



January 24, 2022

Jean Simson, City of Sherwood Planning Commission Chairperson  
c/o: Erika Palmer – Planning Manager  
City of Sherwood  
22560 SW Pine Street  
Sherwood, OR 97140

RE: LU 2012-015 Oregon Street Business Park and LU 2012-012 Sherwood Commerce Center

Dear Chair Simson and Planning Commissioners:

I am the President of Allied Systems Company that is located within the City of Sherwood and directly across from the above mentioned projects. As the president of a business that has been in the City of Sherwood for over 40 years, I strongly support the development of more businesses that will diversify a primarily residential community. This growth is need to help promote the areas economy and diversity the City of Sherwood.

I have several concerns about how the City is proposing development in the area.

1. I understand that initially the primary access for the Sherwood Commerce Center will be via a driveway directly onto Oregon Street. This driveway will be directly across from the primary driveway used by Allied Systems. Our employees and delivery trucks use this driveway to access Allied Systems and Oregon Street. There will be no traffic control device regulating access to Oregon Street from Allied Systems and the Sherwood Commerce Center. During high traffic conditions and/or conditions of poor visibility this creates a safety hazard. I recommend that the time period when the Sherwood Commerce Center is accessed via this driveway be minimized and that Ice Age Drive and the associated traffic control device be developed as soon as possible.
2. Allied Systems has a second driveway down Oregon Street that is not currently being used. However Allied may want to use that driveway in the future as business needs change. We ask that any developments along Oregon Street not adversely affect any future use of our second driveway.
3. I understand that there may be the addition of a traffic light on a proposed intersection of Tonquin Court with Oregon Street. This would be across from our second driveway where the grade of Oregon is relatively steep. Trucks currently use an acceleration lane to climb out of the Oregon Street/Tonquin Road intersection. The addition of a signal at the proposed Tonquin Court / Oregon Street location will cause trucks to have to slow down and stop on a steep grade. Trucks will take a long time to get going after stopping and this will create an unnecessary traffic flow disruption on an already busy street.

Accessing the area from the proposed Ice Age Drive is a far superior option that provides access to the area, does not negatively impact either proposed project, and does not require another public street intersection on Oregon Street.

EXHIBIT S to LU 2021-012  
EXHIBIT P to LU 2021-015

To be clear, I support the development of both the Oregon Street Business Park and Sherwood Commerce Center projects but do not want to see Tonquin Court traffic light constructed and connected to Oregon Street as the City has proposed.

Sincerely,

A handwritten signature in blue ink, appearing to read "J. Rink".

Jeff Rink President  
Allied Systems Company  
21433 SW Oregon Street  
Sherwood, OR 97140



January 24, 2022

**Sherwood Planning Commission**

**City of Sherwood  
22560 SW Pine Street  
Sherwood, OR 97140**

**RE: LU 2012-015 Oregon Street Business Park and LU 2012-012 Sherwood  
Commerce Center – eliminate Tonquin Ct. and signal -**

**Sherwood Planning Commission:**

**Tonquin Court and signal need to be eliminated.** Consolidate to one signal at Ice Age Drive. Perhaps Oregon Street Business Park can access Oregon Street via a private driveway just like the one proposed for Sherwood Commerce Center?

I support both projects and hope to see their construction completed over the next couple years. It is fantastic to see the Tonquin Employment area coming to reality after all these years of planning. However there is one glaring problem. The signalized intersection at Tonquin Court on the slope of Oregon Street.

Any intersection on a slope presents a problem, but this one in particular could result in a great deal of issues considering all the heavy truck traffic on Oregon Street. For example, all the rock quarry traffic off Tonquin headed uphill being required to stop-start on the slope. The best solution seems to be simply consolidating to one signal at top of hill at newly planned Ice Age Drive.

Additionally, Tonquin Court future alignment appears to run thru the Tri-County Gun Club which appears unfeasible. Something does not seem right here and needs your attention. I suggest finding a new alignment that is feasible rather than going thru the Gun Club. **Eliminate Tonquin Court** and use Ice Age Drive to circulate traffic.

Sincerely,



Matt Langer  
15555 SW Tualatin-Sherwood Rd.  
Sherwood, OR 97140

**C&M EXCAVATION & UTILITIES, LLC.**

*General Contractor - CCB 196032*

21287 SW Oregon Street

Sherwood, OR 97140

503-625-5289

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January 24, 2022

Jean Simson, City of Sherwood Planning Commission Chairperson  
c/o: Erika Palmer – Planning Manager  
City of Sherwood  
22560 SW Pine Street  
Sherwood, OR 97140

**Regarding: LU 2012-015 Oregon Street Business Park and  
LU 2012-012 Sherwood Commerce Center**

Dear Chair Simson and Planning Commissioners:

I am an owner of a construction company that is located across the street from the above referenced projects. I have operated in Washington County and specifically in the City of Sherwood for over 20 years. I support the Oregon Street Business Park project.

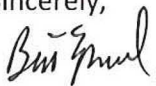
Our business fronts Oregon Street and operates a number of trucks that use this street every day. Requiring the construction of Tonquin Court with these developments will severely disrupt traffic using Oregon Street. Construction of this street and the associated signal is unnecessary and will cause trucks that currently have to use an acceleration to climb up the hill to stop. It takes a long time for trucks to get started on a hill after they slow down or stop. This signal will frustrate both truck drivers and the general public.

The Oregon Street Business Park street plan option does not require this public street intersection / signal and does not negatively impact either project and is therefore the better option.

I do not oppose the Sherwood Commerce Center development, but do oppose the construction of Tonquin Court and its intersection with Oregon Street as proposed by their application.

