1 99.1	NY-0430 NY-0420	NY-0420 262848	210.40 171 97	171.97 142 50	215.40 176.97	176.97 148 93	211.32 173.04	173.04 143 71	211.40 173 13	173.13 143.85	211.64 173.43	173.43 144.35	211.72 173 52	173.52 144.63	211.78 173.60	173.60 147.55	211.86 173 71	173.71 148.04	20.1 27.1	23.7 31 5	35.4 47.2	39.5 52.4	42.9 57 1	47.2 62.5	
Link69	1600.0	Circular	1.8	1.5	18.9	NY-0360	262152_NY-0350	239.07	212.50	244.07	216.42	239.61	213.49	239.64	213.63	239.79	216.63	239.83	218.16	239.87	218.69	239.92	219.20	3.8	4.4	6.7	7.4	8.1	8.8	
Link70	750.0	Circular	3.0	2.6	99.2	NY-0440	NY-0430	229.62	210.40	234.62	215.40	230.23	211.32	230.29	211.40	230.43	211.64	230.48	211.72	230.52	211.78	230.57	211.86	9.0	10.7	15.8	17.9	19.2	21.3	
Link71 Link72	1300.0 600 0	Circular Circular	3.0 3.0	1.5 1 5	75.0 74 9	NY-0500 NY-0490	NY-0490 NY-0480	232.50 213 47	213.47 204 69	237.50 218 47	218.47 209.69	233.12 214 26	214.26 205.62	233.17 214 33	214.33 205.69	233.33 214 54	214.54 205 95	233.37 214 59	214.59 206.02	233.42 214 65	214.65 206.09	233.46 214 71	214.71 206 16	7.1 11 5	8.2 13 3	12.5 20 2	13.8 22 4	15.2 24.6	16.6 26 8	
Link73	1500.0	Circular	3.0	1.5	74.9	NY-0480	NY-0470	204.69	182.73	209.69	187.73	205.62	184.02	205.69	184.12	205.95	184.51	206.02	184.62	206.09	184.75	206.16	184.88	15.6	17.9	27.5	30.3	33.4	36.3	
Link74	400.0	Circular	1.0	0.0	0.6	NY-0220	260399	114.68	114.54	123.72	123.85	115.78	116.51	115.85	116.62	116.16	116.85	116.20	116.88	116.29	116.92	116.31	116.93	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	Existing 2-yr
Link78 Link79	375.0 375.0	Circular	1.5 1 5	6.6 6.7	25.0 25.2	NY-0230 NY-0230	Node588 Node589	138.51 138 51	113.88 113 50	146.05 146.05	123.85 123 15	139.04 139.04	116.10 115 74	139.04 139.04	116.21 115.84	139.18 139.18	116.47 116.11	139.18 139 18	116.49 116.14	139.23 139.23	116.55 116.21	139.23 139.23	116.57 116.23	6.7 6.8	6.7 6.8	10.1 10.2	10.1 10.2	11.8 11 8	11.8 11 8	
Link80	30.0	Circular	3.0	2.7	61.3	Node591	277227_NY-0380	123.77	122.95	127.95	127.95	127.93	127.47	128.93	128.36	130.27	129.66	130.28	129.67	130.30	129.69	130.31	129.70	46.3	51.4	53.3	53.4	53.5	53.6	Existing 2-yr
Link84	5.0	Trapezoidal	3.0	30.0	76.0	Node595	335464	137.68	136.18	142.50	142.50	140.13	139.70	140.51	139.94	140.66	140.04	140.67	140.05	140.68	140.06	140.69	140.06	46.3	51.4	53.3	53.4	53.5	53.6	
Link86 Nyberg1	400.0 360.0	Circular	4.0	0.3	76.2	NY-0220 277232	270963 270982 NY-0200	114.68 122 72	113.37 119.01	123.72 126.72	123.15 126.00	115.78 125 13	115.61 123.90	115.85 125.65	115.72 124 39	116.16 126.72	115.98 125.38	116.20 126.72	116.01 125.46	116.29 126.72	116.08 125.54	116.31 126.72	116.10 125 59	9.3 72.8	9.6 80.0	13.9 90.5	14.1 90.4	16.0 91 1	16.3 90.6	
Nyberg2	140.0	Natural	3.5	0.0		270982_NY-0200	Node592	119.01	119.00	126.00	126.27	123.90	123.59	124.39	124.02	125.38	124.89	125.46	124.96	125.54	125.03	125.59	125.08	96.0	105.9	122.9	124.5	125.7	126.5	
Nyberg2.1	140.0	Natural	3.5	0.0		Node593	Node569	119.00	119.00	126.27	125.27	123.28	122.99	123.65	123.30	124.40	123.93	124.46	123.98	124.52	124.03	124.56	124.06	93.2	102.2	118.6	119.8	120.7	121.3	
Nyberg3 Nyberg4	280.0 65.0	Natural Natural	4.0 4.0	0.4 1 2		Node569	NY-0240 NFW/1	119.00 117 99	117.99 117 18	125.27 129 75	129.75 127.68	122.99 122.86	122.86 122.81	123.30 123.15	123.15 123.08	123.93 123 73	123.73 123.64	123.98 123 77	123.77 123.68	124.03 123.82	123.82 123 73	124.06 123.85	123.85 123.76	90.6 90.4	99.3 99 1	114.8 115 3	116.0 116.6	117.1 118.0	117.8 118.8	
Nyberg5	83.0	Natural	5.0	0.0		Node570	Node571	116.85	116.85	127.68	122.70	121.87	121.85	121.93	121.91	122.01	121.98	122.02	121.99	122.02	121.99	122.03	122.00	90.3	99.1	115.3	116.6	118.0	118.8	
Nyberg6	33.0	Natural	5.0	0.1		Node571	Node574	116.85	116.83	122.70	123.20	121.85	121.85	121.91	121.90	121.98	121.98	121.99	121.98	121.99	121.99	122.00	121.99	90.4	99.1	115.3	116.6	118.0	118.8	
Nyberg8 Overflow1	30.0	Natural Trapezoidal	6.0	1.2		Node575 335464	260399	114.69 141.0	114.33 127.8	123.20	123.85 129.3					117.05 140.043	116.85 130.385	117.07 140.048	116.88 129.316	117.10	116.92 131.01	117.11	116.93 129.32	90.4	99.1	0.0	116.6 0.0	118.0 0,0	118.8	
Overflow2	470.0	Trapezoidal	1.5	2.7		Node595	312443	140.5	127.8	142.5	129.3			140.512	127.803	140.663	130.385	140.67	129.316	140.68	131.01	140.69	129.32	0.0	0.2	17.8	19.0	21.0	22.5	
Weir	2.0	Natural	3.5	0.0		Node574	Node575	119.35	119.35	123.20	123.20	121.85	121.83	121.90	121.88	121.98	121.96	121.98	121.96	121.99	121.97	121.99	121.97	90.4	99.1	115.3	116.6	118.0	118.8	

Attachment C: Figures





🗆 Feet

Project: Project 149233

City of Tualatin







City of Tualatin Stormwater Master Plan

Date: August 2017 Project: Project 149233

0	2,250	4,500
		Enterna Feet

1. Projection: NAD 1983 State Plane Oregon North (feet)

Athey Creek

Legend

3	Basalt Creek Jurisdiction-Tualatin
3	NW Concept Plan Area
71	SW Concept Plan Area
	City Boundary
	UGB
and	Use
	Transportation (ODOT Corridor)
	Open Space - Parks/Greenways/Natural Areas/Private*
	Open Space - WPA/Setbacks/NRPO/Wetlands
	Vacant/Infill
	Low Density Residential
	Medium Density Residential
	High Density Residential
	Commercial
	Institutional
	Industrial
	Basalt Creek Management Area
	*October 2016

Figure 2

Land Use



🗆 Feet











City of Tualatin

Stormwater Master Plan

Date: August 2018 Project: Project 149233



Figure 6 **Hydraulic Modeling Extents**

Manhasset Drive System













Attachment D: Photo Log



Attachment D Modeled System Photo Log

Photographs and descriptions from the June 29, 2016 and December 8, 2016 field investigations are provided on the following pages by modeled system. Photos were used to verify existing system conditions and refine the hydraulic model.



Brown AND Caldwell

D-1

Hydraulic Model System	Manhasset Drive	
	Description:	Open channel upstream of ditch inlet at Manhassat Drive. Channel bottom is rocky and has high roughness.
	Location: Photo number:	Manhasset Drive Open Channel 3
	Description:	Debris in open channel is a restriction during rain events.
	Location:	Manhasset Drive Open Channel
	Photo number:	4
	Description:	Grated inlet at end of open channel segment along Manhassat Drive.



Hydraulic Model System	Nyberg Creek	
	Location:	With a state of the state
	Photo number:	1
	Description:	Grated inlet at the end of railroad ditch where sediment enters the piped system
	Location:	Behind Oil Can Henry's (19417 SW Boones Ferry Road)
	Photo number:	2
	Description:	Alternate view of grated inlet


Hydraulic Model System	Nyberg Creek	
	Location:	Boones Ferry Road and SW Tonka Street
	Photo number:	3
	Description:	Heavy sedimentation in dual culvert across Boones Ferry Road
	Lastie:	What Anatament
	Lucalion:	
	Description:	- Downstream inlet causing flooding issues at the Mohawk Apartments
	Besseription.	



Appendix D: Nyberg Creek Flood Reduction Modeling (TM3)



Use of contents on this sheet is subject to the limitations specified at the end of this document.



Technical Memorandum

6500 SW Macadam Avenue, Suite 200 Portland, OR 97239

T: 503.977.6607

- Prepared for: City of Tualatin
- Project title: Stormwater Master Plan

Project no.: 149233

Technical Memorandum #3

Subject: Nyberg Creek Flood Reduction Modeling

Date: February 15, 2019

- To: Kim McMillan, P.E., City Engineer
- From: Ryan Retzlaff and Angela Wieland, P.E.

Limitations:

This document was prepared solely for the City of Tualatin in accordance with professional standards at the time the services were performed and in accordance with the contract between the City of Tualatin and Brown and Caldwell dated April 11, 2016. This document is governed by the specific scope of work authorized by the City of Tualatin; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by the City of Tualatin and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

Overview

This technical memorandum (TM) summarizes development and results related to the one-dimensional (1D) and two-dimensional (2D) hydraulic modeling of Nyberg Creek from Martinazzi Avenue to Nyberg Lane. Brown and Caldwell (BC) conducted modeling to evaluate the type and extent of conveyance system modifications necessary to reduce or eliminate localized nuisance flooding along Tualatin-Sherwood (TS) Road and Martinazzi Avenue. The nuisance flooding is primarily related to the capacity and geometry of Nyberg Creek and the associated stormwater collection system in the proximity of Martinazzi Avenue and TS Road.

Various types of system modifications including channel widening, channel deepening, and removal of culverts and flow impediments have been evaluated to assess the reduction in water surface elevation at key locations where flooding is experienced.

This TM presents model results (i.e., associated reduction in water surface elevation) for eight system modification alternatives. Three of those alternatives provide significant reduction in water surface elevation along TS Road and Martinazzi Avenue for a 5-year, 24-hour storm event, which was the storm event selected to represent nuisance flooding of the system. These alternatives may be considered by the City of Tualatin (City) as a future capital improvement project (CIP).

Model Development

BC performed modeling using the platform XP-SWMM. Both 1D and 2D modeling approaches were employed to comprehensively identify flooding extents, potential causes of flooding, and how potential changes to Nyberg Creek and the stormwater collection system can reduce flooding (inundation) at five key locations in the Nyberg Creek basin, specifically those locations along Martinazzi Ave and TS Road.

The 1D model includes Nyberg Creek channel cross sections that extend to the top of bank, the double 48-inch culverts behind Fred Meyer, and the narrow channel associated with the embankment east of I-5. The 2D model represents the floodplain or area above the top of bank. This approach allows full representation of the flooded area.

BC used the 1D XP-SWMM Nyberg Creek system model that was developed as part of the City's stormwater master plan (SMP) effort for this evaluation. BC extended the existing model from Martinazzi Avenue to the culvert outfall at Nyberg Lane to capture the full system that influences localized flooding. Additional portions of the stormwater collection system north of TS Road along Martinazzi Avenue, as well as conveyance infrastructure along TS Road, were added to reflect low points in the roadway where water has the potential to exit the closed conveyance system (i.e., catch basins).

BC built the 2D model for Nyberg Creek, extending downstream of Martinazzi Ave to Nyberg Lane, to accurately illustrate surface inundation above the top of bank of the channel and flooding out of the closed conduit collection system. The 1D and 2D models are linked in XP-SWMM and simulated as a single model of the channel and floodplain. Using a 1D and 2D modeling approach, stormwater moves in and out of the channel, flood plain, and structures, simulating the relationship and movement of water as it occurs in nature. BC used light detecting and ranging (LiDAR), field observations from stream walks, aerial photos, and topographic survey to develop the 2D model.

System Hydrology

BC used city-wide hydrology based on the Santa Barbara Urban Hydrograph (SBUH) method, previously developed as part of the SMP, for this modeling effort (see *TM2: Hydrology and Hydraulic Modeling Methods and Results, September 7, 2018*). Future land use conditions were simulated to establish the boundary condition and evaluate alternatives.



Contributing subbasins to Nyberg Creek, downstream of Martinazzi Avenue, were included in the model update to accurately reflect all contributing drainage area. See Attachment A, Figure 1 for contributing subbasins and routing used for this effort.

BC selected the Clean Water Services (CWS) 5-year (3.1 inches), 24-hour Soil Conservation Service (SCS) Type 1A storm event for evaluation based on feedback from City staff and the objective to address more frequent nuisance flooding. All results in this TM are specific for this rainfall event.

System Survey

The BC team surveyed the Nyberg Creek channel from Martinazzi Avenue to Nyberg Lane to inform the geometry for the 1D model extension. This section of the creek had not been surveyed previously as part of the stormwater master plan effort. Accurate data is important because of the shallow grade and significant wetlands.

The survey effort included eight stream cross sections to the top of bank, 10 channel invert elevations to establish the long stream profile, and inverts for the culverts behind Fred Meyer, located approximately 900 feet east of Martinazzi Avenue. Staff also surveyed additional ground, rim, and invert elevations at specific locations and infrastructure along Martinazzi Avenue and TS Road. Finally, staff conducted field and topographic surveys to verify the elevation of the roadway embankment, orientated north and south in the Nyberg wetland complex, approximately 1,000 feet east of I-5. As mentioned, BC used LiDAR to develop the geometry to inform the 2D model.

Boundary Condition

Nyberg Creek discharges to the Tualatin River approximately 5,700 feet downstream of Martinazzi Avenue. During large, regional storm events, the Tualatin River can backwater and influence Nyberg Creek conveyance capacity, which results in flooding along TS Road and Martinazzi Avenue. BC reviewed the potential influence of the Tualatin River on system hydraulics to establish an appropriate boundary condition for the hydraulic model.

To determine the influence of the Tualatin River on Nyberg Creek during smaller storm events, BC modeled the existing channel geometry for the 5-year, 24-hour storm event with future land use hydrology, assuming both a free outfall and using a 10-year flood elevation for the Tualatin River as a downstream boundary condition. The 10-year Federal Emergency Management Agency (FEMA) flood elevation is 119.50 feet for the Tualatin River. For reference, the low point along Martinazzi Ave is at an elevation of 119.70 feet, and the low point along TS Road is at an elevation of 120.65 feet. Both low point elevations are above the 10-year flood elevation for the Tualatin River.

Surface flooding at key (5) locations in the system did not change significantly depending on the boundary condition used. The water surface elevations at key locations along Martinazzi Avenue and TS Road increased by less than 0.10 foot with application of a 10-year flood elevation in the Tualatin as the boundary condition. Additionally, with smaller, more frequent storm events, the timing of the peak discharge for Nyberg Creek and associated water surface elevation in the City's system has a low probability of occurrence with the timing of a 10-year flood elevation for the Tualatin River. This is primarily due to the size of the Tualatin River watershed versus the much smaller local flow contribution from the City. Based on these results, BC did not use a boundary condition to evaluate the 5-year, 24-hour nuisance storm event as part of this analysis.

Model Validation

There were no recent model validation or calibration data available. In leu of a model validation, the City provided flooding photos of Martinazzi Avenue and TS Road during February 1996, which is reflective of a 100-year storm event. BC compared documented flooding in the images provided to the modeled flooding



extents along Martinazzi Avenue and TS Road for the existing channel geometry and the 5-year, 24-hour storm event. The flooding extents for the 5-year, 24-hour storm event is not as extensive and is shallower than the extents in the photos; however, flooding locations are consistent.

Baseline Condition Model

BC established the baseline condition model using future land use conditions with a free outfall (Attachment A, Figure 2).

BC modeled and evaluated system alternatives based on the water surface elevations at five key locations in the Nyberg Creek basin (see Figures 2, 3, 4 and 5). These five locations experience regular flooding and are in the proximity of Martinazzi Avenue and TS Road. Flooding readily occurs along TS Road, Martinazzi Avenue, and the southwest corner of the Fred Meyer Parking lot.

Model Alternative Summary

BC developed and simulated eight alternatives to determine how modifications to the Nyberg Creek system would change the extent of surface flooding and the water surface elevation at key locations in the Nyberg Creek basin. The focus was on reducing the water surface elevation at Martinazzi Avenue and TS Road, so the alternatives emphasized system modifications to move water downstream. Table 1 summarizes the alternatives based on the simulated modifications to Nyberg Creek and associated infrastructure (e.g., channel widening, removal of culvert, removal of embankment, channel slope modification, and channel deepening).

Table 1. Alternative Descriptions						
Alternative	Channel Modification (width)	Channel Modification (depth)	Infrastructure Modification			
1	Maintain existing channel width	Reduction of channel bed elevation by 1 foot from Martinazzi Ave. to Nyberg Lane (length = 5,000 feet)	Removal of 300 feet of berm (located 1,000 feet east of I-5) Removal of 2–48-inch diameter culverts (Key Location ID #5)			
2	Maintain existing channel width	Reduction of channel bed elevation by 1 foot from Martinazzi Ave. to I-5 (length = 1,500 feet)	Removal of 300 feet of berm (located 1,000 feet east of I-5) Removal of 2–48-inch diameter culverts (Key Location ID #5)			
3	Channel width to 15 feet with 3:1 side slope from Martinazzi Ave to I-5 (length = 1,500 feet)	Maintain existing slopes	Removal of 300 feet of berm (located 1,000 feet east of I-5) Removal of 2–48-inch diameter culverts (Key Location ID #5)			
4	Channel width to 15 feet with 3:1 side slope from Martinazzi Ave to Nyberg Lane (length = 5,000 feet)	Maintain existing slopes	Removal of 300 feet of berm (located 1,000 feet east of I-5) Removal of 2–48-inch diameter culverts (Key Location ID #5)			
5	Channel width to 20 feet with 3:1 side slope and a low flow channel from Martinazzi Ave to Nyberg Lane (length = 5,000 feet)	Maintain existing slopes	Removal of 300 feet of berm (located 1,000 feet east of I-5) Removal of 2–48-inch diameter culverts (Key Location ID #5)			
6	Maintain existing channel width	Maintain existing slopes	Removal of 300 feet of berm (located 1,000 feet east of I-5)			
7	No width modification, channel slope modified to be consistent from Martinazzi Ave to Nyberg Lane (length = 5,000 feet)	Minor modification of channel depth	Removal of 300 feet of berm (located 1,000 feet east of I-5) Removal of 2–48-inch diameter culverts (Key Location ID #5)			
8	Maintain existing channel width	Maintain existing slopes	Removal of 2-48-inch diameter culverts (Key Location ID #5)			

Alternatives 1 and 2 reflect the proposed system modifications suggested by the City for evaluation.



Results and Recommendations

Table 2 summarizes the model results for each alternative to inform actions that may reduce the extent, depth, and frequency of localized flooding at Martinazzi Avenue and TS Road. The model results represent the difference in water surface elevation from the baseline condition model at the five key locations.

Alternatives 3, 4, and 5 show the most significant reduction in water surface elevations when compared to the baseline condition (see Table 2). Alternative 5 provides the greatest reduction and shows no flooding at the key locations yet represents the most significant changes to the Nyberg Creek channel and associated infrastructure. Figures 3, 4, and 5 (see Attachment A) show the anticipated flooding (surface inundation) associated with each of these three alternatives.

Future actions to mitigate flooding along Martinazzi Avenue and TS Road should be coordinated with future actions currently being explored by CWS and The Wetland Conservancy in the areas east of I-5 owned by The Wetland Conservancy.

Table 2. Water Surface Elevation Change Compared to Baseline Conditions											
Кеу	Koy Logation Departmention	Alternatives									
Location ID	Rey Location Description		2	3	4	5ª	6	7	8		
1	TS Road, 300' west of Martinazzi Avenue	0.02	0.01	-1.47	NA	NA	0.00	0.00	0.01		
2	Martinazzi Road, west of Fred Meyer	0.01	0.00	-1.26	-1.36	NA	-0.02	-0.02	0.00		
3	SW Corner of Fred Meyer	0.03	0.02	-1.23	-1.33	NA	0.00	0.00	0.02		
4	Martinazzi Avenue Outfall	0.03	0.02	-5.5	-5.51	NA	-0.01	-0.01	0.02		
5	2 - 48" culverts south of Fred Meyer	0.03	0.03	-3.37	-3.37	NA	0.00	0.01	0.03		

a. NA = no flooding occurs at key locations, so no comparison can be made to the baseline condition model.



Attachment A: Figures





2,250

0

Date: December 2018

City of Tualatin

Project: Project 149233

4,500

☐ Feet

Caldwell

Model System Overview









Appendix E: Capital Project Modeling Results



	Table E-1. CIP Hydraulic Model Parameters and Results																
					Node	Name	Invert Ele	evation (ft)	Ground Elevation (ft) Future 10 yr CIP Max Water Surfac		LO yr CIP er Surface	IP Future 25 yr CIP ace Max Water Surface		Future CIP Max Flow (cfs)			
Link ID	Length (ft)	Shape	Diameter/ Height (ft)	Slope (%)	US	DS	US	DS	US	DS	US	DS	US	DS	10-yr	25-yr	CIP Project Number
Herman Roa	d System																
322603	108.8	Circular	2.0	2.2	322601_HE-0160	HE-0150	127.3	125.0	131.1	130.0	129.3	128.4	130.37	129.05	14.24	16.61	CIP #5
Link48	200.0	Circular	3.0	0.1	HE-0150	HE-0140	124.5	124.2	130.0	129.0	128.4	128.1	129.05	128.68	16.58	19.31	CIP #5
Link49	200.0	Circular	3.0	0.1	HE-0140	Node571	124.0	123.7	129.0	128.6	128.1	127.6	128.68	127.94	23.59	27.46	CIP #5
Link50	200.0	Circular	3.0	0.1	Node571	322634.0	123.5	123.2	128.6	128.2	127.6	127.0	127.94	127.20	23.59	27.46	CIP #5
Link52	200.0	Circular	3.0	0.1	HE-0120	322634.0	123.3	123.2	128.3	128.2	127.0	127.0	127.17	127.20	-5.42	-6.14	CIP #5
Link51	160.0	Circular	3.0	0.1	HE-0120	322613.0	123.3	123.2	128.3	128.2	127.0	126.9	127.17	127.09	8.68	9.99	CIP #5
Manhasset	Drive System		_	-				-	_		-	-	-		-	_	
267387	102.0	Circular	2.5	4.1	261974_HE-0510	262060_HE-0500	157.90	153.75	160.40	160.40	158.65	154.70	160.16	154.80	15.0	17.4	CIP #1
Link9	200.0	Circular	2.5	3.4	262060_HE-0500	Node280	153.75	147.00	160.40	153.00	154.70	147.81	154.80	147.88	16.0	18.6	CIP #1
Link12	200.0	Circular	2.5	3.2	Node280	Node283	146.80	140.40	153.00	146.40	147.70	141.47	147.78	141.60	16.0	18.6	CIP #1
Link15	200.0	Circular	2.5	1.2	Node283	HE-0490	140.20	137.90	146.40	143.40	141.47	139.17	141.60	139.37	16.0	18.6	CIP #1
Link11	350.0	Circular	2.5	0.9	HE-0490	262001	137.70	134.65	143.40	139.76	139.17	136.70	139.37	137.02	19.2	22.3	CIP #1
266696	47.4	Circular	2.5	0.6	262001	259248	134.65	134.37	139.76	139.25	136.70	136.19	137.02	136.50	19.2	22.3	CIP #1
266695	132.0	Circular	2.5	0.6	259248	262763_HE-0480	134.17	133.40	139.25	138.78	136.19	135.34	136.50	135.55	19.2	22.3	CIP #1
268265	149.3	Circular	3.0	0.1	262763_HE-0480	262764	133.20	133.00	138.78	137.99	135.34	134.47	135.55	134.59	20.9	24.3	CIP #1
268266	407.7	Circular	3.0	0.7	262764	262765_HE-0470	132.80	129.98	137.99	135.43	134.29	132.26	134.48	132.52	20.9	24.3	CIP #1
266697	194.1	Circular	3.0	0.2	262765_HE-0470	271161	129.88	129.56	135.43	132.56	132.26	131.18	132.52	131.31	25.1	29.3	CIP #1
Nyberg Cree	k System		T	1				T	T		1	1	1	1	1		
Link90	80.0	Circular	2.0	3.0	263397_NY-0290	Node597	179.70	177.30	187.40	186.35	181.24	179.00	182.73	180.36	33.3	36.3	CIP #2.1
Link91	180.0	Circular	2.0	2.4	Node597	Node598	177.30	173.02	186.35	182.52	179.00	174.72	180.36	175.02	33.3	36.3	CIP #2.1
Link95	190.0	Circular	2.0	2.6	Node598	Node599	172.82	167.92	182.52	173.78	174.44	169.54	174.70	169.76	33.3	36.2	CIP #2.1
Link92	230.0	Circular	2.0	3.4	Node599	Node600	167.72	159.79	173.78	166.36	169.14	161.21	169.24	161.31	33.3	36.2	CIP #2.1
Link93	161.0	Circular	2.0	5.6	Node600	Node602	159.63	150.56	166.36	157.22	160.83	151.76	160.90	151.83	33.3	36.2	CIP #2.1
Link94	162.0	Circular	2.0	7.2	Node602	Node603	150.51	138.77	157.22	146.89	151.61	139.87	151.67	139.93	33.3	36.2	CIP #2.1
Link/8	220.0	Circular	2.0	6.6	Node603	NY-0230	138.51	123.97	146.89	130.70	139.65	125.32	139./1	125.58	33.3	36.2	CIP #2.1
Link96	120.0	Circular	2.0	8.6	NY-0230	270963	123.86	113.50	130.70	123.15	125.32	116.00	125.58	116.10	53.5	59.7	CIP #2.1
Link89	400.0	Circular	4.0	1.3	270971	NY-0250	125.30	120.00	130.80	126.15	127.24	125.46	127.55	126.06	52.9	63.3	CIP #2.2
264286	237.6	Circular	4.0	0.4	NY-0250	262213	119.80	118.80	126.15	125.08	125.46	124.81	126.06	125.08	51.2	59.3	CIP #2.2
	150.0	Circular	4.0	0.5	262213	N006569	118.80	118.00	125.08	125.27	124.81	124.61	125.08	124.92	54.6	63.4	
268297	41.3	Circular	3.0	5.8	262848	202850	142.50	140.10	148.93	147.25	144.70	141.60	145.05	141.82	52.4	62.5	
268295	67.6	Circular	3.0	5.8	262856	262847_NY-0370	140.00	133.00	147.25	138.76	141.60	134.70	141.82	135.04	52.4	62.5	
208290	07.0	Circular	3.U 2 E	5.9	20204/_111-03/0	202040	132.80	127.00	130./0	122.62	121.00	131.00	121.04	120.02	55.1 E2 1	03.3 63.3	
200293	21.4 50.0	Circular	5.5 2 E	5.0 1 1	202840	202844	120.00	127.40	122.44	120.03	120 51	129.30	120.02	127.82	53.1 E2 1	62.5	
207215	50.0 62.1	Circular	5.5 2.0	4.Z	202044	2703/1	127.40	127.30	120.03	120.80	176.25	126.20	176.05	126.06) J J J J	05.5 7 /	
Jink26	1810	Circular	2.0	2.4	312443	322031 277227 NIV-0220	126.10	124.11	1/1 50	178 05	128 20	120.29	120.00	120.00	2.1 80 8	۷.4 ۱۸۶ ۲	CIF #2.5 CID #7
Blake Street	Svstem	Circulai	5.5	2.7	555404	277227_111-0360	130.10	122.95	141.30	120.93	130.33	127.00	130.91	129.03	03.0	101.3	
Link21	120.0	Circular	7.0	1 2	Node1557	Node1566	106.2	10/ 9	202 5	202 5	201 11	201 00	108.00	100 76	155 5	10/ 1	CID #6
LIIIKST	120.0	Circular	7.0	1.2	NUCLESS	NUGET200	190.2	194.0	205.5	205.5	201.11	201.00	190.09	123.10	102.2	194.1	CIF #0



Figure E-1. CIP #1 Manhasset Storm System Improvements - Proposed System Node Numbering



Figure E-2A. CIP #2 Nyberg Creek Stormwater Improvements (Phase 1) - Proposed System Node Numbering



Figure E-2B. CIP #2 Nyberg Creek Stormwater Improvements (Phase 2) – Proposed System Node Numbering



Figure E-2C. CIP #2 Nyberg Creek Stormwater Improvements (Phase 3) – Proposed System Node Numbering



Figure E-3. CIP #5 Herman Road Storm System – Proposed System Node Numbering



Figure E-4. CIP #6 Blake Street Culvert Replacement – Proposed System Node Numbering



Figure E-5. CIP #7 Boones Ferry Railroad Conveyance Improvements - Proposed System Node Numbering

Appendix F: Stream Assessment TM (TM4)





Stream Assessment Technical Memorandum City of Tualatin

Prepared for: Brown and Caldwell 6500 SW Macadam Avenue #200 Portland, Oregon

January 30, 2018

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- A Stream Reach Summary Sheets
- B-1 Saum Creek Reach #1 Photo Log
- B-2 Saum Creek Reach #2 Photo Log
- B-3 Saum Creek Reach #3 Photo Log
- B-4 Nyberg Creek Reach #1 Photo Log
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- B-10 Hedges Creek Reach #3B Photo Log



Glossary	
Aggradation	The process of building up a surface by deposition (as in sediment in a stream channel).
Bankfull Depth	The depth of the channel when discharges are at full channel capacity. Discharges above the bankfull depth would overflow onto the floodplain. Evidence of bankfull depth includes breaks in slope on channel banks, vegetation changes,
Bankfull Width	The width of the channel when discharges are at full channel capacity, measured at the elevation of bankfull depth.
Channel	The deepest part of a stream or water body.
Channel Capacity	The maximum flow a given channel can transmit without overtopping its banks.
Downcutting	Streambed erosion that results in deep, narrow, channels.
Downstream	In the direction that flow is headed, generally to a lower elevation in the case of stream channels.
Erosion	The wearing away of soil and rock by the action of streams, mass wasting, and weathering.
Gradient	The steepness of the channel slope, referred to in percent or feet of drop in elevation per foot length of channel.
Hillslope	The flanks that form the valley walls adjacent to stream channels. Hillslopes are the zones where soil and rock are loosened by weathering processes and transported downgradient.
Incision	Downward erosion, as in a streambed. Synonymous with downcutting.
Reach	A length of stream channel with similar physical characteristics, or length of stream channel between two arbitrarily chosen landmarks, such as road crossings or other logical breaks in open channel flow.
Tributary	Any stream that contributes water to another stream.
Upstream	In the direction that flow originates, generally from a higher elevation in the case of stream channels.

1.0 Introduction and Summary

The Tualatin River is the major surface water feature in the City of Tualatin (City), located north of the City Center. The City manages the surface and stormwater that flows into the Tualatin River through pipes and tributary creeks, as well as flood flows from the river that backwater into tributary channels and stormwater pipes.

The City contracted with Brown and Caldwell for development of their Stormwater Master Plan to evaluate hydrology and stormwater flows, identify system deficiencies, and develop and prioritize capital improvement projects to facilitate long-term economic, social and environmental benefit of residents and businesses in Tualatin. As part of the Stormwater Master Plan, the City wanted to incorporate a stream channel assessment into the overall stormwater system evaluation. Tributary streams to the Tualatin River are an important component of the surface water network in the City. They provide conveyance and storage (both in channel and on floodplains) of water and sediment, and habitat to aquatic and terrestrial species.

This stream assessment technical memorandum (TM) provides supporting documentation for Tualatin's Stormwater Master Plan. A field assessment was conducted on priority reaches along tributary streams in September 2017. Figure 1 shows the locations of the tributary stream reaches assessed. The overall goals of the stream assessment were to:

- Provide a baseline assessment of existing physical stream conditions;
- Identify existing problem areas such as locations of channel instability or excessive erosion that may impact private or public infrastructure;
- Assess the potential for changes and impacts to the stream channel; and
- Recommend capital, operational, maintenance or other solutions for issues identified.

Results of the field assessment include recommendations for strategies that address erosion, invasive vegetation, and hillslope instability. Specific recommendations include:

- Development of policies to encourage onsite retention of stormwater and flow mitigation in neighborhoods where stream channels are susceptible to flashy runoff conditions.
- Development of vegetation management plans for stream reaches that are teeming with invasive vegetation.
- Regular inspection of infrastructure that is being impacted by erosion to monitor for further deterioration in advance of future planned capital projects.



Figure 1. Vicinity Map and Location of Priority Stream Reaches Walked during Stream Assessment



2.0 Methodology

The stream assessment was primarily focused on direct observations gained from conducting stream walks on priority stream reaches along Saum, Nyberg, and Hedges Creeks. Priority stream reaches were identified by City staff based on ownership and a history of staff or citizen complaints/ concerns, and potential for additional stream flows due to new or redevelopment.

Prior to stream walks, maps were generated from geographic information system (GIS) coverages provided by the City. Available GIS data including major roads, City parcels, streams, and wetlands were reviewed and incorporated into field maps. Additionally, regional geologic map information was obtained online (Hart and Newcomb 1965).

The stream walks were conducted by Erin Nelson, Altaterra Consulting and Ryan Retzlaff, Brown and Caldwell between September 11, 2017 and September 15, 2017. Streams were walked in the upstream direction from the lowest point in the reach to the highest point in the reach. Photographs were taken to document conditions (generally in the upstream direction). Physical and biological conditions were noted in a field notebook and mapped with geographic references (such as road crossings) and approximate distances upstream from the starting point. The following stream characteristics were documented:

- General vegetation condition, including presence of native and non-native vegetation
- In-stream and hillslope erosion processes (incision, aggradation and hillslope failures)
- Approximate bankfull stream channel widths and depths, measured at appropriate intervals when conditions change
- General aquatic habitat conditions (pools, riffles, large woody debris, flow)
- Location of stormwater outfalls, pipes and groundwater seeps
- Potential pollution sources
- General in-stream sediment distribution throughout stream channel
- Wildlife activity (presence of beaver dams)

These characteristics were noted because they provide evidence of current aquatic health and physical channel conditions, as well as documentation that can be used to compare future stream assessment results.

Observations made during the stream walks were used to qualitatively identify current stream channel deficiencies and potential strategies for improvement. Hydrologic and hydraulic data, including historic, current or predicted stream discharges was not reviewed relative to the physical channel conditions. Analysis of this data compared to physical channel dimensions could potentially be used to predict future changes.


Table 1 provides a list of the reaches included in the assessment and the approximate reach lengths that were walked. Stream reaches were evaluated from downstream starting point to upstream end point.

Stream	Reach	Starting Point	End Point	Approximate Distance (ft)
Saum Creek	#1	Tualatin River	SW Prosperity Park Road	6,775
	#2	SW Lee Street (east end)	SW 65 th Ave	4,950
	#3	SW Blake Street	Upstream 530', downstream vicinity 90'	600
Nyberg Creek	#1	SW Nyberg Lane	SW 65 th Avenue	950
	#2	SW 65 th Ave	1-5	2,100
	#3	SW Martinazzi Ave	Boones Ferry Road	1,400
Hedges Creek	#1	SW Boones Ferry Road/Tualatin River	SW Tualatin Rd	2,250
	#2	Tualatin-Sherwood Rd	SW Industrial Way	1,900
	#3A	Blake St/SW 105 th Ave	Confluence with S. Tributary	1,740
	#3B	Confluence with S. Tributary	SW 99 th Ave	560

Table 1. List of Stream Reaches Walked



3.0 Stream Assessment Results

Stream channel characteristics observed during the stream walk and field investigations are described below for each reach. Additional detail is provided in the reach summary sheets included in Attachment A. Physical reach characteristics are summarized in Table 2. This information can be compared to discharge data, if available, to compare physical channel dimensions (channel capacities) to flow.

Stream	Reach	Avg. Gradient (%)	Avg. Valley Width (ft)	Avg. Bankfull Width (feet)	Avg. Bankfull Depth (feet)	Width:Depth Ratio
Saum	#1	0.59	100-200	13.2	5.9	2.2
Creek	#2	0.36	150-175	10.5	4.7	2.2
	#3 (us of					
	Blake)	1.12	75-100	6	2	3.0
	#3 (ds of					
	Blake)	3.0	75-100	nm	nm	nm
Nyberg	#1	<0.001	300-400	nm	nm	nm
Creek	#2	0.09	500-650	nm	nm	nm
	#3	0.3	30-60	6.5	2.5	2.6
Hedges	#1	0.8	75 - 125	11.5	4.2	2.7
Creek	#2	0.2	125-250	11.5	4.3	2.7
	#3A	0.009	~150	10.6	3.7	2.9
	#3B	3.7	~50	5.7	2.8	2.0

 Table 2. Summary of physical stream channel characteristics by reach.

Notes: us = upstream, ds = downstream, nm = not measured

3.1 Overall Summary

Some of the notable positive characteristics observed in the stream reaches investigated include:

- wide riparian corridors surround many of the stream channels, which is noteworthy given the otherwise urban/suburban setting of the City
- a distinct lack of trash in and around the channels

Preservation of riparian corridors and floodplains is especially important in low-gradient stream systems, where streams typically have a meandering characteristic and require space to maintain this stable channel form. Moderate and steep gradient streams are usually more confined by narrow valleys and narrower floodplains, and stable channel forms do not necessarily need as much lateral space for movement. However, wide swaths of riparian vegetation in these areas is also very beneficial to channel stability. Healthy riparian corridors in moderate and steep gradient systems supply large wood to channels as trees fall in (providing channel structure), and slope stability benefits through water interception, water uptake, and soil reinforcement from roots.

Negative characteristics observed in many of the stream reaches investigated include the presence of invasive non-native vegetation such as reed canary grass, Himalayan blackberry, jewel weed, and English Ivy. Invasive vegetation was observed in almost every stream reach, although some reaches were heavily impacted.

Physical stream channel conditions generally correlate to the reaches position in the watershed and factors such as riparian width, stream channel gradient, and channel confinement (from development or topographic conditions). Bank and bed erosion was most prevalent in the headwater reaches of the stream channels assessed (e.g., Saum Creek Reach #3 and Hedges Creek Reach #3B), where stream channel gradients were steeper, and channels were confined. These headwater reaches are also exposed to the first effects of high flows during rain events, conveyed from surrounding residential neighborhoods. There is very little in-channel or floodplain storage capacity to dissipate flows. The lower or downstream reaches of the streams generally have wide riparian corridors and floodplains to effectively dissipate peak flows from the channel to the floodplain, reducing the power to erode. Localized bank erosion was mostly observed in the lower reaches on the outside of meanders, where erosion would be expected to occur.

3.1 Saum Creek

Approximately 2 ¼ miles of Saum Creek were assessed between its confluence with the Tualatin River to its headwaters, upstream of I-205, near SW Blake Street. Most of the Saum Creek stream corridor within Tualatin is surrounded by a wide riparian protected greenway (the Saum Creek Greenway downstream of I-5 in Reaches #1 and #2 and the Chieftan/Dakota Greenway upstream of I-5 in Reach #3). Highlights of stream channel characteristics, and problems notes are described below and reach description summary sheets for Saum Creek Reaches #1, #2, and #3 are provided in Attachment A. Photo logs of the stream walks for Saum Creek Reaches #1, #2, and #3 are provided in Attachments B-1 through B-3.

3.1.1 Saum Creek Reaches #1 and #2

The lower reaches (Saum Creek Reach #1 and Reach #2) have the benefit of a wide floodplain to accommodate high flows during flood events. There were no outstanding issues observed in either reach that stood out as needing attention. Minor erosion was observed in both reaches, but there was no indication that the erosion is currently impacting City or private property or infrastructure or that remedies are needed at this time for these minor issues. Non-native invasive vegetation was present along many portions of both reaches, intermixed with native vegetation. The City may wish to develop a vegetation management plan for the Saum Creek Greenway to ensure the success of native vegetation and reduce the proliferation of the non-native invasive species in the corridor.

3.1.2 Saum Creek Reach #3

Saum Creek Reach #3 is divided by SW Blake Street. Downstream of SW Blake Street, a hillslope failure on the north side of the channel has caused the outfall that discharges stormwater piped from SW Makah Ct. to hang several feet above the stream bed (Photo 1). The hillslope failure caused several large trees to fall, resulting in a large number of branches, logs and debris in this reach. The entire north slope was saturated at the time of the site visit. Soil saturation could be a contributing factor to the slope instability in this location. The mechanisms of slope failure were not investigated in detail during the site investigation. Further investigation of the geologic condition along this slope is recommended in order to determine cause of failure and need for hillslope reinforcement.



Photo 1. Hanging culvert on north side of Saum Creek Reach #3 in location of hillslope failure (September 2017)

The channel upstream of SW Blake Street was restored in 2014 with a series of rock check dams and pools. This project was constructed in conjunction with a neighborhood water quality project. Prior to the restoration, the channel in this reach was significantly incised and banks were being eroded from high rates and volumes of stormwater runoff emanating from the surrounding residential development (Otak, 2013). A new stream channel gradient was established through the reach using rock weirs and splash pools to dissipate the energy (Photo 2) and the entire corridor was revegetated with native vegetation. A current view of the restoration area is shown in Photo 3. The channel structure (boulders and drop pools) is intact and erosion does not appear to be a current problem in this reach. However, the lower portion of the reach immediately upstream of SW Blake Street is very flat, and the ground is saturated (Photo 4). Saturated conditions, as well as the presence of invasive vegetation appear to be impacting native plants that have been planted in this corridor. There is a need for ongoing vegetation maintenance in the entire reach, but particularly in this area where an investment has already been made on the stream restoration project. Plant selection and/or locations may need some adjustment for the best chance of success.



Photo 2. Otak photo of newly constructed Saum Creek channel in Chieftan/Dakota Greenway (c. 2013)



Photo 3. Saum Creek restoration in Chieftan/Dakota Greenway (September 2017)



Photo 4. Saum Creek immediately upstream of SW Blake Street. Channel is obscured by reed canary grass. This area is very flat, and wet.

3.2 Nyberg Creek

Three reaches (approximately 0.84 miles) of Nyberg Creek between SW Nyberg Lane and SW Boones Ferry Road were assessed and/or walked as part of the stream assessment. Highlights of stream channel characteristics and problems noted are described below and reach description summary sheets for Nyberg Creek Reaches #1, #2, and #3 are provided in Attachment A. Photo logs of the stream walks for Nyberg Creek Reaches #1, #2, and #3 are provided in Attachments B-4 through B-6.

3.2.1 Nyberg Creek Reaches #1 and #2

Nyberg Reach #1 and Nyberg Reach #2 were mostly lacking stream channel characteristics at the time of the stream assessment. These reaches are wetland complexes with significant open water components (Photos 5 and 6). Beaver activity is prevalent, and is likely the reason for the extensive open water in these two reaches. There was evidence of past efforts to address the beaver activity in Nyberg Creek Reaches #1 and #2. However, the beaver activity observed did not appear to be in areas of concern with regard to infrastructure or flooding. Vegetation in Nyberg Creek Reaches #1 and #2 consisted of wetland vegetation. Due to the on-going beaver activity and the changing nature of the flooded areas that currently have wetland characteristics, there is no recommendation for vegetation management.



Photo 5. Nyberg Creek Reach #1 downstream of SW 65th Avenue



Photo 6. Nyberg Creek Reach #2 downstream of I-5, with beaver swimming in foreground.



3.2.2 Nyberg Creek Reach #3

Nyberg Creek Reach #3, between SW Martinazzi Avenue and Boones Ferry Rd has much different physical characteristics than Nyberg Creek Reach #1 and Reach #2. This reach is primarily confined to a narrow swath of open space between commercial development. Immediately upstream of SW Martinazzi Avenue, a notched concrete dam is present, creating a pond (known by City staff as Izzy's Pond) on the upstream side. Upstream of the pond, the channel is piped for approximately 100 feet in a strip mall parking lot. The remainder of the reach consists of open channel that is straight, narrow, and dominated by reed canary grass (Photo 7). Vegetation management is needed in this entire reach, including removal of invasive reed canary grass and replacement with other appropriate native vegetation.



Photo 7. Nyberg Creek Reach #3 upstream of SW Martinazzi Avenue.

3.3 Hedges Creek

Approximately 1 ¼ miles of Hedges Creek was assessed between the Tualatin River and the headwaters near SW 99th Ave. in the Ibach Park neighborhood. Hedges Creek is almost entirely within the City of Tualatin jurisdictional boundary, but much of it is under private ownership. Only a small portion of the stream was walked, at the mouth and at the headwaters. Three independent reaches (Reach #1, #2, and #3) were selected for investigation because of known issues and/or City property ownership. Reach #3 was further divided into two sub-reaches, Reach #3A and Reach #3B, because there were distinctly different characteristics observed in the downstream (#3A) and upstream (#3B) portions of the reach. Highlights of stream channel characteristics and problems notes are described below and reach description summary sheets for Hedges Creek Reaches #1, #2, #3A, and #3B are provided in Attachment A. Photo logs of the stream walks for Hedges Creek Reaches #1, #2, #3A, and #3B are provided in Attachment Attachments B-7 through B-10.

3.3.1 Hedges Reach #1

Hedges Reach #1 extends from the Tualatin River to SW Tualatin Road. This reach reflects a mix of public and private ownership and is partially located within Tualatin Community Park property. The lower 1,200 feet of the channel includes meandering characteristics, except for a few straight sections. In general, the straight sections correspond with sections where the channel bed consists of hard silt. The channel bed otherwise consisted of loose sediment (fine silt and sand, with occasional gravel) in Hedges Reach #1.



Bank erosion was observed in Hedges Reach #1 at a few locations on the outside of meander bends in the first 500 feet upstream of the Tualatin River. Rip-rap armoring was observed at one location on private property approximately 450' upstream from the Tualatin River, and a concrete apron was observed on private property at another location 200' upstream from the Tualatin River. It appears that these materials were used to stabilize the stream banks, prevent erosion, and protect private property. The bank stabilization efforts appear to be locally effective in protecting property in the immediate vicinity of the stabilization.

The channel gradient is steeper in the lower (downstream) portion of the reach, flattening out in the upstream portion towards Tualatin Road.

A channel-spanning debris jam was present approximately 300 feet upstream from the mouth of the channel. This debris jam may be associated the event that washed out a private bridge approximately 500 feet upstream from the mouth. The debris and gravel deposited downstream of the bridge washout is still present in the channel and the culvert (Photo 8) that conveys water through the debris, directs water toward the opposite bank, due to its orientation. It is not clear whether the culvert was placed in the channel pre- or post- bridge wash out, but the culvert is undersized for the volume of flow received in the channel. The area of the culvert is smaller than the bankfull channel capacity upstream and downstream. High flows would back up at this location and eventually overtop the road and result in erosion. The channel makes a 90 degree turn against a vertical bank, 30 feet downstream of the culvert. Due to the orientation of the stream channel and the culvert which concentrates and directs flow in this location, this bank is at risk of erosion, and may be a potential threat to a private structure located on the top of the bank.

Approximately 200 feet downstream, another private structure is located on the top of the bank on the outside bend of a meander. This structure may have similar risks due to proximity to the edge of the bank. Both of these structures are east of SW Martinazzi Ave and north of SW Boones Ferry Road.



Photo 8. Culvert placed in debris from washed out bridge to convey Hedges Creek.



Approximately 1,200 feet upstream of the mouth, an 18-inch diameter stormwater outfall enters Hedges Creek from the south. Stormwater inputs at this location could account for some of the differences in stream characteristics upstream. Upstream of this location, in the Tualatin Community Park, the channel is mostly straight, with a wider floodplain, and a flatter gradient, and based on the channel conditions, erosive flows appear to be less frequent. No channel erosion was observed in this part of the reach. The channel is also largely overgrown with reed canary grass through this portion of the reach (Photo 9), and beaver dams were also observed. Vegetation management is needed to control reed canary grass in the Tualatin Community Park.



Photo 9. Hedges Creek Reach #1. Reed canary grass-choked channel downstream of Tualatin Road.

3.3.2 Hedges Reach #2

Hedges Creek Reach #2 is located between SW Tualatin-Sherwood Road and SW Industrial Way. It is surrounded by the Hedges Creek Greenway open space, a wide riparian floodplain area. Hedges Creek is relatively stable through this reach, with only minor erosion observed on the outside of meanders. The adjacent floodplain provides ample room for the channel to naturally meander and migrate. However, the entire reach needs extensive vegetation management due to observed, dense invasive plants including Himalayan blackberry and reed canary grass, as shown in Photo 10.



Photo 10. Hedges Creek Reach #2.



3.3.3 Hedges Reach #3A

Hedges Creek Reach #3A is located between SW 105th Avenue/Blake Street and a tributary that enters Hedges Creek from the South downstream of SW Alsea Ct. A pedestrian bridge crosses the stream channel in this location.

Hedges Reach #3A has a meandering characteristic and a relatively low gradient. Channel substrate consists of loose silt, hard silt, and an outcrop of bedrock present for about 100 feet of stream channel starting approximately 500 feet upstream of 105th Avenue. A rock wall protecting the bank (and presumably road embankment) 175 feet upstream and on the east side of 105th Avenue/Blake Street has been compromised, as it has been eroded by the stream (Photo 11). At this location, Hedges Creek makes a 90-degree turn, which is a point of maximum velocity and energy on the outside bend. It is recommended to reinforce/ rebuild the rock wall to ensure the road embankment is not compromised and/or reorient the culvert under 105th Avenue/ Blake Street to minimize flow velocity directed at the road embankment and wall. It is assumed that design and construction would be conducted in conjunction with the scheduled road widening project for 105th Avenue.

Another issue observed in Reach #3A is channel incision in a side channel entering the main channel from the south, approximately 700 feet upstream of SW 105th Avenue. The neighborhood west of Ibach Park contributes drainage to this side channel and it appears that this channel receives a large volume of water from the upstream catchment. The extreme erosion in this side channel has exposed a sanitary sewer manhole (Photo 12). This exposure, over time, may compromise the structural integrity of the manhole.

Evidence of a recent stream restoration project was observed upstream of Ibach Park (Photo 13), starting approximately 950 feet upstream of SW 105th Avenue. Large wood, bed protection matting and tiles, and root wads were placed and cabled at several different locations in the channel. It is unclear based on the locations of the restoration efforts what the goals might have been. Bank erosion and hillslope slumps were observed throughout the reach, however, property or infrastructure did not appear to be impacted or immediately threatened by the erosion. Invasive vegetation, including English ivy, and Himalayan blackberry were present throughout the reach as well.

It is recommended that locations of active channel erosion, in the vicinity of the rock wall and the sanitary sewer pipe, in this reach be monitored by the City to ensure that site conditions do not deteriorate. Additionally, the side channel entering Hedges Creek in Reach #3A has experienced erosion due to the flashiness of stormwater runoff from upstream. Flow control and onsite retention standards and policies are recommended for the City's consideration in Hedges Reach #3A, in the vicinity of the area west of Ibach Park, to mitigate for areas of active erosion and preserve the integrity of small streams such as this side channel.



Photo 11. Hedges Creek Reach #3A, showing rock wall location and missing rocks.



Photo 12. Side channel incision and erosion around sanitary sewer manhole.



Photo 13. Restoration area showing cabled logs and root wads. Approximately 950 feet upstream of SW 105th Avenue.

3.3.4 Hedges Reach #3B

Hedges Creek Reach #3B is located between a tributary that enters Hedges Creek from the South downstream of SW Alsea Ct and SW 99th Avenue.

Hedges Reach #3B has a much steeper gradient that Reach #3A and the channel is incised with the width to depth ratio decreasing upstream along the reach. The channel is not stable in this reach. Adjacent slopes have failed on both banks (Photo 14) and the culvert under SW Alsea Ct. is perched resulting from erosion and downcutting at the base (Photo 15).



Photo 14. Left bank slump upstream of confluence.



Photo 15. Perched culvert on downstream side of SW Alsea Ct.



Further upstream of SW Alsea Ct. to SW 99th Ave, there is more evidence of erosion and downcutting. A culvert delivering water to the head of the channel near 9999 SW Alsea Ct. is perched approximately 6 feet above the current channel. The culvert is actively eroding the channel. It appears the channel receives a large volume of water from the upstream catchment. BC estimates approximately 140 acres of residential development is collected and conveyed undetained to this stream reach. Given the susceptibility to headwater channels to experience erosion due to the flashiness of stormwater runoff, flow control and onsite retention standards and policies are recommended for the City's consideration in Hedges Reach #3B to mitigate for areas of active erosion and preserve the integrity of the headwater channels.

4.0 Findings and Recommendations

As part of the City's stormwater master plan development, the City is defining projects and strategies to enhance or protect City resources and address stormwater-related problems occurring on City property. This stream assessment was focused on publicly owned land and resources. Findings and recommendations have been identified and developed specific to reaches observed, and do not reflect all stream conditions in the City.

The following is a summary of findings from the stream assessment and recommendations of strategies, including programmatic, projects, and policies to improve stream channel conditions in the reaches evaluated, and/or solve site specific problems.

4.1 Channel Erosion and Incision

Channel erosion and incision was primarily observed in Hedges Creek, and particularly in the headwaters in Reaches #3A and #3B. Table 3 summarizes the locations of channel erosion that were considered problematic from the standpoint of being a risk to property or infrastructure, and recommended strategies for addressing the situation.

Stream	Reach	Approximate Location and Issue	Ownership	Recommended Strategy
Hedges Creek	#1	~500 ft. upstream of Tualatin River (washed out bridge)	Private	 As of the writing of this report, the City is currently working with the property owner and other resource agencies to address permit compliance.
	#3A	~175 ft. upstream of SW 105 th Ave. (rock wall)	City	 Inspect rock wall for ongoing deterioration. Repair rock wall in conjunction with road project. Reorient the downstream culvert to minimize flow velocity directed at embankment.
	#3A	~700 ft. upstream of SW 105 th Ave. (side channel and exposed sanitary	City	 Consider policies to encourage onsite retention and flow mitigation. Inspect sanitary sewer manhole for ongoing exposure or deterioration.

 Table 3. Summary of Channel Erosion Observations and Recommended Strategies



		sewer manhole)		
#	#3B	Entire stream reach (erosion and instability)	City/ Private	Consider policies to encourage onsite retention and flow mitigation.
#	#3B	Culvert at 9999 SW Alsea Ct. (extreme downcutting)	City	 Consider policies to encourage onsite retention and flow mitigation. Implement channel reconstruction/stabilization project to protect private property (private property owner).

4.1.1 Flow Control

The physical conditions of Hedges Creek Reach #3 indicate that the stream channel is subjected to high flow volumes on a regular basis. There is significant erosion and downcutting at the base of two culverts and in the channel (adjacent to house 9999 SW Alsea Ct, and downstream of SW Alsea Ct) as well as bank and hillslope failures in this reach. Additionally, a side channel entering Hedges Creek near Ibach Park has experienced extreme incision, likely due to altered hydrology upstream. This side channels exposed a sanitary sewer manhole, and if the channel continues to downcut, it may further threaten the integrity of the sewer structure. Altered hydrology (from forested/ undeveloped conditions to residential development) has impacted this reach. These observed locations (see Table 3) may benefit from implementation of flow control design standards aimed at reducing both the peak flow and the duration or flow mitigation in conjunction with new and redevelopment and coordinates with Clean Water Services on stormwater management and stormwater design standards. The City may consider updates to their stormwater management policy to encourage onsite retention and flow mitigation in areas susceptible to hydromodification impacts, such as Hedges Reach #3.

It should be noted that flow control may not be as effective in the downstream reaches (i.e., Hedges Reach #1) because of wide floodplains and wetlands are effective at dissipating flow and reducing erosivity. It is recommended that hydrologic and hydraulic modeling be conducted to model the potential effects of flow control standards on downstream reaches.

4.1.2 Road Embankment Erosion

The rock wall protecting the road embankment on 105th Avenue/Blake Street from Hedges Creek in Reach #3A was observed to be failing. Rocks have fallen into the stream, and only a few pieces of the wall remain in place. It is understood that the City plans to widen SW 105th Avenue, which will require a detailed evaluation and updated design of the road embankment and culvert crossings in relationship to the stream channel. A potential design option is to reorient the culvert in conjunction with the roadway widening project to mimic the direction of the natural stream channel and minimize flow velocity directed at the road embankment. Alternatively, reinforcement/ replacement of the existing rock wall would be needed.



4.2 Vegetation Management

Nearly all the reaches assessed were impacted by invasive vegetation, with the most common species being reed canary grass, Himalayan blackberry and English Ivy. Specific locations where intense vegetation management is recommended is detailed in Table 4.



Stream	Reach	Location	Ownership	Invasive Vegetation	Approximate Distance (ft)
Saum Creek	#3	Upstream of SW Blake Street in vicinity of existing restoration project (maintenance is needed).	City	Reed canary grass, Himalayan Blackberry	Approximately 200
Nyberg Creek	#3	Entire reach	Mostly City, approximately 300 feet private	Reed canary grass	1,400
Hedges Creek	#1	Tualatin Community Park	City	Reed canary grass	~500
	#2	Entire reach	City	Reed canary grass, Himalayan Blackberry	1,900

Table 4. List	of Locations	Recommended	for Vegetation	Manaaement
10.010 11 2.00			jo	

Hedges Reach #2 has the most potential for improvement. This area is within the Hedges Creek Greenway and there are established deciduous and conifer trees in the riparian corridor that provide significant shade and would aid in the establishment of newly planted vegetation if a revegetation effort was initiated. Invasive plants are successful because they thrive in environments where native plants struggle, such as areas that lack shade. Providing a hospitable environment for new plant growth, including shade from established trees, will make restoration efforts more successful.

Vegetation management efforts should include a plan for removal of invasive vegetation, replacement with native vegetation of appropriate type and quantities to be successful, irrigation (initially, until plants are established), follow-up monitoring, and on-going maintenance to continue invasive plant removal. Any efforts to remove invasive vegetation and replant with native riparian plants will require a long-term commitment to maintaining the restored areas to ensure success. At a minimum, annual inspections and potential maintenance (depending on the results of inspection) should occur following re-vegetation efforts. If annual inspections indicate no maintenance is needed, the frequency of inspections can be decreased.