Please approve the Oregon Street Business Park without requiring the Tonquin Court / Oregon Street intersection.

Sincerely,



William D Sproul  
C & M Excavation & Utilities LLC

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EXHIBIT V to LU 2021-012  
EXHIBIT S to LU 2021-015

January 24, 2022

Jean Simson, City of Sherwood Planning Commission Chairperson  
c/o: Erika Palmer – Planning Manager  
City of Sherwood  
22560 SW Pine Street  
Sherwood, OR 97140

RE: LU 2012-015 Oregon Street Business Park and LU 2012-012 Sherwood Commerce Center

Dear Chair Simson and Planning Commissioners:

I have had the pleasure of working for Bruce and Karen Polley for the last 12 years. I left the corporate world after having my son and had happened upon a job opening close to home that fit what I was looking for. When I arrived for my interview, I fell in love with the everything from the scenic views to the tight knit group of employees.

Over the years Bruce and Karen have given me the tools and trust to become an integral part of their company and each year we continue to grow and succeed. I can honestly say that I am lucky to have the best employers, they recognize hard work and let us know that we are valued as an employee.

Bruce and Karen started Blast Cleaning Services 32 years ago and hearing the story of how hard they worked to bring the business from the ground up inspires me. They began by working out of their home and Bruce would drive his station wagon all over Oregon and Washington trying to earn work and drum up new business. Over the years they have built a very reputable business that is needed and recognized by corporations large and small across the Pacific NW that I am proud to say I am a part of.

When they were able to save up enough to purchase a location for their business, they came across the property on Oregon Street and knew that one day it would be part of their retirement plan and leaving a legacy for their children.

I will selfishly say that the day my office view is no longer looking out over Oregon Street and the beautiful views will be sad. However, I am beyond excited for Bruce and Karen to be able to move forward with the plan of developing their property and creating more job opportunities for the City of Sherwood. Their business has provided good careers for local families and is evidenced by their key employees all being long term.

I would like to see them move forward with their business park without losing the land to Tonquin Ct. Which isn't needed or wanted by those who know Oregon St.

Sincerely,

Amy Thornton  
Office Manager  
Blast Cleaning Services/Air-Tek NW  
503-625-7058



1-24-2022

Jean Simson, City of Sherwood Planning Commission Chairperson  
c/o: Erika Palmer – Planning Manager  
City of Sherwood  
22560 SW Pine Street  
Sherwood, OR 97140

Planning meeting for LU 2012-015 Oregon Street Business Park and LU 2012-012 Sherwood Commerce Center

Chair Simson and Planning Commissioners:

My name is Bruce Polley. My wife and I own the property at 21720 Oregon St. the future site hopefully of the Oregon Street Business Park. We have owned the property for 25 years. We own and operate a company called Blast Cleaning Services in Sherwood that we started in our living room in 1990.

Our company services many of the largest industrial companies in the Northwest. We provide excellent family wage jobs to our employees that are mostly long term employees who plan to continue the business.

Our goal when we bought this land was to some day develop it with a site that would provide income for our retirement, and a legacy for our children in our home town of Sherwood.

We were excited when we were contacted by the City of Sherwood that they were eager to incorporate our site and move forward with the Tonquin Employment Area. One of the goals of the TEA is to provide “incubator sites” for small businesses. Something I can relate to. We were excited when we first met with the city to discuss our plans which they seemed excited about at our “Pre App” meeting.

In the last couple of years I have gotten new neighbors. Harsch Investment Properties and Kerr Construction.

I was surprised when our early conversations included running a Cul-de-Sac down my east property boundary. My property is a 9.5 acre triangle on a sloping hill. I have two main roads on two legs of the triangle. Oregon Street and Tonquin Road. Surely they wouldn't impose a third road around my property?? Would they?

The city encouraged us to meet with and work with my neighbors to find a compromise. But those conversations were like “well we need to vote and its 2 to 1, soooo...” And when I would push back with alternatives to Tonquin Ct the conversation ALWAYS turned to “why don't you just sell to us and make it easy”. Literally more than 10 times. It was feeling like this road was a tool being used to make me want to sell rather than develop.

We have always tried to be good neighbors to our business community and the homeowners around us. I was pretty frustrated with how this process was unfolding and would just like to build the business park that the TEA asks for, and not lose the most buildable part of my property which is indeed the East (uphill) section.

The Right Of Way being asked for will impact us severely and may jeopardize the viability of the project by taking away square footage of buildings.

Page 2

We have provided the city with an alternative for future road access to the site which serves the other land owners to the south and east of me, doesn't impact my building area, and actually provides for more square footage and lower development costs for the Sherwood Commerce Center.

I am stumped as to why the city and my new neighbors are pushing for an inferior solution. I am sure you have already heard about the negative impacts of siting the intersection for Tonquin Ct on the hill, with limited sight lines, a steep grade on one of Sherwood busiest streets.

The goal should be to move traffic off of Oregon Street and Tualatin Sherwood road and get it to the freeway via 124<sup>th</sup> St. The solution we proposed does exactly that.

The Tonquin Ct cul-de-sac is a "dead end".

I support the development of the Sherwood Commerce Center and the rest of the TEA. I also support my project, the Oregon Street Business Park. I don not support the dead end on the slope that takes so much away from our project.

Thanks so much for your consideration. I hope you can help us.

Bruce Polley

PO Box 1489

Sherwood, Oregon. 97140



**NORTHWEST EARTHMOVERS**  
INCORPORATED

CCB#62761

P.O. Box 1609  
Sherwood, OR 97140

Phone: (503) 625-3100  
Fax: (503) 625-3108

January 24, 2022

Jean Simson, City of Sherwood Planning Commission Chairperson  
c/o: Erika Palmer – Planning Manager  
City of Sherwood  
22560 SW Pine Street  
Sherwood, OR 97140

RE: LU 2012-015 Oregon Street Business Park and LU 2012-012 Sherwood Commerce Center

Dear Chair Simson and Planning Commissioners:

I am an owner of a construction company that has operated in Washington County and specifically in Sherwood for over 38 years. I support Bruce and Karen Polley's Oregon Street Business Park project. Oregon Street Business Park provides the small industrial spaces needed by new and growing businesses. The area needs the variety of spaces provided by the Oregon Street Business Park to provide the family-wage jobs that support the area's economy and community.

The City has recommended denial for this project because the Polleys have not supported a street that will severely impact their site and disrupt traffic using Oregon Street. Requiring Tonquin Court along the east side of the Polley's site will add a signal onto Oregon Street, which has a large amount of truck traffic. Trucks currently use an acceleration lane to climb out of the Oregon Street/Tonquin Road intersection because of Oregon Street's steep grade. Adding a signal will cause trucks to have to stop on a steep grade. It takes time for a loaded truck to get going on a grade and this will severely disrupt traffic in the area. Adding this signal could prove unsafe when impatient motorists get frustrated by the slow trucks.


The City's plan says that this traffic signal will eventually be removed but does not provide any timeframe for when that will happen. The removal is dependent on a street connection to Ice Age Drive through the gun club, which is outside the UGB and unlikely to happen in any of our lifetimes.

The option brought to the City by Bruce Polley's team accounts for properties that are already in the UGB and prevents an unnecessary signal from being added to Oregon Street. The City's proposed Tonquin Court is a burden not only the travelling public, but also on property owners paying for these excessive addition and taxpayers maintaining them.

Please direct the City to reconsider this unneeded street addition that will only waste money, impede job creation, and create traffic problems. The Polleys have an option which works for the users of Oregon Street, the small property owners surrounding the Harsch site, and the Harsh site also.

Please approve the Oregon Street Business Park application without the inclusion of Tonquin Court.

Sincerely,



Jeff Hargens, President  
Northwest Earthmovers, Inc  
PO Box 1609  
Sherwood, OR 97140



EXHIBIT Z to LU 2021-012

EXHIBIT V to LU 2021-015

January 24, 2022

Jean Simson, City of Sherwood Planning Commission Chairperson

c/o: Erika Palmer – Planning Manager

City of Sherwood

22560 SW Pine Street

Sherwood, OR 97140

RE: LU 2012-015 Oregon Street Business Park and LU 2012-012 Sherwood Commerce Center

Dear Chair Simson and Planning Commissioners:

My family is a resident of Sherwood as well as a neighbor to the Polley family. We have seen the Polley family contribute to our neighborhood and community over the 25 years we have known them. They have supported my family when our daughters participated in the Sherwood High School equestrian team to the point of providing horses and access to their horse facilities on their property. They also interact with our son who has cerebral palsy and is confined to a wheel chair by just taking the time to talk with him as he roams around our local neighborhood including visiting with their horses. On a larger scale the Polley family works to preserve our recreational salmon fishery by being core members of the Coastal Conservation Association. They work long hours in these causes with no return except for making Oregon a better place to live.

I reviewed the two road proposals in discussion and conclude the following:

- 1) The access given on 7971 Infracore Snapshot Exhibit-AKS:
  - a. Opens more access for future expansion to and from Sherwood, Tualatin and Wilsonville/I-5, utilizing the SW 124<sup>th</sup> Street bypass.
  - b. Minimizes current and future congestion on SW Oregon Street.
- 2) Construction of Tonquin Court limits the amount of usable land for the Polley project, which is intended to serve the Sherwood/Tualatin business community.

My family supports the Oregon Street Business Park project. Before retirement I have been an engineer/engineering manager for companies that were started in the Portland area including FLIR Systems and Mentor Graphics. The idea of planting and growing businesses in the Sherwood/Tualatin area is part of the very fabric of working and living in Oregon. I believe the community, county and state should encourage business owners like the Polley family. Their business provides jobs and contributes to the tax base of our community.

I do not oppose the Sherwood Commerce Center development, BUT do oppose the construction of Tonquin Court and its intersection with Oregon Street.

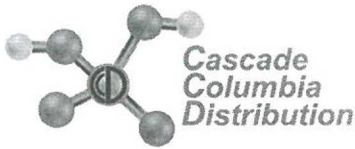
Please approve the Oregon Street Business Park without requiring the Tonquin Court / Oregon Street intersection.

Sincerely,

Richard Pier

27905 SW Ladd Hill Road

Sherwood, OR 97140



January 24, 2022

Jean Simson, City of Sherwood Planning Commission Chairperson  
c/o: Erika Palmer – Planning Manager  
City of Sherwood  
22560 SW Pine Street  
Sherwood, OR 97140  
RE: LU 2012-015 Oregon Street Business Park and LU 2012-012 Sherwood  
Commerce Center

Dear Chair Simson and Planning Commissioners:

I am the General Manager of Cascade Distribution that is located within the City of Sherwood and not far from the above-mentioned projects. I support the Oregon Street Business Park project. The City of Sherwood has typically been a residential community and needs more businesses to provide the family-wage jobs that support the area's economy and community.

The City has recommended denial for the Oregon Street Business Center because it is not proposing the construction of Tonquin Court. Requiring Tonquin Court will severely impact the Oregon Street Business Center site and require the construction of a public street and corresponding traffic signal that will negatively impact traffic along Oregon Street. We have trucks that use Oregon Street on a daily basis. Trucks currently use an acceleration lane to climb out of the Oregon Street/Tonquin Road intersection. The addition of a signal on this street will cause trucks to have to slow down and stop on a steep grade. This will severely frustrate the traveling public when loaded trucks take a long time to get going after stopping. This is also a safety concern as passenger cars/trucks seek to jump ahead of trucks, resulting in quick stops and maneuvers to avoid collisions.