4.3 Slope Stability

Results of the stream assessment identified one location where a capital project may be developed to address City infrastructure potentially susceptible to failure. A perched stormwater pipe above the stream channel in Saum Creek Reach #3 was identified during the stream assessment. Stormwater discharge from this pipe will cause further erosion of the slope around it if left in its current position. A capital project is recommended to replace the pipe and repair the hillslope failure in the vicinity in conjunction with the pipe replacement. The new pipe should be placed on the hillside (i.e., thick-walled flexible pipe or similar) to the bottom of the slope, with energy dissipation provided. A geotechnical evaluation is recommended in order to determine the cause of the slope failure in the vicinity of the perched pipe, and provide input to the slope repair design.



5.0 References

- D.H. Hart and R.C. Newcomb. USGS. Geology and Ground Water of the Tualatin Valley, Oregon. Water Supply Paper 1697. 1965. Accessed online. <u>https://pubs.er.usgs.gov/publication/wsp1697</u>
- Otak 2013. Saum Creek Hydromodification and Water Quality Retrofit. Accessed online. <u>http://www.otak.com/news/media/saumcreekhydromodificationandwaterqualityretrofittualati</u> <u>noregon/</u>



Attachment A

Stream Reach Summary Sheets



Beaver dam ~ 700 ft. downstream of Borland Rd (photo location shown below with camera icon)

Stream	Saum Creek
Reach	#1 (Tualatin River to SW Prosperity Park Rd)
General Charac	cteristics
Reach Length:	~6,775 ft.
Gradient:	~0.6%
Valley Width:	~100—200 ft
Planform:	Meandering
Average BFW:	~13' (range 12' to 15')
Average BFD:	~6' (range 4' to 7')
Substrate:	Predominantly silt, some small gravel
	Invasive vegetation (reed canary grass,
Vegetation:	blackberries, ivy), Douglas fir
Beaver Activity:	Yes. Four beaver dams observed.
lssues:	Minor erosion downstream of Borland Rd.







Hard clay forming pools within channel bed in Saum Creek Reach #2 (photo location shown below with camera icon)

Stream	Saum Creek
Reach	#2 (Lee St. to 65 Ave.)
General Characte	ristics
Reach Length:	~4,950 ft.
Gradient:	~0.4 %
Floodplain Width:	~150' - 175'
Planform:	Meandering (Lee St. to SW 60th, straight (SW 60th to 65th Ave)
Average BFW:	~10' (range 8' to 15')
Average BFD:	~5' (range 3' to 6')
Substrate:	Silt, hard clay, occasional gravel
Vegetation:	Mixed floodplain forest (maples, alders, firs), reed canary grass, jewel weed, blackberries, ferns, willows, sedges
Beaver Activity:	None observed.
Issues:	No critical issues.







Rock check dam and pool in restored section upstream of Blake Street (photo location shown below with camera icon)

Stream	Saum Creek
Reach	#3 (Vicinity of Blake Street)
General Characte	eristics
Reach Length:	~600 ft.
Gradient:	~1.1 % (ds of Blake), ~3% (us of Blake)
Valley Width:	~75' to 100' (confined)
Planform:	Straight
Average BFW:	~6'
Average BFD:	~2'
Substrate:	Fine sediment
Vegetation:	Conifer and deciduous trees (many down in channel), reed canary grass, ivy
Beaver Activity:	None observed.
lssues:	Unstable hillslope and perched culvert, invasive vegetation.



Aerial view of Saum Creek Reach #3 (Vicinity of Blake Street)



Ponded area in Nyberg Creek Reach #1 downstream of 65th Avenue (photo location shown below with camera icon)

Stream	Nyberg Creek
Reach	#1 (Nyberg Lane to 65 Ave.)
General Characte	eristics
Reach Length:	~950 ft.
Gradient:	~0.001% (almost flat)
Floodplain Width:	~300 –400′
Planform:	Straight, ditch-like or undefined channel (wetland, floodplain)
Average BFW:	Not measured. Mostly no single-thread channel. Multiple flow pathways.
Average BFD:	Not measured.
Substrate:	Loose silt and decaying vegetation.
Vegetation:	Wetland plants, reed canary grass, duck- weed, spiraea, jewel weed
Beaver Activity:	Yes, at least two beaver dams in reach.
Issues:	No critical issues.



Aerial view of Nyberg Creek Reach #1 (Nyberg Lane to 65th Avenue)





Nyberg wetlands between 65th Avenue and I-5 (photo location shown below with camera icon)

Stream	Nyberg Creek
Reach	#2 (65 Avenue to I-5)
General Characte	eristics
Reach Length:	~2,100 ft.
Gradient:	~0.095%
Floodplain Width:	~500-650'
Planform:	Flooded, no channel.
Average BFW:	No channel. Not measured.
Average BFD:	No channel. Not measured.
Substrate:	Not evaluated. Flooded.
Vegetation:	Wetland plants, reed canary grass, duck- weed, spiraea, jewel weed
Beaver Activity:	Extensive. Major beaver dam, and beavers observed during field visit.
lssues:	No critical issues.



Aerial view of Nyberg Creek Reach #2 (65th Avenue to I-5)



Nyberg Creek between Tonka Rd and Boones Ferry Rd. (photo location shown below with camera icon)

Stream	Nyberg Creek
Reach	#3 (Martinazzi Road to Boones Ferry Rd)
General Characte	eristics
Reach Length:	~1,400 ft.
Gradient:	~0.29%
Valley Width:	~30-60' (channel is confined by development)
Planform:	Straight, confined by development
Average BFW:	~6.5'
Average BFD:	~2.5′
Substrate:	Fine silt.
Vegetation:	Dominated by reed canary grass, few deciduous trees.
Beaver Activity:	No.
Issues:	No critical issues.



Aerial view of Nyberg Creek Reach #3 (Martinazzi Avenue to Boones Ferry Rd)



Generalized topographic valley cross section of Nyberg Creek between Tonka Rd. and Boones Ferry Rd.



Channel-spanning debris jam in Hedges Creek Reach #1 approx. 300' upstream of Tualatin River (photo location shown below with camera icon)

Stream	Hedges Creek	
Reach	#1 (Tualatin River to Tualatin Rd)	
General Characteristics		
Reach Length:	~2,250 ft.	
Gradient:	~0.8%	
Valley Width:	~75-125′	
Planform:	Meandering and straight, where confined	
Average BFW:	~11.5' (wider near Tualatin, channel narrows upstream)	
Average BFD:	~4.2′	
Substrate:	Varies. Gravel and large rocks near mouth, hard silt in straight sections.	
Vegetation:	Conifer and deciduous trees in lower section, reed canary grass, nettles, blackberries.	
Beaver Activity:	Yes, upper half of reach.	
lssues:	Bank erosion near private property. Washed out private bridge. No City issues.	



Aerial view of Hedges Creek Reach #1 (Tualatin River to Tualatin Rd.)





Typical photo of Hedges Creek Reach #2. Stream channel is overgrown with invasive vegetation. Channel is to the right and 4' below Ryan (standing on the bank). Photo location shown below with camera icon.

Stream	Hedges Creek	
Reach	#2 (Tualatin-Sherwood Rd. to Industrial Way)	
General Characteristics		
Reach Length:	~1,900 ft.	
Gradient:	~0.2%	
Valley Width:	~125-250'	
Planform:	Meandering	
Average BFW:	~11.5′	
Average BFD:	~4.3′	
Substrate:	Clay, hard silt.	
Vegetation:	Reed canary, blackberries, nightshade, jewel weed, some deciduous and conifer trees.	
Beaver Activity:	Yes, one beaver dam noted.	
lssues:	Invasive vegetation.	



Aerial view of Hedges Creek Reach #2 (Tualatin-Sherwood Rd to Industrial Way)





Incised side channel of Hedges Creek. Photo location shown below with camera icon.

Stream	Hedges Creek	
Reach	#3A (Blake St/105th St to Confluence with S. Tributary)	
General Characteristics		
Reach Length:	~1,740 ft.	
Gradient:	~0.9 %	
Valley Width:	~50-150′	
Planform:	Meandering and straight (where steep and confined)	
Average BFW:	~10.5′	
Average BFD:	~3.6′	
Substrate:	Varies. Hard silt, bedrock, gravel, and loose silt.	
Vegetation:	Conifer and deciduous trees, reed canary grass, nettles, blackberries.	
Beaver Activity:	None observed.	
lssues:	Channel incision adjacent to sanitary sewer manhole, and bank erosion and rock wall failure adjacent to Blake St./105th St.	



Aerial view of Hedges Creek Reach #3 (Blake St/105th St to Confluence with S. Tributary)





Unstable hillslope and debris in channel. Photo Location shown below with camera icon.

Stream	Hedges Creek	
Reach	#3B (Confluence with S. Tributary to SW 99th Ave)	
General Characteristics		
Reach Length:	~560 ft.	
Gradient:	~3.7%	
Valley Width:	~50-150′	
Planform:	Straight	
Average BFW:	5.5′	
Average BFD:	2.8′	
Substrate:	Varies. Hard silt, gravel, and loose silt.	
Vegetation:	Conifer and deciduous trees, reed canary grass, nettles, blackberries.	
Beaver Activity:	None observed.	
lssues:	Extreme erosion/channel downcutting in proximity to private property, and hillslope failures.	



Aerial view of Hedges Creek Reach #3B (Confluence with S. Tributary to SW 99th Avenue)




Saum Creek Reach #1 Photo Log

Photo Documentation

Saum Creek Reach #1 (Tualatin River from mouth to SW Prosperity Park Rd.)

Photographs and descriptions of the field investigation (by site) are provided on the following pages. Photographs are shown in the order that the stream survey was conducted, from the most downstream point in the reach to the most upstream point in the reach. In general, photos were taken in the upstream direction, except where noted. Photographs are labeled with a unique identifier that includes photograph number and stream reach identification. Photographs in Saum Creek Reach #1 are identified as S1-X, with X being the number of the photograph. Photo locations are shown in Figure 1.



Figure 1. Saum Creek Reach #1 Photo Location Points





Site location: Photo number:

Description:

Near Tualatin River Tual-1

Flood marker on utility pole (1996 flood). Red arrow shows marker location.



Site location:	NearTualatin
Photo number:	Tual-2
Description:	View of utility pole with flood marker (1996 flood). Red arrow shows marker location.



Site location:	Tualatin River
Photo number:	S1-1
 Description:	Tualatin River from mouth of Saum Creek- looking north
Site location:	<image/> <image/>
Photo number:	\$1-2
Description:	7' high vertical bank (right bank) unstable, bamboo
 Pesciption.	· ····································



































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Site location: Photo number:	For the second
Description:	Left bank slump, seepage, wetland plants observed in vicinity
Site location:	W H H H H W H H H W H H H W H H W H H W H H W H
Photo number:	\$1-20
Description:	Looking upstream (10 1/2 'high, 10' wide)









Saum Creek Reach #2 Photo Log

Photo Documentation

Saum Creek Reach #2 (SW Lee Street to SW 65th Avenue)

Photographs and descriptions of the field investigation (by site) are provided on the following pages. Photographs are shown in the order that the stream survey was conducted, from the most downstream point in the reach to the most upstream point in the reach. In general, photos were taken in the upstream direction, except where noted. Photographs are labeled with a unique identifier that includes photograph number and stream reach identification. Photographs in Saum Creek Reach #2 are identified as S2-X, with X being the number of the photograph. Photo locations are shown in Figure 1.



Figure 1. Saum Creek Reach #2 Photo Location Points





Site location:	50' upstream of SW Lee St. (starting location)
Photo number:	S2-1
Description:	Hard silt on bottom of channel, creates riffles, looking upstream



AltaTerra B2-2









Site location:South of SW 56thPhoto number:S2-5Description:Looking upstream, facing north, cedar tree on left bank appears to shade out invasive plants



 Photo number:
 S2-6

 Description:
 Hard silt creates pool/drop sequence in channel, small riffles





Site location:	South of SW 57th
Photo number:	\$2-7
Description:	Looking upstream at debris in channel and associated bank erosion on edges



South of SW 58th, near trail project under construction S2-8 Looking downstream, hard clay unit in bed, slight knick point in channel, minor incision just upstream of debris jam





 Site location:
 South of SW 58th, near trail project under construction

 Photo number:
 S2-9

 Description:
 Looking upstream- same location as Photo S2-8



Site location: Photo number: Description: South of SW 59th

umber: S2-10

Location of 12" steel pipe in channel disconnected from vertical segment. Some gravel in channel at this location.





Site location:Upstream of Photo S2-10Photo number:S2-11Description:Groundwater seepage on right bank







Site location:1200' east of SW 65th Ave.Photo number:S2-13Description:Fence, looking west



 Site location:
 1000' east of SW 65th Ave.

 Photo number:
 S2-14

 Description:
 Mitigation site on right bank (I-205 side), left side of photo. Red arrow shows channel location.





Site location:1000' east of SW 65th Ave.Photo number:S2-15Description:Looking east (downstream) at mitigation site. Red arrow shows channel location.







Site location:600' east of SW 65th Ave.Photo number:S2-17Description:Right bank swale on west side of mitigation area.



Site location: Photo number: Description: 100' east of SW 65th Ave. S2-18 Debris jam looking downstream





Site location:100' east of SW 65th AvePhoto number:S2-19Description:Looking upstream from same location as Photo S2-18. Gravel in channel at this point.







Saum Creek Reach #3 Photo Log

Photo Documentation Saum Creek Reach #3 (Vicinity of SW Blake St.)

Photographs and descriptions of the field investigation (by site) are provided on the following pages. Photographs are shown in the order that the stream survey was conducted, from the most downstream point in the reach to the most upstream point in the reach. In general, photos were taken in the upstream direction, except where noted. Photographs are labeled with a unique identifier that includes photograph number and stream reach identification. Photographs in Saum Creek Reach #3 are identified as S3-X, with X being the number of the photograph. Photo locations are shown in Figure 1.



Figure 1. Saum Creek Reach #3 Photo Location Points







Site location: Photo number: Description: Downstream of SW Blake St. S3-2 Hillslope failure and perched culvert









AltaTerra B3-4



AltaTerra B3-5



Nyberg Creek Reach #1 Photo Log

Photo Documentation

Nyberg Creek Reach #1 (SW Nyberg Lane to SW 65th Ave.)

Photographs and descriptions of the field investigation (by site) are provided on the following pages. Photographs are shown in the order that the stream survey was conducted, from the most downstream point in the reach to the most upstream point in the reach. In general, photos were taken in the upstream direction, except where noted. Photographs are labeled with a unique identifier that includes photograph number and stream reach identification. Photographs in Nyberg Creek Reach #1 are identified as N1-X, with X being the number of the photograph. Photo locations are shown in Figure 1.



Figure 1. Nyberg Creek Reach #1 Photo Location Points



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Site location:	<image/> <image/>
Dhete number	
Photo number:	NI-1
 Description:	Ponded area adjacent to hyberg creek upstream of Sw hyberg Lane
Dhate number	
Photo number:	NI-Z
Description:	Nyberg Creek where it nows under Sw Nyberg Lane through three 48° cuiverts








AltaTerra B4-4



Site location:	450' upstream of SW Nyberg Lane
Photo number:	N1-7
Description:	Recently removed beaver debris



Looking upstream at ponded area. Red arrow shows location of SW $65^{\mbox{th}}$ Ave.





Site location: 100' downstream of SW 65th Ave. N1-9 Photo number: Upstream end of ponded area **Description:**



Description: Same view as Photo N1-9

AltaTerra







Nyberg Creek Reach #2 Photo Log

Photo Documentation

Nyberg Creek Reach #2 (Downstream of I-5, wetland area)

Photographs and descriptions of the field investigation (by site) are provided on the following pages. Photographs are shown in the order that the stream survey was conducted, from the most downstream point in the reach to the most upstream point in the reach. In general, photos were taken in the upstream direction, except where noted. Photographs are labeled with a unique identifier that includes photograph number and stream reach identification. Photographs in Nyberg Creek Reach #2 are identified as N2-X, with X being the number of the photograph. Photo locations are shown in Figure 1.



Figure 1. Nyberg Creek Reach #2 Photo Location Points



A State			
	11 er -		

South of 7-11, West of SW 65^{th} Ave.
N2-1
Nyberg Creek Wetlands











AltaTerra B5-4



Nyberg Creek Reach #3 Photo Log

Photo Documentation

Nyberg Creek Reach #3 (SW SW Martinazzi Ave. Ave. to SW Boones Ferry Rd.)

Photographs and descriptions of the field investigation (by site) are provided on the following pages. Photographs are shown in the order that the stream survey was conducted, from the most downstream point in the reach to the most upstream point in the reach. In general, photos were taken in the upstream direction, except where noted. Photographs are labeled with a unique identifier that includes photograph number and stream reach identification. Photographs in Nyberg Creek Reach #3 are identified as N3-X, with X being the number of the photograph. Photo locations are shown in Figure 1.



Figure 1. Nyberg Creek Reach #3 Photo Location Points





 Site location:
 East side of SW SW Martinazzi Ave.

 Photo number:
 N3-1

 Description:
 Looking downstream of SW Martinazzi Ave. where 48-inch diameter stormwater pipe enters Nyberg Creek (approximately where red arrow is pointing)



AltaTerra B6-2

Nyberg Creek, concrete dam with notch

Description:





Site location: Photo number: Description:	-350' upstream from SW Martinazzi Ave. N3-5 Looking downstream from footbridge at upstream end of parking lot culvert (obscured by reader of parking lot culvert of parking lot culvert of parking lot culvert of parking lot culvert (obscured by reader of parking lot culvert of parking l
Chan Chan Site location: Photo number:	Ted Canary grass)
 Description:	Looking in downstream direction





Site location:~400' downstream of SW Boones Ferry Rd.Photo number:N3-7Description:Looking upstream, narrow channel



AltaTerra



AltaTerra



Hedges Creek Reach #1 Photo Log

Photo Documentation

Hedges Creek Reach #1 (Tualatin River to SW Tualatin Rd.)

Photographs and descriptions of the field investigation (by site) are provided on the following pages. Photographs are shown in the order that the stream survey was conducted, from the most downstream point in the reach to the most upstream point in the reach. In general, photos were taken in the upstream direction, except where noted. Photographs are labeled with a unique identifier that includes photograph number and stream reach identification. Photographs in Hedges Creek Reach #1 are identified as H1-X, with X being the number of the photograph. Photo locations are shown in Figure 1



Figure 1. Hedges Creek Reach #1 Photo Location Points

Waterbody: Reach description:	Hedges Creek Rea	ach #1
Site locations:	Tualatin River to T	ualatin Road
	Site location:	With a set of the deges Creek below Boones Ferry Road bridge at Tualatin River
	Photo number:	H1-1 2" to 1 E' make in channel (rin ran stabilization)
	Pesciption.	2 to the notion of shares (ip to possibilitation)
	Site location: Photo number:	30 upstream of Tualatin River H1-2
	Description:	1' – 2' rocks in channel, high water mark on bridge abutment corresponds to about 6' above channel bed in this location, steep gradient to mouth













Site location:

350' upstream of Tualatin River

H1-8

Photo number: Description:

Looking upstream at outside bend (adjacent to SW Boones Ferry Road)

















Site location: Photo number: Description: 800' east of Tualatin River H1-15 Looking west (upstream) from new bridge.



Site location:1,000' upstream of Tualatin RiverPhoto number:H1-16Description:Old culvert (where Ryan is standing), photo is looking upstream at outside bend where
stream takes a sharp turn to the north







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Site location:	1400' upstream of Tualatin River
Photo number:	H1-19
Description:	Looking upstream at reed canary grass choked channel.
Fite leasting:	14EC' upetraem of Turlatin Biox
Photo number:	H1-20
Description:	Beaver dam looking upstream, wider floodplain west of this location (open space).









AltaTerra B7-13







Hedges Creek Reach #2 Photo Log
Photo Documentation

Hedges Creek Reach #2 (SW Tualatin-Sherwood Rd. to SW Industrial Way)

Photographs and descriptions of the field investigation (by site) are provided on the following pages. Photographs are shown in the order that the stream survey was conducted, from the most downstream point in the reach to the most upstream point in the reach. In general, photos were taken in the upstream direction, except where noted. Photographs are labeled with a unique identifier that includes photograph number and stream reach identification. Photographs in Hedges Creek Reach #2 are identified as H2-X, with X being the number of the photograph. Photo locations are shown in Figure 1.



Figure 1. Hedges Creek Reach #2 Photo Location Points







Site location: Photo number: Description:

H2-4

Looking upstream, wide floodplain, banks 4- 5' high, width \sim 8 – 10 ', hard silt bed





















Hedges Creek Reach #3A Photo Log

Photo Documentation

Hedges Creek Reach #3A (SW 105th Avenue/SW Blake St. to Confluence with S. Tributary)

Photographs and descriptions of the field investigation (by site) are provided on the following pages. Photographs are shown in the order that the stream survey was conducted, from the most downstream point in the reach to the most upstream point in the reach. In general, photos were taken in the upstream direction, except where noted. Photographs are labeled with a unique identifier that includes photograph number and stream reach identification. Photographs in Hedges Creek Reach #3 are identified as H3-X, with X being the number of the photograph. Photo locations are shown in Figure 1.

Hedges Creek Reach #3 was broken into two sub-reaches, #3A and #3B, to more effectively describe the unique characteristics that occur upstream and downstream of the confluence of a tributary that enters the main channel from the south downstream of SW Alsea Ct. The photos do not have a sub-reach qualifier in their name, but rather are labeled sequentially from the most downstream location to upstream location, in a similar manner to the other stream reaches assessed.



Figure 1. Hedges Creek Reach #3A Photo Location Points





















Photo number: H3-11 Description: Side ch

Side channel, adjacent to sewer manhole being eroded by channel. Manhole is 15' from start of headcut (erosion)



Site location:750 upstream of SW 105^{an} Ave.Photo number:H3-12Description:Main channel, looking upstream





AltaTerra ^{B9-8}























Hedges Creek Reach #3B Photo Log

Photo Documentation

Hedges Creek Reach #3B (Confluence with S. Tributary to SW 99th Ave.)

Photographs and descriptions of the field investigation (by site) are provided on the following pages. Photographs are shown in the order that the stream survey was conducted, from the most downstream point in the reach to the most upstream point in the reach. In general, photos were taken in the upstream direction, except where noted. Photographs are labeled with a unique identifier that includes photograph number and stream reach identification. Photographs in Hedges Creek Reach #3 are identified as H3-X, with X being the number of the photograph. Photo locations are shown in Figure 1.

Hedges Creek Reach #3 was broken into two sub-reaches, #3A and #3B, to more effectively describe the unique characteristics that occur upstream and downstream of the confluence of a tributary that enters the main channel from the south downstream of SW Alsea Ct. The photos do not have a sub-reach qualifier in their name, but rather are labeled sequentially from the most downstream location to upstream location, in a similar manner to the other stream reaches assessed.



Figure 1. Hedges Creek Reach #3B Photo Location Points



Site location:	Immediately downstream from confluence with S. tributary
Photo number:	H3-21
 Description:	Looking upstream, riprap
Site location:	Cuivert crossing under dan H3.22
	10-22
Description.	



























Appendix G: CIP Detailed Cost Estimates



Use of contents on this sheet is subject to the limitations specified at the end of this document.

CIP Cost Summary

CIP ID	Project Title	Capital Expense Total (including contingency)	Engineering and Permitting	Administration	Other fees (studies, mitigation)	Capital Project Implementation Cost Total	Priority Projects (per City)		SDC Eligability ^b	SDC Percentage	SDC Percentage	
1	Manhassat Storm System Improvements	\$1,171,000	\$293,000	\$117,000		\$1,581,000		\$0	100%	15%	\$	237,000.00
2	Nyberg Creek Stormwater Improvements - Phase I	\$1,051,000	\$368,000	\$105,000		\$1,523,000	Х	\$1,523,000	100%	19%	\$	289,000.00
2	Nyberg Creek Stormwater Improvements - Phase 2	\$863,000	\$302,000	\$86,000		\$1,252,000		\$0	100%	19%	\$	238,000.00
2	Nyberg Creek Stormwater Improvements - Phase 3	\$472,000	\$118,000	\$47,000		\$637,000		\$0	100%	19%	\$	121,000.00
3	Sandalwood Water Quality Retrofit	\$79,000	\$20,000	\$8,000		\$107,000		\$0	100%	23%	\$	25,000.00
4	Mohawk Apartments Stormwater Improvements	\$218,000	\$55,000	\$22,000		\$295,000		\$0	100%	20%	\$	59,000.00
5	Herman Road Storm System	\$758,000	\$189,000	\$76,000		\$1,023,000	Х	\$1,023,000	100%	27%	\$	276,000.00
6	Blake St Culvert Replacement	\$381,000	\$133,000	\$38,000		\$552,000	Х	\$552,000	100%	22%	\$	121,000.00
7	Boones Ferry Railroad Conveyance Improvements	\$356,000	\$124,000	\$36,000		\$515,000		\$0	100%	21%	\$	108,000.00
8	89th Avenue Water Quality Retrofit	\$209,000	\$31,000	\$21,000		\$262,000		\$0	100%	0%	\$	
9	125th Court Water Quality Retrofit	\$165,000	\$25,000	\$16,000		\$206,000		\$0	100%	36%	\$	74,000.00
10	93rd Avenue Green Street	\$166,000	\$42,000	\$17,000		\$224,000		\$0	100%	0%	\$	-
11	Juanita Pohl Water Quality Retrofit	\$116,000	\$29,000	\$12,000		\$156,000	Х	\$156,000	100%	0%	\$	-
12	Community Park Water Quality Retrofit	\$117,000	\$29,000	\$12,000		\$158,000	Х	\$158,000	100%	0%	\$	-
13	Water Quality Facility Restoration - Venetia	\$52,000	\$8,000	\$5,000		\$65,000	Х	\$65,000	0%	23%	\$	-
14	Water Quality Facility Restoration - Piute Court	\$83,000	\$12,000	\$8,000		\$104,000	х	\$104,000	0%	23%	\$	-
15	Water Quality Facility Restoration - Sequoia Ridge	\$67,000	\$10,000	\$7,000		\$83,000	х	\$83,000	0%	36%	\$	-
16	Water Quality Facility Restoration - Sweek Drive Pond	\$83,000	\$12,000	\$8,000		\$103,000	Х	\$103,000	0%	21%	\$	-
17	Siuslaw Water Quality Facility Retrofit	\$336,000	\$84,000	\$34,000		\$454,000		\$0	100%	23%	\$	104,000.00
18	Water Quality Facility Restoration - Waterford	\$144,000	\$22,000	\$14,000		\$180,000	х	\$180,000	0%	22%	\$	_
19	Saum Creek Hillslope Repair	\$104,000	\$37,000	\$10,000	\$20,000	\$171,000	Х	\$171,000	0%	19%	\$	-
20	Hedges Creek Stream Repair ^a					\$327,000	Х	\$327,000	0%	24%	\$	-
21	Nyberg Water Quality Retrofit	\$1,234,000	\$432,000	\$123,000	\$248,000	\$2,037,000	Х	\$2,037,000	100%	13%	\$	265,000.00

a. Detailed costs provided in Hedges Creek (SW Ibach Road to SW 105th Avenue) Stream Assessment, CIP Opinion of Construction Costs for Identified Sites (February 2018)

b. SDC Eligibility applies to projects that increase capacity or treatment coverage. Maintenance-related projects to correct an existing deficiency are not eligible

\$12,015,000 TOTAL

\$ 6,482,000
Unit Cost Table

Costs based on RS Means, collected bid tabs, and recent master planning efforts, adjusted to 2018 prices.

ltem	Unit	Unit Cost (2018)
Inspection		
Mainline Video Inspection	FT	3.50
Earthwork	•	
General Earthwork/Excavation	CY	20
Embankment	CY	9
Clear and Grub brush including stumps	AC	8.200
Amended Soils and Mulch	CY	45
Jute Matting, Biodegradeable	SY	6
Tree removal	EA	300
Geomembrane	SY	30
Geotextile	SY	3
Energy dissapation pad - Rip-Rap, Class 50	CY	66
Energy dissapation pad - Rip-Rap, Class 100	CY	81
Energy dissapation pad - Rip-Rap, Class 200	CY	96
Drain Rock	CY	101
Water Quality Facility Installation	ļ	
Pond Outflow Control Structure	FA	6.100
Pond Inlet Structure	FA	4 500
Water Quality Facility Plantings with Trees	SE	6
Rain Garden	SE	27
Stormwater Planter	SE	40
Gravel Access Road	SE	5
Beehive Overflow	FA	1 500
Structure Installation		1,000
Structure installation	٢٨	4 000
Present Congrete Manhole (48" 0.8' deen)	EA	4,000
Precast Concrete Manhole (48, 0-8 deep)		5,800
Precast Concrete Manhole (48, 9-12 deep)		10,200
Precast Concrete Manhole (48 , 13-20 deep)		7 600
Precast Concrete Manhole (60", 9-8 deep)		9,700
Precast Concrete Manhole (00, 9-12 deep)	EA	9,700
Precast Concrete Manhole (72", 0-8 deep)		12,200
Flexes concrete Manhole (72, 9-12 deep)		12,200
		28 800
StormEiltor (2 cartridge catch basin unit 18" cartridges)		28,800
Drawoll (48" 20.25' doop)		12,200
Curb Inlot		1 300
Catch Basin, all types	EA	2,000
Concrete Fill - UIC Decomissioning	ΕΔ	10,200
Connection to Evicting Lateral	ΕΔ	1 200
Connection to Existing Educidi	FA	2 000
Abandon Existing Pine, no excavation (12")	FT	10
Abandon Existing Pipe, no excavation (12")	FT	20
Abandon Existing Pipe, no excavation (21"-24")	FT	25
Abandon Existing Pipe, no excavation (27"-36")	FT	35
Abandon Existing Structure	FA	1,000
Demo pipe	LF	71
Remove existing pavement	SY	10
Remove Manhole Structure	EA	1.000
Plug Existing Pipe	EA	505
Check dams	EA	505
Stem wall check dam	LF	66
Headwall with wingwalls, 84" pipe	EA	14,000
Outfall Improvements	EA	3,000-10,000

Unit Cost Table

Costs based on RS Means, collected bid tabs, and recent master planning efforts, adjusted to 2018 prices.

ltem	Unit	Unit Cost (2018)
Restoration/Resurfacing		
Non-Water Quality Facility Landscaping	AC	15,300
Riparian/Wetland Planting (Non-irrigated)	AC	20,300
Riparian/Wetland Planting (w/temporary irrigation)	AC	32,500
Planting and Bioengineered Restoration	SY	40
4-foot Chain Link Fence	LF	22
Split Rail Fence	LF	25
Hydroseed, large quantities	AC	2500
Seeding, small quantities (< 5,000 sf)	SF	6
Sidewalk Installation	SF	7
Trench resurfacing, Permanent ACP, 6-Inch Depth	SY	71
Concrete Curbs	FT	40
Pipe Unit Cost		
Underdrain Pipe, 4"	LF	29
Underdrain, 6" perforated HDPE	LF	56
HDPE Inlet Lead (12", 2-5' deep)	FT	91
HDPE Pipeline w/asphalt resurfacing (12", 5-10' deep)	FT	140
HDPE Pipeline w/asphalt resurfacing (12", 10-15' deep)	FT	160
HDPE Pipeline w/asphalt resurfacing (18", 5-10' deep)	FT	200
HDPE Pipeline w/asphalt resurfacing (24", 5-10' deep)	FT	275
HDPE Pipeline w/asphalt resurfacing (30", 5-10' deep)	FT	325
HDPE Pipeline (30", 5-10' deep)	FT	240
HDPE Pipeline w/asphalt resurfacing (36", 5-10' deep)	FT	405
HDPE Pipeline (36", 5-10' deep)	FT	265
HDPE Pipeline w/asphalt resurfacing (42", 5-10' deep)	FT	485
HDPE Pipeline (42", 5-10' deep)	FT	345
HDPE Pipeline w/asphalt resurfacing (48", 5-10' deep)	FT	570
HDPE Pipeline (48", 5-10' deep)	FT	430
HDPE Pipeline w/asphalt resurfacing (60", 5-10' deep)	FT	820
HDPE Pipeline (60", 5-10' deep)	FT	680
CMP Pipeline w/asphalt resurfacing (84", 5-10' deep)	FT	1145
CMP Pipeline (84", 5-10' deep)	FT	935
Extra depth pipe	FT	51
Contingencies and Multipliers (applied to construction subtotals)		
Mobilization/Demobilization	LS	10%
Traffic Control/Utility Relocation	LS	5-10%
Erosion Control	LS	2%
Construction Contingency	LS	30%
Engineering and Permitting (%)	LS	15-35%
Administration (%)	LS	10%

Manhassat Storm System Improvements

DESIGN ASSUMPTIONS

1,230 LF of 30" diameter and 750 LF of 36" diameter pipe to replace existing open channel/ditch conveyance system Replace the existing outfall to Hedges Creek

ПЕМ	UNIT	Unit Cost (2018)	Quantity	Total Cost
Earthwork				
General Earthwork/Excavation	CY	20	400	\$8,000
Clear and Grub brush including stumps	AC	8,200	0.25	\$2,050
Structure Installation				
Precast Concrete Manhole (60", 0-8' deep)	EA	7,600	9	\$68,400
Connection to Existing Lateral	EA	1,200	2	\$2,400
Connection to Existing Structure, standard	EA	2,000	1	\$2,000
Demo Pipe	LF	71	900	\$63,900
Outfall Improvements	EA	5,000	1	\$5,000
Restoration/Resurfacing				
Non-Water Quality Facility Landscaping	AC	15,300	0.25	\$3,825
Pipe Unit Cost				
HDPE Pipeline w/asphalt resurfacing (30", 5-10' deep)	FT	325	180	\$58,500
HDPE Pipeline (30", 5-10' deep)	FT	240	1050	\$252,000
HDPE Pipeline w/asphalt resurfacing (36", 5-10' deep)	FT	405	750	\$303,750
Project Sub-Total				\$769,825
Contingencies and Multipliers				
Mobilization/Demobilization	LS	10%		\$76,983
Traffic Control/Utility Relocation	LS	5%	1	\$38,491
Erosion Control	LS	2%	1	\$15,397
Construction Cost Subtotal		-	• • • •	\$900,695
Construction Contingency	LS	30%		\$270,209
Capital Expense Total		·		\$1,170,904
Engineering and Permitting (%)	LS	25%		\$292,726
Administration (%)	LS	10%	1	\$117,090
	·		TOTAL	\$1,580,720

CIP #: 2A

Nyberg Creek Stormwater Improvements - Phase I

DESIGN ASSUMPTIONS

Disconnect storm system at Mohawk Dr.

Install new storm trunkline down Martinazzi to new outfall at Nyberg Creek

ITEM	UNIT	Unit Cost (2018)	Quantity	Total Cost
Earthwork				
General Earthwork/Excavation	CY	20	40	\$800
Energy dissipation pad - Rip-Rap, Class 100	CY	81	15	\$1,215
Structure Installation				
Precast Concrete Manhole (60", 0-8' deep)	EA	7,600	9	\$68,400
Catch Basin, all types	EA	2,000	8	\$16,000
Demo Pipe	LF	71	900	\$63,900
Remove Manhole Structure	EA	1,000	6	\$6,000
Outfall Improvements	EA	10,000	1	\$10,000
Restoration/Resurfacing				
Non-Water Quality Facility Landscaping	AC	15,300	0.1	\$1,530
Riparian/Wetland Planting (Non-irrigated)	AC	20,300	0.1	\$2,030
Concrete Curbs	FT	40	1000	\$40,000
Pipe Unit Cost				
HDPE Inlet Lead (12", 2-5' deep)	FT	91	440	\$40,040
HDPE Pipeline w/asphalt resurfacing (24", 5-10' deep)	FT	275	1500	\$412,500
Project Sub-Total				\$662,415
Contingencies and Multipliers				
Mobilization/Demobilization	LS	10%		\$66,242
Traffic Control/Utility Relocation	LS	10%		\$66,242
Erosion Control	LS	2%		\$13,248
Construction Cost Subtotal				\$808,146
Construction Contingency	LS	30%		\$242,444
Capital Expense Total				\$1,050,590
Engineering and Permitting (%)	LS	35%		\$367,707
Administration (%)	LS	10%	1	\$105,059
	•	•	TOTAL	\$1.523.356

CIP #: 2B

Nyberg Creek Stormwater Improvements - Phase 2

DESIGN ASSUMPTIONS

Upsize storm pipe along Warm Springs Drive

Install new outfall to Nyberg Creek at Tonka and Warm Springs

ПЕМ	UNIT	Unit Cost (2018)	Quantity	Total Cost
Earthwork	_	•	<u> </u>	
General Earthwork/Excavation	CY	20	50	\$1,000
Energy dissipation pad - Rip-Rap, Class 100	CY	66	15	\$990
Structure Installation				
Precast Concrete Manhole (72", 0-8' deep)	EA	9,700	4	\$38,800
Connection to Existing Lateral	EA	1,200	5	\$6,000
Demo Pipe	LF	71	250	\$17,750
Remove Manhole Structure	EA	1,000	2	\$2,000
Outfall Improvements	EA	10,000	1	\$10,000
Restoration/Resurfacing				
Non-Water Quality Facility Landscaping	AC	15,300	0.5	\$7,650
Riparian/Wetland Planting (Non-irrigated)	AC	20,300	0.1	\$2,030
Concrete Curbs	FT	40	50	\$2,000
Pipe Unit Cost				
HDPE Pipeline w/asphalt resurfacing (48", 5-10' deep)	FT	570	800	\$456,000
Project Sub-Total				\$544,220
Contingencies and Multipliers				
Mobilization/Demobilization	LS	10%		\$54,422
Traffic Control/Utility Relocation	LS	10%		\$54,422
Erosion Control	LS	2%		\$10,884
Construction Cost Subtotal			•	\$663,948
Construction Contingency	LS	30%		\$199,185
Capital Expense Total				\$863,133
Engineering and Permitting (%)	LS	35%		\$302,097
Administration (%)	LS	10%		\$86,313
			TOTAL	\$1,251,543

CIP #: 2C

Nyberg Creek Stormwater Improvements - Phase 3

DESIGN ASSUMPTIONS

Upsize storm pipe along Boones Ferry Road

Install new StormFilter systems for increased treatment to Nasoma Ln.

ΠΕΜ	UNIT	Unit Cost (2018)	Quantity	Total Cost
Earthwork		·		
General Earthwork/Excavation	CY	20	30	\$600
Water Quality Facility Installation				
StormFilter (2-cartridge catch basin unit, 18" cartridges)	EA	10,100	2	\$20,200
Structure Installation				
Precast Concrete Manhole (60", 0-8' deep)	EA	7,600	6	\$45,600
Catch Basin, all types	EA	2,000	2	\$4,000
Connection to Existing Lateral	EA	1,200	5	\$6,000
Remove existing pavement	SY	10	100	\$1,000
Demo Pipe	LF	71	450	\$31,950
Remove Manhole Structure	EA	1,000	7	\$7,000
Outfall Improvements	EA	5,000	2	\$10,000
Restoration/Resurfacing		·		
Non-Water Quality Facility Landscaping	AC	15,300	0.1	\$1,530
Riparian/Wetland Planting (Non-irrigated)	AC	20,300	0.1	\$2,030
Pipe Unit Cost				
HDPE Inlet Lead (12", 2-5' deep)	FT	91	150	\$13,650
HDPE Pipeline w/asphalt resurfacing (24", 5-10' deep)	FT	275	60	\$16,500
HDPE Pipeline w/asphalt resurfacing (36", 5-10' deep)	FT	405	250	\$101,250
HDPE Pipeline w/asphalt resurfacing (42", 5-10' deep)	FT	485	75	\$36,375
Project Sub-Total		•		\$297,685
Contingencies and Multipliers				
Mobilization/Demobilization	LS	10%		\$29,769
Traffic Control/Utility Relocation	LS	10%		\$29,769
Erosion Control	LS	2%	1	\$5,954
Construction Cost Subtotal	•	•	• • •	\$363,176
Construction Contingency	LS	30%		\$108,953
Capital Expense Total		•		\$472,128
Engineering and Permitting (%)	LS	25%		\$118,032
Administration (%)	LS	10%	Ī	\$47,213
			TOTAL	\$637,373

Sandalwood Water Quality Retrofit

DESIGN ASSUMPTIONS

220 LF bioswale with temporary irrigation Relocated ditch inlet structure

ПЕМ	UNIT	Unit Cost (2018)	Quantity	Total Cost
Earthwork				
General Earthwork/Excavation	CY	20	250	\$5,000
Embankment	CY	9	70	\$630
Amended Soils and Mulch	CY	45	165	\$7,425
Energy dissipation pad - Rip-Rap, Class 50	CY	66	20	\$1,320
Drain Rock	CY	101	85	\$8,585
Structure Installation		•		
Field Ditch Inlet	EA	4,000	1	\$4,000
Precast Concrete Manhole (60", 0-8' deep)	EA	7,600	1	\$7,600
Connection to Existing Structure, standard	EA	2,000	1	\$2,000
Check dams	EA	505	3	\$1,515
Restoration/Resurfacing	-			
Non-Water Quality Facility Landscaping	AC	15,300	0.4	\$6,120
Riparian/Wetland Planting (w/temporary irrigation)	AC	32,500	0.1	\$3,250
Pipe Unit Cost	· ·			
HDPE Pipeline (30", 5-10' deep)	FT	240	20	\$4,800
Project Sub-Total				\$52,245
Contingencies and Multipliers				
Mobilization/Demobilization	LS	10%		\$5,225
Traffic Control/Utility Relocation	LS	5%		\$2,612
Erosion Control	LS	2%		\$1,045
Construction Cost Subtotal	•			\$61,127
Construction Contingency	LS	30%		\$18,338
Capital Expense Total				\$79,465
Engineering and Permitting (%)	LS	25%		\$19,866
Administration (%)	LS	10%		\$7,946
			TOTAL	\$107,277

Mohawk Apartments Stormwater Improvements

DESIGN ASSUMPTIONS

CCTV 1,000 LF of pipe with unknown alignment and condition Install 4 72" diameter manholes for maintenance access Replace ditch inlet and 170 LF of 36" CMP

ITEM	UNIT	Unit Cost (2018)	Quantity	Total Cost
Inspection		•		
Mainline Video Inspection	FT	3.50	1000	\$3,500
Earthwork				
General Earthwork/Excavation	CY	20	75	\$1,500
Clear and Grub brush including stumps	AC	8,200	1	\$8,200
Structure Installation				
Field Ditch Inlet	EA	4,000	1	\$4,000
Precast Concrete Manhole (72", 9-12' deep)	EA	12,200	4	\$48,800
Connection to Existing Structure, standard	EA	2,000	9	\$18,000
Demo Pipe	LF	71	170	\$12,070
Remove Manhole Structure	EA	1,000	1	\$1,000
Restoration/Resurfacing				
Non-Water Quality Facility Landscaping	AC	15,300	0.1	\$1,530
Pipe Unit Cost				
HDPE Pipeline (36", 5-10' deep)	FT	265	170	\$45,050
Project Sub-Total		·		\$143,650
Contingencies and Multipliers				
Mobilization/Demobilization	LS	10%		\$14,365
Traffic Control/Utility Relocation	LS	5%		\$7,183
Erosion Control	LS	2%		\$2,873
Construction Cost Subtotal				\$168,071
Construction Contingency	LS	30%		\$50,421
Capital Expense Total				\$218,492
Engineering and Permitting (%)	LS	25%		\$54,623
Administration (%)	LS	10%		\$21,8 <mark>4</mark> 9
			TOTAL	\$294,964

Herman Road Storm System

DESIGN ASSUMPTIONS

New 36" diameter trunkline to replace existing open channel/ditch conveyance system Water quality treatment is not included and will be reflected with roadway design Asphalt resurfacing over pipe is not included and will be reflected with roadway design

ПЕМ	UNIT	Unit Cost (2018)	Quantity	Total Cost
Earthwork				
General Earthwork/Excavation	CY	20	250	\$5,000
Structure Installation		·		
Precast Concrete Manhole (60", 0-8' deep)	EA	7,600	10	\$76,000
Catch Basin, all types	EA	2,000	12	\$24,000
Connection to Existing Structure, standard	EA	2,000	4	\$8,000
Demo Pipe	LF	71	600	\$42,600
Remove Manhole Structure	EA	1,000	3	\$3,000
Pipe Unit Cost		·		
HDPE Inlet Lead (12", 2-5' deep)	FT	91	420	\$38,220
HDPE Pipeline (30", 5-10' Deep)	FT	240	110	\$26,400
HDPE Pipeline (36", 5-10' deep)	FT	265	960	\$254,400
Project Sub-Total		•	•	\$477,620
Contingencies and Multipliers				
Mobilization/Demobilization	LS	10%		\$47,762
Traffic Control/Utility Relocation	LS	10%	1	\$47,762
Erosion Control	LS	2%	1	\$9,552
Construction Cost Subtotal	·	•		\$582,696
Construction Contingency	LS	30%		\$174,809
Capital Expense Total		•	•	\$757,505
Engineering and Permitting (%)	LS	25%		\$189,376
Administration (%)	LS	10%	┨ │	\$75,751
	•	•	TOTAL	\$1.022.632

Blake Street Culvert Replacement

DESIGN ASSUMPTIONS

84" diameter culvert replacement

Construction to occur in conjunction with roadway widening project

Asphalt resurfacing over culvert not reelected in cost estimate.

ІТЕМ	UNIT	Unit Cost (2018)	Quantity	Total Cost
Earthwork				
General Earthwork/Excavation	CY	20	900	\$18,000
Embankment	CY	9	60	\$540
Clear and Grub brush including stumps	AC	8,200	0.1	\$820
Jute Matting, Biodegradable	SY	6	60	\$360
Structure Installation				
Headwall with wingwalls, 84" pipe	EA	14,000	2	\$28,000
Dewatering	EA	50,000	1	\$50,000
Outfall Improvements	EA	10,000	1	\$10,000
Restoration/Resurfacing				
Riparian/Wetland Planting (Non-irrigated)	AC	20,300	1	\$20,300
Pipe Unit Cost				
CMP Pipeline (84", 5-10' deep)	FT	935	120	\$112,200
Project Sub-Total		•		\$240,220
Contingencies and Multipliers				
Mobilization/Demobilization	LS	10%		\$24,022
Traffic Control/Utility Relocation	LS	10%		\$24,022
Erosion Control	LS	2%		\$4,804
Construction Cost Subtotal	-			\$293,068
Construction Contingency	LS	30%		\$87,921
Capital Expense Total				\$380,989
Engineering and Permitting (%)	LS	35%		\$133,346
Administration (%)	LS	10%		\$38,099
			TOTAL	\$552,434

Boones Ferry Railroad Conveyance Improvements

DESIGN ASSUMPTIONS

Remove existing ballast/accumulated sediment and replace with rip rap. Install new field ditch inlet and 400 LF of 42-inch pipe.

ITEM	UNIT	Unit Cost (2018)	Quantity	Total Cost
Earthwork				
General Earthwork/Excavation	CY	20	165	\$3,300
Energy dissipation pad - Rip-Rap, Class 100	CY	81	200	\$16,200
Structure Installation				
Field Ditch Inlet	EA	4,000	1	\$4,000
Precast Concrete Manhole (72", 0-8' deep)	EA	9,700	1	\$9,700
Demo pipe	LF	71	400	\$28,400
Outfall Improvements	EA	5,000	1	\$5,000
Restoration/Resurfacing	-			
Non-Water Quality Facility Landscaping	AC	15,300	0.1	\$1,530
Pipe Unit Cost				
HDPE Pipeline (42", 5-10' deep)	FT	345	480	\$165,600
Project Sub-Total				\$233,730
Contingencies and Multipliers				
Mobilization/Demobilization	LS	10%		\$23,373
Traffic Control/Utility Relocation	LS	5%		\$11,687
Erosion Control	LS	2%		\$4,675
Construction Cost Subtotal				\$273,464
Construction Contingency	LS	30%		\$82,039
Capital Expense Total				\$355,503
Engineering and Permitting (%)	LS	35%		\$124,426
Administration (%)	LS	10%		\$35,550
			TOTAL	\$515,480

89th Avenue Water Quality Retrofit

DESIGN ASSUMPTIONS

Contech CDS (Model CDS 3025) hydrodynamic separator with 150 LF of piping

ITEM	UNIT	Unit Cost (2018)	Quantity	Total Cost
Earthwork				
General Earthwork/Excavation	CY	20	50	\$1,000
Energy dissipation pad - Rip-Rap, Class 50	CY	66	25	\$1,650
Water Quality Facility Installation		•		
Contech CDS (Model CDS3025, 72")	EA	28,800	1	\$28,800
Structure Installation				
Precast Concrete Manhole (72", 0-8' deep)	EA	9,700	1	\$9,700
Flow Splitter/WQ Manhole (72", all depths)	EA	12,300	1	\$12,300
Demo pipe	LF	71	100	\$7,100
Remove existing pavement	SY	1,000	13	\$13,000
Outfall Improvements	EA	5,000	1	\$5,000
Restoration/Resurfacing				
Non-Water Quality Facility Landscaping	AC	15,300	0.1	\$1,530
Concrete Curbs	FT	40	20	\$800
Pipe Unit Cost				
HDPE Pipeline w/asphalt resurfacing (24", 5-10' deep)	FT	275	50	\$13,750
HDPE Pipeline (48", 5-10' deep)	FT	430	100	\$43,000
Project Sub-Total			-	\$137,630
Contingencies and Multipliers				
Mobilization/Demobilization	LS	10%		\$13,763
Traffic Control/Utility Relocation	LS	5%		\$6,882
Erosion Control	LS	2%		\$2,753
Construction Cost Subtotal				\$161,027
Construction Contingency	LS	30%		\$48,308
Capital Expense Total				\$209,335
Engineering and Permitting (%)	LS	15%		\$31,400
Administration (%)	LS	10%		\$20,934
			TOTAL	\$261,669

125th Court Water Quality Retrofit

DESIGN ASSUMPTIONS

Contech CDS (Model CDS 3025) hydrodynamic separator with 100 LF of piping

ПЕМ	UNIT	Unit Cost (2018)	Quantity	Total Cost
Earthwork				
General Earthwork/Excavation	CY	20	50	\$1,000
Water Quality Facility Installation		•		
Contech CDS (Model CDS3025, 72")	EA	28,800	1	\$28,800
Structure Installation				
Precast Concrete Manhole (72", 0-8' deep)	EA	9,700	1	\$9,700
Flow Splitter/WQ Manhole (72", all depths)	EA	12,300	1	\$12,300
Connection to Existing Structure, standard	EA	2,000	3	\$6,000
Demo pipe	LF	71	50	\$3,550
Remove existing pavement	SY	1,000	13	\$13,000
Pipe Unit Cost				
HDPE Pipeline w/asphalt resurfacing (24", 5-10' deep)	FT	275	50	\$13,750
HDPE Pipeline w/asphalt resurfacing (36", 5-10' deep)	FT	405	50	\$20,250
Project Sub-Total				\$108,350
Contingencies and Multipliers				
Mobilization/Demobilization	LS	10%		\$10,835
Traffic Control/Utility Relocation	LS	5%		\$5,418
Erosion Control	LS	2%		\$2,167
Construction Cost Subtotal				\$126,770
Construction Contingency	LS	30%		\$38,031
Capital Expense Total				\$164,800
Engineering and Permitting (%)	LS	15%		\$24,720
Administration (%)	LS	10%		\$16,480
			TOTAL	\$206,000

93rd Avenue Green Street

DESIGN ASSUMPTIONS

950 sf of flow-through stormwater planter

Curb and gutter along 550' of unimproved roadway

ПЕМ	UNIT	Unit Cost (2018)	Quantity	Total Cost
Earthwork				
General Earthwork/Excavation	CY	20	100	\$2,000
Water Quality Facility Installation				
Stormwater Planter	SF	40	950	\$38,000
Beehive Overflow	EA	1,500	2	\$3,000
Structure Installation				
Curb Inlet	EA	1,300	4	\$5,200
Connection to Existing Structure, standard	EA	2,000	2	\$4,000
Abandon Existing Pipe, no excavation (12")	FT	10	30	\$300
Remove Manhole Structure	EA	1,000	2	\$2,000
Restoration/Resurfacing				
Trench resurfacing, Permanent ACP, 6-Inch Depth	SY	71	300	\$21,300
Concrete Curbs	FT	40	550	\$22,000
Pipe Unit Cost		-		
HDPE Pipeline w/asphalt resurfacing (12", 5-10' deep)	FT	140	50	\$7,000
Project Sub-Total		·		\$104,800
Contingencies and Multipliers				
Mobilization/Demobilization	LS	10%		\$10,480
Traffic Control/Utility Relocation	LS	10%		\$10,480
Erosion Control	LS	2%		\$2,096
Construction Cost Subtotal	•			\$127,856
Construction Contingency	LS	30%		\$38,357
Capital Expense Total				\$166,213
Engineering and Permitting (%)	LS	25%		\$41,553
Administration (%)	LS	10%		\$16,621
			TOTAL	\$224,387

Juanita Pohl Water Quality Retrofit

DESIGN ASSUMPTIONS

1300 sf of flow through raingarden

ПЕМ	UNIT	Unit Cost (2018)	Quantity	Total Cost
Earthwork				
General Earthwork/Excavation	CY	20	180	\$3,600
Water Quality Facility Installation				
Rain Garden	SF	27	1300	\$35,100
Beehive Overflow	EA	1,500	2	\$3,000
Structure Installation				
Precast Concrete Manhole (48", 0-8' deep)	EA	5,600	2	\$11,200
Connection to Existing Structure, standard	EA	2,000	2	\$4,000
Check dams	EA	505	2	\$1,010
Stem wall check dams	LF	66	90	\$5,940
Restoration/Resurfacing				
Trench resurfacing, Permanent ACP, 6-Inch Depth	SY	71	50	\$3,550
Concrete Curbs	FT	40	100	\$4,000
Pipe Unit Cost	•		• •	
HDPE Inlet Lead (12", 2-5' deep)	FT	91	50	\$4,550
Project Sub-Total				\$75,950
Contingencies and Multipliers				
Mobilization/Demobilization	LS	10%		\$7,595
Traffic Control/Utility Relocation	LS	5%	1	\$3,798
Erosion Control	LS	2%		\$1,519
Construction Cost Subtotal				\$88,862
Construction Contingency	LS	30%		\$26,658
Capital Expense Total	•			\$115,520
Engineering and Permitting (%)	LS	25%		\$28,880
Administration (%)	LS	10%	1	\$11,552
	· ·		TOTAL	\$155,952

Community Park Water Quality Retrofit

DESIGN ASSUMPTIONS

1550 sf of raingarden/swale

ІТЕМ	UNIT	Unit Cost (2018)	Quantity	Total Cost
Earthwork	-			
General Earthwork/Excavation	CY	20	175	\$3,500
Water Quality Facility Installation				
Rain Garden	SF	27	1550	\$41,850
Beehive Overflow	EA	1,500	2	\$3,000
Structure Installation	·	-		
Precast Concrete Manhole (48", 0-8' deep)	EA	5,600	2	\$11,200
Connection to Existing Structure, standard	EA	2,000	2	\$4,000
Abandon Existing Pipe, no excavation (12")	FT	10	60	\$600
Remove Manhole Structure	EA	1,000	3	\$3,000
Restoration/Resurfacing		-		
Trench resurfacing, Permanent ACP, 6-Inch Depth	SY	71	20	\$1,420
Concrete Curbs	FT	40	150	\$6,000
Pipe Unit Cost	·	-		
HDPE Inlet Lead (12", 2-5' deep)	FT	91	25	\$2,275
Project Sub-Total	·			\$76,845
Contingencies and Multipliers				
Mobilization/Demobilization	LS	10%		\$7,685
Traffic Control/Utility Relocation	LS	5%		\$3,842
Erosion Control	LS	2%		\$1,537
Construction Cost Subtotal	·			\$89,909
Construction Contingency	LS	30%		\$26,973
Capital Expense Total	·			\$116,881
Engineering and Permitting (%)	LS	25%		\$29,220
Administration (%)	LS	10%		\$11,688
			TOTAL	\$157,790

Water Quality Facility Restoration - Venetia

DESIGN ASSUMPTIONS

Water quality swale is approx. 15' wide, 200' long, 1.5' deep, with 4' bottom width. 2' of excavation and installation of 1' of amended soils and temporary irrigated vegetation Refurbish maintenance access road from Lee Street

ITEM	UNIT	Unit Cost (2018)	Quantity	Total Cost
Earthwork	-			
General Earthwork/Excavation	CY	20	225	\$4,500
Clear and Grub brush including stumps	AC	8,200	0.3	\$2,460
Amended Soils and Mulch	CY	45	100	\$4,500
Energy dissipation pad - Rip-Rap, Class 50	CY	66	5	\$330
Water Quality Facility Installation				
Water Quality Facility Plantings with Trees	SF	6	2580	\$15,480
Gravel Access Road	SF	5	750	\$3,750
Restoration/Resurfacing		<u>.</u>		
Non-Water Quality Facility Landscaping	AC	15,300	0.2	\$3,060
Project Sub-Total				\$34,080
Contingencies and Multipliers				
Mobilization/Demobilization	LS	10%		\$3,408
Traffic Control/Utility Relocation	LS	5%		\$1,704
Erosion Control	LS	2%		\$682
Construction Cost Subtotal				\$39,874
Construction Contingency	LS	30%		\$11,962
Capital Expense Total				\$51,836
Engineering and Permitting (%)	LS	15%		\$7,775
Administration (%)	LS	10%		\$5,184
			TOTAL	\$64,795

Water Quality Facility Restoration - Piute Court

DESIGN ASSUMPTIONS

4,000 sf facility with a 7 ft design depth

3' of excavation and installation of 1' of amended soils and temporary irrigated vegetation

Install a maintenance access road from Piute Court

ПЕМ	UNIT	Unit Cost (2018)	Quantity	Total Cost
Earthwork				
General Earthwork/Excavation	CY	20	450	\$9,000
Clear and Grub brush including stumps	AC	8,200	0.2	\$1,640
Amended Soils and Mulch	CY	45	150	\$6,750
Energy dissipation pad - Rip-Rap, Class 50	CY	66	10	\$660
Water Quality Facility Installation			•	
Pond Outflow Control Structure	EA	6,100	1	\$6,100
Gravel Access Road	SF	5	1000	\$5,000
Structure Installation			· · ·	
Flow Splitter/WQ Manhole (72", all depths)	EA	12,300	1	\$12,300
Connection to Existing Lateral	EA	1,200	2	\$2,400
Restoration/Resurfacing			· · ·	
Non-Water Quality Facility Landscaping	AC	15,300	0.5	\$7,650
Riparian/Wetland Planting (w/temporary irrigation)	AC	32,500	0.1	\$3,250
Project Sub-Total			•	\$54,750
Contingencies and Multipliers				
Mobilization/Demobilization	LS	10%		\$5,475
Traffic Control/Utility Relocation	LS	5%		\$2,738
Erosion Control	LS	2%		\$1,095
Construction Cost Subtotal			•	\$64,058
Construction Contingency	LS	30%		\$19,217
Capital Expense Total			· · ·	\$83,275
Engineering and Permitting (%)	LS	15%		\$12,491
Administration (%)	LS	10%]	\$8,327
	•	•	TOTAL	\$104,093