The Oregon Street Business Park has provided a viable option that provides access to the area and does not require another public street intersection on Oregon Street.

I would like to emphasize that I strongly support the addition of businesses to the City of Sherwood and am in favor of both the Oregon Street Business Park and the Sherwood Commerce Center projects but, am strongly opposed to the construction of Tonquin Court and the additional public street intersection on Oregon Street.

Sincerely,

A handwritten signature in blue ink that appears to read "Steve Durrell".

Steve Durrell, General Manager  
Cascade Columbia Distribution  
14200 SW Tualatin-Sherwood Road  
Sherwood, OR 97140



*January 24, 2022*

City of Sherwood  
Planning Commission  
22560 SW Pine Street  
Sherwood, Oregon 97140  
[planningcommission@sherwoodoregon.gov](mailto:planningcommission@sherwoodoregon.gov)

*Sent via email*

Re: Testimony Regarding Proposed Development located generally at 21720 SW Oregon Street (Tax Lot 2S128C000500) - LU 2021-015 SP

Dear Planning Commission:

In advance of the January 25, 2022 meeting of the City of Sherwood (the “City”) Planning Commission, please accept this correspondence as written testimony with respect to LU 2021-015 SP, which is comprised of a proposed 9.3 acre industrial development generally located at 21720 SW Oregon Street (Tax Lot 2S128C000500) (referred to herein as the “Proposed Project”). A representative of Schnitzer Properties, LLC (fka Harsch Investment Properties, LLC) will also be providing verbal testimony with respect to the Proposed Project at the Planning Commission meeting on January 25, 2022. This correspondence is not intended to provide an exhaustive review of the Proposed Project.

We have reviewed the Staff Report dated January 12, 2022, and all attachments thereto (collectively, the “Staff Report”), and for the reasons stated therein, herein, and in our verbal testimony, we are in support of the Staff Report’s recommendation (which includes feedback from required City staff and the County of Washington, Oregon (“Washington County”)) for the Planning Commission to deny approval of the Proposed Project. This correspondence will set forth an overview of how the Proposed Project fails to comply with the City’s Zoning and Community Development Code (“SZCDC”) and various other goals and plans of the City and Washington County for properties located within the Tonquin Employment Area (“TEA”).

As an introductory matter, the plans for the Proposed Project do not show the planned local street known as SW Tonquin Ct., which is intended to abut the property line on the eastern side of the Proposed Project. As such, the Transportation Impact Analysis (the “TIA”) for the Proposed Project does not include required components by the City, nor do the plans for the Proposed Project include public infrastructure that is required to serve the Proposed Project. Furthermore, the application for the Proposed Project does not fully comply with the requirements for future access for properties located within the TEA. The Proposed Project would be one of the first







developments on the south side of Oregon St., and as such, new public facilities would be required to serve the Proposed Project and interior TEA properties to the south of the Proposed Project. The applicant has not proposed to construct the public utilities in the SW Tonquin Ct. right-of-way including sanitary, storm, and water lines to serve the adjacent parcels the south. It should be noted that it is our understanding that access and utilities cannot be provided from SW Tonquin Rd. to the east due to steep slopes and access spacing requirements for arterial streets.

Specifically, we believe that the Proposed Project should not be approved because it fails to comply with many provisions of the SZCDC. For example, the Proposed Project would include up to 20,000 square feet of retail space, which is (as currently proposed) in violation of Section 16.31.060 of the SZCDC and the TEA Concept Plan. Furthermore, the plans for the Proposed Project fail to comply with the following provisions of City and County requirements: (i) SZCDC § 16.31.030 (Development Standards); (ii) SZCDC § 16.58.010 (Clear Vision Areas); (iii) SZCDC § 16.82.020(C)(1) (Use Criteria – Public Infrastructure); (iv) SZCDC § 16.106 (Transportation Criteria); (v) SZCDC § 16.82.020(C)(3) (Use Criteria – Compliance with (a) TEA Concept Plan, (b) City Comprehensive Plan and (c) City Transportation System Plan<sup>1</sup>); (vi) SZCDC § 16.90.020(D)(1) (Required Findings – Design Standards under Division II and VI); (vii) SZCDC § 16.90.020(D)(2) (Required Findings – Compliance with (a) TEA Concept Plan, (b) City Comprehensive Plan, (c) City Transportation System Plan and (d) SZCDC); (viii) SZCDC § 16.90.020(D)(6) (Required Findings – Proposed Project’s TIA sufficiency); (ix) SZCDC § 16.96.010(A) (On-Site Pedestrian and Bicycle Circulation); (x) SZCDC § 16.96.010(F) (Access to Major Roadways); (xi) SZCDC § 16.96.030(A) (Driveways); (xii) SZCDC § 16.96.030(B) (Sidewalks and Curbs); (xiii) SZCDC § 16.96.040 (On-Site Vehicle Circulation); (xiv) SZCDC § 16.106.010 (Transportation Facilities); (xv) SZCDC § 16.106.020(A) – (D) (Required Improvements)<sup>2</sup>; (xvi) SZCDC § 16.106.020(E) (Transportation Facilities Modifications); (xvi)