Water Quality Facility Restoration - Sequoia Ridge

DESIGN ASSUMPTIONS

4,000 sf facility with a 5 ft design depth

3' of excavation and installation of 1' of amended soils and temporary irrigated vegetation

Install upstream water quality/flow control manhole for offline configuration

ITEM	UNIT	Unit Cost (2018)	Quantity	Total Cost
Earthwork				
General Earthwork/Excavation	CY	20	450	\$9,000
Clear and Grub brush including stumps	AC	8,200	0.4	\$3,280
Amended Soils and Mulch	CY	45	150	\$6,750
Tree removal	EA	300	30	\$9,000
Energy dissipation pad - Rip-Rap, Class 50	CY	66	2	\$132
Water Quality Facility Installation		•		
Pond Outflow Control Structure	EA	6,100	1	\$6,100
Restoration/Resurfacing		·		
Non-Water Quality Facility Landscaping	AC	15,300	0.2	\$3,060
Riparian/Wetland Planting (w/temporary irrigation)	AC	32,500	0.2	\$6,500
Project Sub-Total	•	•		\$43,822
Contingencies and Multipliers				
Mobilization/Demobilization	LS	10%		\$4,382
Traffic Control/Utility Relocation	LS	5%		\$2,191
Erosion Control	LS	2%		\$876
Construction Cost Subtotal	•	•		\$51,272
Construction Contingency	LS	30%		\$15,382
Capital Expense Total		•		\$66,653
Engineering and Permitting (%)	LS	15%		\$9,998
Administration (%)	LS	10%		\$6 <u>,</u> 665
			TOTAL	\$83.317

Water Quality Facility Restoration - Sweek Drive Pond

DESIGN ASSUMPTIONS

3,000 sf facility adjacent to larger Sweek Pond

3' of excavation and installation of 1' of amended soils and temporary irrigated vegetation

ПЕМ	UNIT	Unit Cost (2018)	Quantity	Total Cost
Earthwork				
General Earthwork/Excavation	CY	20	350	\$7,000
Clear and Grub brush including stumps	AC	8,200	0.2	\$1,640
Amended Soils and Mulch	CY	45	110	\$4,950
Tree Removal	EA	300	30	\$9,000
Energy dissipation pad - Rip-Rap, Class 50	CY	66	4	\$264
Water Quality Facility Installation				
Pond Outflow Control Structure	EA	6,100	1	\$6,100
Structure Installation		•		
Flow Splitter/WQ Manhole (72", all depths)	EA	12,200	1	\$12,200
Connection to Existing Lateral	EA	1,200	3	\$3,600
Restoration/Resurfacing		•		
Non-Water Quality Facility Landscaping	AC	15,300	0.2	\$3,060
Riparian/Wetland Planting (w/temporary irrigation)	AC	32,500	0.2	\$6,500
Project Sub-Total				\$54,314
Contingencies and Multipliers				
Mobilization/Demobilization	LS	10%		\$5,431
Traffic Control/Utility Relocation	LS	5%		\$2,716
Erosion Control	LS	2%		\$1,086
Construction Cost Subtotal				\$63,547
Construction Contingency	LS	30%		\$19,064
Capital Expense Total	-			\$82,612
Engineering and Permitting (%)	LS	15%		\$12,392
Administration (%)	LS	10%		\$8,261
			TOTAL	\$103,264

Siuslaw Water Quality Retrofit

DESIGN ASSUMPTIONS

Replace stormwater pipe from Boones Ferry Rd to Siuslaw Lane due to condition Regrade/amend soils in existing greenway for enhanced water quality treatment Install sedimentation manhole upstream of swale

ПЕМ	UNIT	Unit Cost (2018)	Quantity	Total Cost
Earthwork				
General Earthwork/Excavation	CY	20	560	\$11,200
Amended Soils and Mulch	CY	45	420	\$18,900
Energy dissipation pad - Rip-Rap, Class 100	CY	81	15	\$1,215
Structure Installation		•		
Precast Concrete Manhole (60", 0-8' deep)	EA	7,600	2	\$15,200
Flow Splitter/WQ Manhole (72", all depths)	EA	12,300	1	\$12,300
Catch Basin, all types	EA	2,000	3	\$6,000
Connection to Existing Lateral	EA	1,200	1	\$1,200
Connection to Existing Structure, standard	EA	2,000	1	\$2,000
Abandon Existing Pipe, no excavation (27"-36")	FT	35	70	\$2,450
Check dams	EA	505	5	\$2,525
Outfall Improvements	EA	3,000	2	\$6,000
Restoration/Resurfacing				
Riparian/Wetland Planting (w/temporary irrigation)	AC	32,500	0.2	\$6,500
Pipe Unit Cost				
HDPE Pipeline w/asphalt resurfacing (30", 5-10' deep)	FT	325	100	\$32,500
HDPE Pipeline (30", 5-10' deep)	FT	240	250	\$60,000
HDPE Pipeline (48", 5-10' deep)	FT	430	100	\$43,000
Project Sub-Total				\$220,990
Contingencies and Multipliers				
Mobilization/Demobilization	LS	10%		\$22,099
Traffic Control/Utility Relocation	LS	5%		\$11,050
Erosion Control	LS	2%		\$4,420
Construction Cost Subtotal				\$258,558
Construction Contingency	LS	30%		\$77,567
Capital Expense Total				\$336,126
Engineering and Permitting (%)	LS	25%		\$84,031
Administration (%)	LS	10%		\$33,613
			TOTAL	\$453,770

Water Quality Facility Restoration - Waterford

DESIGN ASSUMPTIONS

2,500 sf facility, approx. 4' deep

3' of excavation and installation of 1' of amended soils and temporary irrigated vegetation Relocation and replacement of outlet control structure with new 24" pipe

ITEM	UNIT	Unit Cost (2018)	Quantity	Total Cost		
Earthwork						
General Earthwork/Excavation	CY	20	560	\$11,200		
Clear and Grub brush including stumps	AC	8,200	0.3	\$2,460		
Amended Soils and Mulch	CY	45	100	\$4,500		
Energy dissipation pad - Rip-Rap, Class 50	CY	66	12	\$792		
Water Quality Facility Installation	•	•				
Pond Outflow Control Structure	EA	6,100	1	\$6,100		
Water Quality Facility Plantings with Trees	SF	6	1200	\$7,200		
Structure Installation						
Flow Splitter/WQ Manhole (72", all depths)	EA	12,300	2	\$24,600		
Connection to Existing Lateral	EA	1,200	8	\$9,600		
Abandon Existing Pipe, no excavation (21"-24")	FT	25	80	\$2,000		
Abandon Existing Structure	EA	1,000	1	\$1,000		
Remove Manhole Structure	EA	1,000	2	\$2,000		
Restoration/Resurfacing						
Non-Water Quality Facility Landscaping	AC	15,300	0.2	\$3,060		
Riparian/Wetland Planting (w/temporary irrigation)	AC	32,500	0.2	\$6,500		
Pipe Unit Cost						
HDPE Pipeline w/asphalt resurfacing (24", 5-10' deep)	FT	275	50	\$13,750		
Project Sub-Total				\$94,762		
Contingencies and Multipliers						
Mobilization/Demobilization	LS	10%		\$9,476		
Traffic Control/Utility Relocation	LS	5%]	\$4,738		
Erosion Control	LS	2%		\$1,895		
Construction Cost Subtotal				\$110,872		
Construction Contingency	LS	30%		\$33,261		
Capital Expense Total				\$144,133		
Engineering and Permitting (%)	LS	15%		\$21,620		
Administration (%)	LS	10%		\$14,413		
			TOTAL	\$180,166		

Saum Creek Hillslope Repair

DESIGN ASSUMPTIONS

Replace existing 18-inch pipe to outfall Install bank reinforcement to prevent further erosion Conduct geotechnical evaluation of bank slope conditions

ITEM	UNIT	Unit Cost (2018)	Quantity	Total Cost
Earthwork				
Clear and Grub brush including stumps	AC	8,200	0.1	\$820
Geotextile	SY	3	140	\$420
Energy dissipation pad - Rip-Rap, Class 200	CY	96	60	\$5,760
Structure Installation				
Precast Concrete Manhole (60", 0-8' deep)	EA	7,600	1	\$7,600
Catch Basin, all types	EA	2,000	1	\$2,000
Demo pipe	LF	71	100	\$7,100
Outfall Improvements	EA	10,000	1	\$10,000
Restoration/Resurfacing				
Riparian/Wetland Planting (Non-irrigated)	AC	20,300	0.4	\$8,120
Pipe Unit Cost				
Underdrain, 6" perforated HDPE	LF	56	50	\$2,800
HDPE Pipeline w/asphalt resurfacing (18", 5-10' deep)	FT	200	120	\$24,000
Project Sub-Total	•	•		\$68,620
Contingencies and Multipliers				
Mobilization/Demobilization	LS	10%		\$6,862
Traffic Control/Utility Relocation	LS	5%		\$3,431
Erosion Control	LS	2%		\$1,372
Construction Cost Subtotal		•		\$80,285
Construction Contingency	LS	30%		\$24,086
Capital Expense Total				\$104,371
Geotechnical Evaluation	LS	20000	1	\$20,000
Engineering and Permitting (%)	LS	35%		\$36,530
Administration (%)	LS	10%		\$10,437
			TOTAL	\$171,338

Hedges Creek Stream Repair

DESIGN ASSUMPTIONS

Costs directly from the Hedges Creek (SW Ibach Road to SW 105th Avenue) Stream Assessment, CIP Opinion of Construction Costs for Identified Sites, February 2018, GreenWorks PC and OTAK, INC. Refer to report for detailed cost information.

Stream rehabilitation

Sanitary infrastructure protection

Outfall Improvements

ПЕМ	UNIT	Unit Cost (2018)	Quantity	Total Cost
Location "M"				
Capital Project Implementation Cost Total				\$146,874
Location "N"				
Capital Project Implementation Cost Total				\$179,793
			TOTAL	\$326,667

Nyberg Water Quality Retrofit

DESIGN ASSUMPTIONS

1.5 acres water quality facility with additional site improvements

3' of excavation and installation of 1.5' of amended soils and temporary irrigated vegetation

Excavated outflow channel from facility to Nyberg Creek

Installation of low flow bypass from Martinazzi and Warm Springs to proposed facility

ПЕМ	UNIT	Unit Cost (2018)	Quantity	Total Cost					
Earthwork									
General Earthwork/Excavation	CY	20	5362	\$107,244					
Clear and Grub brush including stumps	AC	8,200	1.54	\$12,639					
Amended Soils and Mulch	CY	45	2823	\$127,050					
Jute Matting, Biodegradable	SY	6	1083	\$6,500					
Tree removal	EA	300	20	\$6,000					
Energy dissipation pad - Rip-Rap, Class 50	CY	66	59	\$3,911					
Water Quality Facility Installation									
Pond Outflow Control Structure	EA	6,100	1	\$6,100					
Pond Inlet Structure	EA	4,500	1	\$4,500					
Water Quality Facility Plantings with Trees	SF	6	43560	\$261,360					
Gravel Access Road	SF	5	1800	\$9,000					
Beehive Overflow	EA	1,500	3	\$4,500					
Structure Installation									
Precast Concrete Manhole (48", 0-8' deep)	EA	5,600	2	\$11,200					
Precast Concrete Manhole (48", 13-20' deep)	EA	10,200	1	\$10,200					
Precast Concrete Manhole (60", 0-8' deep)	EA	7,600	1	\$7,600					
Precast Concrete Manhole (60", 9-12' deep)	EA	9,700	1	\$9,700					
Flow Splitter/WQ Manhole (72", all depths)	EA	12,300	2	\$24,600					
Catch Basin, all types	EA	2,000	3	\$6,000					
Connection to Existing Lateral	EA	1,200	5	\$6,000					
Abandon Existing Pipe, no excavation (12")	FT	10	490	\$4,900					
Abandon Existing Structure	EA	1,000	3	\$3,000					
Remove Manhole Structure	EA	1,000	2	\$2,000					
Outfall Improvements	EA	7,500	1	\$7,500					
Restoration/Resurfacing									
Riparian/Wetland Planting (Non-irrigated)	AC	20,300	0.5	\$10,150					
Hydroseed, large quantities	AC	2,500	0.5	\$1,250					
Pipe Unit Cost									
HDPE Inlet Lead (12", 2-5' Deep)	FT	91	100	\$9,100					
HDPE Overflow from Beehive Overflows (12", 2-5' Deep)	FT	76	75	\$5,700					
HDPE Pipeline w/asphalt resurfacing (12", 5-10' Deep)	FT	140	485	\$67,900					
HDPE Pipeline w/asphalt resurfacing (24", 5-10' deep)	FT	275	275	\$75,625					
Project Sub-Total				\$811,229					
Contingencies and Multipliers									
Mobilization/Demobilization	LS	10%		\$81,123					
Traffic Control/Utility Relocation	LS	5%		\$40,561					
Erosion Control	LS	2%		\$16,225					
Construction Cost Subtotal				\$949,138					
Construction Contingency	LS	30%		\$284,742					
Capital Expense Total				\$1,233,880					
Engineering and Permitting (%)	LS	35%		\$431,858					
Administration (%)	LS	10%		\$123,388					
Wetland Delineation	LS	15,000	1	\$15,000					
Wetland Mitigation	LS	232,500	1	\$232,500					
			TOTAL	\$2,036,626					

Appendix H: Staffing Analysis



Use of contents on this sheet is subject to the limitations specified at the end of this document.

Table H-1. Staffing Analysis Summary by CIP ID#							
CIP ID	Project Description	Project Information	Priority Project (Y/N)	Engineering Responsibility	Maintenance Details ^a	Estimated Annual Maintenance Resource Needs (FTE) ^b	Estimated Staff Resource Needs (\$ and FTE) ^c
CIP #1 Manhasset Storm System Improvements	Replace existing conveyance open channel with pipe	 Engineering and permitting costs estimated at 25% of the construction cost. Assume consultant to complete. Construction administration (City staff) estimated at 10% of the construction cost. New infrastructure will require more frequent maintenance due to anticipated sediment accumulation (annual pipe cleaning). Project cost (total): \$1,581,000. 	N	Staff/consultant	 1,980 linear feet (LF) of new pipe Annual pipe cleaning (20'/hr) 	Approximately 100 hours of annual maintenance (0.05 FTE)	Construction administration (total): \$117,000 (or 0.78 FTE)
CIP #2a Phase 1 Nyberg Creek Stormwater Improvements	Install upsized and new storm lines in Martinazzi Avenue and construct new outfall to Nyberg Creek	 Engineering and permitting costs estimated at 35% of the construction cost. Assume consultant to complete. Construction administration (City staff) estimated at 10% of the construction cost. New infrastructure will require more frequent maintenance due to anticipated sediment accumulation (annual pipe cleaning, outfall debris removal). Project cost (total): \$1,523,000. 	Y	Staff/consultant	 1,940 LF of new pipe, 1 new outfall Annual pipe cleaning (20'/hr) Outfall debris removal (4 hrs) 	Approximately 100 hours of annual maintenance (0.05 FTE)	Construction administration (total): \$105,000 (or 0.70 FTE)
CIP #2b Phase 2 Nyberg Creek Stormwater Improvements	Install upsized and new storm lines along Warm Springs Drive and construct new outfall to Nyberg Creek	 Engineering and permitting costs estimated at 35% of the construction cost. Assume consultant to complete. Construction administration (City staff) estimated at 10% of the construction cost. New infrastructure will require more frequent maintenance due to anticipated sediment accumulation (annual pipe cleaning, outfall debris removal). Project cost (total): \$1,208,000. 	N	Staff/consultant	 800 LF of new pipe, 1 new outfall Annual pipe cleaning (20'/hr) Outfall debris removal (4 hrs) 	Approximately 44 hours of annual maintenance (0.03 FTE)	Construction administration (total): \$86,000 (or 0.57 FTE)
CIP #2c Phase 3 Nyberg Creek Stormwater Improvements	Install upsized and new storm lines along Boones Ferry and install new WQ treatment facilities (StormFilter cbs)	 Engineering and permitting costs estimated at 25% of the construction cost. Assume consultant to complete. Construction administration (City staff) estimated at 10% of the construction cost. New infrastructure will require more frequent maintenance due to anticipated sediment accumulation (annual pipe cleaning, StormFilter cbs maintenance). Project cost (total): \$637,000. 	N	Staff/consultant	 535 LF of new pipe, 2 new StormFilters Annual pipe cleaning (20'/hr) StormFilter maintenance (6 hr/facility - assumed) 	Approximately 40 hours of annual maintenance (0.02 FTE)	Construction administration (total): \$47,000 (or 0.31 FTE)
CIP #3 Sandalwood Water Quality Retrofit	Retrofit existing open channel to WQ facility	 Engineering and permitting costs estimated at 25% of the construction cost. Assume consultant to complete. Construction administration estimated at 10% of the construction cost. New WQ facility will require annual inspections and maintenance to ensure plant viability and system functionality. Project cost (total): \$107,000. 	N	Staff/consultant	 220' water quality swale Inspection four times/year (4 hrs total) Annual swale maintenance (20'/hr) 	Approximately 15 hours of annual maintenance (0.01 FTE)	Construction administration (total): \$8,000 (or 0.06 FTE)
CIP #4 Mohawk Apartments Stormwater Improvements	CCTV pipe, replace pipe, install four new manholes and restore open channel	 Engineering and permitting costs estimated at 25% of the construction cost. Assume consultant to complete. Construction administration (City staff) estimated at 10% of the construction cost. CCTV effort to be conducted by City staff. New manholes will require annual maintenance (previously unaccounted). Project cost (total): \$295,000. 	N	Staff/consultant	 1,000 LF of CCTV, 4 new manholes CCTV (200'/hr) Annual WQ manhole maintenance (1 hr/MH with biannual frequency) 	Approximately 13 hours of annual maintenance (0.01 FTE)	Construction administration (total): \$22,000 (or 0.15 FTE)
CIP #5 Herman Road Storm System	Construct new storm conveyance associated with roadway improvements	 Engineering and permitting costs estimated at 25% of the construction cost. Assume consultant to complete. Construction administration (City staff) estimated at 10% of the construction cost. New infrastructure will require more frequent maintenance due to anticipated sediment accumulation (annual pipe cleaning). Project cost (total): \$1,023,000. 	Y	Staff/consultant	 1,490 LF of new pipe, 12 new catch basins Annual pipe cleaning (20'/hr) Annual cb maintenance (1hr/cb) 	Approximately 87 hours of annual maintenance (0.05 FTE)	Construction administration (total): \$76,000 (or 0.51 FTE)
CIP #6 Blake Street Culvert Replacement	Replace culvert at Hedges Creek associated with roadway improvements	 Engineering and permitting costs estimated at 35% of the construction cost. Assume consultant to complete. Construction administration (City staff) estimated at 10% of the construction cost. No additional maintenance requirements. Project cost (total): \$552,000. 	Y	Staff/consultant	 120 LF of new culvert No increased maintenance obligation or frequency expected. 	N/A	Construction administration (total): \$38,000 (or 0.25 FTE)
CIP #7 Boones Ferry Railroad Conveyance Improvements	Replace 400 LF of undersized pipe, ditch inlet, install a WQ manhole and mitigate gravel migration downstream	 Engineering and permitting costs estimated at 35% of the construction cost. Assume consultant to complete. Construction administration (City staff) estimated at 10% of the construction cost. New and replaced infrastructure will require more frequent maintenance due to anticipated sediment accumulation (annual pipe cleaning, open channel maintenance) Project cost (total): \$515,000. 	N	Staff/consultant	 480 LF of replaced pipe, 150' open channel, 1 new manhole Annual pipe cleaning (20'/hr) Annual open channel cleaning (20'/hr) Annual WQ manhole maintenance (1 hr/MH with biannual frequency) 	Approximately 32 hours of annual maintenance (0.02 FTE)	Construction administration (total): \$36,000 (or 0.24 FTE)

Table H-1. Staffing Analysis Summary by CIP ID#							
CIP ID	Project Description	Project Information	Priority Project (Y/N)	Engineering Responsibility	Maintenance Details ^a	Estimated Annual Maintenance Resource Needs (FTE) ^b	Estimated Staff Resource Needs (\$ and FTE) ^c
CIP #8 89th Ave Water Quality Retrofit	Install WQ CDS unit and associated piping	 Engineering and permitting costs estimated at 15% of the construction cost. Assume consultant to complete. Construction administration (City staff) estimated at 10% of the construction cost. New infrastructure will require more frequent maintenance due to anticipated sediment accumulation (annual pipe cleaning, CDS maintenance) Project cost (total): \$262,000. 	N	Staff/consultant	 150 LF of new pipe, new CDS WQ facility Annual pipe cleaning (20'/hr) CDS maintenance (6 hr/facility - assumed) 	Approximately 14 hours of annual maintenance (0.01 FTE)	Construction administration (total): \$21,000 (or 0.14 FTE)
CIP #9 125th Ct Water Quality Retrofit	Install WQ CDS unit and associated piping	 Engineering and permitting costs estimated at 15% of the construction cost. Assume consultant to complete. Construction administration (City staff) estimated at 10% of the construction cost. New infrastructure will require more frequent maintenance due to anticipated sediment accumulation (annual pipe cleaning, CDS maintenance) Project cost (total): \$206,000. 	N	Staff/consultant	 100 LF of new pipe, new CDS WQ facility Annual pipe cleaning (20'/hr) CDS maintenance (6 hr/facility - assumed) 	Approximately 11 hours of annual maintenance (0.01 FTE)	Construction administration (total): \$16,000 (or 0.11 FTE)
CIP #10 93rd Ave Green Street	Add WQ planters	 Engineering and permitting costs estimated at 25% of the construction cost. Assume consultant to complete. Construction administration (City staff) estimated at 10% of the construction cost. New WQ facility will require annual inspections and maintenance to ensure plant viability and system functionality. Project cost (total): \$224,000. 	N	Staff/consultant	 950 sf of WQ planters Inspection four times/year (4 hrs total) Annual planter maintenance (50 sf/hr) 	Approximately 23 hours of annual maintenance (0.02 FTE)	Construction administration (total): \$17,000 (or 0.11 FTE)
CIP #11 Juanita Pohl Water Quality Retrofit	Retrofit parking lot with WQ planters	 Engineering and permitting costs estimated at 25% of the construction cost. Assume consultant to complete. Construction administration (City staff) estimated at 10% of the construction cost. New WQ facility will require annual inspections and maintenance to ensure plant viability and system functionality. Project cost (total): \$156,000. 	Y	Staff/consultant	 1,300 sf of WQ planters Inspection four times/year (4 hrs total) Annual planter maintenance (50 sf/hr) 	Approximately 30 hours of annual maintenance (0.02 FTE)	Construction administration (total): \$12,000 (or 0.08 FTE)
CIP #12 Community Park Water Quality Retrofit	Retrofit parking lot with WQ planters	 Engineering and permitting costs estimated at 25% of the construction cost. Assume consultant to complete. Construction administration (City staff) estimated at 10% of the construction cost. New WQ facility will require annual inspections and maintenance to ensure plant viability and system functionality. Project cost (total): \$158,000. 	Y	Staff/consultant	 1,550 sf of WQ planters Inspection four times/year (4 hrs total) Annual planter maintenance (50 sf/hr) 	Approximately 35 hours of annual maintenance (0.02 FTE)	Construction administration (total): \$12,000 (or 0.08 FTE)
CIP #13 Water Quality Facility Maintenance - Venetia	Maintain existing WQ facility to restore function	 Engineering and permitting costs estimated at 15% of the construction cost. Assume consultant to complete. Construction administration (City staff) estimated at 10% of the construction cost. Ongoing facility maintenance reflected in programmatic project. Project cost (total): \$65,000. 	Y	Staff/consultant	 WQ facility maintenance Project to be performed by hired contractor Increased maintenance obligation or frequency to be accounted for in programmatic project 	N/A	Construction administration (total): \$5,000 (or 0.03 FTE)
CIP #14 Water Quality Facility Maintenance – Piute Ct	Maintain existing WQ facility to restore function	 Engineering and permitting costs estimated at 15% of the construction cost. Assume consultant to complete. Construction administration (City staff) estimated at 10% of the construction cost. Ongoing WQ facility maintenance reflected in programmatic project. Project cost (total): \$104,000. 	Y	Staff/consultant	 WQ facility maintenance Project to be performed by hired contractor Increased maintenance obligation or frequency to be accounted for in programmatic project 	N/A	Construction administration (total): \$8,000 (or 0.05 FTE)
CIP #15 Water Quality Facility Maintenance - Sequoia Ridge	Maintain existing WQ facility to restore function	 Engineering and permitting costs estimated at 15% of the construction cost. Assume consultant to complete. Construction administration (City staff) estimated at 10% of the construction cost. Ongoing WQ facility maintenance reflected in programmatic project. Project cost (total): \$83,000. 	Y	Staff/consultant	 WQ facility maintenance Project to be performed by hired contractor Increased maintenance obligation or frequency to be accounted for in programmatic project 	N/A	Construction administration (total): \$7,000 (or 0.05 FTE)
CIP #16 Water Quality Facility Maintenance - Sweek Pond	Maintain existing WQ facility to restore function	 Engineering and permitting costs estimated at 15% of the construction cost. Assume consultant to complete. Construction administration (City staff) estimated at 10% of the construction cost. Ongoing WQ facility maintenance reflected in programmatic project. Project cost (total): \$103,000. 	Y	Staff/consultant	 WQ facility maintenance Project to be performed by hired contractor Increased maintenance obligation or frequency to be accounted for in programmatic project 	N/A	Construction administration (total): \$8,000 (or 0.05 FTE)

Table H-1. Staffing Analysis Summary by CIP ID#							
CIP ID	Project Description	Project Information	Priority Project (Y/N)	Engineering Responsibility	Maintenance Details ^a	Estimated Annual Maintenance Resource Needs (FTE) ^b	Estimated Staff Resource Needs (\$ and FTE) °
CIP #17 Alsea/BF Rd 99th/Siuslaw Greenway	Replace failing pipes, add pretreatment and enhance water quality along greenway path with WQ swale	 Engineering and permitting costs estimated at 25% of the construction cost. Assume consultant to complete. Construction administration (City staff) estimated at 10% of the construction cost. New WQ facility will require annual inspections and maintenance to ensure plant viability and system functionality. Project cost (total): \$454,000. 	Ν	Staff/consultant	 One new WQ manhole Annual WQ manhole maintenance (1 hr/MH with biannual frequency) 500' WQ swale Inspection four times/year (4 hrs total) Annual swale maintenance (20'/hr) 	Approximately 30 hours of annual maintenance (0.02 FTE)	Construction administration (total): \$34,000 (or 0.23 FTE)
CIP #18 Water Quality Facility Maintenance - Waterford	Maintain existing WQ facility to restore function	 Engineering and permitting costs estimated at 15% of the construction cost. Assume consultant to complete. Construction administration (City staff) estimated at 10% of the construction cost. Ongoing WQ facility maintenance reflected in programmatic project. Project cost (total): \$180,000. 	Y	Staff/consultant	 WQ facility maintenance Project to be performed by hired contractor Increased maintenance obligation or frequency to be accounted for in programmatic project. 	N/A	Construction administration (total): \$14,000 (or 0.09 FTE)
CIP #19 Saum Creek Slope Repair	Replace existing outfall and repair hillslope failure	 Engineering and permitting costs estimated at 35% of the construction cost. Assume consultant to complete. Construction administration (City staff) estimated at 10% of the construction cost. Project cost includes additional geotechnical evaluation. No additional maintenance requirements. Project cost (total): \$171,000. 	Y	Staff/consultant	 Replace outfall and bank slope repair No increased maintenance obligation or frequency expected. 	N/A	Construction administration (total): \$10,000 (or 0.07 FTE)
CIP #20 Hedges Creek Stream Repair	Bank slope stabilization, infrastructure protection, and vegetation management	 Project information and costs are included in the "Hedges Creek Stream Assessment, SW Ibach St. to SW 105th Ave.", February 2018, GreenWorks PC and OTAK, INC. Ongoing vegetation management reflected in programmatic project. Project cost (total): \$327,000. 	Y	Staff/consultant	 Increased maintenance obligation or frequency due to be accounted for in programmatic project 	N/A	No related staffing cost estimate
CIP #21 Nyberg Water Quality Facility	Install regional WQ treatment facility at newly acquired City property	 Engineering and permitting costs estimated at 35% of the construction cost. Assume consultant to complete. Construction administration (City staff) estimated at 10% of the construction cost. Project cost includes additional estimate for fees and mitigation. Project cost (total): \$2,037,000. 	Y	Staff/consultant	 WQ facility maintenance Project to be performed by hired contractor Increased maintenance obligation or frequency to be accounted for in programmatic project 	N/A	Construction administration (total): \$123,000 (or 0.82 FTE)
Capital Project Total Staffing Estimate (FTE)					5.5 (total) or	0.6 (annual) ^d	
Priority Capital Project Staffing Estimate (FTE)				2.8 (total) or 0.3 (annual) ^d			
Annual Program Total (FTE), see Table 8-2					0.4		
Annual TOTAL (FTE), All Projects and Programs					1	.0	
Annual TOTAL (FTE), Priority Projects and Programs					0	.7	

a. Annual maintenance activities are estimated based on new assets added as part of the capital project scope.

b. Hour estimate for maintenance is based on average time/task provided by city staff and is provided for reference only. For purposes of calculating an equivalent FTE per cost estimate, an annual FTE works 2080 hrs; 0.02 FTE is 40 hrs. Costs are rounded to the 0.01 FTE. c. Estimated combined resource needs are based directly on the construction administration cost. It reflects staff time (engineering, administration, and operations) to support design, construction and annual maintenance activities. For purposes of calculating an equivalent FTE per cost estimate, an annual FTE works 2080 hrs; 0.02 FTE is 40 hrs. Costs are rounded to the 0.01 FTE.

was assumed at \$150,000/year. Costs are rounded to the 0.01 FTE.

d. Annualized over a 10-year planning period.

Appendix I: Clean Water Services Review Comments



Appendix I

Clean Water Services' Review Comments on the Draft Tualatin Stormwater Master Plan

Clean Water Services (CWS) reviewed the April 2019 Draft Stormwater Master Plan for the City of Tualatin. Review comments were received in September 2019 and primarily included comments related to City-identified water quality project opportunity locations (Table 3-1) and the resulting water quality retrofit projects.

Through this review process, CWS identified four additional water quality opportunity locations. Two locations (Location ID 27 and 28 as identified in Table I-1 below) are proposed as alternative locations for CIPs #8 and #9. Two locations are newly identified water quality opportunity locations.

Feedback from CWS did not result in direct changes to proposed CIPs, but these additional water quality opportunity areas can be considered with implementation of the City's new Public Water Quality Facility Retrofit Program. Table I-1 summarizes the CWS-identified water quality opportunity locations.

Figure I-1 below, was provided by CWS. The figure shows proposed water quality opportunity locations compared with City-identified water quality opportunity areas.
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Table I-1. CWS Additional Stormwater Project Opportunities (with CWS comments)									
SW Project Opportunity Area ID	Location	Basin/ Waterbody	Problem/ Project Category	Source	WQ Retrofit Opportunity	Problem/Project Area Description	Preliminary Project Concepts and Observations (per site visits)	Additional Data Collection/City Input (following Project Development Workshop)	CWS Comments
27* (alternative to Location 16)	125 th to Herman Rd	Cummins Creek	Water Quality (WQ)	Stormwater CIP WQ retrofit evaluation	x	 Project identified through GIS drainage basin analysis, integrating use of archydro basin delineation and storm flow. Large untreated area has the potential for WQ treatment (~150 acres) 	 Partnership with property owners needed to provide LIDA capable of treating the flows to this location. Installation of WQMH (sumped) will enable periodic sediment removal before natural area. Conveyance pipe/outfall replacement due to low slope. 	Flow splitter and WQMH to meet flow and sizing criteria designated by CWS standards.	Difficult location, so consider Public-Private Partnership (3P) to construct WQ facility during redevelopment.
28* (alternative to Location 15)	SW 95 th Ave- SW Tualatin Sherwood Rd	Hedges Creek	WQ Infrastructure need	Stormwater CIP WQ retrofit evaluation	x	 Project identified through drainage basin analysis, integrating use of archydro basin delineation and storm flow. Potential to treat 304 acres, of which 147 acres are currently untreated. Potential for WQ treatment areas to be identified as upstream areas redevelop. Ideal for WQ/green facility in adjacent open area. Consider constructed wetlands. 	 Current conveyance is provided through dual 24" culverts that cross SW Tualatin-Sherwood Rd and flow into 36" CSP alongside the major arterial. The goal would be to split flows between the current conveyance (36" CSP) and a constructed facility (low flow), which would then reconnect into the 36" pipe. The project would require coordination with Washington County, City of Tualatin, CWS, and the developer, (as well as additional upstream property owners potentially) to advance WQ treatment opportunities. Needs further evaluation by consultant of upstream partial WQ treatment. 	 Open conveyance between culverts that cross the road and the 36" pipe can be used to place the flow splitter structure, alleviating need of pipe removal. Facility sizing would be included in scope of project. 	 Land is owned by Zidell Companies who is looking to develop it for commercial use. Consider Public-Private Partnership (3P) to construct WQ facility during redevelopment. Opportunity for partial treatment of large untreated basin with City partnership with smaller WQF construction as upstream development occurs. WQ project(s) could be coordinated with an expansion of the ROW by Washington County . Reference map Site 29 additional for basin detail.
29*	SW Teton Ave & SW Herman Rd Intersection	Hedges Creek	WQ	Stormwater CIP WQ retrofit evaluation	X	 Project identified through drainage basin analysis, integrating use of archydro basin delineation and storm flow. Large untreated area has the potential for WQ treatment (~80 acres). 	Needs further evaluation by consultant of upstream partial WQ treatment .	Flow splitter and WQMH to meet flow and sizing criteria designated by CWS standards.	Opportunity for partial treatment of large untreated basin with City partnership with smaller WQF construction as upstream development occurs.
30*	SW Nyberg St/65 th Ave	Nyberg St	WQ	Stormwater CIP WQ retrofit evaluation	x	 Project identified through drainage basin analysis, integrating use of archydro basin delineation and storm flow. Large untreated area has the potential for WQ treatment (xx acres). Expanded constructed wetland complex to provide WQ treatment before discharging into wetlands surrounding Nyberg Creek, south of SW Nyberg St. 	 Potential for WQ facility near convergence of multiple open conveyance ditches, behind site with large businesses. Expected high level of solids removal and additional treatment area. Needs further evaluation by consultant of upstream partial WQ treatment. 	Facility sizing would be included in scope of project.	 Land owned by the Nyberg Creek Foundation. Opportunity for partial treatment of large untreated basin with City partnership with smaller WQF construction as upstream development occurs.

*Indicates that the SW Project Opportunity Area ID created by CWS as an arbitrary value to continue using the City of Tualatin format.



Figure I-1. Proposed Storm Projects for the Tualatin SMP Source: Clean Water Services



CITY OF TUALATIN



ACKNOWLEDGMENTS

We appreciate the guidance provided by our advisory groups, as well as the involvement of many City Committees and commissions, interest groups, civic leaders, and community members who have given their time, energy, and ideas to this parks and recreation plan. Together, we have created the vision for parks and recreation that will support our high quality of life.

City Council

Mayor Frank Bubenik Council President Nancy Grimes Councilor Maria Reyes Councilor Christen Sacco Councilor Bridget Brooks Councilor Cyndy Hillier Councilor Valerie Pratt

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Systems

Martin Loring, Database Administrator Tom Scott, GIS Technician

Tualatin Advisory Committees &

Commissions

Arts Advisory Committee Planning Commission Youth Advisory Council

City of Wilsonville

Planning Staff and Parks & Recreation Staff



Tualatin Basalt Creek Parks & Recreation Plan

Final Plan | December 2021

ACKNOWLEDGMENTS (CONTINUED)

Area Planning Partners &

Collaborations

Basalt Creek Neighbors & Property Owners

City of Tualatin Community Members

City of Tualatin Business & Employment

Commercial CIO

Community Partners for Affordable Housing (CPAH)

Horizon Community Church

Lennar Homes

Metro Staff

Stu Peterson, Macadam Forbes

Tualatin Chamber of Commerce

Viva Tualatin Staff & Members

MIG, Inc.

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CITY OF TUALATIN

Basalt Creek Parks & Recreation Plan

Executive Summary



Executive Summary

The Basalt Creek Parks and Recreation Plan represents a significant step toward expanding the reach of the City of Tualatin's awardwinning park and recreation facilities and programs to a future 367-acre addition known as the Basalt Creek planning area. The addition is projected to provide 1,897 new jobs and 575 new households in the city.

This plan complements two previous planning efforts in 2018: the Basalt Creek Comprehensive Plan, which described future land uses and needed infrastructure for Basalt Creek, and the Tualatin Parks and Recreation Master Plan, which identified a need for land acquisition and related park and trail planning.

Process

Throughout the development of the Basalt Creek Parks and Recreation Plan, the City has been committed to understanding the social, legal, ecological, and economic dynamics of the neighborhood. Planning tasks included:

- Assessing recreation opportunities in Basalt Creek by developing site selection criteria, conducting a site analysis, making site observations and performing other research.
- Documenting market trends and dynamics to understand recent residential, commercial and industrial development patterns and economic conditions.
- Engaging with community members and stakeholders to discuss park use ideas and preferences identified in 2018 and continue a dialogue with existing Basalt Creek neighbors.

EXECUTIVE SUMMARY



- Establishing a parks and recreation development framework to guide future park and trail investments across the planning area based on the site analysis, public engagement, site characteristics, and City input.
- Identifying key parks and recreation investments that can best serve existing and new residents, employees and employers.
- **Estimating costs** to better plan for the cost of purchasing land, constructing, and maintaining parks and trails in the Basalt Creek planning area.
- Identifying steps towards implementation that guide expansion of parks and recreation facilities, programs, and services to Basalt Creek.

After completing these tasks, the plan reached the following conclusions:

Real Estate Trends and Market Dynamics

- Market trends and real estate dynamics are volatile regionwide; conditions in the planning area reflect this given lack of vacant, developable industrial lands near I-5. Residential lands are also high in demand as communities look to increase the region's housing stock.
- Site conditions across the Basalt Creek planning area vary; some sites are very attractive for industrial investment, while others are less so given their topographical constraints, limited access, presence of utility easements, and natural features.
- Market land pricing will reflect site conditions, suggesting parkland acquisition should focus on planned industrial lands with lower development potential due to site constraints.

Community and Stakeholder

Engagement

 Community engagement for the Basalt Creek Parks and Recreation Plan included over twenty various meetings, property visits, focus groups and a community event with over 650 people that took place in 2021. Engagement included thousands of digital notifications, including surveys, emails, website and social media updates during 2021.

- These conversations and interactions helped to determine what features would be included in proposed park and trail concepts such as trails, sport courts, flexible multi-use fields, play areas, picnicking, and natural areas.
- Safety and visibility along future on-street trails/widened sidewalks, greenways, shared use paths and trail corridors was a noted community interest.
- Documentation of engagement activities is included in Appendix A.





Top and Bottom: Photographs from the Viva Tualatin event on August 28, 2021. (MIG 2021)

EXECUTIVE SUMMARY



Basalt Creek Framework Plan

Park Development Framework and Access Improvements

- The best opportunities for future parks and recreation in the Basalt Creek planning area take advantage of land use, site conditions favorable for parks development, natural features, and access potential.
- A parks development framework for Basalt Creek identifies three opportunity areas: West, Central and East.
- A mix of widened sidewalks, greenways, shared-use paths and trails are needed across the planning area to connect residents, visitors, and employees with their parks and open space.

Legend

- Basalt Creek Planning Area
- Existing Roads
- --- Proposed Roads
- Existing Trails
- Planned and Proposed Trails
- Existing Bike Lanes
- ⊢ Railroad
- Streams
- Waterbodies
- Two-foot contours

Basalt Creek Opportunity Areas

- C West
- Central
 - East

Framework Plan Priority Elements

West Opportunity Area

The West Opportunity Area will serve employees and the surrounding community with future on-street trails/ widened sidewalks and a trailhead that links to planned regional trails/shareduse paths. Other elements include:

- Regional trail connection along existing/future roads to future park in the Central focus area
- Small trailhead and parking area near regional trail
- Safe non-motorized commuting and walking opportunities for future employees
- Sign improvements for pedestrian navigation

Central Opportunity Area

The Central Opportunity Area will feature a new, proposed up to 10-acre neighborhood park and connecting greenway trails, preferably located east of Grahams Ferry Road on lands with lower potential for industrial development. Included in the plan are four different park design examples based on community feedback. The example designs will be used as starting points for more detailed community-driven design once a site is acquired. Other elements and considerations include:

- Future city acquisition of a level, future park site
- Large neighborhood park (+/-10 acres) with a mix of recreation amenities including playground, picnic shelter, sport court, flexible field, trails, natural area
- Potential view of the Basalt Creek canyon
- Active transportation connections to residential areas and regional trails

East Opportunity Area

The East Opportunity Area is characterized by developer-provided park spaces, with onstreet paths and plantings. Other elements include:

- Public stormwater facilities
- Potential to enhance stormwater facilities with amenities to expand recreation
- Potential partnership opportunity with adjacent school
- Opportunity for future trail connections

EXECUTIVE SUMMARY

TABLE 3: LAND ACQUISITION ESTIMATES

2018 Tualatin Parks & Recreation Plan Acquisition Estimates for Basalt Creek Park (P3) (2018 dollars)				
Acreage	20			
Туре	Community Park			
Parkland Acquisition and Easements	\$5,000,000			
Cost Per Acre	\$250,000			
2021 Tualatin Basalt Creek Parks & Recreation Plan Land Acquisition Estimates (2021 dollars)				
Acreage	15-20 total			
Туре	Large neighborhood park			
Parkland Acquisition and Easements (up to 20 acres)	Range: \$5,220,000 - \$6,000,000			
Trails Cost (1.78 acres)	\$535,000			
West Opportunity Area Cost (1 acre)	\$300,000			
West Opportunity Area Cost (1 acre) Central Opportunity Area Cost (10-15 acres)	\$300,000 \$3,000,000 - \$4,500,000			
West Opportunity Area Cost (1 acre) Central Opportunity Area Cost (10-15 acres) East Opportunity Area Cost (0 acres)	\$300,000 \$3,000,000 - \$4,500,000 \$0			

TABLE 4: PARK DEVELOPMENT COSTS SUMMARY

2018 Tualatin Parks & Recreation Plan Estimate of Development Costs, (Appendix D, Table D-2, page D-8)					
Park Type	Large Neighborhood Park (2018 dollars)	Large Neighborhood Park (2021 dollars)			
Site Development (per acre)	\$500,000	\$554,000			
2018 Tualatin Parks & Recreation Plan Improvement Costs for Basalt Creek Park (P3) (Appendix D, page D-6)					
	(2018 dollars)	(2021 dollars)			
Improvement Costs	\$12,110,000	\$13,159,000			
2021 Tualatin Basalt Creek Parks & Recreation Plan Summary of Development Costs (2021 dollars)					
Acreage	15-20 total				
Trails (excludes parks)	\$3,124,000				
West Opportunity Area	\$775,000				
Central Opportunity Area	\$6,675,000				
East Opportunity Area	\$455,000				
TOTAL	\$11,029,000				
Development cost per acre	\$551,500-\$735,300				

Land Acquisition and

Development Costs

The City needs to consider funding strategies for both land acquisition and park development within the Basalt Creek planning area. Those costs, which remain relatively consistent with previous cost estimates performed in 2018, are explained below:

- Estimated total land acquisition costs to implement the Basalt Creek Parks and Recreation Plan: \$5 to \$6 million at \$260,000-\$300,000 per acre in 2021 dollars.
- Estimated total park development costs for Basalt Creek to implement the Basalt Creek Parks and Recreation Plan: \$11.0 million at a cost of \$552,000-\$735,000 per acre in 2021 dollars.
- If recent real estate and development trends continue, these costs will continue to rise. As the City looks further into the future, costs should be escalated accordingly.

Implementation and Action Plan

Four implementation strategies outline a range of actions that are needed to realize the parks vision in Basalt Creek:

- Coordination/Funding: Coordination with other City Departments, developers, potential partners, and stakeholders to align tasks, project resources, and support for implementation.
- Acquisition: Acquire parkland and trails corridors in Basalt Creek through mutually beneficial agreements including easements, donations, outright willing seller purchase, or other acquisition mechanisms and incentives.
- Design, Development and Construction: Provide quality parks and trails that are responsive to community needs through design, development, and construction.
- Maintenance, Operations and Activation: Ensure the long-term function and vibrancy of Basalt Creek parks and trails through effective maintenance and operations.

Staffing, Operations and

Maintenance

 Staff and operating cost impact: 1.5– 2.0 Full Time Employees (FTEs) will be needed annually for maintenance once the parks and recreation assets in this plan are completed, estimated at \$115,000.



Resumen ejecutivo

El Plan de Parques y Áreas Recreativas de Basalt Creek representa un paso importante para extender el alcance de las galardonadas instalaciones y programas de los parques y áreas recreativas de la Ciudad de Tualatin hacia una futura expansión de 367 acres conocida como el área de planeación de Basalt Creek. Adicionalmente también se proyecta que se abrirán 1,897 nuevos empleos y 575 nuevas viviendas en la ciudad.

Este plan complementa dos esfuerzos previos de planeación en 2018: el Plan integral de Basalt Creek, que describe usos futuros de suelo e infraestructura necesaria de Basalt Creek, y el Plan de Parques y Áreas Recreativas de Tualatin, que identificó la necesidad de adquisición de terrenos y la relacionada planeación maestra de parques y senderos.

Proceso

A través del desarrollo del Plan de Parques y Áreas Recreativas de Basalt Creek, la Ciudad está comprometida a entender las dinámicas sociales, legales, ecológicas y económicas del vecindario. Las tareas de planeación incluyen:

- Evaluar las oportunidades recreativas de Basalt Creek al desarrollar un criterio de selección del sitio, conducir un análisis del sitio, hacer observaciones y realizar otra investigación.
- Documentar las tendencias y dinámicas de mercado para entender recientes patrones de desarrollo residencial, comercial e industrial y condiciones económicas.
- Involucrar a miembros de la comunidad y personas interesadas para hablar de las ideas de uso del parque y preferencias identificadas en 2018, y continuar dialogando con los existentes vecinos Basalt Creek.

RESUMEN EJECUTIVO



- Establecer un marco de trabajo para parques y áreas recreativas para orientar las inversiones en parques y senderos en toda el área de planeación con base en el análisis del sitio, participación pública, características del sitio y comentarios de la Ciudad.
- Identificar inversiones claves en parques y áreas recreativas que puedan servir de mejor forma a los residentes existentes y nuevos, empleados y empleadores.
- Calcular costos para planear de mejor forma el costo de la compra de terrenos, construcción y mantenimiento de parques y senderos en el área de planeación de Basalt Creek.
- Identificar los pasos hacia la implementación que guíen la expansión de parques e instalaciones recreativas, programas y servicios a Basalt Creek.

Después de completar estas tareas, el plan llegó a las siguientes conclusiones:

Tendencias de bienes raíces y dinámicas del mercado

- Las tendencias del mercado y las dinámicas de bienes raíces son volátiles en toda la región; las condiciones en el área de planeación reflejan esta falta de terrenos vacantes, desarrollables e industriales cerca de I-5. Los terrenos residenciales también están en alta demanda conforme las comunidades buscan incrementar la cantidad de viviendas en la región.
- Las condiciones de los sitios en toda el área de planeación de Basalt Creek; algunos sitios son muy atractivos para inversión industrial, mientras que otros lo son menos debido a sus limitantes topográficos, acceso limitado, presencia de servidumbres para servicios públicos y características naturales.
- El precio de mercado reflejará las condiciones del sitio, sugiriendo que la adquisición de terrenos para parque debe enfocarse en terrenos industriales planeados con menor potencial de desarrollo debido a las limitantes del sitio.

Participación de la comunidad y de las personas interesadas

 La participación de la comunidad para el Plan de Parques y Áreas Recreativas de Basalt Creek incluyó más de veinte reuniones diversas, visitas a las propiedades, grupos focales y eventos comunitarios con más de 650 personas, lo que ocurrió en 2021. La participación incluyó miles de interacciones digitales, lo que incluyó encuestas, correos electrónicos, sitio web y actualizaciones en redes sociales durante 2021.

- Estas conversaciones e interacciones ayudaron a determinar qué características serían incluidas en los conceptos propuestos de parques y senderos, tales como senderos, canchas deportivas, campos flexibles de uso múltiple, áreas para pícnic y áreas naturales.
- Un notable interés de la comunidad fue la seguridad y visibilidad a lo largo de senderos en la calle/ ampliación de aceras, caminos verdes, caminos de uso compartido, corredores de senderos.
- La documentación de las actividades de participación está incluida en el Apéndice A.





Parte superior e inferior: Fotografías del evento Viva Tualatin el 28 de agosto de 2021. (MIG 2021)

RESUMEN EJECUTIVO



Plan Estructural de Basalt Creek

Plan estructural para el desarrollo de parques y mejoras al acceso

- Las mejores oportunidades para el futuro de los parques y las áreas recreativas en el área de planeación de Basalt Creek toman ventaja del uso del terreno, condiciones favorables del sitio para el desarrollo de parques, características naturales y potencial acceso.
- Un plan estructural para el desarrollo de parques para Basalt Creek identifica tres áreas de oportunidad: oeste, centro y este.
- Se necesita una mezcla de aceras ampliadas, caminos verdes, caminos de uso compartido y senderos, para conectar a los residentes, visitantes y empleados con sus parques y espacios abiertos.

Legend

 Área de planeación de Basalt Creek
 Caminos existentes
 Caminos propuestos
 Senderos existentes
 Senderos planeados y propuestos
 Carriles para bicicletas existentes
 Vías de tren
 Arroyos
 Cuerpos acuíferos
 Curvas de dos pies Áreas de oportunidades en Basalt Creek
 Oeste
 Centro
 Este

Elementos prioritarios del plan estructural

Área de oportunidad del oeste

El área de oportunidad del oeste dará servicio a empleados y a la comunidad circunvecina con futuros senderos en la calle/aceras ampliadas y entradas a senderos que se enlazan con planeados senderos regionales/ caminos de uso compartido. Otros elementos incluyen:

- Conexión a senderos regionales a lo largo de caminos existentes/ futuros a parques futuros en el área focal del centro.
- Pequeña entrada a senderos y área de estacionamiento cerca del sendero regional
- Oportunidades de traslados no motorizados y de caminar para los empleados futuros
- Mejoras en la señalización para la navegación de peatones

Área de oportunidad en el centro

El área de oportunidad en el centro tendrá un nuevo parque propuesto de 10 acres para el vecindario y senderos verdes de conexión preferiblemente ubicados al este de Grahams Ferry Road en terrenos con menor potencial para el desarrollo industrial. Incluidos en el plan hay cuatro ejemplos distintos de diseños de parques, con base en los comentarios de la comunidad. Los diseños de ejemplo se usarán como puntos de partida para un diseño más detallado dirigido por la comunidad, una vez que se adquiera el sitio. Otros elementos y consideraciones incluyen:

- Adquisición futura por parte de la ciudad de un sitio futuro nivelado para parque
- Parque de vecindario grande (+/-10 acres) con una mezcla de servicios recreativos, lo que incluya un jardín de juegos, cobertizo para pícnic, cancha deportiva, campo flexible, senderos y área natural.
- Vista potencial del cañón de Basalt Creek
- Conexiones de transporte activas a áreas residenciales y senderos regionales

Área de oportunidad del este

El área de oportunidad del este se caracteriza por espacios de parque otorgados por constructores, con caminos en la calle y jardineras. Otros elementos incluyen:

- · Instalaciones públicas para agua pluvial
- Potencial para mejorar las instalaciones para agua de lluvia con servicios para extender las áreas recreativas
- Potencial oportunidad de asociación con la escuela adyacente
- Oportunidad para futuras conexiones a senderos

RESUMEN EJECUTIVO

CUADRO 3: ESTIMACIONES DE ADQUISICIÓN DE TERRENOS

Estimaciones para la adquisición para el plan de parques y áreas recreativas de Tualatin 2018 para el parque Basalt Creek (P3) (dólares de 2018)

Acres	20			
Тіро	Parque comunitario			
Adquisición y servidumbre de terrenos para parques	\$5,000,000			
Costo por acre	\$250,000			
Estimaciones para la adquisición para el plan de parques y áreas recreativas de Tualatin Basalt Creek (dólares de 2021)				
Acres	15-20 total			
Тіро	Parque de vecindario grande			
Adquisición y servidumbre de terrenos para el parque (hasta 20 acres)	Rango: \$5,220,000 - \$6,000,000			
Costo de los senderos (1.78 acres)	\$535,000			
Costo del área de oportunidad del oeste (1 acre)	\$300,000			
Costo del área de oportunidad en el centro (10-15 acres)	\$3,000,000 - \$4,500,000			
Costo del área de oportunidad del este (0 acres)	\$0			
Costo por acre	\$260,000 - \$300,000			

CUADRO 4: RESUMEN DE LOS COSTOS DE DESARROLLO DEL PARQUE

Estimaciones de los costos de desarrollo para el Plan de parques y áreas recreativas de Tualatin 2018 (Apéndice D, Cuadro D-2, página D-8)					
Tipo de parque	Parque de vecindario grande (dólares de 2018)	Parque de vecindario grande (dólares de 2021)			
Sitio de desarrollo (por acre)	\$500,000	\$554,000			
Costos para el Plan de mejora de parques y áreas recreativas de Tualatin para Basalt Creek 2018 (P3) (Apéndice D, página D-6)					
	(dólares de 2018)	(dólares de 2021)			
Costos de mejoras	\$12,110,000	\$13,159,000			
Resumen de costos de desarrollo para el plan de parques y áreas recreativas de Tualatin Basalt Creek 2021 (dólares de 2021)					
Acres	15-20 total				
Senderos (excluye todos los parque	\$3,124,000				
Área de oportunidad del oeste	\$775,000				
Área de oportunidad en el centro	\$6,675,000				
Área de oportunidad del este	\$455,000				
TOTAL	\$11,029,000				
Costo de desarrollo por acre	\$551,500-\$735,300				

Adquisición de terrenos y costos de desarrollo

La Ciudad necesita considerar las estrategias de financiamiento tanto para la adquisición de terrenos como para el desarrollo de parques en el área de planeación de Basalt Creek. Estos costos, que permanecen relativamente consistentes con las previas estimaciones de costos realizadas en 2018, se explican a continuación:

- Total estimado de costos por la adquisición de terrenos para implementar el Plan de Parques y Áreas Recreativas de Basalt Creek: de \$5 a \$6 millones de dólares a \$260,000-\$300,000 por acre, en dólares de 2021.
- Total estimado de costos por el desarrollo de parques para implementar el Plan de Parques y Áreas Recreativas de Basalt Creek: \$11.0 millones de dólares a un costo de \$552,000-\$735,000 por acre, en dólares de 2021.
- Si continúan las tendencias de bienes raíces y construcción, estos costos continuarán aumentando. Mientras la Ciudad ve hacia el futuro, los costos deben aumentar en conformidad.

Implementación y plan de acción

Cuatro estrategias de implementación describen un rango de acciones necesarias para alcanzar la visión de parques en Basalt Creek:

- Coordinación/Financiamiento: Coordinación con otros departamentos de la Ciudad, constructores, socios potenciales y personas interesadas, para alinear las tareas, los recursos para el proyecto y para respaldar la implementación.
- Adquisición: Adquirir los terrenos para parques y corredores de senderos a través de acuerdos de beneficio mutuo, que incluyen servidumbres, donativos, compras de propietarios dispuestos a vender u otros mecanismos e incentivos para adquisición.
- Diseño, desarrollo y construcción: Ofrecer parques y senderos de calidad que respondan a las necesidades de la comunidad, a través de diseño, desarrollo y construcción.
- Mantenimiento, operaciones y activación: Asegurar la función y vitalidad de largo plazo de los parques y senderos de Basalt Creek a través de mantenimiento y operaciones efectivos.

Dotación de personal, operaciones y mantenimiento

Impacto de la dotación de personal y costo operativo: 1.5–2.0 Empleados de Tiempo Completo (FTE, por sus siglas en inglés) se requerirán anualmente para el mantenimiento una vez que los parques y activos de recreación se completen, lo que se estima en \$115,000 dólares.



Introduction



Introduction

The Basalt Creek Parks and Recreation Plan addresses an area of unincorporated Washington County between Tualatin's southern boundary and northern Wilsonville.

The area encompasses approximately 367 acres (194 buildable acres) just west of Interstate 5. Currently, the project area is comprised of a mix of low-density, single-family residences, nurseries, farms, light industrial and construction-related businesses, and natural areas. This includes Basalt Creek and the surrounding canyon and wetlands habitat running north-south through the eastern side of the planning area. The Tualatin planning area is expected to accommodate 1,897 new jobs and 575 new households. As of October 2021, two residential development projects are proposed on the east side along Boones Ferry Road which will introduce approximately 400 single-family homes and 116 units of affordable multi-family housing.



Tualatin Basalt Creek planning area is located in southern Washington County.

CHAPTER 1: INTRODUCTION

The Basalt Creek planning area encompasses 367 acres, and will add approximately 7% more land to the City of Tualatin.



Tualatin Basalt Creek Parks and Recreation Plan Timeline



Plan Purpose

This plan provides direction for the stewardship, enhancement, and development of future parks, natural areas, greenways, trails, and other supportive recreation elements in the Tualatin Basalt Creek planning area. This plan follows up on recommendations outlined in the 2018 Tualatin Parks and Recreation Master Plan which addresses the City's overall parks system. The plan will guide the Parks and Recreation Department staff, City Council, the Parks Advisory Committee (TPARK), and the Tualatin Arts Advisory Committee (TAAC) in decisions related to parks and recreation development in this area.

The plan also provides documentation of a substantial public engagement process undertaken during 2021.

Plan Process

The City issued a request for proposal for professional consulting services in January 2021. MIG, Inc. was selected as the project consultant and began the project in March 2021. The plan is estimated to be complete in January 2022. The sequence of major project milestones is listed below.

Tualatin Basalt Creek Parks and Recreation Planning Process



Planning Context

TUALATIN PARKS & RECREATION

MASTER PLAN (2018)

The Tualatin Parks & Recreation Master Plan (2018) outlines a 20year vision and strategic direction for managing and enhancing the City's diverse portfolio of parks facilities and programming for its dynamic and growing community of residents, businesses and visitors. Among many things, the parks system plan identified areas of future expansion, one being the Basalt Creek Planning Area, and articulated an overall vision for how parks and recreation would develop in this area.

The 2018 parks master plan identified the following needs and actions for the Tualatin portion of the larger Basalt Creek Planning Area:

"A new large neighborhood park is proposed for the Basalt Creek Concept Plan Area in south Tualatin to serve residents and employees. Prior to acquisition, opportunities should be evaluated to acquire additional land to support community-wide recreation needs and protect natural resources in the Basalt Creek Canyon. A larger park in the Basalt Creek Concept Plan area would help address traffic congestion by developing the City's second community park, connected to the local and regional trail system, providing tourism attractions and space for community events, large and small group gatherings, sports (fields or a sports complex), as well as other active and passive recreation uses."

- Acquire 10 to 20 acres of park space through an area master plan process;
- Acquire additional land for greenways and natural parks to support planned trail connectivity and protect creek canyon habitat and natural resources; and
- Master Plan and develop park site as a community park to meet neighborhood, employee, and community needs.

TUALATIN BASALT CREEK

COMPREHENSIVE PLAN (2018)

The Tualatin Basalt Creek Comprehensive Plan (2018) guides development of the 847-acre Basalt Creek Planning Area over the next twenty years. A vision for the urbanization of the planning area will meet regional and local goals, and the plan coordinates future land uses, transportation, and other infrastructure investments between Washington County, the City of Wilsonville, and the City of Tualatin. Tualatin's portion of this area (367 acres) is proposed to include Low Density Residential, Medium-Low Density Residential, High Density Residential, Manufacturing Park, and Neighborhood Commercial

areas. The area includes the Basalt Creek Canyon natural area. Given this anticipated development, the comprehensive plan identified a need to plan for parks, greenways, natural areas, and trails needed to serve new residents and businesses. The comprehensive plan also proposes a network of future local roads that support the planning area's long-term development.

ICE AGE TONQUIN TRAIL MASTER PLAN (2013)

This master plan establishes a defined road map for implementation of a regional multi-use trail for users of all ages and abilities that travels through the communities of Wilsonville, Sherwood, Tualatin, and unincorporated Washington County. It provides a detailed trail alignment, design, and implementation guidance, as well as management and operational issues

associated with it.

Top: Tualatin Basalt Creek Comprehensive Plan (2018) Center: Ice Age Tonquin Trail Master Plan (2013) Bottom: Tualatin Parks & Recreation Master Plan (2018)





Existing Conditions and Site Analysis


Existing Conditions and Site Analysis

Site Overview

The Tualatin Basalt Creek Parks and Recreation project area is a 367– acre area located between the City of Tualatin's southern boundary, partially defined by SW Helenius Street and SW Norwood Road – and the City of Wilsonville's northern planning boundary, partially defined by Basalt Creek Parkway. On the west side, the project area is defined by the Portland and Western Railroad. The east side is bound by the Interstate 5 freeway corridor.

Historically, the area has been part of unincorporated Washington County. Residents living here are not tied into services provided by Tualatin or Wilsonville. Instead, residents rely on individual ground water systems, septic systems, and are served by the Sherwood School District. There are no existing parks in the Tualatin Basalt Creek planning area; the closest park in Tualatin is Ibach Park, located one mile north of the project area boundary.

Land Use

As described in Chapter 1, the area is characterized by a mix of land uses including low-density residential, light industrial, agricultural, plant nurseries, hobby farms, and construction-serving uses. Many families have resided on the same properties in the planning area for decades.

Planned land uses defined in the 2018 Basalt Creek Comprehensive Plan process are illustrated in the diagram on the next page. In the Tualatin portion, they include low, medium, and highdensity residential, neighborhood commercial, and manufacturing uses. These land uses are envisioned to address anticipated demand for industrial lands in the inner metropolitan suburbs and supporting job growth in the area while preserving natural space, buffering residential areas, and improving connectivity through Basalt Creek.

Annexation

When a property in the Tualatin Basalt Creek planning area is sold and the new (or existing) owners wish to develop the property according to its planned land use through the City's development process, the landowner will annex into the city. The process of annexation into the City of Tualatin is voluntary. Following annexation, city services can be extended to parcels contiguous with the City's southern boundary in alignment with existing infrastructure concept plans for the Basalt Creek planning area. This process of infrastructure expansion provides incentives for property owners to annex in after their neighbors do, promoting efficient and predictable development.

Circulation System

Existing circulation system in and at the perimeter of the Tualatin Basalt Creek planning area include interstate freeways, railroads, collector roads, limited access major arterial roads, bike lanes and trail systems. Interstate 5's Exit 286 pulls traffic onto Boones Ferry Road, a major north-south collector on the east side of the Tualatin Basalt Creek planning area and is a major source of traffic in the project area. The other major north-south collector,



Grahams Ferry Road, is accessed via Wilsonville's Day Road, and eventually joins Boones Ferry north of the project boundary. The Portland and Western Railroad, on the west side, is a combination freight and commuter rail line serving Beaverton, Tigard, Tualatin and Wilsonville. TRIMET bus service runs along Boones Ferry Road. Bicycle lanes run along Boones Ferry Road, but do not extend to Wilsonville. A pedestrian trail and sidewalk system exists at the perimeter of the project area along the Tualatin boundary. Trails include the planned Ice Age Tonquin Trail along the west side of the railroad and Metro's proposed Sherwood to Sandy Power Line Trail, which cuts diagonally through the project area's southwest corner utilizing right-ofway underneath Bonneville Power Administration overhead voltage lines. Both trail systems pose to

enhance future pedestrian and bicycle connectivity of the Basalt Creek neighborhood.

A network of future local roadways inside the project area, defined by the Basalt Creek Comprehensive Plan process, aims to provide enhanced connectivity with and beyond the project area to both Tualatin and Wilsonville. These future local roads are envisioned to be built as a part of development projects funded by developers or property owners with input from the City. The actual road alignment, as a result, may vary somewhat given the requirements of proposed development project(s) under consideration.

Another proposed project that may impact the Tualatin Basalt Creek planning area is the Washington County



Left: Character of Grahams Ferry Road.

Bottom right: Character of Tonquin Loop. This narrow road has no striping and is lined with residential uses

extension of the Basalt Creek Parkway between Grahams Ferry Road and Boones Ferry Road. This project was considered and discussed during the planning process, but no one proposed design or trail alignment reflects the parkway's construction. If the parkway extension and related bridge over the Basalt Creek moves ahead, the process will entail an environmental review process that is separate from any park or trails concept included in this plan.

Natural Features

Natural features in the Tualatin Basalt Creek planning area include Basalt Creek (also noted on plans as Tapman Creek)¹, the canyon, basalt formations, wetlands, mixed evergreen forest, pastures, orchards and other agricultural lands. Within the project area, the creek is not piped and flows north to south, functioning primarily as a drainage for developed areas in south Tualatin. The Basalt Creek Canyon is contained on the west side of residential parcels fronting Boones Ferry Road. Wetlands and permanently inundated areas are present in the canyon. The canyon receives stormwater runoff generated from residential development in south Tualatin. Neighbors in the project area reported that decades ago, before the residential areas were built out, standing water in the canyon was only present seasonally.

¹ Washington County mapping identifies the name as Tapman Creek. The Basalt Creek Concept Plan (2018) suggested the possible names include Tappin Creek or Seeley's Creek (page 18). Due to lack of clarity over the name, more research may be needed to determine the correct name of the creek.



Top: Open pastures and Douglas fir forest along Grahams Ferry Road

Bottom left: Basalt rock formations along the creek canyon.

Bottom right: Overgrown hazelnut/filbert orchard at the intersection of Basalt Creek Parkway and Grahams Ferry Road.

Acquisition Criteria

Because the City does not own land in the Tualatin Basalt Creek planning area, future parks and recreation development depends on the City's ability to identify and purchase land through a willing seller process. To better understand where the City's best opportunities exist from a site conditions perspective, the project team analyzed a range of property acquisition criteria using City and County-provided Geographic Information Systems (GIS) data. The site opportunities assessment considered the following criteria:

- Slopes
- Proximity to existing trail network
- Proximity to planned residential areas
- Public ownership
- Site with assigned future manufacturing land uses
- Presence of Metro Title 13 lands
- Distance to Basalt Creek

Site Analysis

Preliminary findings from the GIS site opportunities assessment were also cross-checked with other information known about the project area's site conditions. A summary follows:

- The area east of Grahams Ferry consistently scored high for future parks development, although topography constraints at most of the taxlots will present site design challenges.
- The area along Boones Ferry Road also scored somewhat high considering the above criteria, but due to the typical taxlot configuration, dimensions, lack of developable space for park facilities at any one site, high potential to generate additional traffic along Boones Ferry, and limited circulation access, this area is not desirable for future park development.
- Any site west of Grahams Ferry is not a priority for parks development given the most desirable manufacturing lands are located here. These sites have great potential to expand employment opportunities and City tax revenues as help achieve other City and regional goals. An exception may be considered for a small trailhead or enhanced on-street trail development to provide east-west connectivity.

TABLE 1: SITE SELECTION CRITERIA

Site Selection Criteria	Description/Benefit as Parks and Trails Land	
Slopes less and 5%	Enables development of priority park features such as fields, accessible paths and trails, play areas, gathering spaces, and supportive elements such restrooms and parking areas.	
Proximity to existing trail network (within 1/8 of a mile)	Improves overall site connectivity if the future park is near an off street trail or sidewalk. The closer the site is to existing trail connections, the less costly it is to connect to a new park.	
Proximity to planned residential areas	Sites with proximity to residential, especially high-density Plambeck Gardens and medium-density Autumn Sunrise, allows the future park to serve the most future residents.	
Public ownership	It may be easier for the City to acquire County or other publicly held lands, and can help expand or provide greater access to a park site.	
Sites with assigned future manufacturing land uses	Land zoned for future manufacturing is preferred over future residential given the high cost of site acquisition. The site would be undesirable for manufacturing development due to the presence of site constraints such as topography, overhead power lines, access issues, etc.	
Presence of Metro Title 13 lands	Title 13 lands have development restrictions making them less attractive for manufacturing uses. Title 13 lands may be incorporated into a parks design allowing protection of habitat and water quality, as well as providing a natural park amenity.	
Distance to Basalt Creek	There is a desire for Basalt Creek or the canyon to have some role in the park plan concept or character, such as a viewpoint toward the canyon.	

Existing Site Photos



















BASALT CREEK MASTER PLAN

Market Study Overview

In tandem with the park-focused GIS site opportunities assessment, Johnson Economic completed a real estate market overview and forecast for the Tualatin Basalt Creek market area. The market study was intended to document and market trends as they relate to future industrial, commercial, and residential zoned lands in the project area and establish background market dynamics impacting anticipated private-sector development patterns.

An estimate of land absorption rates and associated market pricing confirmed that market conditions are in alignment with the findings of the park-focused site opportunities assessment. From a market perspective, the study concluded that properties zoned for manufacturing east of Grahams Ferry will be difficult to develop for manufacturing uses due to slope and other constraints. Sites west of Grahams Ferry Road have significantly fewer constraints, with developable parcels that can accommodate larger-scale footprint manufacturing supporting a more cohesive development pattern and yielding consistently high estimated market values. Sites along the east side of Boones Ferry Road are also highly developable, but are already spoken for, with two proposed developer residential projects already underway. Sites along the west side of Boones Ferry have significantly impacted developable areas, making them difficult to redevelop in a cost-efficient manner.





B Vision and Goals



Vision and Goals

The vision for park and recreation in Tualatin Basalt Creek builds from the 2018 parks system plan, which states:

> "Tualatin is a vibrant city, with a healthy and cohesive community, connected through attractive parks, diverse facilities, trails, conservation of natural areas, recreation opportunities, and art and culture that are engaging and accessible to all."

As new additions to the City's parks portfolio, future parks and recreation in the Tualatin Basalt Creek planning area will:

- Help improve individual health, wellness and fitness;
- Connect the community to nature;
- Involve people in lifelong learning;
- Steward the City's cultural and natural resources;
- Attract businesses and support our economic vitality; and
- Foster community cohesion and vibrancy.



BASALT CREEK PARKS & RECREATION PLAN

Goals from the system wide plan addressed by the Basalt Creek Parks and Recreation Plan include:

Goal 1

Expand accessible and inclusive parks and facilities to support community interests and recreation needs.

Goal 2

Create a walkable, bikeable, and interconnected city by providing a network of regional and local trails.

Goal 3

Conserve and restore natural areas to support wildlife, promote ecological functions, and connect residents to nature and the outdoors.

It is possible for additional goals to be addressed through the public design process entailed for new Basalt Creek parks, trails and programming development in the future. The Tualatin Basalt Creek planning area is unique as it relates to these goals because as part of unincorporated Washington County, the neighborhood has not received prior City or County investment as it relates to parks and recreation services. There are no existing parks or trails within the project area. The variety of proposals set forward within this plan will help bring this neighborhood into the City's fold, and provide its newest residents with equitable access to parks and recreation facilities and services.

When asked why it is important to plan for future parks in developing areas, respondents in 2021 confirmed this need through a variety of different factors, among them:

"To provide parks and recreation services to the community,"

"To provide spaces for active recreation including playgrounds, sports fields and courts,"

"To plan for future trail connections and greenways,"

"To preserve, protect and enhance natural areas."

The Basalt Creek Parks and Recreation Plan is made possible by a combination of all these reasons.



Community Engagement

6



Community Engagement

The City of Tualatin conducted a series of community engagement events and activities to get feedback from community members and other stakeholders and bring awareness to the Basalt Creek Parks and Recreation Plan.

The goal of the engagement was to provide the community with multiple opportunities to be involved and participate in the planning of future parks and recreation within the Tualatin Basalt Creek planning area. This chapter highlights the following public participation activities that took place over the project duration:

- Community Event
- Surveys & Webpage
- Public Meetings
- Open House
- Focus Groups
- Internal Meetings

For more detailed documentation of the community engagement events and activities, see Appendix A.

CHAPTER 4: COMMUNITY ENGAGEMENT



Community Event

Surveys & Webpage

Public Meetings

Open House

Focus Groups

Internal Meetings

Local Media Coverage

Community Engagement Activities Summary and Timeline | March 2021 - January 2022



BASALT CREEK PARKS & RECREATION PLAN

CHAPTER 4: COMMUNITY ENGAGEMENT



Website Portal

The City created a website portal where community members could access information and give input about the Parks and Recreation Plan over the duration of the project.

Survey Results

A compilation of online and in-person survey results highlights community members' priorities and preferences for future parks and recreation elements. Below is an example of a question board used at an in-person event at Tualatin Community Park. The community responded using comment cards and stickers.



CHAPTER 4: COMMUNITY ENGAGEMENT

Viva Tualatin Community Event Highlight





Viva Tualatin Community Event Highlight





CHAPTER 4: COMMUNITY ENGAGEMENT

Community Engagement Preference Results

PARK PROGRAM PREFERENCE ACTIVITY

COMMUNITY ENGAGEMENT RESULTS

What is your priority for each of the following types of features in the new Basalt Creek Park?



In your opinion, why is it important to plan for future parks in developing areas?

To preserve, protect and enhance natural areas.		
Plan for future trail connections and greenways.		
Space for active recreation including playgrounds, sport fields and sport courts.		
Provide parks and recreation services to the community.		

Draft Plan Public Comments Summary

Comments on the draft plan for public review were received in three ways:

- Online: 218 total comments from open-ended questions in Survey #3
- Email: 3 comments
- Phone: 1 comment

Comments from open-ended questions in Survey #3 included a large number of requests for a sports complex. A sports complex was not included in the Basalt Creek Parks and Recreation Plan because the plan itself calls for a neighborhood park to serve those living and working nearby. Sports complexes are inherently large parks intended to serve the broader community. Land potentially available for parks development in Basalt Creek also has topographical and other site constraints that make it unsuitable for a sports complex.

For more detail, please see Appendix A: Community Engagement.



5 Parks and Recreation Concept



Basalt Creek Parks and Recreation Concept

Parks and Recreation Framework

The parks and recreation framework is the starting point for future park and trails investments in Basalt Creek. The framework reflects an understanding of the project area's existing conditions, extensive public and stakeholder input from 2021, recommendations from the 2018 park system plan, and the City's park standards. The framework establishes the character of future parks and trails development in three distinct park opportunity areas: West, Central and East.

A diagram of the Basalt Creek parks framework is on page 61.

Park opportunity areas each comprise approximately one-third of the overall project area and are generally characterized by land use, topography, natural features, and proximity to primary roads. Each opportunity area expands parks and recreation in Basalt Creek in different ways based on these distinctions, taking advantage of anticipated or planned private development, regional trail expansion, proximity to future park and trail users, and other physical site conditions. The boundaries between opportunity areas overlap somewhat indicating a desire to connect one area to the next in functional, legible, and meaningful ways.

Framework Plan Priority Elements

West Opportunity Area

The West Opportunity Area will serve employees and the surrounding community with future on-street trails/widened sidewalks and a trailhead that links to planned regional trails/shared-use paths. Other elements include:

- Regional trail connection along existing/future roads to new park in the Central focus area
- Small trailhead and parking area near regional trail
- Safe non-motorized commuting and walking opportunities for future employees
- Sign improvements for pedestrian navigation

Central Opportunity Area

The Central Opportunity Area will feature a new, proposed 10-acre neighborhood park and connecting greenway trails, preferably located east of Grahams Ferry Road on lands with lower potential for industrial development. Four example park design concepts included in the plan reflect the community's park program preferences. The example designs should be used as starting points for more detailed community-driven design once a site is acquired. Other elements and considerations include:

- Future city acquisition of a level, future park site
- Large neighborhood park (+/-10 acres) with a mix of recreation amenities including playground, picnic shelter, sport court, flexible field, trails
- Potential view of the Basalt Creek canyon
- Trail connections to residential areas and regional trails

East Opportunity Area

The East Opportunity Area is characterized by developer-provided park spaces, with on-street paths and plantings. Other elements include:

- Public stormwater facilities
- Potential to enhance stormwater facilities with amenities to expand recreation
- Potential partnership opportunity with adjacent schools
- Opportunity for future trail connections



BASALT CREEK PARKS & RECREATION PLAN

Basalt Creek Framework

Legend

1

- Basalt Creek Planning Area
- Existing Roads
- --- Proposed Roads
- Existing Trails
- --- Planned and Proposed Trails
- Existing Bike Lanes
- Here Railroad
- ---- Streams
- Waterbodies
- Two-foot contours
 - Basalt Creek Opportunity Areas

— W	est
------------	-----

Central

East
Lasi



1,400
Expanded Detail - Basalt Creek Parks and Recreation Opportunities Matrix

TABLE 2: RECREATION OPPORTUNITY MATRIX

	West	Central	East
Parks	 Trailhead Parking spaces Bike repair station Benches and tables Potential restroom 	 10-acre large neighborhood park Destination nature or other play area (shaded) Canyon viewpoints (1-2) Large picnic shelter Basketball or sports court Multi-use rectangular field (1) Small low-rise community stage with grass seating (for movies or concerts in parks Designated off-leash area, or small dog park, or larger combined dog park (for large and small dogs) Looped walking trail (with distance markers) Trailhead Art and Interpretive signage Permanent restrooms (2 gender-neutral) Parking (15-30 spaces) Stormwater/green infrastructure features Other potential options: Small hardscape plaza with moveable seating/tables (could be used for fitness and outdoor programs) Outdoor fitness equipment Raquetball court 	 0.65-acre HOA small neighborhood park Sport court Small playground Picnic tables Small shelter 2.65 acres of streetscape buffer plantings 0.60-acres of other connecting open space along development perimeter Potential partnership opportunity with Horizon High School

Expanded Detail - Basalt Creek Parks and Recreation Opportunities Matrix

	West	Central	East
Trails	 Regional trail connection at planned Ice Age Tonquin Trail and Sandy to Sherwood Powerline Trail East-west on-street trail (widened sidewalk) connecting to neighborhood park in central opportunity area 	 East-west on-street trail (widened sidewalk) to west opportunity area trailhead Future north-south trail comprised of alignments on a combination of future local roads and easements 	 Connections to adjacent school sites On street (widened sidewalk) connections to other Tualatin trails
Storm- water	• Stormwater and green infrastructure responsive to site development	• Stormwater and green infrastructure responsive to park development and site conditions	 2.6 acres of stormwater facilities, with passive recreation amenities such as a meander sidewalk, decorative fencing, benches, trash receptacles, dog waste station, and bollards at maintenance access points. All stormwater facilities to include native plantings based on site conditions.

TABLE 2: RECREATION OPPORTUNITY MATRIX (CONTINUED)

Area Wide Connectivity

Connectivity with Surrounding Areas and Regional Trails

The trails concept plan depicts the vision for trails connectivity within and beyond Basalt Creek in coming decades. Several major regional trail projects are posed to synergize connections between Sherwood, Tualatin, and Wilsonville and beyond, significantly expanding the trails recreation role that Basalt Creek may potentially play.

A proposed local system of trails within Basalt Creek enhances connectivity in north-south and east-west directions, some alignments placed alongside future local roads and some along future easements. Land underneath Portland General Electric (PGE) overhead transmission lines may also represent a potential opportunity for enhancing connectivity across the planning area in the future. All trail alignments within the project area ideally tie into existing trails in Tualatin. The future local road network, which introduces a grid street pattern to the west opportunity area, lends to improved overall connectivity – though it will primarily designed for vehicular use. Future local roads in Basalt Creek are envisioned to be built as a part of private development projects funded by developers or property owners with input from the City, so the alignments may vary somewhat given the requirements of proposed development project(s) under consideration.

Expanded bike lane connectivity, although not addressed in this plan, would likely align with future local roads and provide safe, direct, and visible connections to employment locations, regional trail system, residential areas, schools, and other destinations.



Basalt Creek Trails Concept Legend

- Basalt Creek Planning Area
- Existing Roads
- --- Proposed Roads
 - Existing Sidewalk
 - Existing Bike Lanes
 - Existing Trails
 - Planned and Proposed Trails
 - **—** Tualatin (general)
 - On-street trail/widened sidewalk
 - Off-street trail/greenway
 - Tonquin Ice Age Trail
 - Sherwood to Sandy Power Line Trail
 - Proposed Trailhead
- PGE Overhead Power Lines
- ⊢++ Railroad
- ----- Streams
 - Waterbodies

Note: On-street trails (enhanced sidewalks or multi-use paths) in residential areas to follow future development street systems.

350 700 1,400



West Opportunity Area

Employment and Trails-Focused

Recreation

The West Opportunity Area design concept is largely influenced by future manufacturing uses that will characterize this part of Basalt Creek. The focus is to better connect this area to the Central Opportunity Area and provide active options for employees who may want to walk, bike, or scoot to, from, and around their workplaces during lunch or breaks.

Most trails in this area will be on-street trails, otherwise known as extra-wide or enhanced sidewalks. Given the surrounding setting that includes large truck traffic, large floor plate buildings, active parking lots, delivery vehicles, and wide streets to support the range of activity anticipated here, the design of these on-street trails is aimed to keep pedestrians safe, visible, and away from the operations core of any one manufacturing property. Addition of shade trees along new on-street trails should take into consideration elevated driver visibility and adequate spacing from corners and driveway entrances to prevent tree limb and similar damage from entering, passing, and exiting vehicles.

Off-street trail types may be limited to regional trails at the perimeter and corners of the West Opportunity Area.

A trail head location is proposed near one of the major regional trail alignments, and will feature signage, potentially a restroom, a limited number of vehicle parking spaces, bike repair station, picnic table and benches. The trailhead location may in the future support a small-scale, seasonal food cart or similar operation where area employees can walk, bike or scoot to lunch and socialize with other area employees.

Added signage and wayfinding will be key to making the West Opportunity Area's trails legible, functional, and well-connected. Signage will primarily be directional, with some identification and interpretive signs woven in where appropriate.

TRAILHEAD + TRAIL DESIGN











- 1. Multi-use path for pedestrians and bikes separated from vehicular traffic
- 2. Meandering paved trail
- 3. New sidewalk



- 4. Trailhead parking lot
- 5. Trailhead wayfinding
- 6. Food cart pod

Central Opportunity Area

Park Concepts for Prototypical Park Site(s)

As noted in Chapter 1, a new public park was identified as a future need in both the 2018 Tualatin Parks and Recreation Plan and the 2018 Basalt Creek Comprehensive Plan. The Central Opportunity Area will be the preferred location for this future park site based on the project area site assessment and analysis, with a preference for sites on the east side of Grahams Ferry Road. The City does not own land in the Tualatin Basalt Creek planning area, however, and no specific site for a new park is identified at this time. Moving forward, the City is committed to finding a willing seller for this future land acquisition.

That said, there remains a need to plan for future capital funding needs and staffing support if and when the land acquisition piece happens. To do this, project consultants worked with the City to devise a series of prototypical park concepts that address typical site conditions, constraints, and opportunities found across the Central Opportunity Area. There are a variety of park sizes and configurations within the prototypical concepts that anticipate potential acquisition of multiple parcels. The prototypical park concepts are intended as starting points for the future design of any specific site. The park program combinations outlined in the concept designs can and should be adapted to address site conditions and reflect updated community input. Any future design will include a separate, extensive planning process where the community will be involved to refine the park design.



10-ACRE LINEAR/FLAT SITE

CHAPTER 5: PARKS & RECREATION CONCEPT



A large picnic shelter overlooking a flexible open space

TYPICAL 10 ACRE SITE: LINEAR/SLOPING

CHARACTER:

A typical sloping site has multiple flat, terraced areas divided by steeply sloping hillsides. Recreation opportunities and accessible pathways are limited to small footprints. Overall this park maintains a more naturalized character with mature trees and opportunities to restore native vegetation.

POTENTIAL DESIGN:

- Park development on the largest, flattest terrace can support multisport courts, field area or lawn/ turf area, and a play area. A small picnic shelter or informal picnic table arrangements can enhance recreation. The area is surrounded by a small looping paved path and limited landscaping.
- The other portion of the site provides a small ADA parking lot and drop off to support accessibility.
- Recreation is limited by topography to a medium picnic shelter and an informal, flexible open space with a looping trail through natural areas.

BASALT CREEK PARKS & RECREATION PLAN



- 1. Parking (20 spaces)
- 2. Picnic Shelter (small) and Restroom
- 3. Play Area (medium)
- 4. Lawn (irrigated)
- 5. Paved Loop Path
- 6. Multi-Sport Court (Tennis/Pickleball/Futsal)
- 7. Trail Connection
- 8. Parking/Drop Off (ADA only)
- 9. Picnic Shelter (medium)
- 10. Flexible Open Space (unirrigated)
- 11. Trail Loop
- 12. Natural Area

Legend



CHAPTER 5: PARKS & RECREATION CONCEPT

TYPICAL 10 ACRE SITE: LINEAR/SLOPING













72







- 1. Accessible drop off area
- 2. Soft surface trail
- 3. Medium picnic shelter
- 4. Outdoor futsal
- 5. Park restroom

- 6. Multi-sport court (tennis/pickleball)
- 7. Medium sized accessible play area
- 8. Loose parts nature play
- 9. Opportunities for environmental education

CHAPTER 5: PARKS & RECREATION CONCEPT



Youth soccer field lined with trees

TYPICAL 10 ACRE SITE: LINEAR/FLAT

CHARACTER:

A flat site has the most potential to support larger recreation options such as a sports field. Typical parcels in this linear layout are still too constrained to accommodate larger softball or little league fields, but have the potential to support soccer or other sports. A variety of play area configurations or sports courts options could be explored. Multiple looping pathways and trails provide good opportunities for walking. Some portions of the park may be steep and heavily vegetated with limited access and challenging topography.

POTENTIAL DESIGN:

- New shade trees line a large turf youth soccer/multi-use field, providing protection from the elements and a buffer for neighbors.
- A medium and small picnic shelter provides gathering space for groups of various sizes.
- The large playground area here provides varied recreation opportunities for children ages 2–12.
- Multiple looping pathways support walking and jogging.
- The steeper portion of the site has limited access with a short outand-back trail to an overlook or picnic tables in the existing wooded natural area.

BASALT CREEK PARKS & RECREATION PLAN



- 1. Youth Sports Field (soccer)
- 2. Paved Loop Path
- 3. Parking (40 spaces)
- 4. Picnic Shelter (medium)
- 5. Restroom (4 stall unisex)
- 6. Play Area (large)
- 7. Picnic Shelter (small)
- 8. Flexible Open Space
- 9. Loop Path
- 10. Accessible Trail to Overlook in Natural Area

Legend



TYPICAL 10 ACRE SITE: LINEAR/FLAT















- 1. Youth soccer field
- 2. Flexible open space
- 3. Parking lot
- 4. Medium picnic shelter

- 5. Paved path
- 6. Soft surface accessible trail
- 7. Large play area

CHAPTER 5: PARKS & RECREATION CONCEPT



Multi-use field for a variety of drop-in activities

TYPICAL 10 ACRE SITE: SQUARE

CHARACTER:

Two five-acre parcels could be combined to maximize recreation potential in a square layout, however, site conditions are still variable and developed park areas may be divided into different areas by challenging slopes. Depending on topography, more varied recreation opportunities may be possible. This site could accommodate a multi-use sports field along with half sports courts or play areas. Parking areas may be split to support different areas of activity.

POTENTIAL DESIGN:

- Park development is divided by steep slopes into two areas.
- Recreation on the upper terrace could include sport courts, a playground, and picnicking with small flexible lawn surrounded by a paved looped path.
- Recreation on the lower terrace could include a flexible sports field with looping pathways extending into the natural area, picnicking and parking.
- An accessible trail connects the two recreation areas and provides access to the sloping, forested middle section of the park.



- 1. Parking (10-15 spaces)
- 2. Play Area (small)
- 3. Basketball Court (half)
- 4. Multi-Sport Court (Tennis/Pickleball)
- 5. Paved Loop Path
- 6. Picnic Shelter (medium) and Restroom

- 7. Trail Connection Between Program Areas
- 8. Parking (10-15 spaces)
- 9. Picnic Shelter (small)
- 10. Multi-use field
- 11. Soft Surface Trail Loop
- 12. Natural Area

Legend



TYPICAL 10 ACRE SITE: SQUARE







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- 1. Large flexible open space with looping trails
- 2. Medium picnic shelter
- 3. Small picnic shelter
- 4. Half-court basketball

- 5. Multi-sport court (tennis/pickleball)
- 6. Small playground
- 7. Soft surface trail

CHAPTER 5: PARKS & RECREATION CONCEPT



A small playground area and flexible open spaces

TYPICAL 5 ACRE SITE

CHARACTER:

A typical fiveacre site provides recreation opportunities limited to a much smaller footprint and likely concentrated to one area of the site. Steep slopes may further limit access and recreation potential. A site this size is best suited for sports courts, small looping paths, a play area limited to one age group, and picnicking.

POTENTIAL DESIGN:

- Park development concentrated on the flat portion of the site includes a small playground that can accommodate ages 2–5 or 5–12, a half basketball court, and multi– sport court for tennis, futsal, and or pickleball. The area is surrounded by a small looping paved path and landscaping.
- A small looping trail could provide access through the steeper natural areas of the site.

BASALT CREEK PARKS & RECREATION PLAN



- 1. Parking (20 spaces)
- 2. Play Area (small)
- 3. Half Basketball Court (3 x 3)
- 4. Multi-Sport Court (Futsal/Tennis/Pickleball)
- 5. Picnic Shelter (small)
- 6. Paved Loop Path
- 7. Picnic Shelter (small)
- 8. Soft Surface Trail Loop
- 9. Natural Area



TYPICAL 5 ACRE SITE











- 1. Medium picnic shelter
- 2. Small picnic shelter
- 3. Paved path with accessible seating
- 4. Soft surface trail

- 5. Half-court basketball
- 6. Multi-sport court (tennis/pickleball)
- 7. Group swing at small playground
- 8. Group picnicking

East Opportunity Area



East Opportunity Area parks and recreation facilities are characterized by developer-provided parks and recreation programs constructed as part of single and multi-family developments currently proposed along Boones Ferry Road. Based on where the projects currently are at in the development approval process, they are anticipated to the first parks and recreation features constructed in the Tualatin Basalt Creek planning area. Once constructed, the parks will be maintained and managed by the onsite home owners organizations (HOA). These HOA parks facilities are intended for subdivision or housing complex members and not intended for the general public. The planted stormwater facilities will be maintained by the City of Tualatin. The City can provide input on the design of these features so that they meet City development standards. Stormwater features can include passive recreation features within the facility footprint to expand the range of recreation opportunities on the east side. The two proposed residential projects include Autumn Sunrise, a 400-unit single-family phased development, and the Community Partners for Affordable Housing (CPAH) Plambeck Gardens project, which will provide 116 units of much needed affordable multi-family housing in Tualatin. Autumn Sunrise and Plambeck Gardens each provide a range of parks and recreation facilities and features for their residents. The Basalt Creek Parks and Recreation Plan supplements these proposals with additional details about their program and site design in an effort to enhance the parks and recreation experience for East area residents and to help them better reflect the character of similar Tualatin park and stormwater facilities.

Autumn Sunrise Park Site

This 0.65-acre neighborhood park is centrally located within the Autumn Sunrise development. The developer's initial concept includes space for a gazebo-type shelter and footprint for a sport court. Given its central location and that this is the only dedicated neighborhood park space in Autumn Sunrise, it is likely to be highly utilized and will need to address a wide variety of community needs in the small space allocated. Ensuring that the park design best reflects the opportunities and constraints of its context will be important, as well. Decisions around the type of sport court will need to consider sound impacts. A play feature, shade trees, custom planting, picnic/

AUTUMN SUNRISE PARK SITE





seating areas, book share kiosk and dog waste station may be considered.

Two smaller open space areas (one 0.22 acres, the other 0.40 acres) are located at the development perimeter near Horizon High School and the water reservoirs. The developer vision for areas includes picnic benches, trees, and other plantings.





Autumn Sunrise Stormwater Facilities

The development features two stormwater facilities, one located at the corner of Boones Ferry Road and Greenhill Lane (#2 above), the other located within the development on the north end (#3 above). The facilities also provide sound mitigation from Boones Ferry Road and buffers between residences.

Each facility is approximately 1.3 acres in size. The facilities are sized to address onsite stormwater generation with room available for some perimeter enhancements that may include passive recreation amenities such as a meander sidewalk, decorative fencing, benches, trash receptacles, dog waste station, and bollards at maintenance access points. The stormwater facilities shall include native plantings based on site conditions.

With the proposed enhancements, these stormwater facilities expand the parks and recreation experience on the east side by providing opportunities for bird watching, pollinator habitat establishment, and quiet, contemplative space within Autumn Sunrise.



AUTUMN SUNRISE STORMWATER FACILITIES

PLAMBECK GARDENS OPEN SPACE



Plambeck Gardens Open Space

Plan drawings for the proposed Plambeck Gardens site include open space designed within a central quad-style area with residential units surrounding. The range of proposed features include a grass play field, one sport court, two play areas (for different age groups), hardscape walkways, two small picnic shelters with tables, and two stormwater planters along Boones Ferry Road. A fenced community garden space provides opportunity for residents to cultivate their own food, demonstrating the community building potential of the project. All features at Plambeck Gardens are designed to serve residents of the 116-unit multi-family affordable housing development.







6 Implementation



Implementation

Introduction

Parks, natural areas, trails and opportunities to recreate, play, celebrate culture, and connect with friends, coworkers and neighbors are critical to creating healthy communities with a high quality of life. Tualatin's newest residents in Basalt Creek should be provided equitable access to park spaces and amenities like any other part of the city, requiring a combination of implementation actions including (but not limited to) land acquisition, planning, and parks and trails development.

Moving forward, the city will pursue land acquisitions in the Basalt Creek planning area that offer the greatest connectivity and the highest value to the community, while simultaneously helping the city achieve its system-wide park goals. Once land is acquired, efforts will shift toward more detailed planning, public engagement, design, and eventual construction of parks and trails. This chapter addresses implementation, including land acquisition costs; park development costs for Basalt Creek's three opportunity areas; operating costs, staffing needs and considerations; and an action plan focused on a 15-year time frame outlining major tasks and activities needed to fulfill the parks vision in Basalt Creek.

Land Acquisition Costs

The city will need to acquire land for future parks and trails in the Tualatin Basalt Creek planning area, a significant task to accomplish in the short-term. Cost estimating for this has been in the works for several years, understanding the large investment this project represents; the following table summarizes previous cost estimating efforts.

CHAPTER 6: IMPLEMENTATION

2018 Tualatin Parks & Recreation Plan Acquisition Estimates for Basalt Creek Park (P3) (2018 dollars)				
Acreage	20			
Туре	Community Park			
Parkland Acquisition and Easements	\$5,000,000			
Cost Per Acre	\$250,000			
2021 Tualatin Basalt Creek Parks & Recreation Plan Land Acquisition Estimates (2021 dollars)				
Acreage	15-20 total			
Туре	Large neighborhood park			
Parkland Acquisition and Easements (up to 20 acres)	Range: \$5,220,000 - \$6,000,000			
Trails Cost (1.78 acres)	\$535,000			
West Opportunity Area Cost (1 acre)	\$300,000			
Central Opportunity Area Cost (10-15 acres)	\$3,000,000 - \$4,500,000			
East Opportunity Area Cost (0 acres)	\$0			
Cost Per Acre	\$260,000 - \$300,000			

TABLE 3: LAND ACQUISITION ESTIMATES

Land acquisition costs in 2021 are in general alignment with previous estimates accounting for inflation, the 2021 market area study, and a limited number of current real estate comparables in the Basalt Creek area. A factor that remains somewhat uncertain is the continued upward trend of the real estate market in recent years. The ongoing and forecasted strong market demand for both residential and industrial lands in the region suggests that prices will continue to rise, and likely at a rate that exceeds inflation.

With this understanding, the estimated costs for site acquisition may range from \$260,000 and \$300,000 per acre in 2021 dollars. The actual acquisition price for any site will vary and will be determined by an array of factors including site conditions, topographical opportunities and constraints, ease of access, presence of natural features, and updated real estate comparables, among others. This figure reflects land needed for both park and trail land acquisition in the West and Central Opportunity Areas (see details in Chapter 5). Land for parks and on-street trails in the East Opportunity Area are part of the proposed residential developments currently underway.

LAND USE/ZONE CHANGE

PROCESS

The City's land acquisition effort will likely result in a need to request a zone change from Manufacturing to Institutional. This use permits development of parks and open spaces, greenways and natural areas. The process for the land use/zone change is as follows:

- 1. Planning staff report with findings to justify and support the proposed land use change
- 2. Planning Commission recommendation to Council
- 3. Council consideration and approval
- Notice to affected agencies (Metro and State) and property owners within 1,000ft for review and comments
- 5. Appeal (if any) to Land Use Board of Appeals (LUBA)

Given the City's focus on identifying sites for the future park that are also unsuitable/not ideal for manufacturing development, the city is optimistic that the land use change will not present any conflict with City, Metro, County or other goals. The proposed acreage for the park site is relatively small, and Basalt Creek is not included in Metro's regionally significant industrial lands. A park also has potential to provide a physical buffer between residential uses and manufacturing, which may improve neighbors' satisfaction and safety and potentially increase land values.

Site Development Costs

This plan provides order of magnitude construction costs for a range of 10-acre park types¹ in the Central Opportunity Area with connecting trails and easements throughout the project area, including a trailhead in the West Opportunity Area. Proposed enhancements to the parks and recreation features in the East Opportunity Area will be negotiated between the city and developers, so no estimate of site development costs for those park features are included. An exception to this is a lump sum allowance for nature play elements to possibly be designed and constructed within the Autumn Sunrise stormwater facility along Boones Ferry Road, which may be available for public use and not reserved or prioritized for residents living in any specific development.

Site development costs were previously outlined in the 2018 Tualatin Parks & Recreation Plan and are used as a starting point for updating those costs to reflect 2021 costs. A summary of those estimates is on the following page. Differences in both acquisition and land development costs between 2018 and 2021 reflect a change in anticipated size and type of proposed park for the Central Opportunity Area. In 2018, the park was proposed to be a 20– acre community style park. During the planning process in 2021, it was concluded that a large, neighborhood park type was more compatible with the Basalt Creek planning area than a community park. Park design concepts and estimates reflect that change.

Another factor to consider as it relates to forecasted development costs for all land in the Basalt Creek planning area is the absence of existing utilities, with the exception of electricity. For this reason, site development costs overall will demand a significant outlay for sanitary sewer, potable water, storm, etc. The absence of these utilities is a significant construction factor that can increase the estimated site development costs presented in this plan.

See Appendix B: Cost Estimate Detail for more information.

¹ Cost estimating in Chapter 6 uses a 10acre option. A 5-acre park concept is also included in Chapter 5 to show options for a smaller park or as an add-on to create a 15-acre park.

BASALT CREEK PARKS & RECREATION PLAN

TABLE 4: PARK DEVELOPMENT COSTS SUMMARY

2018 Tualatin Parks & Recreation Plan Estimate of Development Costs, (Appendix D, Table D-2, page D-8)					
Park Type	Large Neighborhood Park (2018 dollars)	Large Neighborhood Park (2021 dollars)			
Site Development (per acre)	\$500,000	\$554,000			
2018 Tualatin Parks & Recreation Plan Improvement Costs for Basalt Creek Park (P3) (Appendix D, page D-6)					
	(2018 dollars)	(2021 dollars)			
Improvement Costs	\$12,110,000	\$13,159,000			
2021 Tualatin Basalt Creek Parks & Recreation Plan Summary of Development Costs (2021 dollars)					
Acreage		15-20 total			
Trails (excludes parks)	\$3,124,000				
West Opportunity Area	\$775,000				
Central Opportunity Area	\$6,675,000				
East Opportunity Area	\$455,000				
TOTAL	\$11,029,000				
Development cost per acre	\$551,500-\$735,300				
Operating Costs and Staffing Needs and Considerations

Developing new parks and trails will create an ongoing need for maintenance, operations, management and programming.

- <u>Maintenance</u> includes routine site care, preventative maintenance, and ongoing asset management (the repair and replacement of old and worn amenities, facilities, and plantings). Maintenance also includes the routine site monitoring and inspections, such as Certified Playground Safety Inspections.
- <u>Operations</u> includes facility rentals and reservations, sports field scheduling (if applicable), permitting (for allowable uses) and support functions.
- <u>Management</u> includes community engagement and coordination with potential volunteers, friends groups, or nearby neighbors and businesses. Management also includes tasks such as natural resource studies and inventories.
 - Programming includes the provision of organized recreation events and activities, either hosted or facilitated the City.

For this plan, assumptions for park operations include:

- Parks and trails, and recreation resources at stormwater facilities within the East Opportunity Area will be maintained, operated and programmed by a Homeowners Association (HOA). Once constructed, the stormwater facilities become public (the City receives stormwater tracts in the subdivision) and the City takes over their maintenance.
- Operations, management and programming tasks for the Central and West Opportunity Areas are anticipated to be addressed by existing City staff as part of citywide Parks & Recreation Department operations. These tasks are anticipated to require less then 0.25 FTE of ongoing staff time.
- If park development includes a plaza with event space that the City would like to activate with regular bi-weekly or monthly programs for business employees, neighbors, and visitors, the City should consider either addition of city staff/resources or establishing an agreement with a developer/ business-coordinated organizer or concessionnaire. The operations costs in this plan do not account for this option, and additional staffing and resources will be needed.
- The majority of operations costs and staffing are triggered by maintenance needs defined on the following page.

The 2018 Parks & Recreation Master Plan calculated separate per-acre costs for maintenance and asset replacement by park classification. Inflated for 2021 prices (based on general estimates using the CPI Inflation Calculator), these are presented in the table below. Based on park and trail maintenance alone, approximately \$115,000 (or 1.5 - 2 FTE's) will be needed annually for maintenance. The City should also anticipate setting aside nearly \$110,000 in additional funds each year for ongoing asset management. Typically, these will not be needed until 10–15 years after park development, given the average lifecycle of park amenities and facilities.

Anticipated Maintenance Costs and Staffing for Basalt Creek Parks and Trails					
Type of Site	Acres	2021 Maintenance Cost Per Acre	Total Maintenance Cost	2021Asset Replacement Cost Per Acre	Added Asset Management (Replacement) Allowance ¹
Park	10	\$8,300 ²	\$83,000	\$7,000	\$70,000
Trailhead	1	\$6,650 ³	\$6,650	\$7,000	\$7,000
Trail Corridor/ Greenway	7.5	\$3,350 ⁴	\$25,125	\$4,150	\$31,125
Stormwater Facility	TBD	\$1,500⁵	TBD	TBD	-
TOTAL	18.5		\$114,775		\$108,125

TABLE 5: MAINTENANCE ESTIMATES

- 3 Assumes standard maintenance of a special use site.
- 4 Assumes standard maintenance of a greenway or shared use path.
- 5 Assumes standard maintenance of a natural area.

¹ This reflects an estimated annual allowance of funds that the City should set aside to have funds on hand for the renovation or replacement of facilities at their end of their life cycle. It is estimated to cover capital and operations costs for asset management.

² Assumes enhanced maintenance of a large neighborhood park that provides a mix of developed and natural resources

Action Plan

The tasks identified below define a general implementation strategy for acquiring, designing, developing and activating parks, recreation facilities and trails in Basalt Creek. A general timeline for carrying out these tasks is noted.

1. Coordination/Funding

Coordinate with other City Departments, developers, potential partners, and stakeholders to align tasks, project resources, and support for implementation.

- 1a. Coordinate with other City Departments, developers, potential partners, and stakeholders to align tasks, project resources, and support for implementation.
- 1b. Use the information in this plan to write and submit applications for regional and statewide grants to potentially support park acquisition, parks and trail development, and/or the addition of specific amenities/facilities in Basalt Creek. Include documentation on how this development will address community equity and diversity goals. These grants are limited in availability.
- 1c. Continue coordinating with developers to ensure parks and greenspace in the East Opportunity Area meet City standards for neighborhood parks. Assure development code standards for routine and preventative maintenance, irrigation, asset management, and capital replacement of amenities, facilities and landscape plantings for parks, trails, and greenspace, including stormwater areas.
- 1d. Identify the timing to pursue a bond measure to support site acquisition and development. Knowing the Basalt Creek park projects are primarily neighborhood-serving (and not a benefit to the entire community), discuss with City leaders options for a broader bond measure. Determine the right rate and mix of citywide park and trail projects—potentially along with other city projects—to solicit voter support. Before putting this on a ballot, conduct a random-sample survey to test voter support of potential bond rates and language, using this information to refine the funding request.
- 1e. Continue to coordinate with Metro on regional trail plan implementation to ensure connections and coordination with the Basalt Creek trail system.
- 1f. Work with partners such as Metro to document natural systems and features in the project area.

- 1g. Coordinate with Engineering and Planning divisions (in Community Development) and the Street/Sewer/Storm division (in Public Works) to integrate proposed on- and off-street bike lanes, routes, and paths into street plans and construction documents. Consider additional safety elements as part of the Division's Safe Access to Schools and Parks Program, such as signalized or marked cross-walks to parks when parks sites and trail alignments and routes are identified.
- 1h. Coordination, timing, and sequencing of implementation of this plan with Engineering and the City's Stormwater Master Plan.
- 1. Once target sites are acquired, follow City naming protocols to identify site names to use in public information and publicity materials.
- 1. Continue to foster local support for park construction by periodically updating the project website and maintaining a stakeholder and neighbor contact list to keep residents and potential business apprised of the ongoing process.
- 1k. Coordinate with the landowners and managers of utility corridors to gauge long-term options and restrictions for trail development.
- 1. During the master planning/construction planning for parks, trail corridors, and relevant street rights-of-way, follow City protocols for engaging residents in vetting any design alternatives.
- 1m. Convene a trails working group comprised of Basalt Creek neighbors, TPARK, and other members to advise and coordinate on planning and considerations for future trails in the planning area.

2. Acquisition

Acquire parkland and trails corridors in Basalt Creek through easements, donations, outright purchase, or other acquisition mechanisms.

- 2a. Based on available funding, identify parcels that can be acquired now and held in reserve for later development.
- 2b. Monitor the acquisition process to identify the timing when funding from System Development Charges (SDC) will be available to support site acquisition and development.
- 2c. Continue to monitor sites with historic and local significance in the Basalt Creek Area in case these become available.
- 2d. Acquire sites as willing seller or other opportunities arise.

3. Design, Development and Construction

Provide quality parks and trails through design, development and construction.

- 3a. Develop recreation amenities in stormwater areas in the East Opportunity Area as residential development moves forward. Create an access path from the Autumn Sunrise development to Horizon High School.
- 3b. When properties are acquired in the Central and West Opportunity Areas, create site specific master plans and construction documents to ensure that these sites reflect the goals, objectives and guidelines of the City's Parks & Recreation Master Plan.
- 3c. Involve maintenance staff in site planning to incorporate maintenance efficiencies and ensure long-term site functionality, sustainability, and stewardship.
- 3d. Involve the community in site master planning to ensure local needs are met.
- 3e. Ensure that site development reflects the heritage, character, and environment by identifying a design theme and adding or incorporating historic and cultural resources, public art, innovative features, diverse landscaping, varied color palettes, and amenities and furnishings to support social gatherings and user comfort.
- 3f. Invite developers and businesses at this time to consider the potential sponsorship, naming, donations, adoption, or investment in parks and trails to provide a higher quality of development.

4. Maintenance, Operations, and Activation

Ensure the long term function and vibrancy of Basalt Creek parks and trails through effective maintenance and operations.

- 4a. Reach out to the Autumn Sunrise Homeowners Association to ensure that maintenance staff have been successfully contracted for the caretaking of parks, facilities and greenspace in that subdivision.
- 4b. Hire additional City maintenance staff support as new sites are brought online. Identify task frequencies and maintenance management strategies, recognizing that site use may fluctuate when parks and trails are first opened and as new residences and businesses area developed.
- 4c. Plan a park opening celebration for the the Central neighborhood park to foster community connections to these sites.
- 4d.Query nearby neighbors and new businesses regarding interests to create a Friends of Basalt Creek Parks group or individual/teams/business involvement in an adopt-a-park or trail program.
- 4e. In the first two years of opening, host a minimum of 3-4 community events in Basalt Creek parks and trails. Consider opportunities such as movies in the park, socials, nature program, interpretive walk, Farmer's Market, a Mayor's trail ride, a sanctioned fitness walk or race, a treasure hunt, food truck events, etc., to foster community connections to these new sites and facilities. Target at least one event to business employees.

Short, medium, and long-term actions are outlined to realize the 15-year vision of this parks and recreation plan.¹ Immediate actions are understood to need attention in 1-2 years; short-term actions are understood to be in the 2- 5-year time frame; medium-term 6-10 years, and long-term-11+ years. While implementation strategies noted above are anticipated to occur within a 15-year timeline, City staff will continue to refine this timeline as part of their annual budgeting and work plan development processes. The actual timelines for implementation will reflect changing residential, light industrial, street and utility development plans that will drive the funding, infrastructure/utilities development, and demand for parks and trails in Basalt Creek.

TABLE 6: IMPLEMENTATION TIMELINE

Parks and Trails Implementation Strategy and Anticipated Timeline				
Strategy	Immediate- term (1-2 years)	Short-term (2-5 years)	Medium- term (6-10 years)	Long-term (11+ years)
Coordination and Funding: Coordinate with other City Departments, developers, potential partners, and stakeholders to align tasks, project resources, and support for implementation.	x	x	x	x
Acquisition: Acquire parkland and trails corridors in Basalt Creek through easements, donations, outright purchase, or other acquisition mechanisms	х	x	x	
Design, Development and Construction: Provide quality parks and trails through design, development and construction.		x (East Opportunity Area)	x	x
Maintenance, Operations, and Activation: Ensure the long term function and vibrancy of Basalt Creek parks and trails through effective maintenance and operations.		x (East Opportunity Area)		x

¹ The 15-year vision for the Basalt Creek Parks and Recreation Plan roughly aligns with the 20-year vision for the City's park system established in 2018. Towards the end of their respective plan cycles, it will be necessary to update and assess what has been accomplished, what remains to be done, as well as new projects that will fully realize the vision for parks and recreation across Tualatin.

Land Acquisition Toolbox

Studies completed for this plan confirm demand for land is high, whether residential or manufacturing. Market conditions are amplified given little vacant land exists near I–5. Given the competitive environment, the city should consider a wide range of funding mechanisms, land acquisition tools and incentives that are beneficial to both willing sellers and buyer. This section outlines a range of tools and incentives that may be considered.

FUNDING MECHANISMS

BONDS

A general obligation bonds is a type of municipal bond that is guaranteed by the credit and taxing ability of the issuing jurisdiction. The city may want to explore the potential to go out with a parks bond. Before, during, and after a bond is sought, it is important to cultivate a high degree of community understanding and buy in for bonds funded by tax revenues. Typically, bonding is a citywide effort involving multiple agencies to demonstrate need, priority, and support for the initiative.

GRANTS

Grant funding for parks and open space development, including land acquisition, is funded through public or private entities, and can be tied to specific development or programming initiatives. Grants to develop newly acquired land into a new parks are available, too.

Examples of some grants available include:

Metro's parks and nature bond

distributes Metro bond dollars to greater Portland's 27 park providers so they can build projects that serve their local communities. This program emphasizes the need to connect with communities of color and other communities that have historically been left out of engagement and decisionmaking processes. The Basalt Creek planning area, historically part of unincorporated Washington County, has only recently been included in planning projects and other conversations related to its future as part of Tualatin.

Oregon State Parks Local Government Grant Program (LGGP) provides a maximum \$750,000 award for park development; \$1 million for land acquisition. Grants have 50% matching requirements for cities with population over 25,000.

CHAPTER 6: IMPLEMENTATION

TABLE 7: FUNDING SOURCES

Summary of Funding Sources for Park Acquisition and Development Costs			
Source	Currently Used?	Restrictions on Use	
Property taxes	Yes		
Parks System Development Charges	Yes	Capacity enhancement projects	
Transient Lodging Tax	Yes	70% for tourism related projects	
General Obligation Bond	Yes		
Public Agency Grants	Yes	Specified by grant	
Philanthropic Grants	Yes	Specified by grant	
Donations	Yes	May be specified by donor	

Acquisition Incentives and Tools

A range of incentives and tools may be considered by the city to acquire land in the Tualatin Basalt Creek planning area. They include:

FEE ACQUISITION

The most traditional means to acquire land is through a fee acquisition with a willing seller. Owners are under no obligation to sell to the city. The City and the seller will negotiate a fair market purchase price based on the condition of the property and its proposed land use like any other real estate transaction. A fee simple acquisition of property or land whether a purchase or donation transfers absolute ownership of the property, including the property's title from a landowner (seller) to a purchaser (City). Once a landowner grants the sale of land, the original landowner (seller) generally retains no ownership rights over the property and gives up all rights to control, exclude, or derive income from the property. Fee acquisitions provide the City control over the management of the properties' resources and provide the greatest flexibility for future use and decisionmaking.

PURCHASE OPTIONS

With a purchase option agreement, the City pays the seller a set fee for the exclusive right to purchase the property within a specified term, typically up to a year but it can be longer. The buyer and seller might agree to a purchase price upon execution of the agreement, or the buyer can agree to pay market value at the time their option is exercised. For the City, locking in a price would provide a degree of certainty that makes the purchase easier to plan for in the short term and provides a definable period (example: 12–18 months) to line up funding needed for closing. This kind of agreement does not obligate the City

to exercise their option to purchase, but it does obligate the seller to allow the buyer to purchase within the terms of the contract.

Many of the current property owners in Basalt Creek have owned their land for decades and likely have a low carrying cost due to a low basis and farm tax deferral. As a result, they may be open to a longer-term option agreement which would provide more time to find a new property they'd like to invest in to avoid capital gains and use other tax advantages.

RIGHTS OF FIRST OFFER

A Right of First Purchase guarantees the City a future opportunity to acquire a property before it is sold to someone else. It can be a Right of First Offer, a Right of First Negotiation, a Right of First Refusal, or a combination of all three.

PURCHASE VIA SURPLUS PUBLIC

LAND PROGRAMS

The city should consider exploring purchase of surplus public lands through programs that give preference to public municipalities or other jurisdictions. Publicly owned land, while a small component of the Tualatin Basalt Creek planning area, can provided added acreage to other proposed park sites or trailheads. Washington County participates in such a program.

EASEMENTS

An easement is a "nonpossessory" property interest that allows the holder of the easement to have a right of way or use property that they do not own or possess. Easements are one of the more widely used tools for improving public access to parks and open spaces and land conservation. They can be purchased or donated. Easements allow the owner of the property to continue to own their land while granting legal authority to the city to access, maintain and improve it.

LEGACY NAMING OPPORTUNITY

Major gifts or land transactions that significantly enhance Tualatin's park system may warrant consideration being given to a legacy naming opportunity for the donor/seller. This opportunity would allow a family or individual's name to be prominently associated with land used to develop a future park or trail corridor in Tualatin Basalt Creek. Legacy naming can keep the local history of Basalt Creek tied to a particular site, enhancing the area's character and site understanding.









Appendix A COMMUNITY ENGAGEMENT

CITY OF TUALATIN









Community Engagement Activities Summary and Timeline | March 2021 - January 2022

BASALT CREEK PARKS & RECREATION PLAN



Community Engagement Materials Dates: Aug - Oct 2021

Dates: Aug - Oct 2021 Used for various community, stakeholder and public meetings

Viva Tualatin

Date: Aug 28, 2021 Time: 3-6pm Location: Tualatin Community Park, 8515 SW Tualatin Road



WELCOME **BIENVENIDOS**

About Basalt Creek

- Metro added Basalt Creek to the urban growth boundary
- This area will be become part of Tualatin through voluntary annexation
- Wilsonville will also expand along its northern boundary
- With community input, both cities have created a plan for future expansion, including new park resources

The exciting process of planning for parks and recreation in Basalt Creek kicked off in the spring of 2021!

What is currently underway?

- Identify potential future park and trail concepts
- Project web page with FAQs, schedule, and engagement opportunities
- Potential residential on east side
- Affordable housing development concept

Acerca de Basalt Creek

- Metro agregó Basalt Creek al límite de crecimiento urbano
- Esta área pasará a formar parte de Tualatin a través de la anexión voluntaria
- Wilsonville también se expandirá a lo largo de su límite norte
- Con la opinión de la comunidad, ambas ciudades han creado un plan para la expansión futura, que incluye nuevos recursos del parque

¡El emocionante proceso de planificación de parques y recreación en Basalt Creek comenzó en la primavera de 2021!

¿Qué está actualmente en marcha?

- Identificar posibles conceptos futuros de parques v senderos
- Una página web del proyecto con preguntas frecuentes, programación y oportunidades de participación
- Área potencial residencial en el lado este
- Concepto de desarrollo de vivienda asequible



Project Schedule Calendario del proyecto

Aug-Sept 2021 Agosto – Septiembre de 2021	Sept-Oct 2021 Septiembre – Octubre de 2021	November 2021 Noviembre de 2021
Public Engagement Participación del público	Draft Tualatin Basalt Creek Plan Borrador del plan de Basalt Creek de Tualatin	Final Tualatin Basalt Creek Plan Plan final de Basalt Creek de Tualatin













West focus area

- Regional trail connection along existing/future roads to new park in the Central focus area
- Small trailhead parking area along regional trail
- Safe non-motorized commuting and walking opportunities for future employees
- Sign improvements for pedestrian navigation

Área de enfoque oeste

- Conexión de senderos regionales a lo largo de caminos existentes / futuros caminos al nuevo parque en el área de enfoque central
- Área de estacionamiento pequeña al comienzo del sendero, a lo largo del sendero regional
- Oportunidades seguras de desplazamiento no motorizado y caminatas para futuros empleados
- Meioras en la señalización para peatones

Central focus area

- Opportunity for a level, future park
- Large neighborhood park (10 acres) with a mix of recreation amenities
- Views of the Basalt Creek Canyon
- Trail connection to residential areas and regional trails

Área de enfogue central

- Oportunidad para un futuro parque a nivel
- Parque grande del vecindario (10 acres) con una combinación de amenidades recreativas
- Vistas del cañón de Basalt Creek
- Conexión de senderos a áreas residenciales y senderos regionales

- Basalt Creek Planning Area / Área de planificación de Basalt Creek
- ----- Existing Trails / Senderos existentes

- Waterbodies / Cuerpos de aqua
- Basalt Creek Park Planning / Planificación del parque Basalt Creek
 - West focus area / Área de enfoque oeste
 - East focus area / Área de enfoque este
 - and street plantings
 - Public stormwater facilities
 - Other open space and street plantings
 - Potential to enhance stormwater facilities with amenities to expand recreation
 - Potential partnership opportunity with schools
 - Opportunity for trail connections

Área de enfogue este

- Área residencial servida por desarrolladores de parques, espacios abiertos y plantas en las calles
- Pargue HOA
- Instalaciones públicas de aguas pluviales
- Otros espacios abiertos y plantas
- Potencial para mejorar las instalaciones de aguas pluviales con amenidades para expandir la recreación
- Oportunidad potencial de asociación con escuelas
- Oportunidad para conexiones de senderos



APPENDIX A: COMMUNITY ENGAGEMENT

COMMUNITY ENGAGEMENT MATERIALS | AUG-OCT 2021





Use a comment card to let us know which park features (lettered A through M) are a good fit for Tualatin Basalt Creek.