<sup>1</sup> The Access Management Plan for the Proposed Project (the “Proposed AMP”) shows a collector street that runs directly through Tax Lot 2S128C000600, a nearby 38.78 acre parcel (“Tax Lot 600”), which is in direct violation of the TEA Concept Plan and City Transportation Plan. If the Proposed Project were approved, the resulting lot sizes for Tax Lot 600 would be an average of 10 to 12-acres and would be substantially different in character and employment opportunity due to the impact of the collector road. The TEA Concept Plan and City Transportation System Plan clearly have the intent for a diverse size of properties within the TEA, and they require that the City be available for opportunities for employers of various sizes. There is solid rationale for this intent because doing so allows for a campus-like industrial site, (in furtherance of the City’s Comprehensive Plan). With respect to truck traffic, truck trips associated with the Proposed Project would be required to mix with traffic along SW Oregon St. before reaching the through truck routes on SW Tualatin-Sherwood Rd. and SW 124th Ave. Viable alternatives exist to the proposed street on the Proposed Project’s site plan, and as such, the application is in direct violation of the City’s Transportation System Plan.

<sup>2</sup> The absence of the inclusion of SW Tonquin Ct in the Proposed Project, as required by City and County development code standards, City Transportation System Plan, and Chapters 6 and 8 of the City Comprehensive Plan, demonstrates insufficient long-term access and traffic concern for the TEA, City, and County. Elements of additional documents, including, but not limited to the Oregon Street Access Management Plan, are incorporated into the TEA Preferred Concept Plan, the City’s Comprehensive Plan,





SZCDC § 16.106.030(A) (Location); (xvii) SZCDC § 16.106.030(B) (Street Connectivity and Future Street Systems)<sup>3</sup>; (xviii) SZCDC § 16.106.030(D) (Additional Setbacks); (xix) SZCDC § 16.106.040 (Design); (xx) SZCDC § 16.106.040 (D) (Intersection Angles); (xxi) SZCDC § 16.106.040 (E) (Cul-de-sacs); (xxii) SZCDC § 16.106.040 (M) (Vehicular Access Management)<sup>4</sup>; (xxiii) SZCDC § 16.106.060 (Sidewalks); (xxiv) SZCDC § 16.106.080 (Bike Lanes); (xxv) SZCDC § 16.106.060 (Traffic Impact Analysis); and (xxvi) SZCDC § 16.114.030 (Service Availability). The aforementioned SZCDC sections and relevant documents discussed in the Staff Report are intended to also include any cross-referenced rules, regulations, ordinances, plans, and documents. In addition to the foregoing, we also note that the Proposed Project is subject to several onerous conditional approvals, as referenced in the Staff Report and incorporated herein.

We are in agreement with the Engineering Department's proportionality calculation required under SZCDC § 16.106.090 as set forth in the Staff Report, which requires that the SDC/TDT fees exceed the land valuation of the property being dedicated. We are further in support of the long-term benefits to the TEA and region at large that will result from a fully developed street system as required by the City.

Based on the foregoing, and our verbal testimony that will be offered on January 25, 2022, we strongly support the findings in the Staff Report with respect to the Proposed Project.

Very truly yours,

Schnitzer Properties, LLC

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and the City's Transportation System Plan. These documents, when viewed as a whole and in connection with the City's SZCDC, provide sufficient specificity under state law to require the inclusion of SW Tonquin Ct.

<sup>3</sup> The Proposed Project includes an alignment of a new east-west collector through the TEA that does not comply with the City's Transportation System Plan. Furthermore, the proposed alignment of the collector street directly through Tax Lot 600 is in direct conflict with the TEA Concept Plan. Rather, the proposed alignment heads directly to the southeast corner of the TEA and does not serve as an efficient east-west collector.

<sup>4</sup> The County has not approved a Design Exception as required to comply with Section 220 of the County Road Standards and Section 501-8.5 of the County Development Code. In addition, the Proposed Project fails to comply with the City's Transportation System Plan and the City's Comprehensive Plan, resulting in the Proposed Project not taking permanent access from the lowest classification street available to the Proposed Project.







January 24, 2022

Jean Simson, City of Sherwood Planning Commission Chairperson  
c/o: Erika Palmer – Planning Manager  
City of Sherwood  
22560 SW Pine Street  
Sherwood, OR 97140

**RE: LU 2021-15 Oregon Street Business Park Land Use Application Memorandum**

Dear Chair Simson and Planning Commissioners:

This letter and its attachments are intended as a supplement to land use application LU 2012-015.

AKS Engineering & Forestry, LLC represents Bruce and Karen Polley as part of Site Plan Review application LU 2021-015. The Oregon Street Business Park land use application was submitted on June 25, 2021 with completeness of the application established on September 21, 2021. AKS Engineering, Mr. Polley, and his legal representative met with City staff on October 21 and October 29, 2021 to discuss Oregon Street access issues and alternatives to those the City's Oregon Street Access Management Plan (AMP) previously presented. A Tonquin Court Alternative Alignment was presented to City staff for discussion on November 9, 2021. Mr. Polley has attempted to reach a reasonable solution with adjacent property owners and the City.

The Polley project team has prepared an alternative alignment for Tonquin Court (attached November 9<sup>th</sup> Memorandum and "Tonquin Court Realignment" exhibit) that addresses both the grade challenges and lack of proportionality of the current AMP plan. The proposed alternative will connect to Ice Age Drive/Blake Road near the northeastern most point of that property adjacent to the Bonneville Power Administration (BPA) corridor. From there, it is proposed to follow the Sherwood Commerce Center eastern property line. Following this alignment, access could be easily provided to properties east of the SCC property (Map 2S 1 28D Tls 600, 601, 602), which would otherwise not have a nearby Local Street connection as currently planned within the TEA Implementation Plan or the Oregon Street AMP.