Seleccione las características del parque (con letras de la A a la M) que crea que se ajustan bien a cada una de las áreas de enfoque.



Off Street Trail Sendero en la calle



On Street Trail Sendero en la calle



Signage Señalización



Trail Head Parking Estacionamiento al comienzo del sendero



Picnic Shelter Área para picnic techada



Play Area Área de juegos



CENTRAL FOCUS AREA ÁREA DE ENFOQUE CENTRAL

WEST FOCUS AREA ÁREA DE ENFOQUE OESTE

Multi-use Field Campo de usos múltiples

EAST FOCUS AREA ÁREA DE ENFOQUE ESTE



Sendero





Picnic Shelter Área para picnic techada



Play Area Área de juegos



Sport Court Cancha deportiva



Stormwater Planting Plantas regadas con aguas pluviales







Visual Preference Activity Actividad de preferencia visual

Use this card tocircle which park features (lettered A through M) are a good fit for Tualatin Basalt Creek. Seleccione las características del parque (con letras de la A a la M) que crea que se ajustan bien a cada una de las áreas de enfoque.



Trail Head Parking Estacionamiento al comienzo

Off-Leash Area Area para perros sin correa

Stormwater Planting Plantas regadas con aguas

APPENDIX A: COMMUNITY ENGAGEMENT

COMMUNITY ENGAGEMENT MATERIALS | AUG-OCT 2021



Q: What is your priority for each of the following types of features in the new Basalt Creek Park? Use dot stickers to indicate your answer for ea P: ¿Cuál es su prioridad para cada uno de los siguientes tipos de características en el nuevo parque Basalt Creek?



o each of the
respuesta para
Ι.
on services ty. ios recreativos y omunidad.
ach.
OJARSE ow / Bajo
A I CORREA
Low / Bajo

Using a scale from 1 to 5 (5=supportive, 1=unsupportive) how much do you support the overall park program described for the West, Central, and East focus areas?

Usando una escala del 1 al 5 (5 = apoyo, 1 = no apoyo) ¿Cuánto apoya usted el programa general de parques descrito para las áreas de enfoque Oeste, Central y Este?















SUMMARY - VIVA TUALATIN | AUG 28, 2021



iVIVA! TUALATIN COMMUNITY EVENT

Saturday, August 28, 2021 3pm to 6pm Tualatin Community Park

Basalt Creek Area Park Planning Engagement

RESULTS Park Program Preference Activity Board Votes

In your opinion, why is it important to plan for future parks in developing Areas?		
Preserve, protect & enhance natural areas.	32	
Plan for future trail connections & greenways.	10	
Create space for active recreation including playgrounds, sports fields & sport courts.	27	
Provide parks & recreation services to the community	14	

What is your priority of each of the following features	Trail	What is your priority of each of the following features	Playground
High	47	High	73
don't know	2	don't know	7
Low	0	Low	2
What is your priority of each of the following features	Sports Field	What is your priority of each of the following features	Sports Court
High	50	High	49
don't know	18	don't know	17
Low	12	Low	15

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Project web page, email notifications, social media, newsletters Date: May 2021 – Jan 2022

Survey #1 Basalt Creek Park Planning Pop Quiz Dates: Jul 8 – Aug 13, 2021

Survey #2 Basalt Creek Parks Planning Dates: Aug 31 – Oct 1, 2021

Survey #3 Basalt Creek Parks & Recreation Draft Plan Dates: Nov 12 – Dec 5, 2021

DIGITAL MARKETING TRACKING | MAY 2021-DEC 2021

BASALT CREEK AREA PARKS PLANNING

Digital Marketing Tracking

Date	Description
5/5/2021	Website Engagement
5/5/2021	City Social Media Post
5/11/2021	Nextdoor Post
5/17/2021	Project Email Blast
6/1/2021	Tualatin Today City e-newsletter
7/8/2021	Email Blast - Pop Quiz I
7/8/21 - 8/13/21	Park Planning Pop Quiz I
7/14/2021	July Explore Tualatin now - Park & Rec. e-newsletter
8/31/2021	Email Blast - Survey II
8/31/21 - 10/01/21	Survey II
9/8/2021	September Explore Tualatin now - Park & Rec. e-
	newsletter
9/8/2021	City Social Media Post
9/17/2021	CIO Email - (Personal Email from Deputy City Manager)
9/17/2021	Business CIO Email - (Personal Email from Deputy City
	Manager)
11/1/2021	Novemeber Tualatin Today City e-newsletter
11/10/2021	Nov Explore Tualatin now - Park & Rec. e-newsletter
11/11-12/5	Survey III
11/12/2021	Email Blast - Basalt Creek Draft Review
11/13/2021	City Social Media Post
11/22/2021	Nextdoor Post
11/26/2021	City Social Media Post - Good Read
11/30/2021	Email Blast - Last chance to take survey
12/3/2021	City Social Media Post - Last chance to take survey

PROJECT WEB PAGE | MAY 2021-JAN 2022



EMAIL NOTIFICATION - BASALT CREEK PLANNING UPDATE | MAY 2021



SOCIAL MEDIA - NEXTDOOR POST | MAY 11, 2021



TUALATIN TODAY NEWSLETTER | JUNE 2021

9/24/21, 2:27 PM



Tualatin Today June 2021

Library reopens. For those familiar with our Craft Prep Crew, this will work in a similar fashion. We'll provide the materials and you assemble at your own pace! Once you're finished, drop off the completed bag at the Library. Learn more and sign up on our webpage.







The exciting process of planning fopparks and recreation in the newly expanding Basalt Creek area haskicked off! This next step will result in a big-picture plan to address the parks and recreation needs of the growing communityo find out more about the project or share ideas for future parks in the area, visit our webpage. We are calling on the community to let To accomplish this, the City Council recently us know what you would like to see!

New Parks Utility Fee

A large part of what makes Tualatin a wonderful, livable city is its parks, trails, and greenspaces. These cherished areas connect us to nature, provide gathering places, promote physical activity, and contribute to the overall well-being of the community. Our parks - just like many things - require repairs, renovations, and replacement to keep them safe and accessible. approved a new parks utility fee to fund the cost of the much-needed upkeep of our City parks.

Starting this July, you will notice a \$5 fee on your utility bill. This newly-dedicated park fee will allow you to be part of restoring the beauty of our parks! Please visit our website for more information including videos on what the fee will fund.

https://mailchi.mp/tualatin/iune21-8030023

EXPLORE TUALATIN NEWSLETTER | JULY 2021



WHAT DO YOU KNOW?

Remember those dreaded pop quizzes in school? Well, we have one for you, but don't worry, this one is fun! Time to test your knowledge and see if you are paying attention to latest updates from the City of Tualatin Parks and Recreation. Take this quick quiz to find out and don't miss this chance to share your dreams for the future of our parks.

Take the Quiz



EMAIL NOTIFICATION - BASALT CREEK POP QUIZ | JULY 8, 2021
Park Planning Pop Quiz



9/24/21, 2:48 I	PM Park Planning Pop Quiz	
2.	2. In your opinion, why is it important to plan for future parks in developing areas? Check all that apply:	
	Check all that apply.	
	 Preserve, protect and enhance the environment. Plan for future trail connections and greenways. Prevent overcrowding in existing parks. Provided Parks & Recreation services to the nearby community. Provide new services and features that are not already available. Preserve space for future parkland. 	
	Create space for active recreation including playgrounds, sports fields and courts.	
3.	3. What percentage of Tualatin's City land is used for parks?	
	Mark only one oval.	
	2% 6%	
	9%	
	23%	
https //docs.go	ogle com/forms/d/1-acEyDt-pyMv1p5NKY1yWgoK2W5hKk9g9RKmr0DQfto/edit	3/5

4.	M			Park Pla	nning Pop Quiz
	4. Rank the feat Basalt Creek?	ures bel	ow in im	portance that	you would like to see in a new park in
	Mark only one ova	al per row.			
		High	low	I don't know	
	Trails	\bigcirc	\bigcirc	\bigcirc	
	Sports Feilds	\bigcirc	\bigcirc	\bigcirc	
	Sports Courts	\bigcirc	\bigcirc	\bigcirc	
	Playground	\bigcirc	\bigcirc	\bigcirc	
	Natural Areas	\bigcirc	\bigcirc	\bigcirc	
	Splash Pad	\bigcirc	\bigcirc	\bigcirc	
	Off-Leash Area	\bigcirc	\bigcirc	\bigcirc	
	Picnic Shelter	\bigcirc	\bigcirc	\bigcirc	
5.		oulia you	r aream	park what thin	gs would you put in it?

	m Park Planning Pop Quiz	
6.	6. Would you like to know the answers to these questions and more information to the park planning process in the Basalt Creek area? Please share your name and email with us	
	This content is neither created nor endorsed by Google.	
	Google Forms	

SURVEY #1 - RESULTS | JULY 8 - AUG 13, 2021

TUALA Basalt C PARKS & RECR PLA	
urvey I:	Pop Quiz Results
1. On the m	ap below, which option best represents the Basalt Creek Area?
Response	Choices
2.70%	Option A
68.20%	Option B
8.20%	Option C
200/	Both B & C
20%	
9% 2. In your o	None of the above
9% 9% 2. In your o Response 28.40%	None of the above pinion, why is it important to plan for future parks in developing areas? Check all that apply: Choices Preserve protect and enhance the environment
<u>9%</u> 2. In your o Response 28.40% 56%	None of the above pinion, why is it important to plan for future parks in developing areas? Check all that apply: Choices Preserve, protect and enhance the environment. Plan for future trail connections and greenways.
20% 9% 2. In your o Response 28.40% 56% 44%	None of the above pinion, why is it important to plan for future parks in developing areas? Check all that apply: Choices Preserve, protect and enhance the environment. Plan for future trail connections and greenways. Prevent overcrowding in existing parks.
20% 9% 2. In your o Response 28.40% 56% 44% 40.40%	None of the above pinion, why is it important to plan for future parks in developing areas? Check all that apply: Choices Preserve, protect and enhance the environment. Plan for future trail connections and greenways. Prevent overcrowding in existing parks. Provided Parks & Recreation services to the nearby community.
20% 9% 2. In your o Response 28.40% 56% 44% 40.40% 62.40%	None of the above pinion, why is it important to plan for future parks in developing areas? Check all that apply: Choices Preserve, protect and enhance the environment. Plan for future trail connections and greenways. Prevent overcrowding in existing parks. Provided Parks & Recreation services to the nearby community. Provide new services and features that are not already available.
20% 9% 2. In your o Response 28.40% 56% 44% 40.40% 62.40% 62.40%	None of the above pinion, why is it important to plan for future parks in developing areas? Check all that apply: Choices Preserve, protect and enhance the environment. Plan for future trail connections and greenways. Prevent overcrowding in existing parks. Provided Parks & Recreation services to the nearby community. Provide new services and features that are not already available. Preserve space for future parkland.
20% 9% 2. In your o Response 28.40% 56% 44% 40.40% 62.40% 62.40% 89%	None of the above pinion, why is it important to plan for future parks in developing areas? Check all that apply: Choices Preserve, protect and enhance the environment. Plan for future trail connections and greenways. Prevent overcrowding in existing parks. Provided Parks & Recreation services to the nearby community. Provide new services and features that are not already available. Preserve space for future parkland. Create space for active recreation including playgrounds, sports fields and courts.
20% 9% 2. In your o Response 28.40% 56% 44% 40.40% 62.40% 62.40% 89%	None of the above pinion, why is it important to plan for future parks in developing areas? Check all that apply: Choices Preserve, protect and enhance the environment. Plan for future trail connections and greenways. Prevent overcrowding in existing parks. Provided Parks & Recreation services to the nearby community. Provide new services and features that are not already available. Preserve space for future parkland. Create space for active recreation including playgrounds, sports fields and courts. Other - See below: Disklabel
20% 9% 2. In your o Response 28.40% 56% 44% 40.40% 62.40% 62.40% 89%	None of the above pinion, why is it important to plan for future parks in developing areas? Check all that apply: Choices Preserve, protect and enhance the environment. Plan for future trail connections and greenways. Prevent overcrowding in existing parks. Provided Parks & Recreation services to the nearby community. Provide new services and features that are not already available. Preserve space for future parkland. Create space for active recreation including playgrounds, sports fields and courts. Other - See below: Pickleball courts. Huge need. Preserve property values of homes currently bordering on undeveloped land
20% 9% 2. In your o Response 28.40% 56% 44% 40.40% 62.40% 62.40% 89%	None of the above pinion, why is it important to plan for future parks in developing areas? Check all that apply: Choices Preserve, protect and enhance the environment. Plan for future trail connections and greenways. Prevent overcrowding in existing parks. Provided Parks & Recreation services to the nearby community. Provide new services and features that are not already available. Preserve space for future parkland. Create space for active recreation including playgrounds, sports fields and courts. Other - See below: Pickleball courts. Huge need. Preserve property values of homes currently bordering on undeveloped land Skate Park
20% 9% 2. In your o Response 28.40% 56% 44% 40.40% 62.40% 62.40% 89%	None of the above pinion, why is it important to plan for future parks in developing areas? Check all that apply: Choices Preserve, protect and enhance the environment. Plan for future trail connections and greenways. Prevent overcrowding in existing parks. Provided Parks & Recreation services to the nearby community. Provide new services and features that are not already available. Preserve space for future parkland. Create space for active recreation including playgrounds, sports fields and courts. Other - See below: Pickleball courts. Huge need. Preserve property values of homes currently bordering on undeveloped land Skate Park Recreation programs and parks
20% 9% 2. In your o Response 28.40% 56% 44% 40.40% 62.40% 62.40% 89%	None of the above pinion, why is it important to plan for future parks in developing areas? Check all that apply: Choices Preserve, protect and enhance the environment. Plan for future trail connections and greenways. Prevent overcrowding in existing parks. Provided Parks & Recreation services to the nearby community. Provide new services and features that are not already available. Preserve space for future parkland. Create space for active recreation including playgrounds, sports fields and courts. Other - See below: Pickleball courts. Huge need. Preserve property values of homes currently bordering on undeveloped land Skate Park Recreation programs and parks
20% 9% 2. In your o Response 28.40% 56% 44% 40.40% 62.40% 62.40% 89% 3. What per	None of the above pinion, why is it important to plan for future parks in developing areas? Check all that apply: Choices Preserve, protect and enhance the environment. Plan for future trail connections and greenways. Prevent overcrowding in existing parks. Provided Parks & Recreation services to the nearby community. Provide new services and features that are not already available. Preserve space for future parkland. Create space for active recreation including playgrounds, sports fields and courts. Other - See below: Pickleball courts. Huge need. Preserve property values of homes currently bordering on undeveloped land Skate Park Recreation programs and parks
20% 9% 2. In your o Response 28.40% 56% 44% 40.40% 62.40% 62.40% 89% 3. What per Response	None of the above pinion, why is it important to plan for future parks in developing areas? Check all that apply: Choices Preserve, protect and enhance the environment. Plan for future trail connections and greenways. Prevent overcrowding in existing parks. Provided Parks & Recreation services to the nearby community. Provide new services and features that are not already available. Preserve space for future parkland. Create space for active recreation including playgrounds, sports fields and courts. Other - See below: Pickleball courts. Huge need. Preserve property values of homes currently bordering on undeveloped land Skate Park Recreation programs and parks
20% 9% 2. In your o Response 28.40% 56% 44% 40.40% 62.40% 62.40% 89% 8. What per Response 26.90%	None of the above pinion, why is it important to plan for future parks in developing areas? Check all that apply: choices Preserve, protect and enhance the environment. Plan for future trail connections and greenways. Prevent overcrowding in existing parks. Provided Parks & Recreation services to the nearby community. Provide new services and features that are not already available. Preserve space for future parkland. Create space for active recreation including playgrounds, sports fields and courts. Other - See below: Pickleball courts. Huge need. Preserve property values of homes currently bordering on undeveloped land Skate Park Recreation programs and parks centage of Tualatin's City land is used for parks?
20% 9% 2. In your o Response 28.40% 56% 44% 40.40% 62.40% 62.40% 62.40% 89% 89% 3. What per Response 26.90% 25.90%	None of the above pinion, why is it important to plan for future parks in developing areas? Check all that apply: choices Preserve, protect and enhance the environment. Plan for future trail connections and greenways. Prevent overcrowding in existing parks. Provided Parks & Recreation services to the nearby community. Provide new services and features that are not already available. Preserve space for future parkland. Create space for active recreation including playgrounds, sports fields and courts. Other - See below: Pickleball courts. Huge need. Preserve property values of homes currently bordering on undeveloped land Skate Park Recreation programs and parks centage of Tualatin's City land is used for parks?
20% 9% 2. In your o Response 28.40% 56% 44% 40.40% 62.40% 62.40% 62.40% 62.40% 89% 3. What per Response 26.90% 25.90% 23.10%	None of the above pinion, why is it important to plan for future parks in developing areas? Check all that apply: Choices Preserve, protect and enhance the environment. Plan for future trail connections and greenways. Prevent overcrowding in existing parks. Provided Parks & Recreation services to the nearby community. Provide new services and features that are not already available. Preserve space for future parkland. Create space for active recreation including playgrounds, sports fields and courts. Other - See below: Pickleball courts. Huge need. Preserve property values of homes currently bordering on undeveloped land Skate Park Recreation programs and parks centage of Tualatin's City land is used for parks? Choices 2% 6% 9%
20% 9% 2. In your o Response 28.40% 56% 44% 40.40% 62.40% 62.40% 62.40% 62.40% 89% 62.40% 89% 89% 3. What per Response 26.90% 25.90% 23.10% 19.40%	None of the above pinion, why is it important to plan for future parks in developing areas? Check all that apply: Choices Preserve, protect and enhance the environment. Plan for future trail connections and greenways. Prevent overcrowding in existing parks. Provided Parks & Recreation services to the nearby community. Provide new services and features that are not already available. Preserve space for future parkland. Create space for active recreation including playgrounds, sports fields and courts. Other - See below: Pickleball courts. Huge need. Preserve property values of homes currently bordering on undeveloped land Skate Park Recreation programs and parks centage of Tualatin's City land is used for parks? Choices 9% 12%

SURVEY #1 - RESULTS | JULY 8 - AUG 13, 2021

esponse	Choices	Response	Choices		Response	Choices
1	Trails	Play	round		Off-Leash Area	
70	High	91	High		19	High
29	Low	16	Low]	78	Low
10	I don't know	0	l don't know		10	I don't know
Sports Fields		Natur	Natural Areas		Picnic Shelter	
55	High	38	38 High		85	High
43	Low	62	Low		20	Low
7	I don't know	9	l don't know]	2	I don't know
Sports Courts		Spla	sh Pad			
75	High	39	High			
27	Low	54	Low			
3	I don't know	11	l don't know	1		

Response	Choices				
Playground					
91	High				
16	Low				
	I don't				
0	know				
Natural Areas					
38	High				
62	Low				
	I don't				
9	know				
Splas	sh Pad				
39	High				
54	Low				
	I don't				
11	know				

Response	Choices			
Off-Leash Area				
19	High			
78	Low			
10	I don't know			
Picnic Shelter				
85	High			
20	Low			
2	I don't know			

5. If you could build your dream park what things would you put in it?

- Space for all ages from birth to 100 so shade, physical activities, picnic shelters splash pad and exercise and a building for excersice, arts and community meetings.
- New options in Tualatin Parks. ie frisbee golf. Multiple trails. Off leash dog areas. Multi-Use trail connecting adjacent cities. Place for medium to large community activities. Nearby food / beverage options that support local economy, charities or your organizations. ie food carts or coffee shop.
- Interactive public art, lighted sports fields and courts, lighted 16' wide walking and biking paths, trails and natural areas, really well designed spaces and low water consumption landscaping, mix of large northwest trees and a bunch of sequoias, benches and tables, playgrounds, picnicking, lighted parking, water play features and public gathering spaces, natural and cultural interpretive elements, wifi and electric car charging, attractive park signs, high quality materials, shelters with a strong NW architecture, and connections to adjoining properties so people can easily walk and bike.
- Natural play area Tiny tots play area Splash pad
- Tournament sports complex
- A lake and running creek, wildlife habitat, gardens. bird and bat nest boxes...
- Banks to sit on. Public toilets. Picnic area. Parking. Connection to existing greenways. Bike stand.
- Running trails and dog friendly ! .
- No bridge connection to Sw Boones Ferry, protect the canyon.
- Splash pad/ water park type features
- Ultimate frisbee
- Lots of tall evergreens to walk among, perhaps a sports field under the BPA power-line easement since that's already cleared of trees.
- Lots of flora and fauna with small walking trails wound throughout
- Dedicated PICKLEBALL courts. At least 8 courts.
- Splash pad, nature based playground like park in Sellwood, nature trail that connects easily to bike lines to Wilsonville park and to Ibach Park
- Sports fields
- Trails that connect other parks and natural areas
- Playground, skate park, basketball, picnic

SURVEY #1 - RESULTS | JULY 8 - AUG 13, 2021

Kids water area, big playground, shaded nature areas Natural areas, Trails, Picnic Shelter, Playground, Water feature/Splash area Basketball court and skate park Swings, obstacles, tall slide, NO SAND, balance options (bridge that slightly moves, etc.). Play structure for older kids. Soccer and baseball fields. Trails/hiking. Small dock Loose parts nature play, looped walking path through various kinds of settings, pump track course, small demonstration orchard Plenty of trees and adult playgrounds! Things for kids and family to do. Park like Iback Trail and greenway connections to nearby neighborhoods and other parks Stuff for the grand kids to do. Skate park amd BMX track Active recreation equipment and facilities. Board park Sculpture or mural A park like all the other parks in Tualatin regular park Playground Stuff for families to do playground, basketball court and skate area ٠ Fitness course Playground with rocks and trees and things to climb. Place to ride bikes and skateboards. recreation facilities and programs City park similar to other parks All about soccer fields and fusal courts! Don't know Everything other parks have a building that people can use Swimming pool with water slide • walking trails in natural greenways and creeks, benches at various points on the trail Playground, basketball, skating, picnic splash pad/interactive water feature, shady forest, trail connections to neighborhoods and regional trail system connections to other cities, natural playground with climbing structures, scenic trail by a creek or river with quiet contemplation/bird watching spots Things like are in Cook Park Shade and playgrounds Pickleball Sand volleyball court please Pickelball Regular park attached to a nature reserve with trails attached.

EMAIL NOTIFICATION - BASALT CREEK SURVEY 2 | AUG 31, 2021



A3. 6%

Our community is growing and we are working to ensure your parks and recreation services grow too Do not forget to join us on this on this journey to plan for the future of your parks But we need your help to narrow down why this work is so important. Please take the second survey!

EMAIL NOTIFICATION - BASALT CREEK SURVEY 2 | AUG 31, 2021



EXPLORE TUALATIN NEWSLETTER | SEPT 2021



WE WANT TO HEAR FROM YOU!

Please join us by participating in the second survey to help us narrow down potential concepts and plans for the future of parks in the Basalt Creek area! We would like to thank everyone who has joined us so far in the exciting process of planning for the future of parks and recreation services. Over 100 community members participated in the first survey, sharing their thoughts on the future of parks for the expanding community.

Be sure to take the quick survey and make sure you are heard by visiting the website. There you can also find additional information on the process and a list of community meetings, focus groups, and engagement events that will help us create the parks plan for the future of this area.

Tell Us Your Dreams!

APPENDIX A: COMMUNITY ENGAGEMENT

SOCIAL MEDIA - TWITTER | SEPT 8, 2021





SOCIAL MEDIA - SURVEY 2 FACEBOOK POST | SEPT 8, 2021

EMAIL NOTIFICATION - COMMUNITY INVOLVEMENT ORGANIZATIONS (CIO) | SEPT 17, 2021

From: To:	Negan George recipient email addresses redacted for privacy purposes					
Cc:	Kyla Cesca: Rich Mueller					
Subject: Date:	CIOs - Information on Park Planning in Basalt Creek Friday, September 17, 2021 5:01:00 PM					
Hi Everyone	-					
Our Parks a	nd Recreation Department is currently looking for feedback on the Basalt Creek Parks and					
Recreation	Plan and asked that I share this with members of the CIO Program. Please see below for					
more inform	nation on their work including a link to the survey. Please feel free to reach out to Parks					
Planning an	d Development Manager Rich Mueller who is copied on this email with any questions.					
Kind Regard	ls,					
Megan	George					
Deputy Cit	y Manager					
City of Tua	latin Administration					
From: City	of Tualatin < <u>kcesca@tualatin.gov</u> >					
Sent: Tueso	lay, September 14, 2021 2:49 PM					
To: Kyla Ce:	sca < <u>kcesca@tualatin.gov</u> >					
Subject: Ba	salt Creek Park Survey 2					

EMAIL NOTIFICATION - COMMERCIAL CIO | SEPT 17, 2021

Megan George
recipient email addresses redacted for privacy purposes
Rich Mueller: Kyla Cesca
Commercial CIO - Information on Park Planning in Basalt Creek
Friday, September 17, 2021 5:01:33 PM

Hello Commercial CIO Board Members -

Our Parks and Recreation Department is currently looking for feedback on the Basalt Creek Parks and Recreation Plan and asked that I share this with members of the Commercial CIO. Please see below for more information on their work including a link to the survey. In addition, they are hosting a business and employment focus group on October 5th.

Please feel free to reach out to Parks Planning and Development Manager Rich Mueller who is copied on this email with any questions.

Kind Regards,

Megan George

Deputy City Manager City of Tualatin | Administration

From: City of Tualatin <<u>kcesca@tualatin.gov</u>> Sent: Tuesday, September 14, 2021 2:47 PM To: Kyla Cesca <<u>kcesca@tualatin.gov</u>> Subject: Basalt Creek Area Park Survey

Tualatin Basalt Creek Parks Planning

Survey 2

With this survey, you get to help us with the exciting process of planning for parks in the area shown in green on the map. This area has been added to the urban growth boundary & will become part of Tualatin through voluntary annexation.



 In the first survey the community deemed it important to plan for parks in developing areas, help us narrow down the reason why. From the list below please choose which option is most important to you...

Mark only one oval.

- A. To preserve, protect and enhance natural areas.
- B. Plan for future trail connections and greenways.
- C. Space for active recreation including playgrounds, sport fields and sport courts.
- D. Provide parks and recreation services to the community.



	Highly Supportive	Supportive	Neither Supportive or Unsupportive	Unsupportive	Highly Unsupportive
West Focus Area	\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc
Central Focus Area	\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc
East Focus Area	\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc







Survey 2: Tualatin Basalt Creek Parks Planning

1. In the first survey the community deemed it important to plan for parks in developing areas, help us narrow down the reason why. From the list below please choose which option is most important to you...

Response	Choices
14.70%	Preserve, protect and enhance the environment.
15%	Plan for future trail connections and greenways.
52%	Create space for active recreation including playgrounds, sports fields and courts.
17.90%	Provide parks and recreation services to the community.

2. Using a scale of 1-5 how much do you support the overall park program descried for the focus areas									
AREA	AREA 5 4 3 2 1								
West	80 votes	68 votes	21 votes	5 votes	5 votes				
Central	93 votes	63 votes	12 votes	2 votes	8 votes				
East	50 votes	66 votes	43 votes	10 votes	9 votes				

3. Please choose the features you would like to see in the Tualatin Basalt Creek area.

Response	Choices
110	Trail or Greenway
103	Sport Court
99	Picnic Shelter
112	Play area
127	Mulit-use Field
60	Stormwater Plantings
52	Off Leash Area
73	Natural Area
123	Regional Trail

4. Do you have any other input or ideas to share about the future of parks and trails in the Basalt Creek area?

- Open paved or bark dust paths are ideal for all. Plantings should be far enough off the path for security and light. Info points about the site and plantings are educational and interesting. Thank you for seeking diverse input.
- Nope
- I would love to see this area help connect tualatin to regional biking/walking trails
- Synthetic Turf fields
- Must have acre wide Greenway. Wide fields of grass are huge maintenance waste.
- Tournament sports facilities
- A splash pad like Robinwood Park in West Linn would be awesome. Trails that connect into Wilsonville and up to Tualatin Community Park would be amazing.
- Regional trails with places to slow down and enjoy nature would be amazing. Having multi-use greenways can sometimes provide several opportunities to enjoy the out of doors (picnics, soccer, events, etc.). l've even seen parks mixed in with stormwater-related stuff. That can be a great use of already vegetated areas.
- Preserve habitat for displaced wildlife. This must include 5 layers of vegetation, especially preserving tall (older) trees.
- Any new park and trail development efforts should have minimal impact on the natural wildlife in the area, which is already being affected by development.
- Splash pads would be great to have. If it is possible to be (partially) powered by renewable energy (along with anything else that needs power restrooms, trail lights, etc.) that would be great as well.
- Please be transparent about plans that cut through private property.
- Skate park and spray park
- Full size baseball fields to accommodate our middle schoolers who currently have no city support.
- Trail connections and gravel recreation trails are priorities
- Compared to Tualatin, the City of Wilsonville seems to have done a much better job with their parks, trails, natural areas and bikeways. Although I am a Tualatin resident, based on past performance and absent some change in priorities, the greater area that comes under Wilsonville's control, the better. Note: question 2 appears to be pretty much meaningless since anyone who favors parks and natural areas should be supportive of all opportunities based on the limited information presented. It seems like the tradeoffs between these concepts and residential/commercial development is what is of greater importance.
- We should preserve the wildlife and natural areas in basalt creek, leaving them as natural as possible without human foot traffic.
- We need more fields! Synthetic turf would be great.
- More multi-use field areas would be great!
- We don't have enough field space in Tualatin. I appreciate that these don't increase the already crappy traffic in town.
- We need a baseball field complex to host tournaments etc
- Multi use- synthetic turf would be a huge asset and benefit for our community.
- Turn this area into a mulitsports complex filled with a mix of softball/baseball fields and a turf field designed for football/soccer/lacrosse usage. With softball/baseball fields, tournaments can be run and teams/families from out of the area can stay in local hotels and eat in local restaurants. Thus bringing more income into the Cities.

- We donâ€[™]t have enough field space in Tualatin. I appreciate that these donâ€[™]t increase the already crappy traffic in town.
- More sports fields are needed… we are WAY behind other communities
- A covered basketball court or indoor basketball facility
- We need more lacrosse turf fields
- More sports fields are needed…we are WAY behind other communities
- More fields for team sports
- Glad that park planning is being done to make the community better and allow nearby access to natural spaces.
- Tualatin sorely needs better parks/playgrounds. Our family always chooses to drive further to use Sherwood or Wilsonville parks. We desperately need to keep trees and green areas in tact. Especially in the east focus area. I suggest a park/green/nature area between the existing neighborhood and the new planned residential development.
- The area needs more lighted turf fields in order to play on year around.
- Playground, basketball and soccer
- more sports fields would be good
- We need more bike paths and artificial turf fields for sports.
- place to skate, fountain, art
- Like Iback and Jurgen parks
- soccer and futsal
- Try not to disturb natural habitats
- Sport courts, restrooms and a covered area for our kids to play in the cooler months is really important!
- Park with thing for kids to do
- skate course, water pad, fields, picnic, basketball
- Parks for children, families and dogs.
- the area needs more active sport fields for activities like lacrosse and football that aren't currently allowed on city fields
- *no*
- Outdoor fitness course and tennis courts
- I would love to see a more natural space, that works with the current environment without changing it dramatically. Trails are great, possibly a simple off-leash area, but so much of Tualatin has already been developed and urbanized it would be great to preserve some of the natural beauty of the area. Playgrounds are nice as well, but it would be nice to see a playground that incorporates the natural environment.
- Would love to see connecting biking and running ways built out. Graham's Ferry between Helenius and Tonquin is unsafe.
- This 29 year resident of Tualatin, will be leaving (selling house) and moving as soon as development starts. This entire project is not wanted.
- The parks in Tualatin are lacking compared to other areas in regards to places for children to play. Would love to see more parks like the ones in Wilsonville or Sherwood
- Tualatin needs artificial turf fields. It would be great to have a trail system that connected to other existing trails for biking.

- I think Tualatin needs another turf field for youth sports. We only have the HS, and it would be great if one of the community parks had one too!
- Skateboard park
- Skating
- Soccer fields, basketball courts amd skate park. Playgrounds for little and bigger kids.
- Trail to go places connecting to sidewalks in Wilsonville
- No parks or trails
- City park
- baseball, softball, football, and soccer fields for children
- Children, dogs, families
- We live in Basalt Creek and sorry some of the old timers gave you a bad time at the Iback park meeting. We do not all feel this way. Thanks for give us information and answer questions.
- Playgrounds
- Fields, trails, courts and playgrounds
- Prefer a natural area without dogs
- The Basalt Creek area is currently home to deer, eagles, hawks, raccoons, and many other animals. It would be nice to continue to have space for those animals to exist up and down the creek. I believe regional trails are a great way to encourage alternative transportation idea and recrecreation. Graham's Ferry already has a significant number of bike riders that are willing to risk that we don't have bike lanes, it would be great to see this expand with safer routes.
- fitness course, skating, water park, climbing wall, soccer field, baseball field
- Parks and Trails
- Community Gardens
- Need more fields, serious lack of fiends. More practice, game and lite fields.
- Also need skating and spray pad
- Fields for soccer and softball. Real shortage of fields. Kids practice on fields with holes and little more then dirt.
- tennis and pickleball courts, things for kids to do
- Wading pool
- shortage need soccer fields & playgrounds
- Promote walking with grocery that is a neighborhood store. Promote walking in nature. Promote home landscapes to embrace native plants and connect with green space plants; avoid lawns and required maintenance, chemicals. Educate about local wildlife, coexisting.
- Fields and court, Tualatin has enough nature area that no one can use.
- More courts for basketball, tennis and pickleball. Not enough pickleball courts cause players from LO and WV taking play time.
- Good plan, but have stuff for people to do, and not to look at.
- need more parks they are to crowded and cant use
- Just like Jergens
- Tennis courts since pickle ball is taking them all. Its not even an olympic sport!
- Swimming pool
- Local Team Handball team needs sport court space large enough for their practices, as a growing sport in the US, it's a great investment for local sports and kids.

- Tualatin is in desperate need of permanent pickleball courts!!! Lake Oswego and West Linn both have them and we should too! They are constantly crowded and it is so frustrating to have to put up temporary nets and hope someone is there that knows the code for the lock box
- Please focus on accessibility for those with disabilities. Please consider if a wheelchair could handle terrains. Please invest in equipment that everyone can enjoy, even those who may not have the ability to sit up on their own (multiple platform swings)
- We need more nature oriented walking trails in this area!
- fitness course, playground, basketball court, tennis court, picnic tables, grill
- Would love to see the east area stay forested along Norwood road, space between the existing neighborhood across the street would be ideal for current and future residents in the area.
- sports fields and courts with fitness course trail
- soccer and basketball
- skate course, tennis courts, basketball court, playground, picnic tables & grills
- I support play structures, off leash areas, and fields in geographically suited and environmentally responsible locations
- Fix the problem of the sound of guns being fired at the Tri County Gun club, or the Basalt Creek park will sound like a war zone.
- Splash park and art
- Playgrounds, sports fields and courts.
- Tualatin needs youth sports fields. There are not enough and we use crappy school fields that are dangerous. Baskeball courts and skate area for kids.

WEBSITE ENGAGEMENT COMMENTS | MAY 5 - OCT 1, 2021



- This also mentions a Community Park how would that be constructed? Would there be classes and rooms available for the Community
- Have not formed personal park ideas. I live in the area and we're quite interested to see what planners are thinking. Many opti
- More park space like Browns Ferry Park! Natural areas not lawns.

WEBSITE ENGAGEMENT COMMENTS | MAY 5 - OCT 1, 2021

CITY OF TUALATIN WEBS TE ENGAGEMENT COMMENTS

- I would love to see more trails that connect up with existing city trails, sport courts, covered picnic areas, and ball fields.
- Would love to see connecting biking and running ways built out. Graham's Ferry between Helenius and Tonquin is unsafe.
- Turf fields!!
- Please build turf fields that allow for multiple sports to be played year-round.
- I'd love to see some version of a nature playground. https://www.bendparksandrec.org/park/rockridge-park/ is a great example!
- Playgrounds, basketball court, fitness course equipment, and disk golf.
- Skate Park
- More connected hiking trails.
- Preserve canyon.
- Greenway areas that connect existing and new parks, as well as preserve the value of homes currently bordering natural areas.
- The best park I have been to is the Sam Johnson Park in Redmond. Inspiration can certainly found there!
- Dog park with grass (not wood chips), water, shelter, walking path. Nature trails along creek with plant ID stakes.
- Please see email, only one line of text is accepted here.
- Playground, basketball court, picnic tables
- Picnic places and playground and field
- Basketball Courts
- Walking paths, playground, skate park, basketball
- Things for kids to do
- playground, trail, skating, basketball, splash pad, picnic covering
- Trail, play area, skateboard ramps, grass, picnics
- Fitness course and basketball hoops
- outdoor swimming pool, spray pad, childrens playground, sports field, picnic area
- bocce ball court, tennis courts, soccer field
- park with childrens playground and basetball court for teenagers
- Childrens play ground, sports field, picnic tables, walking trail, fountain kids play in
- Parks and trails
- Games for the grand kids to play, and benches for old people to sit.
- A park for all ages and many things to do.
- things to climb on at playground and climbing wall
- fustal courts, community gardens, playgounds
- Protect canyon/trails; 30 acre park with sports fields, playgrounds, trails; N/S off road multi-use paths; bike lanes; art
- We need a large sports complex. Every city around us has one. Tigard just improved Cook park. Newberg's are booked everyday.
- Playing fields especially turf fields for youth and adult sports

WEBSITE ENGAGEMENT COMMENTS | MAY 5 - OCT 1, 2021

CITY OF TUALATIN WEBSITE ENGAGEMENT COMMENTS

- Disc golf course! Forested holes at 350' range for challenge & more dynamic course. Wide open=boring. Water hazards=lost discs.
- Would love to see connecting biking and running ways built out. Graham's Ferry between Helenius and Tonquin is unsafe.
- Eugene has some wonderful dog parks, that are a pleasure for both people and dogs to be in. trails, shade and sun, open/wooded
- •
- Native plant garden with access for Indigenous communities to have an opportunity to create and participate in a shared space.
- Preservation of green space and natural features, natural areas, trails

BASALT CREEK - PRIORITY RESULTS | OCT 2021



BASALT CREEK - PRIORITY RESULTS | OCT 2021

PARK PROGRAM PREFERENCE ACTIVITY

COMMUNITY ENGAGEMENT RESULTS

In your opinion, why is it important to plan for future parks in developing areas?

To preserve, protect and enhance natural areas.	
Plan for future trail connections and greenways.	
Space for active recreation including playgrounds, sport fields and sport courts.	
Provide parks and recreation services to the community.	

TUALATIN TODAY NEWSLETTER | NOV 2021



EXPLORE TUALATIN NEWSLETTER | NOV 2021



REVIEW THE DRAFT BASALT CREEK PARKS & RECREATION PLAN

The exciting process of planning for parks and recreation in the Basalt Creek area is now in the final stages. A draft of the plan is ready for the community to review and share feedback on the project website. This next step will result in a big-picture plan to address the parks and recreation needs of the expanding community. Please be sure to visit the website between Friday, November 12 and Friday, December 3 to view the draft and take the survey.

SOCIAL MEDIA - FACEBOOK | NOV 13, 2021

City of Tualatin - Government added a new photo. *** Published by Hootsuite O - November 13 at 10:00 AM - 😚 The exciting first steps of planning for parks & recreation in the Basalt Creek area is in the final stages. We invite you to view the draft of the plan to address the parks & recreation needs and desires of the growing south Tualatin community and take the last survey to share your thoughts. Do not miss this opportunity to be heard! https://www.tualatinoregon.gov/.../basalt-creek-parks... ty of PLAN CITY OF TUALATIN Yo PARKS & RECREATION PLAN

Draft - November 2, 2021

479 People reached

27 Engagements

Distribution score

Boost post

01



EMAIL NOTIFICATION - BASALT CREEK SURVEY 3 | NOV 12, 2021

Basalt Creek Parks & Recreation Draft Plan Survey

Final Survey

Thank you for taking the time to review the Tualatin Basalt Creek Parks & Recreation Draft Plan. This draft is the result of a planning process that began in the spring involving the steps diagramed below including asking you to share their thoughts and ideas. We are once again checking in and asking you to share feedback on the draft by taking this survey.

If you missed the opportunity to view the draft, please revisit our website or view it directly here:

https://www.tualatinoregon.gov/sites/default/files/fileattachments/parks_and_rec reation/page/46491/basaltcreekprp_2021-1102_draft.pdf



Trail Concept Plan: In addition to the regional trails planned by metro, a set of local pathways are proposed as part of the plan. They will connect residence, employees and community members. After viewing the map below, please let us know your level of support for the local pathways.



Do you have any additional thoughts you would like to share about the trail concept plan?

Your answer

The plan includes different park example designs to give ideas on what a future park might be like. If you could chose one of the four park design ideas, which would you select? (Larger images can be found here on our website: https://www.tualatinoregon.gov/sites/default/files/fileattachments/parks_and_rec reation/page/46491/example_park_designs.pdf)


SURVEY #3 - BASALT CREEK PARKS & RECREATION DRAFT PLAN NOV 12 - DEC 5, 2021

Why did you select the park example design you chose?

Your answer

Once land has been acquired there will be a community planning process to select the elements for a future park. The community will chose items such as a playground, sport court, trails, picnic shelters, natural area, green space etc. Is there an element you feel should be added to the list?

Your answer

Submit

Clear form

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WEBSITE BANNER - DRAFT PLAN REVIEW & SURVEY | NOV 2021

SOCIAL MEDIA - FACEBOOK | NOV 26, 2021

City of Tualatin - Government Published by Hootsuite **O** · November 26 at 1:00 PM · O

Have you read it yet? The exciting first steps of planning for parks & recreation in the Basalt Creek area is in the final stages. We invite you to read the draft plan to address the parks & recreation needs and desires of the growing south Tualatin community. Then take the survey to share your thoughts with us, visit https://www.tualatinoregon.gov/.../basalt-creek-parks...

...



...

SOCIAL MEDIA - FACEBOOK | DEC 3, 2021

City of Tualatin - Government added a new photo. Published by Hootsuite • - December 3 at 9:01 AM - •

Have you reviewed the draft of the Basalt Creek Parks Plan & taken the survey? If not, great news! The timeline has been extended until Sunday Dec. 5 to make sure everyone has time to share feedback. Visit our website to review the plan & take the survey: https://docs.google.com/.../1FAIpQLSdOKR4RsyLUIV.../viewform



EMAIL - LAST CHANCE DRAFT PLAN REVIEW & FINAL SURVEY, DEC 2021



Have you had a chance to review the draft of the Basalt Creek Parks Plan and take the final survey? If not, great news! The timeline has been extended to make sure everyone has time to share their feedback with us. If you have taken the final survey, thank you so much for your time and connecting with us.

View the draft & take the survey on or before Sunday, December 5.

Please don't miss the opportunity to view draft of the plan to address the needs and desires of the community in the Basalt Creek planning area. It is the result of months of public outreach, and research to develop site acquisition criteria and recommendations, community engagement to develop park design ideas, plus a plan for implementation. Community input has been an important part of this process, and we invite everyone to review the plan and then take the survey to share your thoughts!



City of Tualatin | Mailing: 18880 SW Martinazzi Ave., Physical: 8515 SW Tualatin Rd., Tualatin, OR 97062

<u>Unsubscribe {recipient's email}</u> <u>Update Profile | Constant Contact Data Notice</u>



- Need more multi-use synthetic turf fields. Tualatin is far behind most other communities.
- I am so happy to see that there is a planned park in South Tualatin. As an avid runner and cyclist we are very excited to see new trails as well.
- Connecting parks and/or greenspaces with trails is of high-importance to me. I really like the idea of staying on a trail and moving between these types of places. Often, it's the trail walk I enjoy the most about a park. The paths don't need to be large, just continuous and contiguous between the parks and/or greenspaces. Some observational stopping points and/or benches along these trails would be a plus.
- comprehensive
- Quiet surprising and disappointing that half of the park site option proposals are in area designated to be manufacturing.
- good plan
- More fields not unusable nature land
- Great!
- Parks that have playgrounds, fields, courts and other things that kids can do
- I believe this was already factored in. Making sure bike lanes are included in the plan to connect Wilsonville, Sherwood and Tualatin.
- Good job, good plan.
- I see a miss in this plan for the West section. Safe walking and biking accessibility to the newly
 proposed trail system coming from the Ibach neighborhood. To be more specific, Graham's Ferry
 needs sidewalk and a bike shoulder developed to make it walk/running and bike friendly. There is
 a nasty bottleneck between Tonquin Loop and Tonquin road on Graham's Ferry that is not safe for
 biking or walking/running currently.
- okay
- Tualatin desperately needs dedicated pickleball courts not courts that will be shared with other sports! There is already dedicated tennis courts and futsal courts in the area but no dedicated pickleball courts! As a long time resident of Tualatin I would like to be able to play where I live instead of driving to LO, West Linn, or other areas
- Well thought out plan
- Without physically visiting the physical site I feel I am somewhat blind/ignorant. I am not all in support of the bridge over the creek. There are pollution and noise issues in addition to traffic congestion that are not addressed. How will nature trails/expanded walkways cross busy streets?
 P.22 How will the park and connecting trails address traffic congestion? I love that throughout the plan the goal is to meet neighborhood, employee and community needs. P.28 Should the legend cover almost a quarter of the map? P.98 Stormwater facilities on the east side; does the land itself transfer to the city? In other words, the city maintains them do they also own the facility land? Please use my personal email:
- no
- Make Boones Ferry wide enough to accommodate more traffic lanes. More lanes are needed for existing traffic, which will drastically worsen with new home sites.
- It makes sense to divide the area into three sections given the vast difference in terrane and intended use. I want more information about how the parks and trails (regardless of them being created and operated by the HOA's) in the new development will be connected to and accessible by the existing neighborhoods (especially Norwood Heights).

- The plan looks like it does a good job of taking into consideration how to develop the land in a friendly way for both cars and people!
- Appears to be a comprehensive plan.
- Well thought out
- Tualatin lost out on an opportunity to create multiple multi-use synthetic fields. We are continuing to fall behind surrounding communities.
- Need more sports fields.
- Thank you for all the work on this. I believe we need more turf fields for youth sports.
- We have to prioritize our youth sports. Having multiple sports fields will enhance these parks even more.
- Great connectivity and park ideas
- Very excited to see this plan come to fruition !
- Yes this needs to have baseball fields / soccer fields. Not just 1 field. Our city lacks sports facilities for our youth.
- More sports fields!!!!
- I am really disappointed that there are not plans for a multiplex baseball field/ lacrosse or soccer. There is plenty of space and the city of Tualatin's little league fields for youths sports is subpar. The surrounding cities, Clackamas, Sherwood, West Linn all have beautiful turf complexes that allow their youth to play outdoors longer than our muddy fields. I would like Tualatin to focus more on our youth. Tualatin has done a great job of having nature parks and walking paths. We need a place where our youth can play that isn't underwater more than half the year. A place that brings people from out of town into our city. The addition of a youth sports complex could bring growth to small businesses during weekend tournament. I think it is a mistake to ignore the opportunity to create a place for children to learn to be a team. I understand not everyone loves sports, I myself was not the best athlete. What I have learned it that youth sports give kids confidence, help foster friendships, help create a sense of community and responsibility. Please consider modifying the plans to help expand opportunities for our youth.
- This plan needs a revision. We as a city a far behind others in this area when it comes to usable space for kids to play sports and be active year round. We need multiple turf fields, a baseball softball complex, and as many milt use spaces as you can fit. Tualatin is the laughing stock when you travel around the state to play tournaments or to be active year round without being in three feet of mud. Bring in teams year round which brings in revenue and keep our kids playing in town instead of looking for club teams down the road.
- Love parks!
- There should be more sports field for soccer. The areas that our kids currently play are less than ideal during the fall and winter months. It was so bad this year that practices were cancelled because of the poor field conditions.
- Okay plan
- The plan is complete and comprehensive.
- The city needs a sports complex. Not any of the proposed options.
- This plan has missed the mark. Our community must put our youth sports as the top priority. Create a sports complex that helps make Tualatin an attractive place to raise families.
- Please create a sports complex.
- No thoughts to share

2. Trail Concept Plan: In addition to the regional trails planned by metro, a set of local pathways are proposed as part of the plan. They will connect residence, employees and community members. After viewing the map below, please let us know your level of support for the local pathways.

	Supportive	Neither	Unsupportive
On-Street trail/widened sidewalk (pink highlight)	69	6	5
Greenway Off Street (green highlight)	71	7	2

3. Do you have any additional thoughts you would like to share about the trail concept plan?

- Build as soon as possible
- I am a walker, and always delighted to have safe walking paths to explore
- I think we have plenty of trails now.
- Ensure the off-street, separated trails are built when the roads are developed. Ensure the relatively flat hard surface is about 16 feet wide for safety and enjoyment of the many users the facilities will support. Design the street lighting to adequately light the pathways as well since the they are an integral part of the transportation system.
- Good plan
- Looks great!
- Good trails plan with connectivity.
- good
- Your definition of 'trails' should not include sidewalks. It is deceiving when you talk about the 'trails' in your plan. The term 'trails' should be restricted to pathways that do not have, and are not adjacent to, motorized vehicles or roads (e.g., walking trails through natural areas).
- We really do need a bike lane on Grahams Ferry from Victoria Gardens to Tonquin. That sections is very dangerous for walkers and cyclists.
- The best part about trails is getting away from traffic and "noise" (at least as much as possible). Aside from general pedestrian mobility/convenience, planning for "trails" next to semi-trucks and heavy traffic doesn't sound too appealing.
- build it
- Good plan
- Parks that have fields and courts, not trails
- Good plan
- I would say more access points to the west sections of the trail via walking/running from the Ibach neighborhood.
- good
- Good plan
- Connected trails are great! Trees and native plants.
- no
- Want the on-street section to connect across Norwood and onto 89th

- NA
- Good connections for walking
- Appears to connect to places.
- Looks like people can get around
- Off street pathways open up opportunities for biking in particular that can reduce car/bike accidents. In favor of both, but lean towards off-street.
- We need more synthetic turf fields and pickleball courts.
- We already have enough parks. Need more sports fields.
- Trails look good.
- Connecting the trail system to potential stops at local coffee shops, breweries, cafes, farmers
 market, or food card pod would be a great way to make Tualatin an even more livable and lively
 city.
- Connectivity is good
- Less road trails so kids /dogs can be free and not have to worry about speeding cars
- Please make sure to minimize damage and disturbance to the Koller wetlands, but also please make the gun range close because it is terrible.
- More off street trails, PLEASE!
- More trials are not needed better playgrounds and sports facilities for our youth is needed
- More sports fields!!!!
- We are not hurting for more trails and people to maintain this spaces.
- Love it
- Good
- You need a trail plan for the whole city. Not just new areas!
- Trails to a sports complex would be great.
- Nothing to share

4. The plan includes different park example designs to give ideas on what a future park might be like. If you could chose one of the four park design ideas, which would you select?



Typical 10 acre site: linear/sloping
 Typical 10 acre site: linear/flat
 Typical 10 acre site: square
 Typical 5 acre site

5. Why did you select the park example design you chose?

- I like the ability to incorporate sports or group activities, a field like the lusher farms soccer field would be amazing and maybe a future option if the land is prepared for that.
- Playground, courts, sport field
- The only example with a sports field
- I like it that way!
- Most space for things to do.
- Like the more naturalized character of this option.
- No strong feelings
- It's the only concept that seems to have enough space to support youth sports. Considering you would be placing the park on the opposite side of a natural barrier from the residential neighborhoods, I can't see why you would want either sport courts or a "play area". This is very confusing considering the NEED for sports fields in the community.
- Based on the designs options presented, the square is the only shape and size that can accommodate multipurpose sports fields as well as all the other types of facilities shown in the small linear design concepts. Even at that, 10 acres is way too limited to meet the needs of this part of Tualatin and in the future people will wish you had the foresight and vision to at least double the size when you had the chance
- The linear options are fine as additional parklands only after the larger more useful site has been acquired. They can be very useful for those who don't live within a 5 minute walking distance to the main park where most of the bigger gathering will occur
- Playgrounds, picnic shelters, and trails
- Best one
- I chose option 2 because it utilized the full 10 acres and had options for larger recreational areas.
- It provides a better balance of recreational use and conservation (wildlife and ecological functions). It would be the best solution to meeting your 3 goals.
- We think that an additional field is a good idea.
- I think this area has some slopes to it already (down to the creek), so it makes sense to maintain the banks and build with them, rather than against them. I also like the idea of walking "deeper" into the park as this tends to push further away from the roads and can make me feel like I'm closer to nature.
- best chance for soccer fields, basketball courts, playground and picnic place
- Property funding, maintenance and amenities could be more readily funded without as much dependence on additional city revenue
- place for fields
- Best one
- playgrounds
- Big field
- It shows more trails than the square.
- Good plan
- best one
- Whichever one can allow for pickleball courts
- Something for everyone
- One can see far across the park, making it feel expansive. Can view more of the park offerings from alone spot.

- layout
- Sloping allows for geographical change, Scenic views
- Allows for more overall usable space
- I like the idea of supporting a large amount of recreation as well as making it seem extra friendly for families with young children
- Seems to be a good one.
- Don't know
- Like the option that has a dedicated field space. Great for impromptu games of soccer or ultimate Frisbee.
- Sports Field
- We need more synthetic turf fields and pickleball courts.
- Only one that includes sports field...but need more of them. Not just one.
- The only one that included what our city needs....sports field. However, one field is not enough.
- It's somehow the only one with a sports field.
- There is space created for a sports field.
- Sports field and multiple parking lots
- I thought it or the 10 acre square sight gave the most flexibility and accessibility.
- Like it
- Most inclusive to all walks of life (pun intended)
- Maintains the most existing trees.
- Tualatin desperately needs more outdoor sports options for kids. More basketball courts, baseball field options, more opportunities/locations to play
- not enough parking to have a large sports field on the 10 acre square site. Prefer some sloping for visual interest
- most stuff
- Because you can fit a baseball / soccer field complex
- More sports fields!!!
- Would like to see an example with a new concept. This looks like Jurgens. Take this opportunity to create something Tualatin does have. Add multiple soccer fields or a four plex baseball/softball area for youth. Adults have opportunities to play tennis and pickle ball at Jurgens. Please make our town competitive with the surrounding towns that put their youths needs first.
- Sports fields
- Great park design but not what we need.
- Just like it
- Best field
- I think they all are terrible. Tualatin needs more sports fields why not put some in the area
- This plan has the most things for family to do.
- We are in desperate need of additional sports fields for our youth. It is so important to give kids the opportunity to play different sports but that will never happen if there aren't enough fields to go around for the different sports. The spring is especially hard because there's softball, baseball, lacrosse and soccer all needing a place to practice/play and the grass fields are unusable until the end of March usually.
- The stuff in it.
- Sloping

- More sports field space.
- Has 1 sports field. However, we need to make more sports fields a priority.
- Please read what the majority of the comments focus on...youth sports.
- 1 of the 4 options actually has a sports field in it.
- Best for walking
- I don't like a steep slope so I picked the flat.

6. Once land has been acquired there will be a community planning process to select the elements for a future park. The community will chose items such as a playground, sport court, trails, picnic shelters, natural area, green space etc. Is there an element you feel should be added to the list?

- playground, trails, area for sports
- Sports complex
- I don't understand why their are less parking spaces for a 10 acre plot then a five acre plot?!?
- Skate park, basketball courts, fitness course
- As I mentioned before, "dedicated" pickleball courts.
- NO. Just Sports Fields! Every site plan I see here has a lack of parking and a lot of unused space. If you are adding a bunch of new people to the area shouldn't you proportionally add parks area?
- Large, multipurpose, and versatile sports fields with adequate parking are required to meet community needs. Provide night lighting if not located next to residential areas, otherwise don't. Wide pathways in parks link the facilities and are attractions in their own rite by supporting walking and a safe place for children to ride bikes. And, as mentioned parks are a great place to integrate public art to enhance all the users experience.
- Water park. Something like the commons.
- No, you have an inclusive list already!
- Yes.
- skating and spray park
- more fields
- Skating area and spray park
- community gardens
- Easy bike accessibility
- Fitness course
- Dedicated pickleball courts please!
- Native plant garden, share plants. Water feature for children.
- soccer fields and skating
- Natural playground/play areas (as seen in several adjacent cities), refuge or wildlife habitat viewing area, area to acknowledge and teach about native land and original/rightful inhabitants
- This all sounds great, can't think of any additional elements currently.
- Sports courts and fields
- Playgrounds
- Things find at other parks.
- Things for kids and family's to do.
- Tennis and pickleball courts (set up for both, combined is good)

- Synthetic turf sports complex
- We need more synthetic turf fields and pickleball courts.
- Need more sports fields.
- More sports fields.
- A sports complex
- A sports complex. Not just 1 field.
- Splash pad, art features, and modern playground
- Splash pad
- BMX track
- Skating
- Chess area :)
- Wetlands/preserved natural areas.
- Splash pads for summer play
- covered picnic/rest area, safety lighting at night
- futsal courts
- Baseball and soccer turf fields. This can be used for softball, football, lacrosse, camps, and any outdoor fitness training.
- More sports fields!!!
- Turf baseball complex
- Baseball softball field
- Youth baseball/softball complex turf
- Juniors/seniors field with soccer fields and tball fields in the outfield
- Multiple soccer/football lacrosse fields
- Multi use turf fields for recreation
- Frisbee golf
- Love it
- More space for soccer fields.
- More soccer and sports fields. Kids are playing on poor park and school fields. City needs safe year round fields for kids.
- Baseball fields, soccer fields
- Bigger playgrounds, more basketball courts, a skating place and fountain and wading pool for kids.
- Yes, we desperately need a public (non school district) multi-use turf field with lights similar to Snyder Park in Sherwood and Hazelia Park in Lake Oswego. Additional futsal courts would be great as well.
- Vegetable gardens and butterfly garden.
- Trees
- No. Seems like what is at other parks.
- Sports complex!
- Sports complex!!
- A multi-use sports complex that would bring families and revenue to Tualatin.
- Thanks for listening
- Tualatin parks really need to step it up. Play structures need to be well thought out.

SURVEY #3 RESULTS - BASALT CREEK PARKS & RECREATION DRAFT PLAN PUBLIC

REVIEW & SURVEY INPUT | NOV 12 - DEC 5, 2021

Basalt Creek Draft Plan Comments

(Emails & Phone Calls)

#1 - 11/12/21 – Eric Johnson with property in the Tonquin Industrial Group area called to say he does not want trail to be shown on his property. This is the Metro proposed Sherwood to Sandy trail under the Bonneville Power Lines. Rich Mueller contacted Eric Johnson back with information on the origin of this trail and that the plan will only show this in the Basalt Creek planning area, and removed from his property.

#2 - 11/22/21 – John and Grace Lucini email with response:
From: Rich Mueller
Sent: Tuesday, November 30, 2021 3:56 PM
To: G Lucini
Cc: Ross Hoover <rhoover@tualatin.gov>; John Lucini
Subject: RE: Submission of Citizens Comments- Basalt Creek Parks & Recreation-Master Plan City of Tualatin

Hi Grace,

Thank you for your comments and input regarding Basalt Creek Parks & Recreation Plan. This high level plan does not address operational procedures and regulations, which are part of future park planning phases. Your questions about operational processes and procedures will be addressed when planning occurs for a specific park site or trail section. I refer you to the Community Development Department for questions about planning procedures and land use in Basalt Creek.

At this time a Council presentation about the parks and trail plan is scheduled during work session on January 10, 2022, and consideration of acceptance at the January 24, 2022 meeting during general business. The plan adoption is expected to be considered in the winter or spring 2022.

Thanks,

Rich Mueller Parks Planning & Development Manager City of Tualatin | Parks & Recreation Department 18880 SW Martinazzi Ave | Located at 8515 SW Tualatin Road, Tualatin, OR 97062 Phone: 503.691.3064 | Fax: 503.691.9786 www.tualatinoregon.gov

From: G Lucini Sent: Sunday, November 21, 2021 11:18 PM To: Rich Mueller <rmueller@tualatin.gov> Cc: Ross Hoover <rhoover@tualatin.gov>; John Lucini Subject: Submission of Citizens Comments- Basalt Creek Parks & Recreation- Master Plan City of Tualatin

Please accept this submission of our Citizen Comments as part of the Public Record for the proposed Basalt Creek Tualatin Parks & Recreation Master Plan.

Our comments are provided within the attached PDF file. Please let us know if you have any difficulty in opening the file.

We have included at the end of our Comments 3 specific requests for information from the City:

•Would you let us know when this proposed Master Plan will be presented for review and hearing by the City?

•Will the City of Tualatin Planning Commission be the Governing Body, or will this be presented and heard by the City of Tualatin City Council?

•As Interested Persons, we submit in writing a request to be Notified of future Public Meetings for this proposed Land Use Action. Our contact information is provided within our submission.

We look forward to receiving a response to these requests for information.

Respectfully submitted, John and Grace Lucini

#3 – Marissa Houlberg with response From: Rich Mueller Sent: Wednesday, December 01, 2021 12:56 PM To: Subject: RE: Final Basalt Creek Survey

Hi Marissa,

Thank you for your Basalt Creek area parks and recreation survey comments, information and inquiry. I have responded to your questions below.

How will nature trails/expanded walkways cross busy streets? The on street paths or wide sidewalks are expected to cross at traffic lights on Boones Ferry, and traffic light or designated pedestrian crossing on Grahams Ferry. For the off street north south trail along the canyon, the plan is to go under Basalt Creek Parkway toward Wilsonville. The Basalt Creek Parkway shown on the trail map is from Washington County. We are not proposing street locations in our plan, but including county and city planned or proposed streets so that active transportation for pedestrians and bikes are considered to be included when future streets are designed/constructed.

How will the park and connecting trails address traffic congestion? We don't have a park location at this time, but the intent is for a smaller neighborhood park (up to 10 acres) to serve the Basalt Creek neighborhood and business area with minimal traffic impacts. The plan includes a trailhead with off street parking in the industrial east side of Basalt Creek.

Should the legend cover almost a quarter of the map? This map came from another plan, and will see about adjusting. Thanks for catching and bring to our attention.

Stormwater facilities on the east side; does the land itself transfer to the city? In other words, the city maintains them do they also own the facility land? I understand that the two storm facilities are public, and once the developer builds them, the city receives these facilities as tracts during the subdivision plat process. The city will then own and maintain these storm facilities.

Thanks again for taking time to review and providing valuable input on the plan.

Rich Mueller Parks Planning & Development Manager City of Tualatin | Parks & Recreation Department 18880 SW Martinazzi Ave | Located at 8515 SW Tualatin Road, Tualatin, OR 97062 Phone: 503.691.3064 | Fax: 503.691.9786 www.tualatinoregon.gov

-----Original Message-----From: Rich Mueller Sent: Tuesday, November 30, 2021 1:05 PM To: Marissa Houlberg Cc: Kyla Cesca <kcesca@tualatin.gov> Subject: RE: Final Basalt Creek Survey

Hi Marissa,

Thank you for providing comments and input. Yes, we received and will respond to your questions this week.

Thanks,

Rich Mueller Parks Planning & Development Manager City of Tualatin | Parks & Recreation Department 18880 SW Martinazzi Ave | Located at 8515 SW Tualatin Road, Tualatin, OR 97062 Phone: 503.691.3064 | Fax: 503.691.9786 www.tualatinoregon.gov

-----Original Message-----From: Marissa Houlberg Sent: Saturday, November 27, 2021 8:17 PM To: Rich Mueller <rmueller@tualatin.gov> Subject: Final Basalt Creek Survey

I am hoping my survey response was received. I 'submitted' the complete survey but did not close the tab. Later a message appeared, 'update' and then the survey appeared with the responses cleared. So I am hoping you received my responses!

Marissa

#4 – 12/3/21 Email from Jim Odoms From: Jim Odoms Sent: Friday, December 3, 2021 3:37 PM To: Kyla Cesca <kcesca@tualatin.gov> Subject: Re: Last Chance!

Scrap this entire proposal. It is not necessary as there are ample parks/green spaces in the area. Also, there is no funding for this project. Eventually this will show up on our tax bill which is already too high.

From: City of Tualatin <kcesca@tualatin.gov> Sent: Thursday, December 02, 2021 7:50 AM To: Jim Odoms Subject: Last Chance!

11-21-2021 FOR THE PUBLIC RECORD

TO: Rich Mueller, Parks Planning & Development Manager City of Tualatin Parks & Recreation

Cc: Ross Hoover, Parks Director City of Tualatin Parks & Recreation

FROM: John and Grace Lucini

RE: Citizen Comments - Proposed Basalt Creek Parks & Recreation Master Plan

(Please forward this submission of Citizen Comments regarding an active Land Use Action by the City of Tualatin to the appropriate City Department for inclusion in the City's Land Use Adoption process and for review by the Governing Body)

We appreciate the opportunity to provide comments on the draft of City of Tualatin Parks and Recreation Master Planning for the Basalt Creek Area. It is apparent much and effort has been spent developing this draft.

As potentially directly affected property owners in the Basalt Creek Area, we also appreciated the efforts of the Parks and Recreation Department in reaching out to hold a Basalt Creek property owners Stakeholders Community Meeting on 9-9-2021 during the development of this Master Plan for the Basalt Creek Area. Attached to the end of our Citizen Comments, is a brief summarization of the issues and concerns which we heard expressed by Basalt Creek property owners during that 9-9-2021 Stakeholder's meeting. (Please see APPENDIX #2

9-9-2021 City Of Tualatin Basalt Creek Stakeholders-Property Owners Meeting 9-9-2021 -Ibach Park - Various Points Of Discussion We Heard)

Purposeful Land Use Planning is critical to produce high satisfaction recreational opportunities in a safe manner for all users of the parks and/or their facilities for long term use and preservation for future generations. Oregon Statewide Land Use Planning Goals #1, 2, 5, 6, 7, 8 and 10, 11, and 12 are relevant to this Land Use Planning effort. Goals #5 and #6 are particularly applicable as this Land Use Planning requirement is specific to protection and conservation of various natural Resources AND OPEN SPACES which have been in abundance in the Basalt Creek Area- and particularly within the Basalt Creek Canyon area.

We note the draft of this regional Master Plan for the Basalt Creek Area, states additional Public Master Planning of individual Parks and Trails in the Basalt Creek Area would be conducted by the City- which we support.

The comments provided within this submission may be applicable to this regional Master Plan or should be applied to the individual Master Planning of the future Parks and Trails in the Basalt Creek Area. If there are issues which will be shared throughout the Basalt Creek Area, it would seem appropriate that this regional Master Plan for the Basalt Creek Area would be the most appropriate Land Use Planning document to address common regional issues. This provides a strong framework upon which future individual Master Plans can build upon, provides for consistency of Land Use Planning within the region and provides for efficiency in future individual Land Use Planning for individual projects.

It is hoped the Land Use planning for these future individual Parks and Trails will require and provide strong and consistent outreach, input and integration of feedback from Basalt Creek Area property owners for long term success of this Master Plan and of the individual projects.

POINTS OF CONCERN:

PROVISION OF PUBLIC SERVICES:

TRANSPORTATION:

11-21-2021 LUCINI COMMENTS- DRAFT BASALT CREEK PARKS & REC MASTER PLAN PAGE 1 OF 23

- Additional information is needed within this regional Master Plan to give clear guidance on the planning requirements for the successful integration of traffic impacts caused by the future projects allowed by this Master Plan.
- The draft narrative briefly identified issues with congestion on SW Boones Ferry Road. However, this
 Master Plan does not provide specific goals and mechanisms to evaluate and mitigate impact on both
 local roads and on Boones Ferry, Grahams Ferry, and Day Road for types of parks anticipated to have
 scheduled events (such as sports fields with scheduled games or practices or larger event spaces) which
 may cause peak numbers of vehicles coming and leaving future parks during commute hours-and
 exacerbate local and regional traffic issues which already exist during commute hours.
- Little information is provided within this draft on specific actions to be used in planning future parks and trails in the Basalt Creek Area authorized by this Master Plan- to mitigate negative impacts of parking lots as to size, shape, lighting, noise and drainage, surface material, trash and location upon the surrounding environment and wildlife.
- Minimal information is provided as to impacts which may occur within the Basalt Creek Area due to the
 ongoing plans of Washington County to construct the Basalt Creek Parkway Extension across the entire
 southern border of the City's planning area- including a bridge across the Basalt Creek Canyon- where
 this Master Plan identifies a high percentage of future Parks and Trails will be located.
 - The Master Plan should identify potential impacts on planning future parks and trails not only due to changes in traffic flow, but also impacts to future Parks and Trails by additional stormwater, noise or air pollution.
 - The Master Plan should also identify potential collaboration or competition on use of lands within this Master Plan's "Central Area". If the County locates a stormwater collection within the City of Tualatin's planning area, this basin this may impact the City's planning of future parks. There may also be a potential for integration of a stormwater basin developed by the County into the City's future Parks or Trails. These issues should be specifically identified within this regional Master Planning document.

PUBLIC SAFETY: DEVELOPMENT AND ENFORCEMENT OF RULES AND REGULATIONS-

This regional master plan needs to identify specific methods to be used to develop clear coordinated, integrated, consistent rules and regulations/limitations of future public parks and trails within the Basalt Creek Area-

- Due to stated plans for interconnection of trails with those of other local governments, this Master Plan should provide specifics as to the importance of-and actions which should be taken- to ensure the consistency, coordination and integration of rules and limitations to be applied to trails which connect to trails of other jurisdictions- throughout the region.
- This regional Master Plan should provide clear guidance and mechanisms on:
 - how the Public will be informed of any restrictions or limitations of use for all future parks or trails in the Basalt Creek Area- in a consistent manner in a regionally centralized location as well as at individual sites.
 - to avoid unintentional misuse regionally and at site locations, this Master Plan should identify a standardized method to provide potential users easily accessible information on restrictions or limitations if preplanning use any of the parks or trails.

- This regional Master Plan should include specifics how the health and welfare of citizens, property and the environment will be regionally planned and provided for planning future parks and trails throughout the entire the Basalt Creek Area- again to provide for consistency in goals and implementation.
 - How and when will Rules and Limitations on future Parks and Trails in the Basalt Creek Area be determined.
 - Which limitations or prohibitions will be universal to all parks and trails?
 - Which limitations or prohibitions be determined during the planning of individual projects or project types?
 - Clarity is needed as to the criteria which should be used for determining limitations or prohibitions on future parks and trails- to be applied in a consistent and thoughtful manner throughout the Basalt Creek Area
 - How will hours of use be determined?
 - Will overnight camping, creation of unplanned/unauthorized trails, use of firearms (an activity which occurs occasionally within the area), or littering be allowed in a future park or on a trail in the Basalt Creek Area?
 - What criteria will determine if dogs or bicycles etc. will be allowed, limited, or prohibited in specific areas?
 - This Master Plan should identify what impacts of funding may impact the planning of future park or trail use (i.e., Will Metro place limitations on dogs in Natural Areas)
 - The draft does not comment upon additional funding for planned routine and continuous Police monitoring which will be more challenging due to due to impacts of topography and vegetation.
 - This regional Master Plan does not provide information as to how various local governments will determine who will fund and provide for Public Safety Services- including Police, fire and emergency medical services on interconnecting trails between various jurisdictions.
 - This regional Master Plan does not provide information or guidance as to what actions the City should take to help ensure the privacy and freedom from trespass for local property owners within the Basalt Creek Area-relating to the planning of future parks and trails within the area.
 - This is an important issue, as most of the land within the Basalt Creek Area is currently not within the City Limits.
 - Clarity should be provided within this regional Master Plan for the Basalt Creek Area as to the regulations pertaining to the protections should be provided to local property owners with specifications as to which local jurisdiction the protections are applicable in the planning process; and which jurisdiction will be implementing the protections and enforcing violations.

The scope of this regional Master Plan of the Basalt Creek Area includes multiple Natural Resources which the City intends to incorporate and utilize in the planning for future Public Parks and Trails. However, the City lacks identification of multiple Natural Resources in the Basalt Creek Area in the **City's adopted Natural Resource Map 72-1: Natural Resources Protection Overlay District (NRPO) and Greenway Locations and Map 72-3: Significant Natural Resources**

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(Please see APPENDIX #4 Maps 72-1 and 72-3)

How will the rules or limitations for future Parks and Trails in the Basalt Creek Area be developed for the protection and conservation of Natural Resources in the Basalt Creek Area?

How will the rules or limitations for the protection of Natural Resources in the Basalt Creek Area be enforceable when the City's adopted Natural Resource Maps 72-1 and 72-3- which do not provide relevant information as to the existence of various Goal #5 and Title #13 Natural Resources in the Basalt Creek Area which are to be protected?

DOGS in NATURAL AREAS. Basalt Creek Area is rich in many Natural Resources which can be negatively impacted by inadequate Land Use Planning.

This draft of a Master Plan for planning the future developments of individual parks and trails in the Basalt Creek Area specifically identifies opportunities for various future dog parks to be planned for the "Central Area' of the Basalt Creek Area- in the Central Planning area.

Yet, this regional planning document for future Public Parks and Trails in the Basalt Creek Area does not address nor provide relevant or educational information identified in Literature Studies- including reviews and studies published by Metro and the Oregon State Legislature -which recognize the I negative impacts caused by dogs on natural resources, local waters, and on wildlife.

Nor does this regional Master Plan identify and address the conflicting plans to locate multiple dog parks in the Basalt Creek Central Area -which contains the highest valued habitats and the largest amount of wetlands of the three planning areas identified in this draft. (Please see APPENDIX #1

5-10-2021 On Site Visit By City Of Tualatin Parks & Rec Department & Consultantshttps://www.oregonmetro.gov/recreation-ecology-literature-review https://www.oregonmetro.gov/sites/default/files/2017/09/28/impacts-of-dogs-on-wildlife-water-quality-science-review.pdf}

This draft of a Regional Master Plan lacks criteria on areas where dogs will be limited or prohibited.

- Regional Plan lacks clear guidance or actions which will be required to mitigate the negative impacts of dogs- including if leashes will be required (except in specifically identified off leash areas).
- Regional Plan lacks clearly stated goals and methods of implementation for continuous and routine funding for additional services for any future parks and trails in the Basalt Creek Area- including designated off leash areas- for cleanup and removal of dog excrements and any needed treatment of the soil.

A reality should be acknowledged, that while most dog owners are thoughtful citizens, not all dog owners will pick up and dispose of solid dog waste in the appropriate or directed manner. Citizens also have limited ability to control where dogs urinate and have even less ability to remove the impacts of dog urine from the environment.

As a lifelong dog owner of many dogs, and having known the multiple joys of their companionship, I also realize the need for careful thoughtful planning of dog parks and the multiple negative impacts dogs have on the environment. The City should include within this Master Planning document- specific planning actions which will minimize the negative impacts of dogs to the environment and wildlife in the Basalt Creek Area - to help preserve the health and longevity of the natural resources the City is planning to exploit when locating parks and trails in the Basalt Creek Canyon Area.

ASSESSMENT OF EXISTING CONDITIONS & INFRASTRUCTURE- PART OF MASTER PLANNING

Over the years, various levels of City staff have commented that required assessments and analysis of the existing conditions of the Basalt Creek Area will be done as development begins in the Basalt Creek Area.

The development in the Basalt Creek Area has already begun.

CITY LACKS MANDATED REGIONAL STORMWATER MASTER PLAN FOR BASALT CREEK AREA. -THIS MAJOR CONSTRAINT ON EFFECTIVE LAND USE PLANNING FOR THE BASALT CREEK AREA IS NOT IDENTIFIED IN THIS DRAFT OF A REGIONAL LAND USE MASTER PLAN FOR THE BASALT CREEK AREA AND WILL BE A CONSTRAINT ON EFFECTIVE LAND USE PLANNING FOR FUTURE INDIVIDUAL PARK DEVELOPMENT PROJECTS.

- Tualatin has a population over 2,500 and is required to adopt a Stormwater Management Plan for the Basalt Creek Area and has not yet complied with the State's requirements for the Basalt Creek Area. This State mandated document is a critical tool in regional Land Use Planning, and the information is needed for appropriate Land Use planning for individual parks and trails in the Basalt Creek Area in the future.
- The City is proposing a regional Land Use Master Plan for the Basalt Creek Area- while knowing the City lacks an adopted Stormwater Management Plan for the Basalt Creek Area.
 - At what time will the City stop kicking the can down the road and adopt a regional Stormwater Management plan for the Basalt Creek Area as required by the State?
 - The City now indicates a budget line item for 2021-22 for the intention to start the development of a Stormwater Management Plan for the Basalt Creek Area. The reality is the City will most likely not have an adopted Stormwater Management Plan for the Basalt Creek Area within the next year-within the timeframe the City would want to adopt and implement this Master Plan.
 - Or will the City wait to adopt a regional Master Plan for the Basalt Creek Area which is intended to direct the creation of future Public Facilities and Public Uses of land -which contain significant steep slopes, high valued habitats and significant wetlands- until the City adopts a Stormwater Management Plan for the Basalt Creek Area?
 - The lack of a well written Stormwater Management Plan for the Basalt Creek Area increases the need for this regional Master Plan to provide clear acknowledgement of the issue, and guidance on specific mechanisms the City will take to protect citizens, property, water quality and other Natural Resources throughout the region, and to mitigate potential Natural Hazards within the region when planning for future parks or trails in the Basalt Creek Area

RELATED ISSUES OF EXISTING CONDITIONS INCREASING NATURAL HAZARD RISKS IN BASALT CREEK AREA-NOT ADDRESSED IN DRAFT

- The highest percentage of future parks and trail are identified to be located within the "Central" Basalt Creek- which also has the steepest slopes and land instability concerns within the Basalt Creek Area.
- The draft of the Master Plan includes an "Existing Conditions Map" (page 35).
 - However, this map lacks needed information on steep slopes which exceed 25%- which is a much greater and significant limitation and constraint for Land Use Planning than when quantified and included with other slopes which are of 10% grade or greater.
 - The slopes which are 25% or more- have greater land stability issues, drainage issues, erosion issues and water quality issues, Natural Hazard concerns, and ADA mitigation issues.

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- The Map of "Existing Conditions" provides inadequate basic information necessary for the planning of future Parks and Trails in the Basalt Creek Area.
- These are all significant elements of Land Use Planning which the City should be including within this
 regional Master Plan to guide in siting the location of future Parks and trails in the Basalt Creek Area. The
 City has a responsibility for the protection and safety of citizens and property from Natural Hazards,
 including the identification of potential land instability issues, and related impacts of stormwater drainage
 which may potentiate land instability issues. The future locations of Public Parks and Trails may either
 impact or be impacted by land instability issues in the Basalt Creek Area.

ADDITIONAL ISSUES WITH CITY MANDATES TO PROTECT AND CONSERVE NATURAL RESOURCES and OPEN SPACE IN BASALT CREEK AREA

While the proposed Basalt Creek Master Plan for future Parks and Trails states goals of Steward the City's cultural and natural resources", the proposed draft provides inadequate documentation of the Natural Resources within the Basalt Creek Area.

The proposed Master Plan for the Basalt Creek Area provides little guidance or specific actions as to how the City will be a good steward in protecting and conserving the Natural Resources AND OPEN SPACES identified in Oregon Statewide Land Use Goal #5

The City has been charged with the requirement to protect and conserve various Natural Resources AND OPEN SPACE in Oregon Statewide Land Use Goal #5 and OAR 660-023-0000.

To protect natural resources and conserve scenic and historic areas and open spaces. Local governments shall adopt programs that will protect natural resources and conserve scenic, historic and open space resources for present and future generations. These resources promote a healthy environment and natural landscape that contributes to Oregon's livability. (Please see APPENDIX #3- Guidelines and Implementation Goal #5 Open Space)

There are additional Federal, State and Metro mandates for the protection of Natural Resources- including water and air

- The Federal government, the State of Oregon, and Metro have all documented multiple Natural Resources exist in the Basalt Creek Area.
- The City has adopted a one map system. The adopted maps with a one map system which serves as both the comp plan map and the zoning map.
- The City's adopted Natural Resource Map 72-1: Natural Resources Protection Overlay District (NRPO) and Greenway Locations and Map 72-3: Significant Natural Resources (attached) do NOT provide clear and standardize documentation of the Goal #5 Natural Resources or Title #13 Resources within the Basalt Creek Area as provided for other lands within these maps of the City's planning area.
 - The map included within the proposed Master Plan on Page 35 is not consistent with the information contained within the City's official and adopted Significant Natural Resources Map 72-1,
 - The City has not yet adopted a designated Protection Overlay District (NRPO) within the Basalt Creek Area- although the Natural Resources identified by other Federal, State and Metro Maps appear to provide justification as to lands which should hold this designation -and should be provided additional protections.

Many City levels of City staff have commented that the City will be requiring the developers in the Basalt Creek area to conduct their own Goal #5 Natural Resources Inventory as part of planning of the development.

- The City of Tualatin may be one of the developers of the future Public Parks and Trails within the Basalt Creek Area, and as such would be among the developers required to conduct a Goal #5 inventory as part of the regional planning of future individual parks and trails in the Basalt Creek Area.
 - Lacking the identification of the various Goal #5 Natural Resources in the Basalt Creek Area within the City's adopted maps 72-1 and 72-3,
 - it is questionable if City Codes intended to protect and conserve the various Natural Resources and reduce the impacts of erosion and stormwater drainage within the City - will also protect and conserve the various Natural Resources within the Basalt Creek which are not identified within these adopted Natural Resource Maps of the City.
 - it is questionable how the proposed regional Master Plan for planning future Parks and Trails the Basalt Creek Area will ensure the protection and conservation of multiple Natural Resources in the Basalt Creek Area.
 - If the City Maps do not provide relevant information as to Natural Resources in the Basalt Creek Area- how does this Master Plan identify where multiple known Natural Resources are located in the Basalt Creek Area- what documents does this Master Plan include to provide clear guidance for future planning?
 - Where is the inventory and data on the quality and conditions of the Natural Resources in the Basalt Creek Area- which the State and City Codes utilize to determine the amount of buffer zone require for various Natural Resources?
 - This draft of the Master Plan does not address nor provide specific mechanisms or guidance as to how or when future parks or trails in the Central Area will demonstrate compliance to Goal #5 requirements in the Basalt Creek Area- while lacking needed information which should be contained within the City's Natural Resource Maps 72-1 and 72-3.
 - This draft of the Master Plan which is to provide guidance and direction for future planning of individual Parks and Trails in the Basalt Creek Area does not provide information or data to clearly identify
 - The type, location and condition of various Natural Resources the City is required to protect and conserve
 - \circ $\;$ Lands which are identified as having Significant Natural Resources
 - Land which has been designated within a Protection Overlay District- or should be considered for inclusion in a Protection Overlay District in future Land Use Planning
 - The amount of buffer zone protection required for these resources' dependent upon the quality and quantity at each location.
 - Criteria which would prohibit or limit the location of future Parks or Trails in the Basalt Creek Area - due to existing conditions
 - Will this regional Master Plan for future Parks and Trails in the Basalt Creek Area acknowledge the need and goal for preservation and conservation of Open Space for future generations -as presented in Oregon Statewide Planning Goal #5? (Please See APPENDIX #3)
- 11-21-2021 LUCINI COMMENTS- DRAFT BASALT CREEK PARKS & REC MASTER PLAN PAGE 7 OF 23

State Of Oregon Statewide Land Use Planning Goal #5 -Guidelines And Implementation -Open Space)

- The City has yet to identify and designate Significant Natural Resources and/or Protection Overlay District (NRPO) within the Basalt Creek Area within the City's Maps 72-1 and 72-3.
- Yet it is apparent, the City is attempting to exploit the advantages of these various multiple Natural Resources which exist in the Basalt Creek Area for future Parks, Trails for various types of recreational activities.
- The need for open space in the regional planning of Parks and Trails in the Basalt Creek Area should be determined, and standards developed for the amount, distribution, and type of open space.
- The City cannot abdicate its responsibility within this regional Master Plan for addressing and providing guidance for the protection and conservation of Natural Resource AND OPEN SPACE.

PUBLIC EDUCATION COMPONENT:

This draft of the regional Master Planning for future Parks and Trails in the Basalt Creek Area, commented upon the provision of environmental educational. The City's Parks and Recreation Department is losing out on a wonderful opportunity to provide clear guidance and a strong framework upon which the Department and the City can create multiple types of educational opportunities - to include environmental education, but to also provide other additional educational opportunities for urban families. This Master Plan should expand upon how this Master Plan can establish the authority for and help develop and foster various educational opportunities to be created during the Land Use Planning of local Parks.

Topics for inclusion in Public Education component of this Master Plan could include a spectrum of potential topics and goals:

- Information on the creation of the Canyon Area- how the Canyon has provided a rich habitat for wildlife
- Discussion on the importance and need for protection and conservation of various Natural Resources found within the Basalt Creek Area
- How can park and trail users help in the protection and conservation of the local Natural Resourceswhen using the Parks and Trails- including staying on trails and not creating unauthorized trails.
- Provide understanding for why specific limitations on use of the future Parks or Trails- help protect and conserve Natural Resources
- Provide for continuing courses on native plants, and hands on opportunities for families to help restore
 native habitats within the Basalt Creek Area, or for growing their own native plants at home.
- Round Table discussions on social planning by the City (i.e., how the City works to provide public access to Natural Areas, while also providing protections of local property owners on trespass and privacy issues.)

This regional Master Plan should also identify and encourage a goal for educational components to be developed in the planning of future individual Parks - to be inclusive of all ages, races ethnicities and backgrounds; and to utilize multiple methods of outreach. This regional Master Plan should seek and develop methods to determine which languages educational information should be provided.

LAND USE PLANNING IN THE BASALT CREEK AREA BY THE CITY OF TUALATIN

For a successful outcome, the City of Tualatin will have to work with multiple property owners within the Basalt Creek Area- in the present and in the future. The City needs to be cognizant of their actions and the impacts upon Basalt Creek property owners - who may also be potential future City residents if they elect to annex their property into the City. Engaging and working cooperatively with Basalt Creek property owners in Land Use planning actions affecting the Basalt Creek Area will be the most likely path to the successful implementation of this and other Land Use Planning Actions the City will be taking in the urbanization of the Basalt Creek Area.

The large numbers of property owners who took the time to attend the 9-9-2021 Stakeholder's meeting, should be an indication to the City as to the level of concern there is within the community.

I also add, I heard skepticism expressed by more than one property owner questioning if attending the 9-9-2021 meeting or making comments regarding the Master Planning for Public Use would actually be heard or effective the City's Land Use planning actions.

The cynicism which Basalt Creek Property owners have expressed has some validity. The City's draft of the Basalt Creek Parks and Recreation Master Plan was posted for Public Review on 11-10-21. Embedded within the draft of the Master Plan were design plans very similar to two proposed Land Use action for multi acre developments within the Basalt Creek Area. Both of these Land Use Actions had not yet been to a hearing for adoption.

Yet on 11-10-2021 the site draft of the Basalt Creek Master Plan for Public Parks and Trails included maps with site designs very similar to the site design maps submitted for CPAH Variance requests VAR 21-0003, and the Autumn Sunrise CUP 21-0001 and Subdivision SB21-0001- neither of which at that time had been to Hearing yet were already embedded into the draft of the Basalt Creek Parks and Recreation Master Plan.

(Please APPENDIX #5 Similarities Of Maps Embedded In Proposed Master Plan & Maps Of Developer Requested Land Use Actions- Not Yet Presented To Governing Body For Acceptance By The City Of Tualatin)

The inclusion of site designs very similar to those developers had submitted but had not even been presented to the Governing Body for review was perhaps intended to indicate recent updated information and communication with local developers who have already annexed their property into the City.

However, there may be other perceptions as to the use of maps similar to unadopted developer site design maps into a proposed regional Master Plan.

- it gives the appearance that the outcomes of the developers proposed Land Use applications were already pre-determined by City staff prior to the hearings, and
- Land Use actions for several requested Land Use Actions by developers were already being integrated into City documents without involvement of Citizens, and outside the light of governmental process.

These types of actions by the City of Tualatin give credence -rightfully or wrongly-to citizens perceptions that Land Use actions impacting the Basalt Creek Area by the City of Tualatin may be pre-determined prior to full Citizen Involvement.

The City's inaction in identifying how Basalt Creek property owners can obtain equal participation within the City of Tualatin's Citizen Involvement programs -such as those provided to Citizens of the City of Tualatin through the City 's Citizen Involvement Organizations (CIO's) compounds the skepticism.

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Many property owners in the Basalt Creek Area are not citizens of the City of Tualatin, may not consider themselves a part of the fabric of the City of Tualatin, and may not be involved in the City's networking systems. It is hoped the City will make every effort though various types of outreach -to continue to connect and reconnect with citizens in the Basalt Creek Area. The City needs to make a strong effort to resolve or integrate concerns expressed by Basalt Creek property owners into this is Master Planning effort.

A follow-up stakeholder meeting with Basalt Creek property owners- prior to submitting this draft into the hearing process for adoption-could provide the City an opportunity to identify how the City has listened to concerns and taken actions to effect resolution of concerns regarding this regional Master Plan to gain additional support for this Master Plan.

Would you let us know when this proposed Master Plan will be presented for review and hearing by the City?

Will the City of Tualatin Planning Commission be the Determining Body, or will this be presented and heard by the City of Tualatin City Council?

We look forward to receiving a reply to these questions.

As Interested Persons, we submit in writing a request to be Notified of future Public Meetings for this Land Use Action. Our contact information is provided.

Grace Lucini John Lucini 23677 SW Boones Ferry Road, Tualatin OR 97062

Respectfully submitted,

John and Grace Lucini

APPENDICES:

- #1 5-10-2021 ON SITE VISIT BY CITY OF TUALATIN PARKS & REC DEPARTMENT & CONSULTANTS
- #2 9-9-2021 CITY OF TUALATIN BASALT CREEK PROPERTY OWNERS MEETING 9-9-2021 IBACH PARK- VARIOUS POINT OF DISCUSSION WE HEARD
- #3 STATE OF OREGON STATEWIDE LAND USE PLANNING GOAL #5 -GUIDELINES AND IMPLEMENTATION -OPEN SPACE
- #4 CITY OF TUALATIN ADOPTED NATURAL RESOURCE MAPS 72-1 AND 72-3 ORD 1418-19
- #5 SIMILARITIES OF MAPS EMBEDDED IN PROPOSED MASTER PLAN & MAPS OF DEVELOPER REQUESTED LAND USE ACTIONS - NOT YET PRESENTED TO GOVERNING BODY FOR ACCEPTANCE BY THE CITY OF TUALATIN

11-21-2021 LUCINI COMMENTS- DRAFT BASALT CREEK PARKS & REC MASTER PLAN PAGE 10 OF 23

APPENDIX #1

CITY OF TUALATIN PARKS AND RECREATION DEPARTMENT---BASALT CREEK MASTER PLANNING 5-10-2021 ONSITE VISIT- LUCINI PROPERTY 23677 SW BOONES FERRY ROAD TUALATIN OREGON ROSS HOOVER, RON MULLER, CITY CONSULTANT/S CITY OF TUALATIN

WRITTEN POINTS OF CONCERN PROVIDED AT SITE VISIT:

- 1. PROTECTION AND CONSERVATION OF NATURAL RESOURCES AND OPEN AREAS MANDATED
 - MULTIPLE NATURAL RESOURCES KNOWN TO EXIST WITHIN BASALT CREEK AREA
 - Basalt Creek Canyon is rich in multiple natural resources -not yet documented within natural resource maps adopted by the City of Tualatin
 - o Basalt Creek Canyon has extremes in topography, and is predisposed to high landslide susceptibility
 - Local existing stormwater management system and treatment facilities are limited in Basalt Creek Area designed and constructed for undeveloped lands- and not increased stormwater management needs associated with increased impervious surfaces with upstream urbanized development
 - NEED FOR COORDINATION BETWEEN WASHINGTON COUNTY, CITY OF TUALATIN AND CITY OF WILSONVILLE WITH
 OVERLAPPING JURISDICTIONS AND RESPONSIBILITIES DURING NEXT SEVERAL YEARS OF URBANIZATION OF THE
 ENTIRE BASALT CREEK CANYON AREA BY LOCAL CITIES
 - o Agreed upon recreational goals within Basalt Creek Area for future generations by all local governments
 - Clearly identified and coordinated accountability and responsibility- by each local government -during all phases of planning and implementation of recreational needs throughout years of transitioning as part of urbanization process
 - Coordinated and Identified Funding Needed for:
 - Intergovernmental Coordinated planning for Trail and Parks siting and design.
 - Intergovernmental Coordinated Planning of Type and Amount of recreational use.
 - Intergovernmental Coordinated land acquisition; construction; maintenance; with provision of continuous effective and safe public services (water, sewer, stormwater, trash, police) for entire Basalt Creek Area
 - Adoption of clearly identified uniform and consistent measures identified and coordinated to address potential public health issues:
 - Water born illnesses (i.e., cyanobacteria (harmful algae) blooms, giardia, e. Coli bacteria --mainly from dogs).
 - Drowning and/or potential physical injuries due to steep slopes and wetlands
 - Intergovernmental adoption of clearly identified and coordinated methods and funding methods for routine monitoring to identify and address potential negative impacts of humans or pet impacts upon known Natural Resources within the Basalt Creek Area
- 2. NEED FOR INCLUSION OF POTENTIALLY AFFECTED PROPERTY OWNERS DURING ALL PHASES OF LAND USE PLANNING- TO GAIN SUPPORT AND PARTICIPATION IN EFFECTING COMMON GOALS
- 3. CANYON HAS MORE GRADUAL GRADE FROM THE WEST SIDE- EASIER AND LESS EXPENSIVE CONSTRUCTION COSTS FOR ADA COMPLIANCE AND ACCESS INTO CANYON AREA
- 4. PROTECTION AND CONSERVATION OF NATURAL RESOURCES AND OPEN AREAS MANDATED
 - MULTIPLE NATURAL RESOURCES KNOWN TO EXIST WITHIN BASALT CREEK AREA

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- 6. CANYON HAS MORE GRADUAL GRADE FROM THE WEST SIDE- EASIER AND LESS EXPENSIVE CONSTRUCTION COSTS FOR ADA COMPLIANCE AND ACCESS INTO CANYON AREA

REFERENCES:

- https://www.oregonmetro.gov/recreation-ecology-literature-review
- https://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/RECREATION/HARMFULALGAEBLOOMS/Pages/Educat ionandOutreach.aspx
- <u>Factsheet: IMPACTS OF DOGS ON WILDLIFE 2019</u>
 <u>Excerpts from research publications literature reviews and science commentary</u>
 Compiled by ProtectNatureTO a coalition of over 20 nature- and stewardship-based organizations advocating for
 the protection of wildlife and natural areas across the City of Toronto
- 11-21-2021 LUCINI COMMENTS- DRAFT BASALT CREEK PARKS & REC MASTER PLAN PAGE 12 OF 23

In summary, people and their dogs disturb wildlife, and people are not always aware of or willing to acknowledge the significance of their own impacts. Wildlife perceive dogs as predators. Dogs subject wildlife to physical and temporal displacement from habitat, and dog scent repels wildlife with lingering impacts. Dogs disturb wildlife which can induce long-term stress, impact animals' immune systems and reduce reproduction. Dogs spread disease to and outright kill wildlife. People with dogs are much more detrimental to wildlife than people alone; off leash dogs are worse; and off-trail impacts are highest. Urban wildlife is subject to many human-induced stressors including habitat loss, degraded and fragmented habitat, impacts from a variety of user groups, roads, trails, infrastructure, noise and light pollution.

https://www.protectnatureto.org/wp-content/uploads/2019/10/Impacts-of-dogs-on-wildlife-Factsheet_PNTO_Oct_-2019.pdf Article attached

<u>The Impacts Of Dogs On Wildlife And Water Quality: A Literature Review</u> Compiled by Lori Hennings, Metro Parks and Nature, April 2016

The evidence that dogs negatively impact wildlife is overwhelming. It is clear that people with dogs – on leash or off – are much more detrimental to wildlife than people without dogs...

Under the Oregon Department of Environmental Quality (DEQ), Metro is a Designated Management Agency to protect water quality in compliance with the federal Clean Water Act. Limiting dog access at most natural areas is one of Metro's commitments to DEQ, because dog feces pollute water. Feces are often delivered to waterways through stormwater. The DEQ identifies pet waste as a significant contributor to one of the region's most ubiquitous and serious pollutants, E. coli bacteria. Contact with E. coli-polluted water can make people sick. Because dog waste can be a relatively simple source to reduce or eliminate exposure to E. coli, DEQ considers reducing or eliminating dog waste an important action item in jurisdictions' clean water implementation plans for the Willamette Basin watershed.

https://olis.oregonlegislature.gov/liz/2020R1/Downloads/CommitteeMeetingDocument/217728

MAPS ATTACHED:

- US Fish & Wildlife Service National Wetlands Inventory and Topographical
 Basalt Creek Area- FRESHWATER FORESTED/SHRUB WETLAND
- Oregon Statewide Wetlands Inventory- Basalt Creek Area PSS1A data (3 pages)
- Metro Basalt Creek- Title 13
- Metro Basalt Creek- UPLAND HABITATS; RIPARIAN HABITATS; SLOPES >10%; SLOPES >25% AND WETLANDS
- Metro Basalt Creek- SLOPES >10%; SLOPES >25% AND WETLANDS-Public Access from WEST SIDE OF CANYON
- Oregon State University- Basalt Creek Landslide Susceptibility
- Tapman Creek to Willamette River

APPENDIX #2

9-9-2021 CITY OF TUALATIN BASALT CREEK PROPERTY OWNERS MEETING 9-9-2021 IBACH PARK- VARIOUS POINT OF DISCUSSION WE HEARD:

- There were discrepancies between the City's previously stated plans for the Basalt Creek Area and what the consultants stated during the 9-9-21 meeting.
 - While the City is referencing the 2018 Parks Master Plan Update as the basis of their planning (which identifies 10-20+ acres of future Parks and Trails in the Basalt Creek Area,
 - o during the 9-9-21 meeting Rich said the City is now only looking at 10 acres
 - I asked Rich if the City would provide more clarification / documentation as to the apparent changes in planning.
- Another discrepancy between the possible locations of Public Trails. The Master Plan indicated a north south trail between Grahams Ferry and Boones Ferry Roads.
 - During the 9-9-21 meeting, when questions were asked about the location of a public trail within the Basalt Creek Canyon area- what I heard the City's Consultant's reply- was they were looking at the Tonquin Trail west of the Canyon.
 - They commented the trails were being considered for placement next to roads--- this is different than previously stated plans and then the City's 2018 Master Plan. Again- a significant discrepancy.

There were multiple issues discussed during the meeting-Major points:

- 20-30 property owners showed up at the City's meeting held on 9-9-21 at Ibach Park
- Majority of citizens attending the meeting have one or more acres of property within the Basalt Creek Area- several
 owning around 5-10 acres which represents a large amount of land within the Basalt Creek Area, and a fairly good
 turnout for a "neighborhood" meeting.

There were comments made regarding:

- the way the City is conducting the planning process, the need for potentially affected property owner continuous participation within the process- which <u>should not stop</u> with one "Focus Group" meeting,
- the City's stated reliance upon existing Citizen Involvement systems- and the lack of representation of Basalt Creek
 property owners in the City's various Citizen Involvement Groups (CIO's, Parks Advisory Committee, City Planning
 Commission), and lack of elected representation within the City's Land Use planning process.
- the lack of relevant information on the availability of funding to purchase land within the Basalt Creek Area- and the lack of a timeline as to when and how the City plans to acquire land for their planning of parks.
- the City's identification of almost the entirety of the Basalt Creek Area as potentially having Public Parks and Public Trails casting a shadow over properties in the Basalt Creek Area- and the ability to sell; the lack of information as to how the City will evaluate price of land they want for the extensive number of future parks and trails they plan to site in the Basalt Creek Area.
- The City and their consultants repeatedly discussing the need for a large Public Park including sports fields etc.referencing the numbers of people using the Ibach Park during the meeting.
 - Questions were then made by the attendees --- who are the intended users of the parks to be planned for the Basalt Creek Area?
 - There are two public schools within blocks of the area- both of these schools have extensive public land and ability to provide for various sports needs on lands which are still not developed within the school grounds
 - If the City plans to build a destination sports park in the Basalt Creek Area- it would be serving
 recreational needs outside of the local area and local citizens
 - If the City plans to build a destination sports park in the Basalt Creek Canyon Area- would draw
 additional traffic congestion during commute hours and parking needs within the Basalt Creek Area
 (especially if access would be from Boones Ferry Road.

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		•	This would compound the existing congestion on Boones Ferry Road; the additional traffic volume which will be a direct result of the City's planning for the 60+ acres of 300-400 residential units east of Boones Ferry Road; the additional traffic volume from Washington County's planned Basalt Creek Parkway Extension an intended regional freight expressway with major intersections at Grahams Ferry and Boones Ferry Roads.	
		•	If the City plans to build a destination sports park or other type of destination recreational park requiring large parking facilities, bathrooms, or other building structures in the Basalt Creek Canyon Area- would also increase impervious surfaces within lands which have high valued habitats and known issues of extremes in topography.	
			 The City has not identified Significant Natural Areas in the Basalt Creek Area within the City's Adopted Natural Resource Maps, has not adopted a stormwater management plan and has not conducted a Goal #5 Natural Resources Inventory within the Basalt Creek Area- which causes questions as to how the City can be asking what type of Parks and other recreational structures should be planned within the Basalt Creek Area when the basic required documents and assessments have not been adopted by the City. 	
			 It is unknown how the City will be determining where and what are significant resources in the Basalt Creek Area- the location or the quality or condition of the natural resources and the consequential amount of buffering space will be required around the natural resources- for the preservation and conservation of multiple natural resources known to exist within the Basalt Creek Area. 	
			 This rises a significant concern- the City has not yet publicly established within this parks and trails planning process within the Basalt Creek Areawhat land may or may not be appropriate for Public Use- due to environmental constraints 	
•	the City's planning and development of the Basalt Creek Area- and inequity issues as to where the City is indicating future park locations in the Basalt Creek Area			
	 the City is already planning the development of the 60+ acres of flat land east of Boones Ferry Road without major parks indicated <u>for Public use</u>- which shifts the lands for future Public Parks to the lands west of Boones Ferry Road. 			
		The City's posters presented during the 9-9-21 meeting indicated potential parks within the area east of Boones Ferry Road		
		0	the developers of 60+ acres of land east of Boones Ferry Road- <u>have not indicated plans for large</u> <u>parks for Public Use on their flat land</u> within the information provided during their Public Meetings.	
		0	the CPHA Affordable Housing Project east of Boones Ferry Road has stated the parks and play structures within their development are being planned only for use on 5 acres of land- <u>and will not be provided for Public use</u>	
		•	This planned action by the City of Tualatin provides increased the value and salability of the Autumn Sunrise Development east of Boones Ferry Road - as the developers can advertise close access to large Public Parks and Natural Area-	
		•	While shifting the burden to provide most of future <u>Public parks</u> to be accommodated on the properties east of Boones Ferry Road	
			 on to land which is owned by citizens-most of whom are not residents of the City nor represented within this Land Use Planning Process. 	
			 On to land, which is not as flat and appropriate sports fields, and has more extremes in topography and more Natural Resources which should be protected and conserved. 	
Several safety issues about planning public trails within Natural Areas were presented				
	0	 including questions as to how the City would address safety issues and health concerns which have developed along the Springwater Trail- a trail similar to what the City is considering. 		
	• There were additional safety issues expressed about parks located within steep terrain and areas with water and impacts upon water quality.			

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• There were several additional issues ... including concerns about the actual utility of the meeting-

- o if this Citizen Outreach Event was conducted just to fulfill a requirement,
- o if all the topics discussed during the meeting would be documented and presented to the Council members,
- desire expressed for the City to continue to meet with Basalt Creek property owners as part of the development of the Master Plan- and not just as one of many focus groups providing feedback.

APPENDIX #3

STATE OF OREGON LAND USE PLANNING GOAL #5 GUIDELINES & IMPLEMENTATION - OPEN SPACE

- The need for open space in the planning area should be determined, and standards developed for the amount, distribution, and type of open space.
- Criteria should be developed and utilized to determine what uses are consistent with open space values and to evaluate the effect of converting open space lands to inconsistent uses. The maintenance and development of open space in urban areas should be encouraged
- Plans providing for open space, scenic and historic areas and natural resources should consider as a
 major determinant the carrying capacity of the air, land and water resources of the planning area. The
 land conservation and development actions provided for by such plans should not exceed the carrying
 capacity of such resources

State of Oregon Goal #5 Open Space. Implementation

- Development should be planned and directed so as to conserve the needed amount of open space.
- The conservation of both renewable and non-renewable natural resources and physical limitations of the land should be used as the basis for determining the quantity, quality, location, rate and type of growth in the planning area.
- Fish and wildlife areas and habitats should be protected and managed in accordance with the Oregon Wildlife Commission's fish and wildlife management plans.
- Stream flow and water levels should be protected and managed at a level adequate for fish, wildlife, pollution abatement, recreation, aesthetics and agriculture.
- Significant natural areas that are historically, ecologically or scientifically unique, outstanding or important, including those identified by the State Natural Area Preserves Advisory Committee, should be inventoried and evaluated. Plans should provide for the preservation of natural areas consistent with an inventory of scientific, educational, ecological, and recreational needs for significant natural areas

APPENDIX #4 CITY OF TUALATIN NATURAL RESOURCE MAPS 72-1 AND 72-3

CITY OF TUALATIN ADOPTED NATURAL RESOURCE MAPS

PROTECTION OVERLAY DISTRICT (NRPO) AND GREENWAY LOCATIONS MAP 72-1

SIGNIFICANT NATURAL RESOURCES MAP 72-3

THESE MAPS OMIT SIGNIFICANT INFORMATION ON MULTIPLE NATURAL RESOURCES KNOWN TO EXIST WITHIN THE BASALT CREEK AREA

- STANDARDIZED EVALUATION OF THE CITY'S NATURAL RESOURCES IS NOT PROVIDED
- QUESTIONS ARISE AS TO APPLICABILITY OF THE CITY'S STATUTES WHICH UTILIZE OR REFERENCE THESE MAPS FOR LAND USE PLANNING IN THE BASALT CREEK AREA
- QUESTIONABLE ACCURACY OF IDENTIFICATION, LOCATION AND CONDITION OF NATURAL RESOURCES IN THE BASALT CREEK AREA WITHIN AN ADOPTED CITY MAP- NEEDED FOR PLANNING THE FUTURE LOCATIONS OF PARKS AND TRAILS IN THE BASALT CREEK AREA
 - ACCURATE DATA NECESSARY FOR DETERMINATION OF LOCATION AND AMOUNT PROTECTIVE BUFFERING ZONES FOR VARIOUS NATURAL RESOURCES
 - ACCURATE DATA NECESSARY TO EVALUATE IMPACT OF UPSTREAM AND DOWNSTREAM STORMWATER AND EROSION UPON WETLANDS WHEN DETERMINING FUTURE PARKS AND TRAILS IN THE BASALT CREEK AREA



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APPENDIX #5 SIMILARITIES OF MAPS EMBEDDED IN PROPOSED MASTER PLAN

& MAPS OF DEVELOPER REQUESTED LAND USE ACTIONS

- NOT YET PRESENTED TO GOVERNING BODY FOR ACCEPTANCE BY THE CITY OF TUALATIN

MAPS EMBEDDED INTO PROPOSED MASTER PLAN AND POSTED TO CITY'S OFFICIAL WEBSITE 11-10-2021

SIMILAR TO MAPS OF DEVELOPERS REQUESTS FOR LAND USE ACTIONS- WHICH HAD NOT YET BEEN TO HEARING

- HAS THE APPEARANCE CITY PREDETERMINATION OF ACCEPTANCE OF REQUESTED LAND USE ACTIONS
 WHICH HAVE NOT YET COMPLETED THE PUBLIC LAND USE PROCESS
- CLOUDS THE TRANSPARENCY OF THE GOVERNMENTAL PROCESS
- CAUSES QUESTIONS AS TO THE ABILITY OF CITIZENS TO HAVE AN IMPACT AND EFFECTIVELY PARTICIPATE IN CITIZEN
 INVOLVEMENT

AUTUMN SUNRISE MAPS-

3-22-2021- CITY ADOPTED MAP FOR AUTUMN SUNRISE PROPERTIES ORD 1454-21



11-10-2021- MAP EMBEDDED IN PROPOSED MASTER PLAN OF AUTUMN SUNRISE DEVELOPMENT





CPAH MAPS

4-26-2021 MAP OF CPAH PROPERTY WHEN ADOPTED INTO THE CITY Ordinance No. 1456-21 AN ORDINANCE ANNEXING TERRITORY AT 23500 SW BOONES FERRY ROAD TAX MAP 2S135D LOT 303, INTO THE CITY OF TUALATIN (ANN 20-0004)





From:	<u>G Lucini</u>
To:	Rich Mueller; Ross Hoover
Cc:	John Lucini
Subject:	Re: Submission of Citizens Comments- Basalt Creek Parks & Recreation- Master Plan City of Tualatin
Date:	Tuesday, December 14, 2021 4:28:10 PM
Attachments:	image003.png
	image002.png
	image.png

Hi Rich,

Thank you for providing the information as to the additional revisions made on the draft upon which the Public Comments were based, which we received this morning.

Perhaps I may be reading the text within Chapter 2 Existing Conditions & Site Analysis (page 32) incorrectly, but under Natural Features it states:

"The Basalt Creek Canyon is contained on the east side of residential parcels fronting Boones Ferry Road."

This is not accurate, and may lead to significant misunderstanding of the proposed Land Use Action and potential impacts - including local property owners.

It also identifies a major deficiency in accurate information as to the location, condition and value of various Natural Resources which are known to exist within the Basalt Creek Area, but not identified in the City's adopted Natural Resources Maps 72-1 and 72-3, which is extremely problematic in a Land Use Planning Action such as the proposed Parks And Recreation Master Plan for the Basalt Creek Area.

The text continues...

"Wetlands and permanently inundated areas are present in the lower half on the canyon."

This statement is not clear, and may be misleading as to the size, scope and importance of this Federally identified wetland to the flora and fauna which are dependent upon this Natural Resource.

It is not clear where the City obtained this information which is stated as fact in the proposed Master Plan.

There are significant discrepancies between what is currently stated in the proposed document as the existing conditions within the Basalt Creek Area, and what can be either seen by the naked eye, or substantiated by various authoritative resources- such as the Federal Government and Metro.

It is hoped the City will make clarifications regarding these issues during the presentation to the City's Parks Advisory Committee Meeting this evening, and make further clarifications within future revisious of this draft.

Additional supporting information regarding these issues is provided below:

#1 There are many existing family homes fronting Boones Ferry Road in the Basalt Creek Area within the scope of this document.

Relevant comments and facts regarding the existing conditions and the concerns of the citizens who currently own these lands should accurately and appropriately recognized

- 1. Contrary to what is stated within the proposed Master Plan, our home, and the other homes which front Boones Ferry Road- the Basalt Creek Canyon are located on the east side of the Canyon- not on the west side of the Canyon.
- 2. The wetlands within the Basalt Creek Canyon are a part of our backyard, and are also on the west side of our home- not the east
- 3. It is important that accurate information be included within the City's Master Planning for the Basalt Creek Area- due to some inaccurate and incomplete information contained within the City's adopted maps and documents- and the need for relevant accurate facts and concerns to be presented as part of the City's Land Use Planning process.
- 4. The City of Tualatin Parks and Recreation Department sought input from local residential property owners in a Stakeholder Meeting on 9-9-2021 which had an overwhelming attendance of 20-30 local residents.
 - It should be noted, due to the multiple questions and concerns expressed by these citizens these citizens (who own the property which the City is intending to establish Land Use planning authority) never participated in the planning activities for various types and uses for future parks in the Basalt Creek Area- which were summarized within the Citizen Involvement section of the Draft.
 - Little information was provided within the proposed Master Plan as to the multiple specific concerns expressed by the existing property owners
 - It would seem appropriate the proposed document would clearly identify the various concerns specifically identified during the 9-9-2021 local property Stakeholders Meeting- and present clear resolutions within the proposed document-
 - The City will have to work with these local property owners in order to obtain the land in the Basalt Creek Area which the City will have to acquire for future parks and trails.
 - There are few clearly identified steps for the inclusion of directly affected Basalt Creek property owners and what steps the City shall take implemented future Master Planning of individual Park and Trails for
 - protection of existing neighborhoods in the Basalt Creek Area (Metro Title 12)
 - the protection of privacy of local citizens
 - protection of property rights of Basalt Creek citizens

These are significant issues which should be included within this regional Land Use Master Plan, as a large portion of the land within this proposed Master Plan has not been annexed into the City.

This issue becomes more problematic due to the lack of elected representation within this and other Land Use Actions by these property owners whose property

is not annexed and are outside the City Limits.

The City of Tualatin has been aware for many years, that the City's Citizen Involvement Organizations (CIO's) do not allow membership for property owners outside the City Limits- and has not taken effective actions to mitigate the lack of a Citizens Involvement Program - as specified by the State of Oregon Land Use Goal #1 for Citizen Involvement- for these property owners in the Basalt Creek Area to have their concerns heard and addressed.

#2 The City's proposed Master Plan for the Basalt Creek Area, lacks standardized and clearly identified location, condition and value of various title #13 and Goal #5 Natural Resources- including Open Space -within the proposed Basalt Creek Master Plan by the City of Tualatin Parks and Recreation Department ---which is a document to authorize the planning of future recreational activities on lands which are known to be rich in various Natural Resources.

There are additional concerns within the proposed Master Plan's Chapter 2 Existing Conditions as to the location of Wetlands and permanently inundated areas. Within the Basalt Creek Area, various wetlands are located within the southern portion of the Basalt Creek Land Use Planning area.

However the wetlands within the Basalt Creek Canyon Area are extensive - covering over 14 acres of land.

Both the Federal Wetlands Inventory, the State of Oregon and Metro have identified this major wetland -PSS1A -to be located within the majority of the Basalt Creek Canyonnot just the "lower half" of the Canyon as stated within Chapter 2 of the proposed Master Plan.

It is important that this major wetland is appropriately identified due to its continued existence is not only important to the continual health of the local flora and fauna, it is a major element and a limiting condition for Land Use Planning in the Basalt Creek Canyon Area--- the major portion of the Central Planning Area of the proposed Master Plan.

The need for accurate presentation of facts on a large Natural Resource which the City is required to protect and conserve is problematic and compounds Land Use Planning by the City- as the City's adopted Natural Resource Maps 72-1 and 72-3 lack standardized and clearly identified location, condition and value of various Goal #5 Natural Resources- including Open Space -within the Basalt Creek Area. (Please see maps included below).

The proposed document also does not provide clear standardized accurate information as to the known existence of multiple Natural Resources AND OPEN SPACE which the City is required to protect and conserve in the Basalt Creek Area- including the types, location, condition and value of these resources.

The City of Tualatin has been notified for many years of the lack of clearly identified and standardized Natural Resources in the Basalt Creek Area within the City's adopted governing documents.

The City is conducting a major Land Use Planning Action which may directly or

indirectly impact these Naturals Resources, regardless of which department within the City is initiating this Land Use Plan.

Please see copy of City of Tualatin's response (dated 11-30-21) to our Citizen Comments submitted 11-21-2021 regarding this proposed Master Planning for Public Parks and Trails in the Basalt Creek Area.

The City continues to attempt to delay their role and responsibilities in the basic elements of Land Use Planning- in the provision of accurate and relevant information on the documentation of the existence of Natural Resources within the Basalt Creek Area which should be contained in a regional Master Plan being proposed for adoption. This issue is especially relevant when the City's adopted Maps do not provide the supportive necessary information.

Senior City staff have stated the City will have developers conduct the required Goal #5 Natural Resources Inventory at the time of proposed development. This approach is not supported by Oregon's Statewide Planning Goals.

It also appears this proposed Land Use Action identifies the City's role as the entity who will be conducting the planning and perhaps implementing the development of future parks and trails in the Basalt Creek Area, and as such the City should be providing clear guidance within this regional Master Plan as to which ands which should - or should not be considered for planning the location of future parks or trails within and area abundant in Natural Resources.

It appears the City does not intend to address these concerns as indicated in the City's email dated 11-30-2021.

lieh Mundler - Smueller Bhaulain, ann 6 - G Luom 2n Rosa Nicover - Micoverginuasini gawi, John Lucini +	Tue. New 30, 2021 at 3.58 PM
Hi Grace,	
Thank you for your comments and input regarding Basalt Creek Park address operational procedures and regulations, which are part of fut operational processes and procedures will be addressed when planni refer you to the Community Development Department for questions at Creek.	s & Recreation Plan. This high level plan does not ure park planning phases. Your questions about ng occurs for a specific park site or trail section. I bout planning procedures and land use in Basalt
At this time a Council presentation about the parks and trail plan is so 2022, and consideration of acceptance at the January 24, 2022 meeti expected to be considered in the winter or spring 2022.	heduled during work session on January 10, ng during general business. The plan adoption is
Thanks,	
Rich Mueller	
Parks Planning & Development Manager	
City of Tualatin Parks & Recreation Department	
18880 SW Martinazzi Ave Located at 8515 SW Tualatin Road, Tuala	tin, OR 97062
Phone: 503,691,3064 Fax: 503,691,9786	
www.tualatinoregon.gov	

The proposed Master Plan for the Basalt Creek Area provides a hypocritical approach by the City of Tualatin in the planning of future parks and trails in the Basalt Creek Area,

This proposed Master Plan clearly identifies the intentions to utilize and exploit the various Natural Resources and Open Spaces ---which make many portions of the Basalt Creek Area unique and desirable for future parks and trails.