### **Tonquin Court**

Tonquin Court, as currently shown within the City's Sherwood Oregon Street Access Management Plan Memorandum (June 25, 2021), is not practical to construct. Steep cross-slopes of the existing terrain will require significant cuts/fills to construct Tonquin Court. The grade of SW Oregon Street is remarkably steep, posing significant challenges for large trucks. Trucks starting from the SW Tonquin Road intersection or the SW Oregon Street/SW Murdock Road roundabout have significant issues climbing towards SW Tualatin-Sherwood Road. Trucks often use the eastbound right lane of SW Oregon Street as an acceleration lane. These grades may also pose obstacles to providing facilities that would be compliant with City and County standards at the City-proposed Tonquin Court intersection.

Beyond the un-constructability issue, Tonquin Court poses a disproportionate burden on the Polley Property. As shown, Tonquin Court eliminates  $\pm 13.3\%$  of the Polley site through the needed area for right-of-way dedication, grading, and through the creation of a remnant portion of the property ( $\pm 5,043$  square feet) north of the Tonquin Court/SW Oregon Street intersection. These streets require not only improvements, but the creation of public utility easements and the imposition of additional setbacks on



the property, further reducing the actual buildable area of the property beyond that which is reasonable or feasible for the future development of the site. Tonquin Court itself and related local street setbacks eliminate ±35% of the proposed building area. The size and configuration of the site, including existing/expanding street rights-of-way, needed stormwater facilities, and the additional, unnecessary street right-of-way seriously hinder development of the site and make the recapture of lost building area difficult or unlikely.

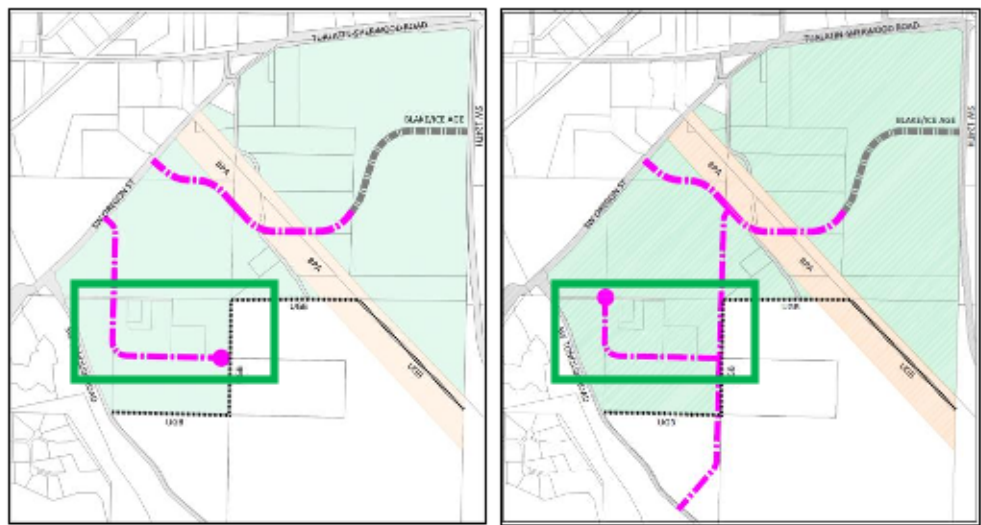
**Alternative Future Access**

Future development of the alternative Tonquin Court could allow the restriction or closure of interim Oregon Street accesses to Mr. Polley’s property. In order to maintain the developability of the property, Mr. Polley accepts the possibility of restricted access or closure of the interim access as solutions to Oregon Street access issues. Within the attached plan, this access is shown as a turn-restricted emergency access.

As currently configured, the Sherwood Commerce Center project could dedicate a 3/4 right-of-way along these areas and have interim access to SW Oregon Street as currently planned. This area maintains a relatively level grade along its length, leading to SCC’s southern “expansion properties” (Map 2S 1 33 Tls 200, 201, 300, 400, 401, and 403) not currently planned for development, and the Woodburn Industrial Capital Group LLC (Kerr) properties to the south (described below). Development of the SCC properties, Kerr properties, or Munger property (Map 2S 1 28D TL 602) could help fund this section of roadway with an appropriate, to-be-determined percentage funded by Mr. Polley’s project.

**Access to Woodburn Industrial Capital Group (Kerr) Properties (Map 2S 1 33 Tls 100 & 400)**

The Tonquin Court Alternative does not significantly differ from the current plan for the Kerr properties. Grading along the SCC expansion/Kerr shared property line is planned to meet both the current and proposed locations of Tonquin Court, as demonstrated by Preliminary Plans included as part of land use application LU 2021-014. These areas will be at a similar elevation to those currently at the southeastern corner of the Polley property and northeastern corner of the Kerr property, ±195 feet, and following the shared property lines to an elevation of approximately 220 feet. The planned alternative would also offer the opportunity to connect to SW Tonquin Road at a future date, improving access for those properties.



AMP Tonquin Court

Alternative Street Plan

### **Emergency Access**

The alternative street cul-de-sac length may be reduced following future development of sites east of the proposed alternative Tonquin Court. Secondary emergency access will be available through Mr. Polley's property from SW Oregon Street and via the "unnamed road" to the south of the property. Through-connections via the Sherwood Commerce Center and SCC expansion property could also provide additional access to southern portions of Tonquin Court. These connections to Tonquin Court will allow emergency access to areas where development timing may not allow the immediate construction of portions of Tonquin Court, including existing homes on properties now owned by Sherwood Commerce Center.

### **Access to Other TEA/Urban Reserve Properties**

The proposed alternative alignment of Tonquin Court expands access to other Tonquin Employment Area (TEA) properties and those within the City's Urban Reserve.