While the proposed Master Plan includes statements as to the City's intention to preserve and protect various- but unidentified natural resources ----the City has not offered clear information as to what Natural Resources the City will be protecting and conserving in the Basalt Creek Area.

The lack of basic and necessary facts and documents relating to the very existence of various Natural Resources within this proposed Master Plan or within the City's adopted Maps does not support the City's contention of current or future protections for sensitive resources in the Basalt Creek Area.

We hope the City will address and resolve the concerns which we present regarding the proposed and newly revised draft of the City of Tualatin Parks and Recreation Master Plan for the Basalt Creek Area.

John and Grace Lucini

The maps provided below provide information and facts regarding the Existing Conditions within the Basalt Creek Area- which support and clarify the concerns which we present regarding information provided within Chapter 2 of the proposed Master Plan.

#1 <u>The Basalt Creek Canyon lies to the west of the many existing homes in the Basalt</u> Creek Area which front SW Boones Ferry Road.

#2 The Wetlands and permanently inundated areas are <u>present and identified</u> <u>throughout the length of the canyon</u>.

#3 The Basalt Creek Area has multiple Title #13 and Goal #5 Natural Resourcesincluding Open Space which currently exist but are not specifically addressed nor identified for protection or conservation by the City.



Healthy upland habitat sustains native plants and wildlife

Upland habitat is typically located further away from water sources. Healthy upland wildlife habitat provides food and shelter for urban wildlife and improves the health of water resources downstream. The best upland wildlife habitats include larger habitat patches with extensive interior habitat areas. These areas minimize lower quality edge habitat, provide connectivity and proximity to streams or wetlands and/or contain habitats for unique and sensitive species.









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The November 23 draft plan was for technical corrections, and reformatting some pages. Content changes can be found on the Trail Concept map (page 67). Appendix A included format changes and addition of focus groups, meetings and site visits starting on page 78, and appendix B was included to show cost estimates. There are minor technical corrections to the appendices yet to be made, such as correct the spelling of your name on site visit documents (pages 93-96). The appendix will also include the last survey (#3), and public comments which are in the parks advisory committee meeting packet.

Thanks,

Rich Mueller

Parks Planning & Development Manager

City of Tualatin | Parks & Recreation Department

18880 SW Martinazzi Ave | Located at 8515 SW Tualatin Road, Tualatin, OR 97062

Phone: 503.691.3064 | Fax: 503.691.9786

www.tualatinoregon.gov



From: G Lucini <

Sent: Friday, December 10, 2021 10:39 AM To: Rich Mueller <<u>rmueller@tualatin.gov</u>>

Cc: Ross Hoover <<u>rhoover@tualatin.gov</u>>; John Lucini <

Subject: Re: Submission of Citizens Comments- Basalt Creek Parks & Recreation- Master Plan City of Tualatin

Hi Rich,

Thanks for letting us know about the upcoming Parks Advisory Meeting on 12-14-21 where TPARK has the City's proposed Master Plan for Parks and Trails in the Basalt Creek Area as an agenda item.

We appreciate the inclusion of our prior 11-21-21 submissions regarding the proposed Master Plan within the Informational Packet for the 12-14-21 meeting.

I noticed the date on proposed Master Plan for the Basalt Creek Area has been changed to a 11-23-2021 version- which I assume may be different from the previous version provided for Public Comment.which was dated 11-2-2021.

Is there a copy of the currently proposed 11-23-21 draft which indicates the changes which have been made since the 11-2-21 draft upon which our Citizen Comments were made?

This would be very helpful, as the document is over 100 pages, and attempting to compare the 11-2-21 version to the 11-23-21 version to identify any changes is very difficult.

Perhaps there is a version of the current proposal - with strike throughs which clearly identify the changes which have been made?

Or can the pages which contain changes or additions since the 11-2-21 version be identified?

Thanks,

John and Grace Lucini

On Tue, Dec 7, 2021 at 4:50 PM Rich Mueller <<u>rmueller@tualatin.gov</u>> wrote:

Hi Grace,

For your information there is an upcoming Park Advisory Committee public meeting to review and provide input on the draft plan and community comments received. This virtual meeting is scheduled on Tues, Dec. 14 at 6 pm. The meeting information, agenda, packet, and virtual link can be found at https://www.tualatinoregon.gov/recreation/tualatin-park-advisory-committee-meeting-59.

Rich Muelle	r
Parks Plann	ning & Development Manager
City of Tuala	atin Parks & Recreation Department
18880 SW N	Martinazzi Ave Located at 8515 SW Tualatin Road, Tualatin, OR 9706
Phone: 503	.691.3064 Fax: 503.691.9786
www.tualati	noregon.gov
From: Rich M Sent: Tuesda	1ueller 1y, November 30, 2021 3:56 PM
To: G Lucini Cc: Ross Hoo	ver < <u>rhoover@tualatin.gov</u> >; John Lucini <
To: G Lucini Cc: Ross Hoo Subject: RE: S City of Tualat	ver < <u>rhoover@tualatin.gov</u> >; John Lucini < Submission of Citizens Comments- Basalt Creek Parks & Recreation- Master Pla :in
To: G Lucini Cc: Ross Hoo Subject: RE: S City of Tualat Hi Grace,	ver < <u>rhoover@tualatin.gov</u> >; John Lucini < Submission of Citizens Comments- Basalt Creek Parks & Recreation- Master Pla :in
To: G Lucini Cc: Ross Hoo Subject: RE: S City of Tualat Hi Grace, Thank you f Plan. This h which are pa processes a site or trail s questions al	ver < <u>rhoover@tualatin.gov</u> >; John Lucini < Submission of Citizens Comments- Basalt Creek Parks & Recreation- Master Platin for your comments and input regarding Basalt Creek Parks & Recreationigh level plan does not address operational procedures and regulations art of future park planning phases. Your questions about operational and procedures will be addressed when planning occurs for a specific p section. I refer you to the Community Development Department for bout planning procedures and land use in Basalt Creek.

_	
	in the winter or spring 2022.
	Thanks,
	Rich Mueller
	Parks Planning & Development Manager
	City of Tualatin Parks & Recreation Department
	18880 SW Martinazzi Ave Located at 8515 SW Tualatin Road, Tualatin, OR 97062
	Phone: 503.691.3064 Fax: 503.691.9786
	www.tualatinoregon.gov
	From: G Lucini Sent: Sunday, November 21, 2021 11:18 PM To: Rich Mueller < <u>rmueller@tualatin.gov</u> > Cc: Ross Hoover < <u>rhoover@tualatin.gov</u> >; John Lucini < Subject: Submission of Citizens Comments- Basalt Creek Parks & Recreation- Master Plan City of Tualatin
	Please accept this submission of our Citizen Comments as part of the Public Record for the proposed Basalt Creek Tualatin Parks & Recreation Master Plan.
	Our comments are provided within the attached PDF file.
	Please let us know if you have any difficulty in opening the file.
	We have included at the end of our Comments 3 specific requests for information from the City:
	 Would you let us know when this proposed Master Plan will be presented for review and hearing by the City? Will the City of Tualatin Planning Commission be the Governing Body, or will this
	be presented and heard by the City of Tualatin City Council?
	• As Interested Persons, we submit in writing a request to be Notified of future Public Meetings for this proposed Land Use Action. Our contact information is provided

within our submission.

We look forward to receiving a response to these requests for information.

Respectfully submitted,

John and Grace Lucini



Tualatin Park Advisory Committee

Dates: May 11, Jun 8, Jul 13, Aug 10, Oct 12, Nov 9, Dec 14, 2021 Time: 6pm Location: Virtual Minutes available at City of Tualatin website

Basalt Creek Informational Webinar Date: May 17, 2021

Time: 12pm

City Council

Dates: Jul 14, 2021, Jan 10 & 24, 2022 Time: 5pm-7pm Location: Virtual

Joint Meeting of Tualatin Park Advisory Committee, Arts Advisory Committee, Planning Commission, & Youth Advisory Council (Public Meeting & Focus Group) Date: Sept 14, 2021 Time: 6pm Location: Virtual

INFORMATIONAL WEBINAR - SLIDES | MAY 17, 2021





INFORMATIONAL WEBINAR - SLIDES | MAY 17, 2021



INFORMATIONAL WEBINAR - SUMMARY | MAY 17, 2021

BASALT CREEK INFORMATIONAL WEBINAR

May 17, 2021 at 12pm

Summary

Attendance - Cathy Holland and the Lucinis.

Staff – Ross Hoover, Rich Mueller, Erin Engman, Steve Koper, Kim McMillian, Jonathan Taylor

Welcome

Jonathan Taylor began meeting by introducing staff and giving a brief overview: This informational webinar is about proposed long-term development and planning projects in the Basalt Creek and Southwest Industrial Areas. These projects have been identified and developed by the City of Tualatin of the last decade.

Community Development

Erin Engman gave a presentation on the planning area history and the future: The planning area was added to the urban growth boundary in 2004 and we are now prepared for applicants to annex into the City. There is a concept plan identifies zoning, future roads and utilities to guide future development. This also includes the need for two off street trials adopted by the Basalt Creek Compressive Plan.

Parks & Recreation

Ross Hoover gave a presentation on the parks planning process for the area:

Thanked participants and stressed the importance of community participation and engagement to the planning process. Shared an overview of existing plans for parks, trails and green spaces for the area from the master plan based on what the community wants. We are starting to work on the details with a consultant to learn what the community would like to see and gave an overview of what the process will entail.

Urban Renewal

Jonathan Taylor gave a presentation on the urban renewal in the area: Explained what urban renewal is and how tax increment-financing works. Explained the timeline, including project history and future work though 2022.

Questions Related to Parks

Q: There a lot of decisions to be made about parks, is the city leaning toward a location on one particular side of Boons Ferry Rd

A: We are not, we are open to all areas and working with the community to determine the best location. Q: What funding can the City use to purchase property for parks?

A: The final Basalt Creek park plan document will list all the potential funding sources. But what we can share is the pandemic has reduced government revenue, particularly lottery funding which funds the state grants for parks. There will also be access to SCD funds as development happens.



UPDATE TO CITY COUNCIL - SLIDES | JULY 14, 2021









PARKS & RECREATION MASTER PLAN

- Acquire 10-20+ acres of park space through an area master plan process.
- Acquire additional land for greenways and natural parks to support planned trail connectivity and protect creek canyon habitat and natural resources.
- Master Plan and develop park site as a community park to meet neighborhood, employee, and community needs.

Basalt Creek Parks Planning Progress Report July 2021

UPDATE TO CITY COUNCIL - SLIDES | JULY 14, 2021





APPENDIX A: COMMUNITY ENGAGEMENT



UPDATE TO CITY COUNCIL - SLIDES | JULY 14, 2021



TUALATIN Basalt Creek Parks Planning PARKS & RECREATION Progress Report July 2021

UPDATE TO CITY COUNCIL - SLIDES | JULY 14, 2021



MEETING AGENDA - JOINT ADVISORY MEETING | SEPT 14, 2021

MEETING NOTICE & AGENDA



A JOINT MEETING OF THE TUALATIN PARK ADVISORY COMMITTEE, ARTS ADVISORY COMMITTEE, PLANNING COMMISSION, & YOUTH ADVISORY COUNCIL September 14, 2021 - 6:00 pm

> Virtual Meeting To join by phone: +1 253 215 8782 US (Tacoma) Meeting ID: 861 8501 3113 To join by video: https://us06web.zoom.us/j/86185013113

A. Call to Order - The Tualatin Parks Advisory Committee Chair will Chair the Meeting.

B. Basalt Creek Parks & Recreation Plan Focus Group

<u>Welcome</u> About Basalt Creek What is currently underway Project schedule

<u>Tualatin Basalt Creek Map with Existing Site Photos</u> Character of: Regional trail Future residential areas Prime manufacturing land Basalt Creek canyon Interactive engagement to share important or interesting information about Basalt Creek area

<u>Tualatin Basalt Creek Parks & Recreation Concept Map</u> West focus area Central focus area East focus area Interactive engagement for support of park facilities and programs in focus areas

<u>Tualatin Basalt Creek Park Visual Preference Activity</u> West focus area Central focus area East focus area Interactive engagement to prioritize potential future facilities

<u>Tualatin Basalt Creek park Program Preference Activity</u> Interactive engagement to identify reasons to plan for future parks in developing areas Interactive engagement to rank importance of parkland features & amenities

Discussion/Questions

C. Adjournment

TUALA ADVISOR	MEETING MINUTES A JOINT MEETING OF THE ATIN PARK ADVISORY COMMITTEE, ARTS RY COMMITTEE, PLANNING COMMISSION, & YOUTH ADVISORY COUNCIL September 14, 2021 - 6:00 pm
	Virtual Meeting
Members Present:	
Park Advisory Committee	Beth Dittman, Brandon Gill, Emma Gray, Josh Huffman, Anthony Warren
Art Advisory Committee	Janet Steiger Carr, Mason Hall, Brett Hamilton, Dawn Upton
Planning Commission	Daniel Bachhuber, Ursula Kuhn, Janelle Thompson
Youth Advisory Council	Parker Johnson
Council:	Councilor Bridget Brooks
Staff Present:	Ross Hoover, Parks and Recreation Director Rich Mueller, Parks Planning and Development Manager Julie Ludemann, Recreation Manager Kyla Cesca, Office Coordinator
Project Consultants:	Rachel Edmonds, MIG Project Manager Cindy Mendoza, MIG Director of Park and Recreation
Public Present:	Denise Cline

A. Call to Order

Tualatin Parks Advisory Committee Chair Beth Dittman called the meeting to order at 6:04 pm and welcomed members. Beth led advisory committee members and planning commissionaires through introductions.

Ross Hoover summarized the parks and recreation planning process for Basalt Creek. Ross provided an overview of the parks planning project currently underway. He discussed the purpose of planning parks in Basalt Creek and shared the project schedule. Ross expressed the amazing opportunity to imagine the future of parks in the Basalt Creek that is expected to become part of the City of Tualatin as development occurs. He introduced the planning consultant team from MIG that included Rachel Edmonds and Cindy Mendoza.

B. Basalt Creek Parks & Recreation Plan Focus Group

Rachel Edmonds introduced herself and Cindy Mendoza who both worked on the 2018 Parks and Recreation Master Plan for the City. Rachel explained the public engagement phase, and recapped engagement done to date. She shared the screen to show slide/board 1, having a Basalt Creek map with existing site photos. Rachel discussed the current characteristics of the area that determines parks and recreation opportunities. The information Rachel Edmonds provided included:

- Basalt Creek runs though center of the area.
- Title 13 lands are natural areas that have environmental protections.
- Typography shown in pink is slopes 10% and over.
- Existing uses include hobby farms, orchards, industrial, and rail line.
- Ice Age Tonquin Trail is a Metro planned multi use path along west boundary.
- Points out image of canyon which is much larger than people expect.
- Tasked with creating a framework for future parks.

Rachel Edmonds shared slide/board 2 showing the concept maps and focus areas that include West focus area, Central focus area, and East focus area.

Rachel provided the following characteristics for focus areas:

- West Manufacturing
 - Trail alignment for walking & biking
 - o Connect to central focus area
- Central Best location for a future 10-15 acre neighborhood park
 - Could have a visual connection to the creek or canyon
 - Area slated for residential and manufacturing
 - Connect to Ice Age Tonquin Trial
- East Residential with HOA park
 - o Subdivision already planned
 - Developers will provide parks facilities
 - o Parks & recreation and MIG is providing guidance to developer
 - o Potential partnership with Horizon High School
 - o HOA will manage storm water

Project consultant Rachel Edmonds displayed slide/board 3 that shows the Tualatin Basalt Creek Park Program Preference Activity. Rachel discussed the facility elements identified as possible opportunities for each of the three focus areas, and engagement to rank importance of parkland features & amenities. Rachel then turned the meeting over to Cindy Mendoza to lead committee members and commissioners through interactive engagement.

Advisory committee members and planning commission were asked by Cindy Mendoza to share their thoughts and priorities. Below is the input, ideas and comments from committee/commission members:

- Parker Johnson (YAC) Attended a focus group with YAC on this topic and indicated YAC are pro trails and natural areas.
- Daniel Bachhuber (Planning Commission) A soccer coach, he is aware that the league wants more fields. He is interested in the demand for fields and available field space in Tualatin compared to other nearby Cities.

	O sum siller Des ster
•	Councilor Brooks
	has visited the canyon and creek/weilands area. Waterways already have an algae
	proposed bridge though wetlands, and need to be mindful of how it is managed. Supports
	shorts fields, but they should be placed where they won't affect the environment
•	Emma Grav
•	Highest priority is protecting natural resources, storm water management, trails, and native
	plantings. Agrees with other amenities, but larger parks create parking lots that cause
	issues. She mentioned consideration of pervious hardscape.
•	Mason Hall
	Biggest concern is preserving the environment (safe, clean), and impacts of construction.
	This area needs affordable housing as well. Mentioned the need for development regulation
	to protect environment.
•	Janet Steiger Carr
	Provided accessibility input and reminder that parks, trails and other amenities need to be
	ADA accessible.
•	Ursula Kuhn
	Recognizes there is limited acreage available and for the city to look at the bigger picture to
	decide the best use for the land. Recommends keeping natural areas and leaving room for
	changes.
•	Janelle Thompson
	Said there are many areas with steep slopes and natural areas. Sees opportunities for on
•	Would like to see level of service data on fields, natural areas and trails
•	Brandon Gill
	Supports community gardens in parklands, and the need for accessibility.
•	Brett Hamilton
	Emphases on community access to natural areas and nature.
•	Beth Dittman
	Suggests considering smaller areas with connectivity like Fanno Creek has. Spread out
	facilities into smaller separate spaces for field, play areas and gardens.
•	Denise Cline
	Supports wildlife corridors and vision for connectivity to other parks and trails.
•	Parker Johnson Mentioned King City Community Dark is an event to a further works to have active recent to the
	Mentioned King City Community Park is an example of what works to have active recreation
	and nature together, with recreation amenities and that connection around the park.
Ci	ndy Mendoza and Rachel Edmonds addressed the chat and verbal questions that included.
•	The difference between HOA park and City park by explaining HOA parks small in scale for
	that residential development to use (not community scale use), and managed/maintained by
	the HOA.
•	That roadway speeds will inform and take bike safety into account.
•	Field space needs were address in the system wide master plan that demonstrated a field
	shortage issue in Tualatin. Fields come down to the amount of space available with an
	awareness that not all needs can be met. Additional fields may be obtained through
	partnerships with schools.
•	This park will be small, 10-15 acres and an example is Ibach, which is 19 acres.

- It was mentioned that the area will have built in storm water facilities that can tie to wildlife habitat. Play areas can have natural and nature components, but is hard to be specific without a site determined.
- Title 13 lands will be protected in accordance with environmental requirements. Title 13 lands have three classifications (1-3) from Metro in the tri county area. The different green color shades on the map represent the three categories that have environmental development requirements and regulations.
- Trail cost vs. park costs were explained with trails usually being less cost except in natural areas where environmental challenges exist.

Ross Hoover thanked everyone for their ideas, comments and input. Ross encouraged all to take the survey on the webpage, and mentioned that the data from the master plan can be found on the Parks & Recreation website. He expressed that the community wants all the amenities, and will work to invest in public spaces to be useful for everyone. Ross mentioned that more athletic fields are needed, and is working with user groups and schools to use fields efficiently in synergy with other public spaces.

Rachel Edmonds addressed a timeline question and indicated that development on the east side will happen first, as there are current residential developments planned. Development of the area will be dependent on current property owners. A park master plan is typically a 10 to 25 year vison.

Cindy Mendoza mentioned part of the funding for parks will be through SDC funds, but depending on amenities and other costs, several funding opportunities will be need to be considered.

Rich Mueller thanked members for attending and asked committee and commission members to share the project information and link to the survey with others.

B. Adjournment

Chair Beth Dittman adjourned the meeting at 7:06 pm.

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Youth Advisory Council Date: Aug 19, 2021

Neighborhoods & Property Owners

(Open House & Focus Group) Date: Sept 9, 2021 Time: 6pm Location: Ibach Park, 10455 SW Ibach Street

> Business & Employment Date: Oct 5, 2021 Time: 3pm Location: Virtual

MEETING SUMMARY - TUALATIN YOUTH ADVISORY COUNCIL | AUG 19, 2021

TUALATIN YOUTH ADVISORY COUNCIL August 19, 2021 Meeting Summary 6 pm

The Tualatin Youth Advisory Council works to improve the lives of youth by building relationships, advocating for diverse needs, and providing a link from youth to government.

Attendance - Ava, Lucy, Parker, Noah, Dillon, Simon, Aaron, Oliver, Avery and Hannah

Staff - Julie Ludemann

Special Presentation – Basalt Creek Park Planning

Julie Ludemann shared the City is currently reaching out to the community to see what they would like for parks in the Basalt Creek area. The Basalt Creek park planning engagement boards where presented to the meeting attendees and Julie lead though each board and provide information.

Boards 1 & 2

 Basalt Creek was recently added to the urban growth boundary and part will annex into Tualatin when developed.

• Currently basalt creek is home to a bit of farmland, residential, and light industrial areas. Board 3

- The area is shown in three different zones; West, Central, and East.
- The East focus area will be mainly residential.
- The Central focus area is the best suited for a City park.
- The West area could hold a possible regional trail connection.

Board 4

 Meeting attendees were asked to express their thoughts and ideas by providing feedback on comment sheets.

Board 4 Results

In your opinion, why is it important to plan for future parks in developing Areas?			
Preserve, protect & enhance natural areas.			
Plan for future trail connections & greenways.	0		
Create space for active recreation including playgrounds, sports fields & sport courts.	0		
Provide parks & recreation services to the community	1		
MEETING SUMMARY - TUALATIN YOUTH ADVISORY COUNCIL | AUG 19, 2021

What is your priority of each of the following features	Trail	What is your priority of each of the following features	Playground
High	8	High	7
don't know	1	don't know	4
Low	0	Low	0
What is your priority of each of the following features	Sports Field	What is your priority of each of the following features	Sports Court
High	7	High	4
don't know	3	don't know	7
Low	0	Low	0
What is your priority of each of the following features	Natural Area	What is your priority of each of the following features	Picnic Shelter
High	10	High	5
don't know	0	don't know	4
Low	0	Low	1
What is your priority of each of the following features	Splash Pad	What is your priority of each of the following features	Off Leash
High	1	High	3
don't know	3	don't know	7
Low	6	Low	0

Comment Sheet Results

Using a scale of 1-5 how much do you support the overall park program descried for the focus areas										
AREA	5 4 3 2 1									
West	5 votes	4 votes	1 votes	0 votes	0 votes					
Central	7 votes	2 votes	0 votes	0 votes	0 votes					
East	4 votes	3 votes	1 votes	0 votes	0 votes					

Visual Preference Activity

Α	On street trail	3 votes
В	On street trail	2 votes
С	Signage	1 votes
D	Parking	6 votes
Ε	Picnic Shelter	2 votes

MEETING SUMMARY - TUALATIN YOUTH ADVISORY COUNCIL | AUG 19, 2021

F	Play Area	1 votes
G	Multi-use Field	7 votes
Н	Trail	7 votes
I	Off-Leash Area	2 votes
J	Picnic Shelter	3 votes
К	Play Area	3 votes
L	Sport Court	2 votes
Μ	Storm Water Planting	8 votes

Written Comments

- East focus area could feature an up to date basketball court. Current courts such as Tualatin Parks are cracked or kind of weathered/beat up.
- I feel that an on street trail would be a better fit in the east focus/residential area, given a higher consistency of youth, and, therefore bikes, scooters, and non-motorized vehicles. A sport court would be better in the central area as well in my opinion.
- I honestly think all of this is a really good plan and could be really awesome.

NEIGHBORHOOD FOCUS GROUP/OPEN HOUSE EVENT FLYER | SEPT 2021

(Mailed directly to property owners in the area)





Scan the QR code with your smartphone camera to visit the website for more information

NEIGHBORHOOD & PROPERTY OWNERS FOCUS GROUP



Please join us share your ideas to help plan for parks for your Basalt Creek Area.

We look forward to meeting with you and hearing your thoughts to ensure resources are provided. If you would like more information on this process or are unable to attend, please visit the website where you can find out more, take the latest survey, share your thoughts, and learn about other engagement events and meetings.

TualatinOregon.gov/Recreation

THURSDAY SEPTEMBER 9, 2021 6PM

Ibach Park Large Picnic Shelter 10455 SW Ibach St. Tualatin. OR 97062

Click Basalt Creek Parks and Recreation Plan

NEIGHBORHOOD FOCUS GROUP/OPEN HOUSE DISCUSSION NOTES | SEPT 9, 2021

Tualatin Basalt Creek neighborhood focus group

Ibach Park, September 9, 2021, 6:00-7:30PM (25 people attending)

Note: These meeting notes should not be understood as a complete transcript of discussion that took place during the focus group. Effort was taken to record all remarks as completely as possible.

Ross Hoover provided opening remarks.

Rachel Edmonds of MIG, Inc. provided an overview of the purpose of the project, the framework concept for three focus areas, etc. Why the plan and feedback from stakeholders is needed at this time. Apprised residents that there is no site identified at this time and highlighted the long-term nature of the project.

Discussion:

- This area will be light manufacturing and industrial areas that typically don't have parks.
- Creek on the map extends further South than shown. It is not a flowing creek in the northern portion, which goes across my property. Is there going to be a zoning change to allow this park?
- Number 6 on your boards you cannot build here so it will stay green. Ibach Park is only a half a
 mile walking distance from to TBC.
- Should industrial areas even have parks? Industrial businesses should provide parking and provide open space to serve their own employees. Business pays for parks and indicated during the system plan is to serve employment with parks and trails.

Cindy Mendoza of MIG, Inc. responded that any kind of park facilities in areas where there is manufacturing will look different than traditional parks – it will focus on trails, connectivity, giving employees opportunities to get out on their lunch break.

- The area has changed a lot people don't want to talk about parks without a zoning change, period. Residents want to be compensated fully.
- Does the city have a budget for this project?
- I have a great site and I'm curious about the price per acre you might be offering.
- We have lived on this property for 31 years. Early on we had a zoning change, but it was switched back to industrial. That was a setback. We also fought and lost the prison locating here.
- I could get \$400,000 to \$600,000 per acre anywhere in Basalt Creek.
- If you are targeting a 20-acre park, acquisition starts at \$8 million. In my opinion, no one should sell for their land to the city for less than that.
- Residents have been here a long time. Most 10-20 years.
- The county took 17 feet of my road frontage at some point for a project along Grahams Ferry. Later, it turned out they didn't even need it, so I sold it to them for very cheap and it was just a waste. There is a history of city, county and state governments not doing what they promised in this area and we're suspicious.

Ross Hoover acknowledged the neighbor's experience, noted that he can't change anything that happened in the past, but is intent on working transparently with neighbors on the parks plan.

Ibach Park Focus Group - 1

APPENDIX A: COMMUNITY ENGAGEMENT

NEIGHBORHOOD FOCUS GROUP/OPEN HOUSE DISCUSSION NOTES | SEPT 9, 2021

- The only thing that pertains to us is how much money we will get. I myself have a park of woods on my own property already.
- I just moved in, but I don't want my neighbors to move because I don't want to factory next door to my house.
- I'm not thinking about selling at all but I'm wondering what will happen on my property.

Ross Hoover stated that as people apply to annex into Tualatin and develop their property, it will be developed in the new land use of either residential or manufacturing.

- It doesn't enhance the lives of people living there now. I don't want people riding bicycles and walking their dogs in my backyard of my property. End of the story, my property is not for sale.
- Where will the park be?
- The circles you have on here suggest that the land in green will be a park. You are prohibiting me from selling land because no one wants to risk being next to a park.

Cindy Mendoza noted that research and studies have found that being adjacent to a park raises property values. Wouldn't some of you rather live next to a park versus a warehouse?

• It sounds like you are looking for 10 to 20 acres of flat land. This excludes the basin of the Canyon, so is it the West side of Boones Ferry? How will this park fit in a canyon?

Ross Hoover replied that no site is selected at this time.

- Some parks aren't flat, have you ever been to Tryon Creek?
- Are you thinking of a structure or a natural open space?
- We're going to be moving so why does our input matter anyway?

Rachel Edmonds responded that although flat land is a criteria being looked at, the likely site will end up have a combination of flat and hilly topography based on the general site characteristics of TBC.

• I heard that they want a Recreation Center that means you need a lot of parking lots, there's also stormwater impacts. I want to know what will be included.

Rachel Edmonds responded that the park program was first articulated in the 2018 system plan, and it has been refined and somewhat scaled down since doing outreach this summer. Highlighted the importance of getting back responses in helping to further refine the park facilities/features. At the end of the day, the program is what the park is going to be – the site is the canvas. As designers, we really use that information when deciding about one features versus another feature in a park design.

- One of the maps I've seen shows a trail or path along the Basalt Creek Parkway.
- What do trails look like in this situation? How would this be a good environment to for a trail?
- The bridge is going to affect water quality.
- How do you manage public facilities in places like this? You're going to need rules and regulations.
- We need to have a better understanding of this plan. It's not appropriate to have a path in the middle of a wetland. We also need that to know what the criteria you using, what are those and how are they developed?

Ibach Park Focus Group - 2

NEIGHBORHOOD FOCUS GROUP/OPEN HOUSE DISCUSSION NOTES | SEPT 9, 2021

Rachel Edmonds responded that MIG, Inc. has advised the city on a range of criteria to locate the park – some that you typically use for any new park, and some that are more specific to the TBC area. For example: proximity to existing or future road and trail network, slope, proximity to natural areas, etc. Say a seller comes forward – with this information, the city will be prepared to evaluate any offered site against those criteria to understand if it would be worth purchasing.

Any future park design and construction project has multiple opportunities to get involved – master plan phase (now), and other phases as the project moves closer toward construction. There is a public process for them, and information gathered from all stakeholders is directly used to refine the design.

- I live near the Canyon where the creek becomes a lake, technically in Wilsonville
- I must be honest; it is a losing proposition to plan a park in the canyon neighbors won't have it.
- It's wild down there there's families of coyotes, tons of mosquitoes, there's even bobcats.
- Stepping backward, is there a plan to reimagine the parks we already have? What about making those better we can improve them? Atfalati is an example, I know it's too small but it's just what came to mind. Can't we improve those Instead of building a new park?
- Who's funding this how is it getting funded? Does eminent domain apply to parks and trails?

Ross Hoover indicated a statement that pledged the city does not plan to use eminent domain to obtain land for a park. He clarified that the city has never in its history used that tool to obtain parkland or trails lands. He did acknowledge that that tool is used for public infrastructure such as utilities and critical road expansions, etc. The desire is to work with a willing seller.

• What if the City doesn't find one? What happens then?

Ross Hoover responded they were confident they would find a willing seller.

- I appreciate the comments from the city that they won't be taking my land.
- But we need to pay more attention to how and where we draw these circles on the map. It's creating confusion.

Rachel Edmonds responded that the intent of the diagrams was to provide a general understanding of the overall park concept without using property lines or geography as the boundaries between the focus areas. The concept is still being developed and will be further refined.

- You do know where the constraints are, so it's also important to map where the park is not going to be. For example, all the Metro protected lands should be shown as an area where the park won't be, don't just blanket everything with big circles.
- I can be sitting in my yard, and I hear traffic going down Grahams Ferry backfiring. There already is noise. Industrial traffic, semis. Who would want to have a park near that?

Cindy Mendoza responded that we are looking not only to design a park that can be protected from area noise pollution coming in, but the future design will actually also be looking at ways to mitigate noise generated from the park, with the intent on ensuring neighbors are not negatively affected.

- Do you even have money to buy property at today's prices? How is a park funded?
- The central zone describes park that might be on one side of Boones Ferry, and then you show 400 units of housing in the east zone. Doesn't that increase the value of houses on that side?

APPENDIX A: COMMUNITY ENGAGEMENT

NEIGHBORHOOD FOCUS GROUP/OPEN HOUSE DISCUSSION NOTES | SEPT 9, 2021

• Shouldn't a park be put on the east residential area so it's easy to get to and people don't have to cross streets the land would be flat and therefore cheaper to develop? It would be closer to people who need a park need a skate park need a recreation facility.

Ross Hoover described what system development charges (SDCs) are, and how SDC's are collected once a developer is issued permits to build. He described that there's a timing issue with spending SDC money that you want to use now before you've collected it. You can't really do that. There's a lag.

• SDCS for one house Tualatin is at \$30,000. You have 400 houses coming in on the east side. You do the math - that seems like a lot of money.

Ross Hoover and Rich Mueller clarified that only a portion of SDC funding is allocated to parks. The majority of SDC funding is used for utilities like the water system, sewer system, stormwater system, roads, etc. SDCs were developed as a tool to not put the burden of funding new development on existing residents. Property taxes fund operation of City government, schools, fire and rescue, county, other governmental services.

Ross Hoover outlined other funding sources that are being pursued – Metro, future park bond, state grants, etc.

• I also heard that the HOA parks are intended for the residents of those future developments only. Doesn't that seem unfair?

Cindy Mendoza clarified that the park concept for the east side does include homeowners' association (HOA) parks and open space. The owner/developer builds these features, and they are geared towards the needs of residents living there. The parks department has a goal to provide parks for everyone, which is why we are working on this project.

• Suppose you plop park in the central focus area. Who is going to even go to that park? Don't you want it by residential uses?

Rachel Edmonds responded that ideally the park will be located to serve a wide variety of people who will be living working and commuting through the area, of all ages and abilities. Try looking this as a long-term design, the area is going to look quite different in thought 10 years but even more so in 20.

- I take issue with people driving to a destination park. There's so much traffic on Boones Ferry already. How will the park improve the quality of life for anybody trying to get it, or anybody living nearby?
- Who was coming in to use this place? Traffic generation is a major concern
- Do users exist? I'm assuming you mean residents and employees. What focus area circle do they live in?
- We have worked hard to upgrade our natural areas in properties along Boones Ferry. We like to have the city create a natural resource map to show what won't be available and how nature is protected.
- We will be impacted greatly, and we don't have representation in the city, there needs to be more meetings where we can be involved. Basalt Creek residents are not represented on TPARK.
- Will all the information that we've talked about be shared with council?

NEIGHBORHOOD FOCUS GROUP/OPEN HOUSE DISCUSSION NOTES | SEPT 9, 2021

Ross Hoover and Rich Mueller outlined opportunities to be involved with the City – there are two nonresident spaces on the TPARK citizen group. Other opportunities are online, Council, etc. Any interested sellers should contact the City. He highlighted benefits to working with the City, expanded timeline, legacy opportunities, park naming, etc.

Cindy Mendoza emphasized that the City's job is to respond to issues like these. Begin and continue the communication.

- Topography of the land is ultimately going to dictate what happens.
- There are other constraints such as power lines, access, egress.
- There's a trail from Victoria Gardens development down into the Canyon that was a source of problems for years, teenagers, drug use, etc. I had a neighbor that lived there for 17 years and had to deal with it for a long time. He ended up installing motion activated floodlights which somewhat addressed it.
- And as for trails, if they are not lighted, there bad things will happen on those trails.

Rachel Edmonds responded that some trails being considered at this point are all on street trails, think about it as a wider sidewalk.

• You need to update the website to say a 10-to-15-acre park. It currently says a 10 to 20-acre park be clear that trails count towards that acreage desired.

Meeting convened, City and MIG handed out print outs of the materials presented and encouraged people to use the website to provide additional thoughts and comments. Several people continued conversations with city staff.

APPENDIX A: COMMUNITY ENGAGEMENT

BUSINESS & EMPLOYMENT FOCUS GROUP DISCUSSION NOTES | OCT 5, 2021

Tualatin Basalt Creek Parks & Recreation Plan | Business Focus Group

Via Zoom, October 5, 2021, 3:00-4:00PM

(2 focus group attendees)

- Stu Peterson, Macadam Forbes
- Jonathan Taylor, Economic Development Manager, City of Tualatin
- Also in attendance were Ross Hoover, Rich Mueller, Kyla Cesca (City of Tualatin)
- Rachel Edmonds and Cindy Mendoza (MIG, Inc)
- Chamber of Commerce was engaged outside of this meeting

Ross Hoover provided opening remarks.

Rachel Edmonds of MIG, Inc. provided an overview of the purpose of the project, the framework concept for three focus areas and why we are looking for feedback from the business community.

Cindy Mendoza of MIG, Inc. engaged the group with business-focused discussion.

Discussion:

Q: What types of parks, trails, plazas, greenspace, recreation amenities and programs would best support new businesses in Basalt Creek? What needs would they meet?

Connectivity along sidewalks is great, but trails running through the center of a site are off-putting to potential business.

As far as parks go in Tualatin and the surrounding cities, they are great, but I find few people or employees use them during the daytime. Still, they enhance quality of life and are important to have. It's difficult to find employees these days, so the quality of the area will be a differentiator. Tualatin and Sherwood offer amazing quality of life, distinct from places like Portland.

The more that trails or future parks can share an edge with residential areas, the better. The more attractive they are, the better.

Q: Some industrial areas bill themselves as industrial parks with green space or other lifestyle benefit tied to higher employee satisfaction and productivity. Is that a trend you see coming to town?

As long as trails don't run through a business' access or parking areas or the truck court, then it's fine.

Employee security, especially for firms with proprietary methods of manufacturing or products, is a big concern. Trails can present safety and security issues, and they need to be protected and policed.

I rarely see employees using surrounding parks during the day, but their presence is still important. Folks take breaks during the day and want to walk around where it is safe and attractive.

Q: How do we get people to and from their workplaces off road, to reduce traffic burden on an area? It sounds like paths or trails to get people to the workplaces are good if they are located at the edges of the site.

Tualatin Basalt Creek Parks & Recreation Plan | Business Focus Group - 1

BUSINESS & EMPLOYMENT FOCUS GROUP DISCUSSION NOTES | OCT 5, 2021

Trails are so important as many people bike to work, errands, etc. And they do so more and more. Tualatin-Sherwood Road is supposed to have a better bike trail in the future. I see that as being an important facility for the whole city and region and could benefit this area of town.

E bikes and E scooters will bring the ability to travel longer distances to work along trails. It sounds like you just need a wide sidewalk or similar facility that doesn't infringe on development opportunities of the site.

Security and theft protection is a major concern of all employers, so any introduced trails concept has got to recognize that.

Q: I'm hearing that the front of the right-of-way is the best location for trails as opposed to an alignment along the backside of a property where visibility is poorer. Is this right?

Yes, it should be in the visible areas

Q: What about natural areas and green spaces? It seems like businesses prefer that the neighborhoods they are in to be attractive.

There's an example of a dog park in Tigard that nearby employees don't use. People drive to this area to use the dog park and people from the nearby apartment buildings also use it. It's located right in the middle of an industrial park, and you would think more employees would use it, but they don't.

Q: *I* want to address an underlying assumption that employees don't need or want recreation space where they work. Research has shown that the leisure lifestyle space trends are strong and there a way to attract employment and increase employee productivity. What do you think about that?

I'd still focus on trails as the main employment piece. People love to get out and walk. Lots of places into Tualatin or Wilsonville you must get into a car to get to. And people just want to walk these days wherever they can.

What would really work is if you can get people at workplaces walking to go get something to eat. Like a small food cart pod.

This area is an urban renewal area, and we should begin thinking about that as ideas are proposed and developed. The highest and best use for land inside the UGB is the focus. I think in the urban renewal area document, \$3.2 million is allocated for the Tonquin Ice Age Trail improvements. Trails are the only park type item that can be funded with urban renewal dollars. And it would be important to provide connectivity to the east side via trails, if possible.

Q: We know there are synergies between parks and businesses and there are some good examples out there to learn from. What are some good models you are aware of we should look at?

'What not to do' is more known than what to do. For example, Tualatin Commons has no connectivity. You really need to be able to get to these places from all sides.

Connectivity and the ability to walk around to a food cart pod location might be something to pursue. The opportunity for people to walk and get food is good. The zoning needs to be flexible to allow more than just the primary designated use, like industrial development. Employers and employees like having services like that nearby.

Tualatin Basalt Creek Parks & Recreation Plan | Business Focus Group - 2

APPENDIX A: COMMUNITY ENGAGEMENT

BUSINESS & EMPLOYMENT FOCUS GROUP DISCUSSION NOTES | OCT 5, 2021

A common complaint we come across is that when other improvements bring added traffic to an area that is already going to get more traffic from a proposed use. You need to balance those things with what the site is intended to be.

Keep in mind that industrial uses have about 2 employees per 1000 square foot versus five to six employees per 1000 square foot for other kinds of commercial development. It's just not a huge influx of demand from employees, so any kind of food cart pod idea needs to be small and scaled correctly. Suggest three to four food carts during the sunny season would be perfectly adequate.

Tualatin has a history that industry subsidizes residential uses. It's had lower property taxes because of industry. So, if we take 10 acres off the table for industry to put towards a park in this area, it's going to affect the estimated tax revenues.

The 2018 park system plan identified up to a 20-acre site based on level of service goals the parks department has. The consultant team developed a set of criteria that identified areas not attractive to industrial development for one or more reasons. During that analysis, it became apparent that a 10-acre future park size was more realistic based on lot configuration.

The city doesn't intend to look at prime industrial lands for park space.

Tualatin Basalt Creek Parks & Recreation Plan | Business Focus Group - 3

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City Departments & Staff

(City Departments & Staff Park Maintenance Division) Date: Sept 8, 2021 (Community Development) Dates: Mar 15, Apr 8, May 17, Jun 15, Jul 19, Aug 10 & 30, Oct 7, Nov 16 & 23, 2021

> Site Visits Dates: Mar 12, May 10, Nov 19, 2021

Tualatin & Wilsonville City Staff Date: Jul 22, Aug 23, Nov 18, 2021

Metro Date: Jul 22, Aug 17/18, Sept 8, Oct 11, Nov 18, 19 & 22, 2021

Chamber of Commerce Date: Jul 26, 2021

Tualatin & Lennar Homes Date: Aug 11, 2021

Community Partners for Affordable Housing Date: Aug 31, 2021

Tualatin, Wilsonville & Washington County Active Transportation Meeting Date: Oct 5, 2021

Tualatin, Sherwood, King City and Durham Date: Nov 18, 2021

SITE VISIT - INFORMATIONAL HANDOUT | MAY 10, 2021

(Provided by Grace Lucini)

CITY OF TUALATIN PARKS AND RECREATION DEPARTMENT---BASALT CREEK MASTER PLANNING 5-10-2021 ONSITE VISIT- LUCINI PROPERTY 23677 SW BOONES FERRY ROAD TUALATIN OREGON ROSS HOOVER, RON MULLER, CITY CONSULTANT/S CITY OF TUALATIN POINTS OF CONCERN: 1. PROTECTION AND CONSERVATION OF NATURAL RESOURCES AND OPEN AREAS MANDATED MULTIPLE NATURAL RESOURCES KNOWN TO EXIST WITHIN BASALT CREEK AREA Basalt Creek Canyon is rich in multiple natural resources -not yet documented within natural resource maps adopted by the City of Tualatin Basalt Creek Canyon has extremes in topography, and is predisposed to high landslide susceptibility Steep slopes, hydrology, and other issues due to upstream development- water level has increased over years as has number of dead trees (decreasing tree canopy) while also increasing amounts of algae have been noted Local existing stormwater management system and treatment facilities are limited in Basalt Creek Area designed and constructed for undeveloped lands- and not increased stormwater management needs associated with increased impervious surfaces with upstream urbanized development NEED FOR COORDINATION BETWEEN WASHINGTON COUNTY, CITY OF TUALATIN AND CITY OF WILSONVILLE WITH OVERLAPPING JURISDICTIONS AND RESPONSIBILITIES DURING NEXT SEVERAL YEARS OF URBANIZATION OF THE ENTIRE BASALT CREEK CANYON AREA BY LOCAL CITIESo Agreed upon recreational goals within Basalt Creek Area for future generations by all local governments o Clearly identified and coordinated accountability and responsibility- by each local government -during all phases of planning and implementation of recreational needs throughout years of transitioning as part of urbanization process Coordinated and Identified Funding Needed for: Intergovernmental Coordinated planning for Trail and Parks siting and design; . Intergovernmental Coordinated Planning of Type and Amount of recreational use; Intergovernmental Coordinated land acquisition; construction; maintenance; with provision of continuous effective and safe public services (water, sewer, stormwater, trash, police) for entire Basalt Creek Area Adoption of clearly identified uniform and consistent measures identified and coordinated to address potential public health issues: Water born illnesses (i.e. cyanobacteria (harmful algae) blooms, giardia, e. Coli bacteria --mainly from dogs); Drowning and/or potential physical injuries due to steep slopes and wetlands Intergovernmental adoption of clearly identified and coordinated methods and funding methods for routine monitoring to identify and address potential negative impacts of humans or pet impacts upon known Natural Resources within the Basalt Creek Area 2. NEED FOR INCLUSION OF POTENTIALLY AFFECTED PROPERTY OWNERS DURING ALL PHASES OF LAND USE PLANNING- TO GAIN SUPPORT AND PARTICIPATION IN EFFECTING COMMON GOALS 3. CANYON HAS MORE GRADUAL GRADE FROM THE WEST SIDE- EASIER AND LESS EXPENSIVE CONSTRUCTION COSTS FOR ADA COMPLIANCE AND ACCESS INTO CANYON AREA 5-10-2021 ON SITE CITY OF TUALATIN PARKS & REC BASALT CREEK MASTER PLANNING PAGE 1 OF 2

SITE VISIT - INFORMATIONAL HANDOUT | MAY 10, 2021

(Provided by Grace Lucini)

REFER	ENCES :
٠	https://www.oregonmetro.gov/recreation-ecology-literature-review
•	https://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/RECREATION/HARMFULALGAEBLOOMS/Pages/Educat ionandOutreach.aspx
	Factsheet: IMPACTS OF DOGS ON WILDLIFE 2019 Excerpts from research publications, literature reviews and science commentary Compiled by ProtectNatureTO – a coalition of over 20 nature- and stewardship-based organizations advocating for the protection of wildlife and natural areas across the City of Toronto In summary, people and their dogs disturb wildlife, and people are not always aware of or willing to acknowledge the significance of their own impacts. Wildlife perceive dogs as predators. Dogs subject wildlife to physical and temporal displacement from habitat, and dog scent repels wildlife with lingering impacts. Dogs disturb wildlife which can induce long-term stress, impact animals' immune systems and reduce reproduction. Dogs spread disease to and outright kill wildlife. People with dogs are much more detrimental to wildlife than people alone; off leash dogs are worse; and off-trail impacts are highest. Urban wildlife is subject to many human-induced stressors including habitat loss, degraded and fragmented habitat, impacts from a variety of user groups, roads, trails, infrastructure, noise and light pollution.
	https://www.protectnatureto.org/wp-content/uploads/2019/10/Impacts-of-dogs-on-wildlife-Factsheet_PNTO_Oct2019.pdf Article attached
٠	The Impacts Of Dogs On Wildlife And Water Quality: A Literature Review Compiled by Lori Hennings, Metro Parks and Nature, April 2016
	The evidence that dogs negatively impact wildlife is overwhelming. It is clear that people with dogs – on leash or off – are much more detrimental to wildlife than people without dogs
	Under the Oregon Department of Environmental Quality (DEQ), Metro is a Designated Management Agency to protect water quality in compliance with the federal Clean Water Act. Limiting dog access at most natural areas is one of Metro's commitments to DEQ, because dog feces pollute water. Feces are often delivered to waterways through stormwater. The DEQ identifies pet waste as a significant contributor to one of the region's most ubiquitous and serious pollutants, E. coli bacteria. Contact with E. coli-polluted water can make people sick. Because dog waste can be a relatively simple source to reduce or eliminate exposure to E. coli, DEQ considers reducing or eliminating dog waste an important action item in jurisdictions' clean water implementation plans for the Willamette Basin watershed.
	https://olis.oregonlegislature.gov/liz/2020R1/Downloads/CommitteeMeetingDocument/217728
MAPS AT	TACHED:
•	US Fish & Wildlife Service National Wetlands Inventory and Topographical - Basalt Creek Area- FRESHWATER FORESTED/SHRUB WETLAND Oregon Statewide Wetlands Inventory- Basalt Creek Area PSS1A data (3 pages) Metro Basalt Creek- Title 13 Metro Basalt Creek- UPLAND HABITATS; RIPARIAN HABITATS; SLOPES >10%; SLOPES >25% AND WETLANDS Metro Basalt Creek- SLOPES >10%; SLOPES >25% AND WETLANDS-Public Access from WEST SIDE OF CANYON Oregon State University- Basalt Creek Landslide Susceptibility Tapman Creek to Willamette River
	5-10-2021 ON SITE CITY OF TUALATIN PARKS & REC BASALT CREEK MASTER PLANNING PAGE 2 OF 2

SITE VISIT - INFORMATIONAL HANDOUT | MAY 10, 2021

(Provided by Grace Lucini)



APPENDIX A: COMMUNITY ENGAGEMENT

SITE VISIT - INFORMATIONAL HANDOUT | MAY 10, 2021

(Provided by Grace Lucini)



MEETING AGENDA - BASALT CREEK ACTIVE TRANSPORTATION | OCT 4, 2021

BASALT CREEK ACTIVE TRANSPORTATION MEETING (Tualatin, Wilsonville, WA County)

October 5, 2021 at 3pm

Attendance

City of Tualatin: Ross Hoover, Rich Mueller, Kyla Cesca, Steve Koper, Erin Engman **City of Wilsonville**: Kris Ammerman, Miranda Bateschell **Washington County**: Jessica Pelz, Renus Kelfkens, Russ Knobel

- Introduction
- City of Tualatin Parks and Recreation Update
- City of Wilsonville Update
- Washington County Update
- City of Tualatin Planning and Development Update
- Discussion



Pamplin Media Group: Oct 22, 2021

PAMPLIN MEDIA GROUP | OCT 22, 2021

Tualatin quizzes residents on preferred parks in Basalt Creek

Parks & Rec asks what types of amenities residents would like on 10-20 acres of land (https://pamplinmedia.com/images/artimg/00003717748739-0651.jpg)Tualatin Parks & Recreation wants to hear from the public on what they would like to see when it comes to constructing greenways, natural parks and trail connections in the future Basalt Creek development.

At issue is what to do with 10 to 20 acres of park space planned for the area.

"We know we want parks in Basalt Creek." said Ross Hoover. Tualatin Parks & Recreation director. "We know there'll be future residents. We know there'll be future businesses. We know people will need open space and natural areas and trails."

Southwest Basalt Creek Parkway splits the future Basalt Creek development into two sections. Wilsonville plans to eventually annex land to the south of the roadway. Tualatin will take in 194 buildable acres to the north

The Tualatin portion of the area is expected to accommodate 575 new households and generate as many as 1.897 new jobs.

To compare what 10 to 20 acres of park land looks like, consider that bach Park encompasses about 20 acres, while Tualatin Community Park sits on about 27 acres of land

"People love their parks in Tualatin. We're hearing that, and we're hearing a broad array of desires and dreams and visions for what could be in Basalt Creek

COURTESY PHOTO: TUALATIN PARKS & RECREATION - Tualatin is asking residents what they

in the future, anything from athletic field to playgrounds, to natural areas, to preservation to trails," said Hoover. "You name it — you take the spectrum of potential park amenities --- and that's what we've heard "

Rich Mueller, Tualatin's parks planning and development manager, said in all, the city government ended up convening 14 meetings and focus groups to receive input on Basalt Creek park plans. Tualatin officials have also conducted two surveys.



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In total, 400 people have been engaged in the process, including Tualatin youths, property-owners and other residents. One focus group included some 25 residents of the Basalt Creek area, which is now mostly rural as it awaits development.

Mueller said plans are underway to have community members review a draft plan of the park land in Basalt Creek and fill out another survey, set to begin Nov. 12 and continue through Dec. 3.

Residents can still share their thoughts by going to the Tualatin Parks & Recreation website and clicking on the "Tualatin Basalt Creek Parks & Recreation Plan" icon.

Hoover said a consultant identified potential park spaces in the Basalt Creek area, which contains a variety of different topographical elements, including some slopes with more than a 10% grade. The area's namesake, Basalt Creek, runs through the area as well. "It's really varied, and so you can see there's these big flat areas and rolling hills, and then as you get into the creek, steeper slopes," said Hoover.

The final plan for the area is expected to be presented to the Tualatin City Council in January.

"It's fantastic to see people get engaged in that and participate in that process, because that's what this is all about," said Hoover. "We are creating the avenue for people to plug in and have a real say in what they want."



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Appendix B cost estimate detail

CITY OF TUALATIN



APPENDIX B: COST ESTIMATE DETAIL

BASALT CREEK SIT	TE DEVELOPMENT COST ESTIM NITY AREA (EXCLUDES SITE W	ATE / ORDER OF MAGNITUDE CC /IDE TRAILS)	ISTS AND ASSUMPTIONS
	Assumptions	Cost per unit (2021 dollars)	Order of Magnitude Cost (2021 dollars)
PLANNING			
Master Planning		-	-
SITE ACQUISITION			
Parkland Acquisitions or Easements (per acre)	1-acre site	\$300,000	\$300,000
SITE DEVELOPMENT			
Site infrastructure (per acre of developed site)	Grading, landscape, irrigation, trees, stormwater, open space improvements, and off street parking	\$155,000	\$155,000
Concrete pad/ plaza	5000 square foot plaza	\$9	\$45,000
Restroom facilities	2 unit single-occupant	\$200,000	\$200,000
Signage allowance	Destination, wayfinding, identification, regulatory	\$10,000	\$10,000
Subtotal			\$710,000
Mobilization	8% of raw cost		\$56,800
Design Fee	12% of raw cost and mobilization		\$92,016
Contingency	25% of raw cost, mobilization and design fee		\$214,704
TOTAL			\$1,073,520

Development Cost Assumptions:

- These costs are an order of magnitude planning level estimate. As implementation moves forward, costs will need to be reviewed as the scope, schedule and design development provide additional context and specificity to the individual projects.
- These costs are conceptual and based on diagrammatic plan and assumptions. Periodically and prior to final design, these costs should be updated to ensure they are consistent with current materials costs and labor markets.
- This opinion of costs is based on 2021 construction costs and is derived from recent construction projects. Contingencies are included to provide greater context and flexibility given the conceptual nature of the Tualatin Basalt Creek Parks & Recreation Plan at this stage.