As shown within the DKS AMP, current plans for Tonquin Court end at the furthest extent of the Kerr Property (TL 400) with eventual connection to an East-West Collector. This original alignment did not plan to connect properties east of the SCC property or other properties along and beyond Dahlke Lane/the Bonneville Power Administration corridor and left such connections to future planning decisions. Because Dahlke Lane would require significant dedications and realignment itself, it will not probably serve as a potential Local Street serving to connect properties to Ice Age Drive.

The alternative alignment connects these properties for transportation and utility needs more expediently and efficiently. Connections south could allow Urban Reserve properties to connect to points north or extend south to SW Tonquin Road, as shown on the attached plan. The alternative also allows easier expansion to properties within the eastern portion of the TEA the Tri-County Gun Club (Tualatin Valley Sportsmen's Club) properties, should those properties be brought into the Urban Growth Boundary in the future.

### **Comparison to Current AMP**

While the length of right-of-way has increased from those illustrated within the AMP, grading and other efficiencies from timing with development may lead to significantly easier and less costly construction of the Tonquin Court Alternative. Significantly less grading is required with the alternative proposal than would be required with the original alignment of Tonquin Court. The SCC project could be easily shifted west to accommodate the right-of-way eliminated on the west property line and added to the east property line with minimal changes to the site plan. In our estimate, shifting the SCC site results in a reduction of total building area of less than 1% while maintaining all building widths, drive aisles, loading areas, and much of the parking, while also leaving a buffer for grading and retaining wall construction.

The alignment of Ice Age Drive will follow the previously prescribed route, meandering east from SW Oregon Street following the BPA corridor and other existing utility corridors, to make a future connection to SW 124<sup>th</sup> Avenue. The addition of the alternative Tonquin Court allows easier connection to SW 124<sup>th</sup> Avenue for properties within the southern end of the Tonquin Employment Area.

The City's Access Management Plan also proposes the signalization of Tonquin Court. This signalization, for the reasons previously stated, negatively impacts the area and surrounding residents and businesses. The AMP states that the signal would remain signalized until such time that Tonquin Court could be extended east. The City has not provided a timeline for that extension, which will depend not only on

development of properties that are unlikely to develop, but also extensions of urban facilities that are not currently planned.

### **Conclusion**

The Planning Commission has not had an opportunity to review the appropriate materials submitted by the Applicant to the City, specifically the November 9<sup>th</sup> Alternative Street Plan memo, as they were not included in the Staff Report and application materials distributed for the January 11 and January 25, 2022 Planning Commission meetings. As such, we request a continuance of this hearing for the Planning Commission to have the appropriate time to review the materials.

We believe that we have provided a viable, equitable alternative to the Oregon Street AMP, which is more equitable to all properties in the Tonquin Employment Area, but also improves overall regional circulation. Please approve LU 2021-015 without the requirement to construct Tonquin Court as currently planned and please instruct Staff to research the alternative street plan provided.

Sincerely,

**AKS ENGINEERING & FORESTRY, LLC**



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Attachments: Hathaway Larson Letter  
November 9<sup>th</sup> Alternative Street Plan Memo  
Tonquin Court Alternative Plan  
Proportionality Analysis





January 24, 2022

Planning Commission Members  
City of Sherwood

Re: LU 2021-015 SP Oregon Street Business Park

Dear Planning Commission Members:

This firm represents Bruce and Karen Polley, the applicants in the above-referenced matter. We are writing to address the staff's recommendation that the application in this matter be denied. The focus of our letter will be on staff's findings relative to transportation issues, particularly those that relate to the fact that the applicants did include in the application a proposal to dedicate property for a future Tonquin Court. We will explain that staff's recommendation of denial because the applicants will not agree to an exaction of property violates the 5<sup>th</sup> Amendment to the United States Constitution. Staff has not and cannot meet its burden under the 5<sup>th</sup> Amendment to show that the exaction meets the essential nexus or rough proportionality requirements.

## **BACKGROUND**

### **The Property**

Bruce and Karen Polley (the "applicants") own the parcel located near the intersection of Tonquin Road and Oregon Street with the common address of 21720 SW Oregon Street, also identified as Tax Lot 500. We will refer to the property as the "Polley parcel." The Polley parcel is approximately 388,907 square feet. The Polley parcel has had direct access since at least 1994 to Oregon Street via a private driveway located close to the eastern boundary line. The Polley parcel most closely resembles a triangle with the east end being the widest part and narrowing to a point at its western end where it abuts Tonquin Road. The topography slopes from east to west. The flattest portion of the Polley parcel is at the east side where it abuts a parcel currently owned by Sherwood Commerce Center, LLC (referred to as "SCC" and the "SCC parcel").

### **Tonquin Employment Area Concept Plan**

The Polley parcel is within the Tonquin Employment Area ("TEA"). The TEA plan is a conceptual plan that was prepared by a third-party consultant, Angelo Planning. It depicts a conceptual plan

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for how access can be provided for parcels within the plan area. Based on conversations with city staff, the applicants understand that neither the city nor any of its consultants ever applied any engineering analysis to determine the feasibility of constructing streets where Angelo depicts them in the conceptual plan. Indeed, staff acknowledges that the location of future streets shown in the TSP is conceptual, and final street alignment is generally determined through development applications. Staff Report, p. 77.