BASALT CREEK PARKS & RECREATION PLAN

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BASALT CREEK SITE DEVELOPMENT COST ESTIMATE / ORDER OF MAGNITUDE COSTS AND ASSUMPTIONS EAST OPPORTUNITY AREA (EXCLUDES SITE WIDE TRAILS)										
	Assumptions	Cost per unit (2021 dollars)	Order of Magnitude Cost (2021 dollars)							
PLANNING										
Master Planning		-	-							
SITE ACQUISITION										
Parkland Acquisitions or Easements (per acre)	Stormwater sites at Autumn Sunrise be dedicated to City as tracts once subdivision construction is complete.	-	-							
SITE DEVELOPMENT										
Nature play features at stormwater facility	Nature play area will meet ADA, CPSI and ASTM standards.	\$300,000	\$300,000							
Signage allowance	Identification, regulatory	\$2,000	\$2,000							
Subtotal			\$302,000							
Mobilization	8% of raw cost		\$24,160							
Design Fee	12% of raw cost and mobilization		\$39,139							
Contingency	25% of raw cost, mobilization and design fee		\$91,325							
TOTAL			\$456,624							

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APPENDIX B: COST ESTIMATE DETAIL

BASALT CREEK SITE DEVELOPMENT COST ESTIMATE / ORDER OF MAGNITUDE COSTS AND ASSUMPTIONS **CENTRAL OPPORTUNITY AREA** (EXCLUDES SITE WIDE TRAILS)

CENTRAL OFFOR	TONITY AREA (EACLODES SIT	E VVIDE IRAILS)	r			1				
			Order of Magnitude Cost (2021 dollars)							
	Assumptions	Cost per unit (2021 dollars)	10 acre linear and sloping site	10 acre linear flat site	10 acre square combination	5 acre combination				
PLANNING										
Master Planning		\$85,000	\$85,000	\$85,000	\$85,000	\$85,000				
SITE ACQUISITION										
Parkland Acquisitions or Easements (per acre)	Summary cost estimate in Chapter 6 assumes a 10-acre site	\$300,000	\$3,000,000	\$3,000,000	\$3,000,000	\$1,500,000				
SITE DEVELOPMENT										
Site infrastructure (per acre of developed site)	Grading, landscape, irrigation, trees, stormwater, open space improvements, and off street parking (does not include natural areas)	\$155,000	\$1,240,000	\$1,224,500	\$1,201,250	\$527,000				
Amenities										
Restroom facilities	2 unit single-occupant	\$200,000	\$200,000		\$200,000	\$200,000				
Restroom facilities	4 unit single-occupant	\$375,000		\$375,000						
Basic site furnishings allowance	Approximately 6 benches, 8 trash receptacles, 2 bike racks, 4 picnic tables	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000				
Wayfinding	Basic park signage (identification, directional, regulatory)	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000				
Interpretive signage	Basic design, fabrication and installation for 2 signs	\$10,000		\$10,000	\$10,000					
Lighting	Pedestrian lighting allowance (10 lights across the site)	\$250,000	\$250,000	\$250,000	\$250,000					
Recreation Facilities	None of the facilities listed below are illuminated									
Picnic shelter - small (each)	Sized for 4 to 6 tables and no utilities	\$150,000	\$150,000	\$150,000	\$150,000	\$300,000				
Picnic shelter - medium (each)	Sized for 8 to 10 tables and no utilities	\$275,000	\$275,000	\$275,000	\$275,000					

continued next page

BASALT CREEK PARKS & RECREATION PLAN

BASALT CREEK SITE DEVELOPMENT COST ESTIMATE / ORDER OF MAGNITUDE COSTS AND ASSUMPTIONS **CENTRAL OPPORTUNITY AREA** (EXCLUDES SITE WIDE TRAILS)

CENTRAL OFF OF			Order of Magnitude Cost (2021 dollars)						
			10 acre 10 acre 10 acre 5 acre						
	Assumptions	Cost per unit (2021 dollars)	10 acre linear and sloping site	10 acre linear flat site	10 acre square combination	5 acre combination			
Play area - neighborhood (each)	Each, includes areas for tots and school age play. Range between \$150,000 and \$350,000. Higher end represents addition of accessible safety surfacing.	\$350,000	\$350,000		\$350,000	\$350,000			
Play area - destination (each)	Themed play experience; customized central play feature with additional age- group play nodes; assumes safety surfacing	\$800,000		\$800,000					
Shade structure (each)	Fabric-roofed elements that cool off hot play areas/spray parks etc.	\$20,000		\$20,000					
Half basketball court (each)	Striping, backboard, net, hoop	\$50,000			\$50,000	\$50,000			
Full basketball court (each)	Striping, backboards, nets, hoops	\$75,000	\$75,000						
Tennis/pickleball (each combo)	Tennis court/4 Pickleball courts with striping and netting, no lights	\$120,000	\$120,000		\$120,000	\$120,000			
Soccer field (each)	Natural turf field with basic drainage/prep and features. Field with artificial turf and lights closer to \$3,000,000	\$300,000		\$300,000					
Natural area (per acre)	Restoration for 1-acre of natural area	\$45,000	\$90,000	\$94,500	\$101,250	\$72,000			
Turf area for play / pick up activities (per acre)	1 acre irrigation and drainage improvements, for unstructured play	\$125,000	\$251,090	\$78,914	\$189,681	\$60,979			
Subtotal			\$6,146,090	\$6,722,914	\$6,042,181	\$3,324,979			
Mobilization	8% of raw cost		\$491,687	\$537,833	\$483,374	\$265,998			
Design Fee	12% of raw cost and mobilization		\$796,533	\$871,290	\$783,067	\$430,917			
Contingency	25% of raw cost, mobilization and design fee		\$1,858,578	\$2,033,009	\$1,827,156	\$1,005,474			
TOTAL (EACH PARK CONCEPT)			\$9,292,888	\$10,165,046	\$9,135,778	\$5,027,368			

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BASALT CREEK TR	AIL CONCEPT ACQUISITION A	ND DEVELOPM	ENT COST ESTIN	/ATE / ORDER O	F MAGNITUDE (Costs and ass	SUMPTIONS (in 2	2021 dollars)							
Trail type or improvement	Assumptions	Material	Facility width (feet)	Buffer total	Lineal feet	Miles	Trail facility (SF)	Aggregate base (SF) (asphalt trails only)	Acreage	Acquisition Cost	Raw Cost to Develop	Mobilization 8% of raw cost	Design Fee 12% of raw cost and mobilization	Contingency 25% of raw cost, mobilization and design fee	Total Cost
New on-street trail/widened sidewalk	No cost to acquire land; land dedication will be part of the development requirements; factor in cost of facility only; does not include curbs, drainage infrastructure	concrete	12	6	16,705	3.16	200,460	-	4.6	0	\$1,503,450	\$120,276	\$194,847	\$454,643	\$2,273,216
Developer provided sidewalk signage enhancements	Lump sum for 10 added signs at \$1000 each	concrete	6	-	4,985	0.94	29,910	-	0.69	0	\$10,000	\$800	\$1,296	\$3,024	\$15,120
Off-street trail/ greenway, private easement	Need to negotiate easement with impacted property owners	asphalt	12	6	2,650	0.50	31,800	47,700	0.73	\$219,008	\$182,850	\$14,628	\$23,697	\$55,294	\$495,477
Off-street trail/ greenway, BPA easement	Bonneville Power Administration owns utility ROW; easement could be negotiated directly with Tualatin; assumes no cost	asphalt	12	6	1,450	0.27	17,400	26,100	0.40	0	\$100,050	\$8,004	\$12,966	\$30,255	\$151,276
Off-street trail/ greenway PGE easement	PGE has utility easements from the property owners; any future trails would be negotiated with both landowner and utility	asphalt	12	6	2,870	0.54	34,440	51,660	0.79	\$237,190	\$198,030	\$15,842	\$25,665	\$59,884	\$536,611
Off street trail/ greenway, private easement, within existing City limits	Requires easement with Victoria Gardens subdivision	asphalt	12	6	950	0.18	11,400	17,100	0.26	\$78,512	\$65,550	\$5,244	\$8,495	\$19,822	\$177,624
Existing sidewalk trail signage enhancement within City limits	Lump sum for 6 added signs at \$1000 each	concrete	5	-	2,810	0.53	-	-	-	0	\$6,000	\$480	\$778	\$1,814	\$9,072
TOTALS					32,420	6.14	325,410	-	7.5	\$534,711	\$2,065,930	\$165,274	\$267,745	\$624,737	\$3,658,397

Trails Cost Assumptions:

- New on-street trails/widened sidewalks are a 12-foot wide concrete facility (4-inch depth of concrete over a 6-inch gravel base) with a 6-foot wide vegetated buffer between the street and the sidewalk.
- Concrete paving cost per square foot (2021 dollars): \$7.50
- Off-street trails are a 12-foot wide asphalt facility (2-inch depth of asphalt over a compacted gravel base extending 2-feet beyond the asphalt on both sides) with a 1-foot maintained/mowed vegetated edge.
- Asphalt paving cost per square foot (2021 dollars): \$4.75









CITY OF TUALATIN

PO BOX 369 TUALATIN, OREGON 97062-0369 (503) 692-2000

October 12, 1992

City Council City of Tualatin

CITY OF TUALATIN-CLACKAMAS COUNTY URBAN GROWTH MANAGEMENT AGREEMENT 1992

Attached is a proposed Urban Growth Management Agreement between Clackamas County and City of Tualatin.

REASONS FOR THE AGREEMENT

The proposed agreement furthers coordination in land use planning between the County and City, as required by Statewide Planning Goal 2. It ensures that development actions or public service extensions that conflict with Tualatin's Comprehensive Plan will not be allowed in unincorporated areas inside the UGB.

The proposed Agreement recognizes the City's authority for public facilities planning within the UGB and provides for coordination with the County, in accordance with Oregon Administrative Rule 660-11-015.

The proposed Agreement provides for the City's planning district designation to apply to an annexed area automatically on the effective date of the annexation. This will eliminate the need for a plan map amendment to accompany each annexation in Clackamas County.

RECOMMENDATION

Staff recommends that Council adopt the attached resolution authorizing the Mayor and City Recorder to execute the attached Urban Growth Management Agreement.

Submitted by:

Lee D. Leighton

Associate Planner

f: Comp Plan/Clackamas County UGMA

Approved By Tualatin City Council Date 10/11/92Recording Secretary 1.5

LOCATED AT: 18880 SW Martinazzi Avenue

RESOLUTION NO. 2766-92

ADOPTING CITY OF TUALATIN - CLACKAMAS COUNTY URBAN GROWTH MANAGEMENT AGREEMENT 1992

WHEREAS, the CITY and the COUNTY have a mutual interest in coordinated comprehensive plans, compatible land uses and coordinated planning of urban facilities; and

WHEREAS, OAR 660-03-010 requires management of unincorporated areas within an urban growth boundary to be set forth in a statement submitted to the Land Conservation and Development Commission (LDCD) at the time of acknowledgement request; and

WHEREAS, OAR 660-11-015 requires the responsibility for the preparation, adoption and amendment of the public facility plan to be specified within the urban growth management agreement; and

WHEREAS, Statewide Planning Goal 2 requires coordination between CITY and COUNTY in comprehensive planning; and

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF TUALATIN:

Section 1. The Urban Growth Management Agreement (UGMA) as shown in Exhibit A attached to this resolution is hereby adopted.

Section 2. The Mayor of the City of Tualatin is hereby authorized to sign and date the UGMA in Exhibit A.

Section 3. After signing by the Mayor, the Planning Director shall forward the UGMA to Clackamas County for signing by the Chair and designated members of the Clackamas County Board of Commissioners.

INTRODUCED AND ADOPTED THIS 12th day of October, 1992.

CITY OF TUALATAN, OREGON BY Mayor

ATTEST:

Rhodis BY City Recorder

Resolution No. 2766-92

ELACK CO LIGMA FILL 1492 92-1127

CITY OF TUALATIN - CLACKAMAS COUNTY URBAN GROWTH MANAGEMENT AGREEMENT 1992

WHEREAS, the CITY and the COUNTY have a mutual interest in coordinated comprehensive plans, compatible land uses and coordinated planning of urban facilities; and

WHEREAS, the CITY and the COUNTY will make a good faith effort to reconcile any differences that may emerge from the above mutual interests; and

WHEREAS, information exchanges should concentrate on issues that may have a significant impact on either party and should not entail cumbersome procedural requirements that may increase the time necessary to expedite decision making; and

WHEREAS, OAR 660-03-010 requires management of unincorporated areas within an urban growth boundary to be set forth in a statement submitted to the Land Conservation and Development Commission (LDCD) at the time of acknowledgement request; and

WHEREAS, OAR 660-11-015 requires the responsibility for the preparation, adoption and amendment of the public facility plan to be specified within the urban growth management agreement; and

WHEREAS, Statewide Planning Goal 2 requires coordination between CITY and COUNTY in comprehensive planning; and

WHEREAS, the Tualatin Comprehensive Plan and Development Code employs a one-map system wherein the Plan Map fulfills a dual role acting as the Plan Map and the Zone Map, thus there is a no separate Zone Map.

NOW, THEREFORE, THE CITY AND COUNTY AGREE AS FOLLOWS:

- 1. <u>Boundary</u>
 - A. The Urban Growth Management Boundary (UGMB) shall include unincorporated land within the Urban Growth Boundary (UGB) as shown on map Attachment "A" to this agreement. Any amendments to the Metro UGB, shown on map Attachment "A" will automatically be reflected in the UGMB.

2. <u>Comprehensive Planning, Plan Amendments and Public</u> <u>Facilities Planning</u>

A. The development of a comprehensive plan and comprehensive plan changes for the area within the UGMB shall be a coordinated CITY-COUNTY planning effort.

Page 2

CITY shall be responsible for preparing all legislative comprehensive plan amendments in the UGMB. COUNTY shall adopt CITY land use plan designations for all unincorporated lands within the UGMB. COUNTY shall adopt no comprehensive plan amendments for lands within the UGMB, except those which may be needed for consistency with comprehensive plan amendments adopted by CITY.

CITY shall be responsible for the preparation, adoption, and amendment of the public facility plan within the UGMB required by OAR Chapter 660, Division 11, Public Facilities Planning. Preparation and amendment of such public facility plan shall provide for coordination with and participation by COUNTY. No County service or other special districts exist within the UGMB.

3. <u>Development Proposals in UGMB</u>

COUNTY's zoning shall apply to all unincorporated lands within the UGMB. COUNTY shall zone all unincorporated lands within the UGMB as Future Urbanizable (FU-10). Subject to the terms of this Agreement, COUNTY shall retain responsibility and authority for all implementing regulations and land use actions on all unincorporated lands within the UGMB.

The provision of public facilities and services shall be consistent with the adopted public facility plan for the unincorporated UGMB. Within the UGMB, COUNTY shall issue no permits or otherwise authorize extension or connection of public facilities and services in violation of the FU-10 zone.

COUNTY shall not form any new County service districts or support the annexation of land within the unincorporated UGMB to such districts or to other service districts unless agreed to by CITY.

4. <u>City and County Notice and Coordination</u>

A. The COUNTY shall provide notification to the CITY at least 35 days prior to the first scheduled public hearing open all quasi-judicial actions, proposed legislative changes to the COUNTY comprehensive plan or its implementing ordinances affecting land within the UGMB.

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> C. No new serv. dists.

- B. The COUNTY shall provide notification to the CITY at least 15 days prior to staff decision on applications for administrative actions as provided for in the COUNTY's Zoning and Development Ordinance for applications within the UGMB.
- с. The COUNTY shall notify and invite CITY staff to participate in pre-application meetings on significant development proposals, planned unit developments, mobile home parks, or Design Review Committee meetings on development proposals within unincorporated areas of the UGMB. These meetings shall be set by the COUNTY after consultation with CITY staff. If CITY chooses to attend pre-application meeting, the meeting shall occur at a mutually agreeable time. In the event that a mutually agreeable time cannot be achieved, or in the event CITY informs COUNTY that it does not wish to attend a pre-application meeting, such meeting shall occur at COUNTY's convenience within 30 days from the date the CITY is contacted.
- D. The CITY shall provide notification to the COUNTY at least 20 days prior to the first public hearing held by CITY on all proposed annexations, public facilities plans or amendments, or extra-territorial service extensions into unincorporated areas. In the case of a CITY initiated annexation or extra-territorial service application to the Portland Metropolitan Area Local Government Boundary Commission (PMALGBC), the CITY shall notify the COUNTY and provide an opportunity to comment prior to submitting the application. In the case of a private party annexation or extra-territorial service application to the PMALGBC, notice to the COUNTY shall be in accordance with PMALGBC procedures.
- E. The CITY shall provide notification to the COUNTY at least 20 days prior to the first public hearing on all proposed legislative changes to the CITY comprehensive plan or quasi-judicial actions adjacent to unincorporated areas.
- F. Any amendments proposed by the COUNTY or CITY to the UGB as shown on Attachment "A" shall be reviewed by CITY and COUNTY prior to submission to METRO. If and when CITY and COUNTY find it necessary to undertake a change of the UGB, the parties shall follow the procedures and requirements set forth in State statutes and Oregon administrative rules.

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G. The COUNTY shall enter all written comments of the CITY into the public record and shall consider the same in the exercise of its planning and plan implementation responsibilities. The CITY shall enter all written comments of the COUNTY into the public record and shall consider the same in its exercise of its planning and plan implementation responsibilities.

5. <u>City Annexations</u>

A. The CITY and the COUNTY recognize the final annexation decision making authority of the PMALGBC as set forth in applicable State law.

Due to the CITY's one-map Comprehensive Plan System, the CITY Planning District already applying to an unincorporated property is automatically redesignated and effective upon the effective date of the annexation. The Tualatin Development Code, Section 1.080(6), sets forth the automatic affirmation of existing Planning Districts upon annexation. This automatic redesignation complies with ORS 215.130(2)(a). If a property owner, developer, or the CITY desire a Planning District designation other than that already applying to the property, an application for a Plan Map Amendment may be requested at the time of or following annexation.

Upon annexation, the CITY shall assume jurisdiction of COUNTY roads and local access roads that are within or abutting the area annexed. As a condition of jurisdiction transfer for roads not built to CITY street standards on the date of the final decision on the annexation, the COUNTY agrees to pay the CITY a sum of money equal to the cost of constructing, including labor and materials, a 2-inch asphaltic concrete overlay over the width of the then existing pavement; however, if the width of the pavement is less than 20 feet, the sum shall be calculated for an overlay 20feet wide. The cost of asphaltic concrete overlay to be used in the calculation shall be the average of the most current asphaltic concrete overlay projects performed by each CITY and COUNTY. Arterial roads will be considered for transfer on a case-by-case basis. Terms of transfer for arterial roads will be negotiated and agreed to by both jurisdictions.

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6. <u>Development in Unincorporated Areas</u>

A. Development within UGMB may occur pursuant to the COUNTY's Future Urbanizable - 10 acre minimum zoning. The COUNTY shall not form any new COUNTY service districts for sanitary sewer or water services in the UGMB unless agreed to by the CITY.

> B. Public water and/or sanitary sewer shall be provided by the CITY to health hazard areas in the UGMB when the appropriate authority has determined that a health hazard exists and the health hazard area must be serviced. If the health hazard exists on a tax lot or tax lots contiguous to the CITY limits, such tax lots shall be annexed to the CITY as a condition to the CITY providing public water and/or sanitary sewer service.

The CITY shall not extend public water and/or sanitary sewer to the UGMB, except for health hazard situations as in 6B above and extra-territorial approvals by the PMALGBC. In the case of a CITY initiated extraterritorial service application to the PMALGBC, the CITY shall notify the COUNTY and provide an opportunity to comment prior to submitting the application. In the case of a private party extra-territorial service application to the PMALGBC, notice to the COUNTY shall be in accordance with PMALGBC procedures.

7. <u>Terms of Agreement</u>

- A. It is hereby understood that this agreement may be amended in writing at any time by the concurrence of both the CITY and COUNTY. The parties shall review this Agreement at each periodic review and make any necessary changes.
- B. This agreement may not be terminated except during either jurisdiction's Periodic Review. At such time, either party may terminate this Agreement after one hundred twenty (120) days written notice to the other party, provide, however, that in the event this action is taken, termination shall not occur until after a representative of the Department of Land Conservation and Development (DLCD) reviews this Agreement and the concerns of both jurisdictions regarding this successful operation.

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с. This agreement supersedes the Clackamas County-Tualatin Dual Interest Area Agreement, which was entered into on the 10th day of January, 1980. No other agreements concerning planning and land use jurisdiction in the UGMA exist between Clackamas County and the City of Tualatin.

IN WITNESS WHEREOF, the respective parties have caused to be signed in their behalf to make and enter into this agreement this Brd day of Pecember, 1992.

CITY OF TUALATIN

By Steven L. Stolze,

Mayor

ATTEST:

By Stephen A. Rhodes, City Recorder

Attachment ("A") clugma.agr

CLACKAMAS COUNTY BOARD OF COMMISSIONERS Ву Ed Lindquist, . By Judie Hammerstad, Commissioner B Commissioner Darlene Hooley



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BEFORE THE BOARD OF COUNTY COMMISSIONERS

OF CLACKAMAS COUNTY, STATE OF OREGON

In the Matter of Approving an Urban Growth Management Agreement Between the City of Tualatin and Clackamas County

the transfer of the to

ORDER NO. 92-1129

Comp Plan, Class Light

This matter coming on at this time and it appearing to the Board that agreements for the coordination of land use actions within the Clackamas County unincorporated area adjacent to cities are needed; and

It further appearing to this Board that this Urban Growth Management Agreement replaces the previous agreement signed by the Board in January of 1980; and

It further appearing to this Board that the City of Tualatin has agreed to the language in this agreement, and

It further appearing to this Board that said agreement is in the best interests of Clackamas County,

NOW, THEREFORE, IT IS HEREBY ORDERED that the within mentioned agreement with the City of Tualatin, a copy of which is on file in the Department of Transportation and Development, be and the same is approved.

DATED this 3rd day of December, 1992

BOARD OF COUNTY COMMISSIONERS

Judie Hammerstad, Chair

Hooley, Darlene Commissioner

Ed Linger, Commissioner CITY OF TUGLATIN

DEC 1 6 1992

MAYOR _____ COUNCIL ____ POLICE ____ ADM ____ FINANCE ____ PLANNING ____ LEGAL ____ OPER ___ ASST ADM ____ PARK & REC ____ ENG & BLDG ____ LIBRARY ____ ECO DEV ____ COURT ____ FILE ____



BCC 19-0557

Washington County – Tualatin Urban Planning Area Agreement

THIS AGREEMENT is entered into by WASHINGTON COUNTY, a political subdivision in the State of Oregon, hereinafter referred to as the "COUNTY," and the CITY OF TUALATIN, an incorporated municipality of the State of Oregon, hereinafter referred to as the "CITY."

WHEREAS, ORS 190.010 provides that units of local government may enter into agreements for the performance of any or all functions and activities that a party to the agreement, its officers or agents, have authority to perform; and

WHEREAS, Statewide Planning Goal #2 (Land Use Planning) requires that City, County, State and Federal agency and special district plans and actions shall be consistent with the comprehensive plans of the cities and counties and regional plans adopted under ORS Chapter 197; and

WHEREAS, the Oregon State Land Conservation and Development Commission (LCDC) requires each jurisdiction requesting acknowledgment of compliance to submit an agreement setting forth the means by which comprehensive planning coordination within the Regional Urban Growth Boundary (UGB) will be implemented; and

WHEREAS, following the Urbanization Forum process, the COUNTY through Resolution & Order 09-63, and the CITY through Resolution 4906-09 agreed that future additions to the UGB during or after 2010 must be governed and urbanized by the CITY in the COUNTY and also agreed to urge Metro to expand the UGB only to such areas as are contiguous to incorporated areas of Washington County; and

WHEREAS, the State legislature with House Bill 4078-A in 2014 and House Bill 2047 in 2015 validated the acknowledged UGB and Urban and Rural Reserves established through the Metro Regional process involving both the COUNTY and the CITY; and

WHEREAS, the Basalt Creek and West Railroad Planning Areas, generally located between the CITY and Wilsonville, were added to the UGB by the Metro Council in 2004, through Ord. No. 04-1040B; and

WHEREAS, Metro Ord. No. 04-1040B included a condition that the Basalt Creek and West Railroad Planning Areas undergo Title 11 concept planning, as defined in Metro Code Chapter 3.07 of the Urban Growth Management Functional Plan (UGMFP); and

WHEREAS, the COUNTY, the CITY, Wilsonville and Metro entered into an Intergovernmental Agreement (2011 IGA) (Contract No. BCC 11-0470) to consider the Basalt Creek and the West Railroad Areas in a single concept planning effort and refer to the two areas generally as the Basalt Creek Planning Area, a distinct subarea; and

Washington County – City of Tualatin Urban Planning Area Agreement Page 2 of 13

WHEREAS, the CITY, COUNTY, Wilsonville and Metro entered into the First Addendum to the 2011 IGA, acknowledging the Basalt Creek Transportation Refinement Plan (BCC 13-0724), a collaborative transportation planning effort that identified the major transportation projects for the Basalt Creek Planning Area; and

WHEREAS, the CITY, Wilsonville and Metro, agreed to extend the 2011 IGA through Addendum No. 2.0 (BCC No. 16-1110) until the cities and COUNTY amend their respective UPAAs and incorporate the Basalt Creek Concept Plan into each city's respective comprehensive plans or until September 28, 2019; and

WHEREAS, the CITY through Resolution 5392-18 and Wilsonville through Resolution 2697 adopted the Basalt Creek Concept Plan, which included the necessary transportation and land use planning for the area as well as an agreement on the boundary between Tualatin and Wilsonville; and

WHEREAS, the COUNTY, CITY, Wilsonville and Metro through the Basalt Creek Area planning process, recognized that major multimodal transportation investments have been identified that require significant multijurisdictional coordination and agreed to seek additional funding for the transportation infrastructure in the Basalt Creek Planning Area as needed; and

WHEREAS, the COUNTY and the CITY desire to amend the Urban Planning Area Agreement (UPAA) to reflect the changes to the UGB, the CITY's Urban Planning Area, and the need for urban planning of the new Urban Reserve lands; and

WHEREAS, the COUNTY and the CITY, to ensure coordinated and consistent comprehensive plans, consider it mutually advantageous to establish:

- 1. An Urban Planning Area Agreement incorporating a site-specific Urban Planning Area within the UGB where both the COUNTY and the CITY maintain an interest in comprehensive planning, and an Urban Reserve Planning Area outside the UGB where both the COUNTY and the CITY maintain an interest in concept planning;
- 2. A process for coordinating comprehensive planning and development in the Urban Planning Area and concept planning in the Urban Reserve Planning Area;
- 3. Special policies regarding comprehensive planning and development in the Urban Planning Area, and concept planning in the Urban Reserve Planning Area; and
- 4. A process to amend the Urban Planning Area Agreement.

NOW THEREFORE, THE COUNTY AND THE CITY AGREE AS FOLLOWS:

I. Location of the Urban Planning Area and Urban Reserve Planning Area

The Urban Planning Area and Urban Reserve Planning Area mutually defined by the COUNTY and the CITY include the areas designated on the Washington County-Tualatin UPAA "Exhibit A" to this agreement.

- II. Coordination of Comprehensive Planning and Development
 - A. Amendments to or Adoption of a Comprehensive Plan or Implementing Regulation.
 - 1. Definitions

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Comprehensive Plan means a generalized, coordinated land use map and policy statement of the governing body of a local government that interrelates all functional and natural systems and activities relating to the use of lands, including, but not limited to, sewer and water systems, transportation systems, educational facilities, recreational facilities, and natural resources and air and water quality management programs. "Comprehensive Plan" amendments do not include small tract comprehensive plan map changes.

Implementing Regulation means any local government zoning ordinance adopted under ORS 197, 215 or 227, a land division ordinance adopted under ORS 92.044 or 92.046 or similar general ordinance establishing standards for implementing a comprehensive plan.

- 2. The COUNTY shall provide the CITY with the opportunity to participate, review and comment on proposed amendments to or adoption of the COUNTY comprehensive plan or implementing regulations. The CITY shall provide the COUNTY with the opportunity to participate, review and comment on proposed amendments to or adoption of the CITY comprehensive plan or implementing regulations. The following procedures shall be followed by the COUNTY and the CITY to notify and involve one another in the process to amend or adopt a comprehensive plan or implementing regulation:
 - a. The CITY or the COUNTY, whichever has jurisdiction over the proposal, hereinafter the originating agency, shall notify the other agency, hereinafter the responding agency, of the proposed action at the time such planning efforts are initiated, but in no case less than 35 calendar days prior to the first hearing on adoption.

Washington County – City of Tualatin Urban Planning Area Agreement Page 4 of 13

For COUNTY or CITY comprehensive plan updates with the potential to affect the responding agency's land use or transportation system, the originating agency shall provide the responding agency with the opportunity to participate in the originating agency's advisory committee, if any.

- b. For COUNTY or CITY comprehensive plan updates with the potential to affect the responding agency's land use or transportation system, the originating agency shall transmit the draft amendments by first class mail or as an attachment to electronic mail to the responding agency for its review and comment at least 10 calendar days before finalizing. The responding agency shall have 10 calendar days after receipt of a draft to submit comments orally or in writing. Lack of response shall be considered "no objection" to the draft.
- c. The originating agency shall respond to the comments made by the responding agency either by a) revising the final draft amendment recommendation(s), or b) a statement on the record explaining why the comments cannot be addressed in the final draft.
- d. Comments from the responding agency shall be given consideration and included as part of the public record on the proposed action. If after such consideration, the originating agency acts contrary to the position of the responding agency, the responding agency may seek appeal of the action through the appropriate appeals body and procedures.
- e. Upon final adoption of the proposed action by the originating agency, it shall transmit the adopting ordinance to the responding agency as soon as publicly available, or if not adopted by ordinance, whatever other written documentation is available to properly inform the responding agency of the final actions taken.
- B. Development Actions Requiring Individual Notice to Property Owners
 - 1. Definition

Development Action Requiring Notice means an action by the COUNTY or the CITY which requires notifying by mail the owners of property which could potentially be affected (usually specified as a distance measured in feet) by a proposed development action which directly affects and is applied to a specific parcel or parcels. Such development actions may include, but not be limited to, small tract zoning or comprehensive plan amendments, conditional or special use permits, land divisions, planned unit developments, variances, and other similar actions requiring a quasi-judicial hearings process.

- 2. The COUNTY will provide the CITY with the opportunity to review and comment on proposed development actions requiring notice within the designated Urban Planning Area and/or Urban Reserve Planning Area. The CITY will provide the COUNTY with the opportunity to review and comment on proposed development actions requiring notice within the CITY limits that may have an effect on unincorporated portions of the designated Urban Planning Area or the COUNTY's transportation network.
- 3. The following procedures shall be followed by the COUNTY and the CITY to notify one another of proposed development actions:
 - a. The originating agency with jurisdiction over the proposal, shall send by first class mail or as an attachment to electronic mail a copy of the public hearing notice which identifies the proposed development action to the responding agency, at the earliest opportunity, but no less than 14 calendar days prior to the date of the first scheduled public hearing or end of the comment period, whichever occurs first. The failure of the responding agency to receive a notice shall not invalidate an action if a good faith attempt was made by the originating agency to notify the responding agency.
 - b. The responding agency receiving the notice may respond at its discretion. Comments may be submitted in written or electronic form or an oral response may be made at the public hearing. Lack of written or oral response shall be considered "no objection" to the proposal.
 - c. If received in a timely manner, the originating agency shall include or attach the comments to the written staff report and respond to any concerns addressed by the responding agency in such report or orally at the hearing.
 - d. Comments from the responding agency shall be given consideration and included as a part of the public record on the proposed action. If, after such consideration, the originating agency acts contrary to the position of the responding agency, the responding agency may seek appeal of the action through the appropriate appeals body and procedures.

Washington County – City of Tualatin Urban Planning Area Agreement Page 6 of 13

C. Additional Coordination Requirements

- 1. The CITY and the COUNTY shall do the following to notify one another of proposed actions with the potential to affect the responding agency's land use or transportation system, but are not subject to the notification and participation requirements contained in subsections A. and B. above.
 - a. The originating agency with jurisdiction over the proposed actions shall send by first class mail or as an attachment to electronic mail a copy of all public hearings agendas which contain the proposed actions to the responding agency, at the earliest opportunity, but no less than three calendar days prior to the date of the scheduled public hearing. The failure of the responding agency to receive an agenda shall not invalidate an action if a good faith attempt was made by the originating agency to notify the responding agency.
 - b. The responding agency receiving the public hearing agenda may respond at its discretion. Comments may be submitted in written or electronic form or an oral response may be made at the public hearing. Lack of written or oral response shall be considered "no objection" to the proposal.
 - c. Comments from the responding agency shall be given consideration as a part of the public record on the proposed action. If, after such consideration, the originating agency acts contrary to the position of the responding agency, the responding agency may seek appeal of the action through the appropriate appeals body and procedures.

III. Concept Planning for Urban Reserve Areas

- A. Definitions
 - 1. Urban Reserve means those lands outside the UGB that have been so designated by Metro for the purpose of:
 - a. Future expansion of the UGB over a long-term period (40-50 years), and
 - b. The cost-effective provision of public facilities and services when the lands are included within the UGB.

- 2. Urban Reserve Planning Area (URPA) means those Urban Reserves identified for annexation and urbanization by the CITY at such time as the UGB is amended to include the Urban Reserve Area.
- 3. Urban Reserve Planning Area Planning Responsibility Undefined means those Urban Reserves that the CITY and at least one other city may have an interest in ultimately governing, but no final agreement has been reached. These areas are not considered part of the URPA for the purpose of this agreement.
- B. The CITY's Urban Reserve Planning Area and Urban Reserve Planning Area Planning Responsibility Undefined are identified on "Exhibit A" to this Agreement.
- C. The CITY shall be responsible for developing a concept plan in consultation with the COUNTY for the URPA in coordination with Metro and appropriate service districts. The concept plan shall include the following:
 - 1. An agreement between the COUNTY and the CITY regarding expectations for road funding, jurisdictional transfer over roadways to and from the CITY and COUNTY, and access management for County roads in the URPA. The agreement should describe any changes to the CITY and/or COUNTY transportation system plans, other comprehensive plan documents, or codes that have been adopted or will be necessary to implement this agreement.
 - 2. An agreement between the COUNTY and the CITY that preliminarily identifies the likely provider of urban services, as defined in ORS 195.065 (4), when the area is urbanized.
- D. The concept plan shall be approved by the CITY and acknowledged by the COUNTY.
- E. Upon completion and acknowledgement of the concept plan by the CITY and the COUNTY, and the addition of the area into the UGB by Metro, the affected portion of the URPA shall be designated as part of Urban Planning Area, as described below. Inclusion in the Urban Planning Area is automatic and does not require an amendment to this Agreement.
- F. Once an URPA has been added to the UGB and prior to annexation into the CITY, the COUNTY will apply the Future Development 20-Acre (FD-20) land use designation to the land.

- IV. Comprehensive Planning and Development Policies for Urban Planning Areas
 - A. Definition

Urban Planning Area means the incorporated area and certain unincorporated areas contiguous to the incorporated area for which the CITY conducts comprehensive planning and seeks to regulate development activities to the greatest extent possible. The CITY Urban Planning Area is designated on "Exhibit A."

- B. The CITY shall be responsible for comprehensive planning within the Urban Planning Area.
- C. The CITY shall be responsible for the preparation, adoption and amendment of the public facility plan required by OAR 660-011 within the CITY's Urban Planning Area in coordination with other service providers that provide urban services within this area.
- D. As required by OAR 660-011-0010, the CITY is identified as the appropriate provider of local water, sanitary sewer, storm sewer and transportation facilities within the Urban Planning Area. Exceptions include facilities provided by other service providers subject to the terms of any intergovernmental agreement the CITY may have with other service providers; facilities under the jurisdiction of other service providers not covered by an intergovernmental agreement; and future facilities that are more appropriately provided by an agency other than the CITY.
- E. The COUNTY shall not approve land divisions within the unincorporated Urban Planning Area that are inconsistent with the provisions of the Future Development 10-Acre District (FD-10) or the Future Development 20-Acre District (FD-20), as applicable.
- F. The COUNTY shall not approve a development proposal in the Urban Planning Area if the proposal would not provide for, nor be conditioned to provide for, an enforceable plan for redevelopment to urban densities consistent with the CITY's Comprehensive Plan in the future upon annexation to the CITY as indicated by the CITY Comprehensive Plan.
- G. The COUNTY shall not oppose annexations to the CITY within the CITY's Urban Planning Area.
- H. The Tualatin Comprehensive Plan employs a one-map system wherein the Comprehensive Plan Map fulfills a dual role by serving as both the Plan Map and Zone Map, thus eliminating the need for a separate Zone Map. The CITY's

Comprehensive Plan Map establishes future land use designations for unincorporated portions of the Urban Planning Area. Upon annexation of any property within the Urban Planning Area to the CITY, the Planning District or zone specified by the Tualatin Comprehensive Plan Map is automatically applied to the property on the effective date of the annexation (as authorized by ORS 215.130 (2) a).

If a property owner, contract purchaser, the authorized representative of a property owner or contract purchaser, or the CITY desire a Planning District or zone different from that shown on the Tualatin Comprehensive Plan Map, an application for a Plan Map Amendment may be filed with the CITY at the time of or following annexation.

I. The CITY and the COUNTY will implement the applicable Urban Reserve concept plans and related agreements. The CITY will amend the CITY Comprehensive Plan to include this area consistent with the original concept plan. If modifications to the original concept plan are made during the comprehensive planning process, the parties will update the related agreements to reflect these changes, which may include transportation, access and funding, if needed. Until the CITY amends its Transportation System Plan (TSP) to include the land within the CITY's Urban Planning Area, the COUNTY's TSP will serve as the TSP for the Urban Planning Area.

V. Special Policies

- A. The CITY shall specify in its Comprehensive Plan that access to SW 124th Avenue and Basalt Creek Parkway shall be limited to the following locations: SW Tualatin-Sherwood Road, SW Tonquin Road, SW Grahams Ferry Road, SW Boones Ferry Road and one other location within the CITY portion of the Basalt Creek Planning Area.
- B. The CITY agrees to incorporate the planned local street network identified in the Basalt Creek Refinement Plan into the CITY's TSP and include all transportation projects on the COUNTY's Transportation Development Tax (TDT) Road Project List to be eligible for TDT funding.
- C. The CITY agrees to work with the COUNTY and other partners to secure funding for construction of Basalt Creek Parkway from SW Grahams Ferry to SW Boones Ferry Road and other transportation improvements identified on the Basalt Creek Transportation Refinement Plan to support development in the Basalt Creek Planning Area.

Washington County – City of Tualatin Urban Planning Area Agreement Page 10 of 13

- D. Where the CITY Urban Planning Area boundary on "Exhibit A" is shown as SW 124th Avenue, SW Basalt Creek Parkway, SW Tonquin Rd. and/or SW Waldo Way, the boundary shall extend to the centerline of each road.
- VI. Amendments to the Urban Planning Area Agreement
 - A. The following procedures shall be followed by the CITY and the COUNTY to amend the language of this agreement or the Urban Planning Area Boundary:
 - 1. The CITY or the COUNTY, whichever jurisdiction originates the proposal, shall submit a formal request for amendment to the responding agency.
 - 2. The formal request shall contain the following:
 - a. A statement describing the amendment.
 - b. A statement of findings indicating why the proposed amendment is necessary.
 - c. If the request is to amend the planning area boundary, a map that clearly indicates the proposed change and surrounding area.
 - 3. Upon receipt of a request for amendment from the originating agency, the responding agency shall schedule a review of the request before the appropriate reviewing body, with said review to be held within 45 calendar days of the date the request is received.
 - 4. The CITY and the COUNTY shall make good faith efforts to resolve requests to amend this agreement. Upon completion of the review, the reviewing body may approve the request, deny the request, or make a determination that the proposed amendment warrants additional review. If it is determined that additional review is necessary, the following procedures shall be followed by the CITY and the COUNTY:
 - a. If inconsistencies noted by both parties cannot be resolved in the review process as outlined in Section VI. A. 3, the CITY and the COUNTY may agree to initiate a joint study. Such a study shall commence within 30 calendar days of the date it is determined that a proposed amendment creates an inconsistency, and shall be completed within 90 calendar days of said date. Methodologies and procedures regulating the conduct of the joint study shall be mutually agreed upon by the CITY and the COUNTY prior to commencing the study.

Washington County – City of Tualatin Urban Planning Area Agreement Page 11 of 13

- b. Upon completion of the joint study, the study and the recommendations drawn from it shall be included within the record of the review. The agency considering the proposed amendment shall give careful consideration to the study prior to making a final decision.
- B. The parties may individually or jointly initiate review of this Agreement to evaluate the effectiveness of the processes set forth herein and determine if conditions warrant any amendments. Both parties shall make a good faith effort to resolve any inconsistencies that may have developed since the previous review. If, inconsistencies still remain at the conclusion of the review period, either party may terminate this Agreement.
- VII. This Agreement shall become effective upon full execution by the CITY and the COUNTY and shall then repeal and replace the Washington County – Tualatin Urban Planning Area Agreement effective December 23, 2009. The effective date of this Agreement shall be the last date of signature on the signature page.

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Washington County – City of Tualatin Urban Planning Area Agreement Page 12 of 13

IN WITNESS WHEREOF the parties have executed this Urban Planning Area Agreement on the date set opposite their signatures.

CITY OF TUALATIN By City Manager

Approved as to Form: By City Attorney

Date 5/20/19

20/2019 Date

WASHINGTON COUNTY

Kathryn Harrington hair, Board of Commissioners

Date 06/06/19

Approved as to Form:

By County (

Date 6/4/19

By ______ Recording Secretary

APPROVED WASHINGTON COUNTY BOARD OF COMMISSIONERS

RO 9 -31 WINCTE ORDER # 4-16-DATE BY Barbara Ne CLERK OF THE BOARD

Agreement Amended by Washington County Land Use Ordinance No. 849 Adopted April 16, 2019

Date _____



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Agreement Amended by Washington County Land Use Ordinance No. 849 Adopted April 16, 2019

Washington County - City of Tualatin Urban Planning Area Agreement Page 13 of 13

Date: 02/08/2019

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TO: ERIN ENGMAN-CITY OF TUALATIN

CITY OF TUALATIN PLANNING COMMISSION

RE: PROPOSED MASTER PLAN ADOPTIONS (PTA/PMA 24-0003 SCHEDULED AGENDA ITEM FOR PLANNING COMMISSION MEETING 7-17-2024

FOR THE PUBLIC RECORD

Thank you to the City of Tualatin for sending the email Notice of proposed Changes to multiple Governing Documents which are part of the City's Comprehensive Plan. We received the Notice on 7-10-2024 for the scheduled Planning Commission Meeting Agenda Item for 7-17-2024... 7 days later.

This unanticipated Notice was surprising to us – as we are Affected Property Owners in the Basalt Creek Area and also have been extremely Interested Persons who have actively sought for years to address the need for the City of Tualatin to adopt an effective Stormwater Management Plan for the Basalt Creek Area since 2015.

We present two main issues to the City of Tualatin Planning Commission for their consideration and discussion during their 7-17-2024 meeting.

1) CONCERNS REGARDING THE PROPOSED MEMORIALIZATION OF AN INCOMPLETE AND NOW OUTDATED 2019 BROWN & CALDWELL STORMWATER MANAGEMENT MASTER PLAN (SWMP) AS A "BACKGROUND DOCUMENT" WITHIN THE CITY'S GOVERNING DOCUMENTS

2) CONFLICTING MAP INFORMATION PROVIDED WITHIN PROPOSED LAND USE ACTIONS

- THE CITY OF TUALATIN PARKS AND RECREATION BASALT CREEK MASTER PLAN
- AND MAPS WITHIN PMA 24-0003

SPECIFIC CONCERNS:

1) CONCERNS REGARDING THE PROPOSED MEMORIALIZATION OF AN INCOMPLETE AND NOW OUTDATED 2019 BROWN & CALDWELL STORMWATER MANAGEMENT MASTER PLAN (SWMP) AS A "BACKGROUND DOCUMENT" WITHIN THE CITY'S GOVERNING DOCUMENTS

The City has provided little to no Public Outreach within the last years to inform or provide the Public, Affected Property Owners and/or Interested Citizens participation in the development of the proposed memorialization of the dated and incomplete 2019 Brown & Caldwell Stormwater Management Master Plan (SWMP) document as a "background document" to be included within the City's Governing Documents

The City's claim of compliance to the State's Goal #1 for Citizen Involvement stated within Exhibit 1 PTA PMA 240003 FINDINGS AND ANALYSIS sites only one Public Outreach Event relating to 2019 Brown & Caldwell Stormwater Management Master Plan (SWMP) Update document.

• The City did not clearly identify the Public Outreach Event cited in Exhibit 1 -while related to the same 2019 Brown & Caldwell Stormwater Management Master Plan (SWMP) document –was actually an Outreach Event....

 was actually an Outreach Event held in 2020 for a different Land Use Action which was the 2021 adoption of the document to Update the City's Stormwater Master Plan

 The adoption of the 2019 Brown & Caldwell Stormwater Management Master Plan (SWMP) Update document actually failed in 2021 due to the inadequacies identified by the Public within the 2019 Brown & Caldwell Stormwater Management Master Plan (SWMP)

• While the City's Exhibit #1 claimed the 2020 Public Comment Period for a different Land Use Action as justification of compliance to #1 for Citizen Involvement for a current PTA

 Exhibit #1 did not summarize, list or include the Citizen Comments submitted during the Public Comment Period in 2020 to the City regarding the 2019 Brown & Caldwell Stormwater Management Master Plan (SWMP) Update document,

 The incomplete provision of relevant facts within Exhibit #1 from the City's citation of the Public Comment Period in 2020 for the 2019 Brown & Caldwell Stormwater Management Master Plan (SWMP) Update document

 inhibits current decision makers from effective communication previously submitted by citizens regarding the document,

· diminishes citizens ability to influence current decision makers,

 limits clear identification and understanding of the multiple technical issues related to the proposed document and

 hinders current decision makers from learning fact base information upon which to base their deliberations.

• It should also be remembered that Basalt Creek property owners outside City Limits do not have elected representation within the City's Land Use Planning Process- yet are effectively impacted by Land Use Actions taken by the City of Tualatin.

• These property owners who are not City residents are also denied equal membership within the City's (CIO's) which the City states meet the State's required Citizen Involvement program for Land Use Actions Land Use Planning Goal #1 for Citizen Involvement.

Had the City included within Exhibit #1 for the currently proposed PTA-

-The Citizen Comments submitted during the December 2020 Citizen Comment Period for the 2019 Draft of the Brown & Caldwell Stormwater Management Master Plan (SWMP) information relevant to the City's current Land Use proposal

would have included:

Our 12-15-2020 Submission during the Citizen Comment Period in 2020- a copy has been attached as a PDF

 Our submission included our comprehensive review of the 2019 Draft of the Brown & Caldwell
 Stormwater Management Master Plan (SWMP)

• Our submission also included a review the 2019 Draft of the Brown & Caldwell Stormwater Management Master Plan (SWMP) and a report conducted by an Environmental Engineer Mr. David La Liberte' of La Liberte' Environmental Associates.

Mr. La Liberte has professional knowledge of the Basalt Creek Area having conducted various drainage studies and analysis within the area. His extensive Curriculum Vitae (CV) was also included within our 12-15-2020 submission

His report identified <u>multiple</u> inadequacies within the 2019 Draft of the Brown & Caldwell Stormwater Management Master Plan (SWMP)

OUR DECEMBER 15, 2020, SUBMISSION TO THE CITY ALSO INCLUDED A FULL REPORT AND A <u>SUMMARY</u> OF MR. LA LIBERTE'S FINDINGS SUBMITTED AFTER HE REVIEWED THE 2019 DRAFT OF THE BROWN & CALDWELL STORMWATER MANAGEMENT MASTER PLAN (SWMP)

A summarization of Review of Document Comments

by Mr. La Liberte, Principle Engineer La Liberte' Environmental Associates:

Significant problems in the Plan for the BFR south area are:

- lack of identified stormwater facilities
- omission of hydrologic and hydraulic modeling analysis
- potential for misapplication of design alternatives
- · absence of stormwater problem acknowledgement and evaluation
- no assessment of stormflows on steep slopes
- topography and soils suggest that infiltration is not a likely future runoff design solution in the Boones Ferry Road area
 - o This is an important issue as to the elevation of lands, steep slopes, and drainage into Basalt Creek
 - The elevation of lands above the drinking water wells is of concern with impact upon the well from which the Lucini's obtain their water
- · effect of stormflows on the Basalt Creek Concept Plan are neglected
- no existing and future development stormwater flows are compared
- protection of natural resources is unclear
- no designation of Capital Improvement Projects (CIPs9) in the BFR south area
- There is no assessment of peak and average stormflows on the steep slopes, which constitute the west flank of the BFR south area
 - These Tualatin stormflows discharge to the Basalt Creek Concept Plan area and their existence is not established in the SWMP.
 - Stormflows on these steep slopes have excessive peak and average flow velocities, which cause erosion SEE: Supplement B Part 1 Analysis Report Section 4.
 - Stormflow Hydraulics and Part 2 Appendices A2 and I
- The Tualatin SWMP makes no provisions for temporary stormwater storage and discharge facilities when
 phasing-in large developments such as the Autumn Sunrise property in BFR south.
 - The concern is that arbitrary storage and discharge locations could occur in the interim, before the final storm water facility is operable.
 - It needs to be specified in the Tualatin SWMP that new construction developments must use storm water facilities and outfalls consistent only with its final specifications and drawings.

Yet it appears the City is intent upon memorializing the now dated and incomplete 2019 Brown & Caldwell Stormwater Management Master Plan (SWMP) Update document -with known deficiencies -as a part of the City's Governing Documents- as a "background document".

This is the same document- which the Public identified in 2020-21- provided incomplete stormwater management planning for the entirety of the City's Land Use Planning jurisdiction (including the Basalt Creek Area).

On 3-8-2021- after a prior adoption of this document on 2-8-2021 by the City Council (Ordinance 1453-21)- the Council withdrew and repealed this document from adoption under Ordinance 1455-21.

City of Tualatin Ordinance No 1455-21 Section 2 specifies:

"The City hereby initiates a new Comprehensive Plan Amendment process relating to the City's Stormwater Master Plan to include the City's entire planning area. City staff are directed to draft a revised Stormwater Master Plan, which must include the Basalt Creek and Southwest Concept areas, for presentation and consideration by the Council, consistent with applicable Tualatin Development Code procedures"

During the same 3-8-2021 City Council meeting, the Council directed the City staff to reinitiate the Stormwater Master Plan process to include all of the City's planning area- including the Basalt Creek Area.

In the 3-16-2021 LUBA Stipulated Motion to Dismiss the appeal of the City's Stormwater Master Plan the City also stated its intent to adopt a new Stormwater Master Plan in the near future.

Since that time, the City has Publicly re-stated on numerous occasions their "intent" to develop a new Stormwater Master Plan (SWMP).

It is now over 3 years later, and the City has not presented a SWMP as per State Public Facilities requirements which includes the entirety of the City's Land Use Planning jurisdiction- including the Basalt Creek Area.

Since 2021, due to the absence of an adopted SWMP for the Basalt Creek Area- the City has commented about their reliance upon Clean Water Services to meet Stormwater Management Planning needs. The lack of an effective and adopted SWMP plan for the Basalt Creek Area- may contribute to the City's consultant's study of existing conditions and their comments included within the City's Notice 7-10-24 of the upcoming Planning Commission Meeting

"Many of you may have provided comments or participated in the City's past consideration of the Stormwater Master Plan in 2021. Since that time, staff has worked with consultants to study the existing conditions within the Basalt Creek planning area. The study concluded that Clean Water Services stringent stormwater standards must be applied to future development within the Basalt Creek planning area."

It is noteworthy to understand --the City of Tualatin should have known since 2004 (when Metro adopted 04-1040B and the "Tualatin Area" was brought into the UGB) of the City's future responsibilities to develop an appropriate Stormwater Management Plan(SWMP) for the Basalt Creek Area. The City's SWMP for the Basalt Creek Area should have been adopted when the City gained Land Use Planning responsibilities over the Basalt Creek Area in 2019 and been functional for future use in Land Use Planning Actions impacting the Basalt Creek Area.

The City of Tualatin has had 20 years to prepare and develop an effective Stormwater Management Plan per OAR 660-011-000 for the Basalt Creek Area is past due.

An effective thoughtful integrated SWMP for the Basalt Creek Area is integral for appropriate Land Use Planning, future industrial or residential development, transportation planning, flooding mitigation, erosion control, landslide prevention, and natural hazard protections for downstream citizens, property and natural resources in an area known to have steep slopes >25%, and multiple existing Natural Resources identified my Metro for Goal 5 and Title 13 Resources and 14+ acres of wetlands identified in the Federal and State Wetland Inventories.

An effective coordinated SWMP for the Basalt Creek Area will require collection and analysis of data to effectively determine what and where major stormwater projects in the Basalt Creek Area will be required, when the timing of this infrastructure will be needed, and the anticipated funding for the projects – in an area with overlapping local governments with Land Use Planning jurisdiction.

We do not see significant that changes have been made to the 2019 Brown & Caldwell Stormwater Management Master Plan (SWMP) Update document which provides additional required information for the inclusion of the Basalt Creek Area to meet State Stormwater Management Planning Requirements.

We did not find within the documents posted to the City's website on 7-10-24, a clearly identified exhibit or addendum which presents a Stormwater Management Plan for the Basalt Creek Area (per state requirements) to augment the deficiencies within the 2019 Brown & Caldwell Stormwater Management Master Plan (SWMP) Update document

The need for thoughtful Land Use Planning Documents, Land Use Planning, and Land Use decision making within the Basalt Creek Area has been- and is at this time - significantly important and critical. The Basalt Creek Area is actively undergoing transition from mainly rural development with minimal infrastructure within unincorporated Washington County ---to more modernized urban higher density development with more complex infrastructure where both Washington County and the City of Tualatin have overlapping Land Use Planning jurisdiction and may not share the same development requirements or goals.

The adoption of the 2019 Brown & Caldwell Stormwater Management Master Plan (SWMP) document as a "background document" does not address the failure of the City to develop, adopt and utilize a thoughtful and effective Stormwater Management Plan for the Basalt Creek Area.

In fact, the memorialization of the 2019 Brown & Caldwell Stormwater Management Master Plan (SWMP) document within the City's Governing Documents may actually hinder effective, clear and standardized assessment of current and future stormwater management needs – and the identification , planning and funding of major infrastructure within the entirety of the City's Land Use Planning responsibilities.

Listed below are some of the State's Public Facilities Planning mandated requirements for the development and adoption of a Stormwater Management Plan for municipalities over 2,500 citizens- of which the City of Tualatin is one.

OAR 660-011-0000

https://secure.sos.state.or.us/oard/displayDivisionRules.action?selectedDivision=3061

LAND CONSERVATION AND DEVELOPMENT DEPARTMENT Chapter 660 Division 11 PUBLIC FACILITIES PLANNING

o 660-011-0005 Definitions

- (7) "Public Facility Systems": (c) Storm sewer:
 - (A) Major drainageways (major trunk lines, streams, ditches, pump stations and retention basins)
 (B) Outfall locations.
- o 660-011-0010 The Public Facility Plan
- o 660-011-0015 Responsibility for Public Facility Plan Preparation
- o 660-011-0020 Public Facility Inventory and Determination of Future Facility Projects
 - o 660-011-0025 Timing of Required Public Facilities
 - o 660-011-0030 Location of Public Facility Projects
- o 660-011-0035 Determination of Rough Cost Estimates for Public Facility Projects and Local Review of Funding
- Mechanisms for Public Facility Systems
- o 660-011-0045 Adoption and Amendment Procedures for Public Facility Plans

We request the City of Tualatin Planning Commission (which is also the City's stated CCI for Citizen Involvement and responsible for the implementation of the citizen involvement program" Goal 1: Citizen Involvement OAR 660-015-0000(1)) to provide informative responses to the following questions:

A. What is the intended use of a memorialized 2019 Brown & Caldwell Stormwater Management Master Plan (SWMP) Update as a "background document" – when the document is dated and has not met all of the requirements established by the State for a Public Facilities Management Plan for the entirety of the City's planning jurisdiction?

B. How does the proposed memorialization of the of the 2019 Brown & Caldwell Stormwater

Management Master Plan (SWMP) Update as a "background document" within the City's Governing Documents ----provide clear, standardized, equitable stormwater management planning for use in evaluation, determination and/or implementation of future Land Use Actions throughout all of the City's planning jurisdiction- including the Basalt Creek Area?

C. What has caused the City of Tualatin's procrastination in developing and adopting an effective Stormwater Management Plan (SWMP) which includes the entirety of the lands within the City's Land Use Planning Jurisdiction within the scope of the document to conform to the mandated requirements established by the State?

D. What actions need to be taken to have the City staff comply with the directions provided by the City Council on 3-8-2021 to reinitiate the Stormwater Master Plan process to include all of the City's planning area, including the Basalt Creek Area?

We provide our comprehensive reviews of the 2019 Brown & Caldwell Stormwater Management Master Plan (SWMP) Update document which were previously submitted to the City – as Google Links (double click to open) :

 Our 12-15-2020 submission to the City during the Citizen Comment Period for the then proposed 2019 Brown & Caldwell Stormwater Management Master Plan (SWMP) Update

2020 12-15 LUCINI Comments Stormwater Master Pl...
 The 12-14-21 LEA Comments of the 4-2019 Draft Tualatin Stormwater Master Plan included within our 12-15-21 submission
 2020 12-14 David La Libete #1.pdf

 Our 2-5-2021 submission to the Tualatin City Council Quasi-Judicial Hearing Scheduled 2-8-2021 City of Tualatin Proposed Land Use Action PTA 21-0001 City of Tualatin Stormwater Master Plan Adoption-

2021 2-5 Lucini Submission to Tual Council Stormwat...

2) CONFLICTING MAP INFORMATION PROVIDED WITHIN PROPOSED LAND USE ACTIONS

• THE CITY OF TUALATIN PARKS AND RECREATION BASALT CREEK MASTER PLAN

• AND MAPS WITHIN PMA 24-0003

There appears conflicting information provided within various maps being proposed for adoption by the City which may cause confusion in utilization, implementation or enforcement of City Codes or in Land Use Planning Actions.

Inconsistencies in mapping information within the City's Governing Documents may also have unexpected and unnecessary impacts upon a property owner's use or enjoyment of their property or developers attempting to understand existing conditions and limitations.

Both the proposed City of Tualatin Parks & Recreation Basalt Creek Master Plan, and the proposed PMA Map changes contain information on the future location of a Public Trail/Path running in a north-south direction within the Basalt Creek Area- but in different locations within the Basalt Creek Area.

There is minimal supporting information provided with the proposed map changes identifying the assessment factors of the feasibility of effective and successful implementation of the Trail at their proposed locations.

• The Basalt Creek Area has multiple Natural Resources not clearly identified in a clear and standard manner within the City's Natural Resources **Maps 72-1 Natural Resources Protection Overlay District (NRPO) and Greenway Locations Map and 72-3 Significant Natural Resources Map-** including 14+ acres of wetlands identified within the Federal Wetlands Inventory and within the States Wetlands Inventory.

Metro has also identified Goal #5 and Title #13 Natural Resources within the Basalt Creek Area within the area of the proposed Public Trails/Paths.

As the City's Natural Resource Maps lack complete accurate information as to the type, location and condition of the various Natural Resources existing within the Basalt Creek Area, the guardrails for the City's required protection of these resources are significantly diminished.

It is not clear the identified location of the proposed Public Trail/Path in either the Tualatin Parks & Recreation Basalt Creek Master Plan, or the proposed PMA Map changes have been appropriately evaluated as to the potential impact upon the Natural Resources at their identified locations. This is particularly relevant to the City's proposed changes in PMA 24-0003 where the proposed Public Trail is identified as being directly within the wetlands.

• There is a lack of information as to the anticipated feasibility, success, costs or timing of obtaining a fully functional Public Trail in the Basalt Creek Area through multiple private properties which are currently outside the City Limits. While the City owns several acres in the Basalt Creek Area, there are several other property owners who are not.

The proposed changes to PMA Maps 24-0003 72-2 and 8-4 Bicycle and Pedestrian Plan identify the Public Path/Trail in a location which bisects private property- and not along tax lot lines as identified within the City of Tualatin Parks & Recreation Basalt Creek Master Plan.

As property owners along the proposed north-south Public Trail, we are much less interested in having a Public Trail bisect our property, than one which is located on the western border of our property.

We request the City of Tualatin Planning Commission (which is also the City's stated CCI for Citizen Involvement and responsible for the implementation of the citizen involvement program" Goal 1: Citizen Involvement OAR 660-015-0000(1)) to provide informative responses to the following question:

• Will the Planning Commission obtain clarity as to the future location of the proposed Public Trail/Path to run in a north-south direction within the Basalt Creek Area?



APPROXIMATE LOCATION OF OUR PROPERTY-WITHIN CITY OF TUALATIN PROPOSED PARKS & REC MASTER PLAN BASALT CREEK AREA - MAP OF EXISTING CONDITIONS PAGE 35

- PROPOSED PARKS & RECREATION MASTER PLAN DOES NOT INDICATED FUTURE LOCATION OF PUBLIC TRAIL
 BISECTING OUR PROPERTY OR THROUGH SENSITIVE WETLANDS & GOAL 5 TITLE 13 NATURAL RESOURCES
- WHILE PROPOSED CHANGES TO CITY MAPS 8-4 PLANNED PED TRAIL & 72-2 GREENWAY & PATH WOULD BISECT OUR PROPERTY WITH POTENTIAL IMPACTS TO SENSITIVE WETLANDS & GOAL 5 NATURAL RESOURCES

CITY OF TUALATIN PROPOSED FOR ADOPTION EXHIBIT 5 MASTER PLAN PARKS & RECREATION -BASALT CREEK AREA



BASALT CREEK MASTER PLAN

PAGE 65 MAP CITY OF TUALATIN PARKS & RECREATION MASTER PLAN FOR BASALT CREEK AREA

IDENTIFIES PROPOSED TRAIL WEST OF BASALT CREEK CANYON- OUTSIDE OF SENSITIVE WETLANDS

• INDENTIFIED ALONG BORDER OF TAXLOTS- WHICH WOULD NOT BISECT TAX LOTS OF PRIVATE PROPERTY •

CONFLICTS WITH PROPOSED CHANGES TO CITY MAPS 8-4 AND 72-2



LOCATION OF PROPOSED PLANNED PEDESTRIAN TRAIL MAP 8-4 BICYCLE & PEDESTRIAN PLAN

- WITHIN WETLANDS OF BASALT CREEK CANYON
- WITHIN PRIVATE PROPERTY NOT OWNED BY THE CITY
- BISECTING PRIVATE PROPERTY
- NOT CONSISTANT WITH PROPOSED CITY OF TUALATIN PARKS & REC MASTER PLAN



PROPOSED MAP 72-2 GREENWAY DEVELOPMENT PLAN & PATH LOCATIONS

PROPOSED LOCATION OF PLANNED PUBLIC PATH:

- THROUGH BASALT CREEK WETLANDS
- THROUGH PRIVATE PROPERTY
- BISECTING PRIVATE PROPERTY

AND

NOT CONSISTANT WITH PROPOSED CITY OF TUALATIN PARKS & RECREATION MASTER PLAN

Respectfully submitted, John and Grace Lucini 23677 SW Boones Ferry Road Tualatin, OR 97062