The applicants submit that had the city employed an engineering firm to assist in the development of the TEA concept plan or used its own engineering department, the location for the future Tonquin Court would not be as it is depicted. Angelo Planning located the future street on the boundary line between the Polley parcel and the SCC parcel where there is a significant slope from east to west. In meetings with the city, staff did not disagree that to construct any street in that location one will have to either raise the right-of-way up to the level of the SCC parcel or lower it to the level of the Polley parcel. In either case, extreme excavation and large retaining walls will be required. Sound engineering principles do not support that location. In fact, the applicants are confident that if the city believed it was paying to construct the street rather than rely exacting money from private parties, Tonquin Court would not be constructed where it is depicted on the concept plan. That would be an irresponsible use of public tax dollars.

### **The Applicants' Proposal**

The applicants are proposing to develop the Polley parcel with 120,815 square feet of industrial space in five buildings. As the staff report confirms, the triangle configuration of the parcel necessitates that the majority of the proposed building space be located near the east end of the property. The application proposes three buildings with a combined 42,250 square feet of floor area adjacent to the Polley parcel's east property line. The far west end is the narrowest and with the slope of the parcel, the west end is the only appropriate location for stormwater management facilities.

The application proposes to use a private access driveway existing private driveway for access to Oregon Street similar to the existing private driveway. Sherwood Development Code ("SDC"), section 16.106 does not outright prohibit direct access onto an arterial but provides that such access should be minimized. The spacing of access points on Oregon Street is the issue and there is no location on the Polley parcel frontage where access will meet the technical requirement. However, Washington County access management standards recognize that it cannot simply refuse to allow direct access, at least on an interim basis, where adequate access cannot otherwise be provided. Washington County Road Design and Construction Standards ("DCS"), sections 501-8.5 (B) & (E). Indeed, it is that provision upon which SCC relies for its access onto Oregon Street.

To address long-term access within the TEA, applicants presented an access management plan that in the future will make the primary and, perhaps, the sole access to the Polley parcel, compliant with city and county spacing standards. The applicants provided that alternative street plan to staff on November 9, 2021. Inexplicably, the Polley alternative street plan was not included in the

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hearing packet or discussed in the staff report. We attached another copy of the Polley alternative street plan to this letter and request that it be added to the record. The Polley parcel alternative street plan illustrates an alternative realignment of Tonquin Court from that depicted in the TEA concept plan to a location along the eastern property line of the SCC parcel (TL 600). Tonquin Court would run south from the southeast corner of the Polley parcel to provide future access to the Kerr property and others south of TL 600. It would run east, as shown in the TEA implementation plan, along the southern boundary of TL 600 to the Gun Club property that is not in the UGB yet. From there it extends north along the east side of TL 600 just as shown on Figure 18 in the implementation plan where it will intersect the future collector (Ice Age Drive). Eventually, when Ice Age Drive is constructed as a collector road, that will intersect with Oregon Street. That intersection will comply with all standards. The relocated Tonquin Court will connect to Ice Age collector providing the east/west connection within the TEA and a compliant intersection on Oregon Street. Among the benefits of the Polley alternative street plan is it because the city has the ability to acquire dedication along the east side of TL 600 now, the alternative plan advances the city's interest in the long-term TEA access faster than the city can do under the DKS AMP.

### **Staff Report**

On transportation, staff concluded that the application did not meet several sections within SDC 16.106 but almost each finding of non-compliance revolves around the same issue: the applicants' refusal to propose dedication for a public street that is not needed to serve the proposal and is not depicted in an appropriate location. The applicants will discuss later, in more detail, the erroneous conclusions staff reached. Here, it is important to explain the fact that the applicants' proposed direct access onto Oregon Street is not a basis upon which staff can criticize the application. The SCC proposal next door also proposes direct access for a significantly larger development and staff supports that application. Both applications rely on interim direct access that does not fully comply with spacing standards. To be compliant, both applications require a long-term access plan that demonstrates how access can be provided to the TEA consistent with city and county standards. Staff insists that the AMP upon which the SCC relies is a better option than the Polley alternative street plan. We will demonstrate that staff is incorrect.

There is no question that long-term, compliant access is dependent on the future construction of Ice Age Drive as a collector that will intersect with Oregon Street and some east/west connecting road within the TEA. Any suggestion that constructing Tonquin Court as proposed in the TEA concept plan is a means to achieve compliance with the county standards is inaccurate. Tonquin Court would be a local street and direct access from a local street onto an arterial is no more compliant than direct access from a private driveway. The only way to achieve compliance is for the city to construct Ice Age Drive to a collector classification and install a controlled intersection at Oregon Street. All traffic into and from the TEA properties south of Oregon Street would require an extension of Tonquin Court or the development of a new street extending east connecting to Ice Age Drive, if it is ever constructed. Thus, the justification for interim access provided by SCC applies equally to Polley parcel.



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## ANALYSIS

### The Law on Exactions

When local government, as a condition of granting a development permit, compels the applicant to give private property, it is an exaction. *Nollan v. California Coastal Commission*, 483 U.S. 595, 107 S. Ct. 3141 (1987). In 2013, the Supreme Court confirmed that a condition requiring an applicant to complete off-site improvements is also an exaction reasoning that compelling an applicant to pay money for off-site public improvements is legally the same as requiring a dedication of real property. *Koontz v. St. John's Water District*, 570 U.S. 595, 133 S. Ct. 2586 (2013). To be compliant with the 5<sup>th</sup> Amendment's requirement that government not take private property for public use without paying compensation, a local government has the burden of demonstrating that (1) there is an essential nexus between the exaction and a legitimate governmental interest, and impacts from the proposed development substantially impede that same interest such that the local government could validly deny the application without mitigation of the impacts, and (2) that the exaction is roughly proportionate in both nature and extent to impacts generated by the proposed development. The test is commonly referred to as the *Nollan/Dolan* test first explained in *Nollan v. California Coast Commission* (essential nexus prong) and *Dolan v. City of Tigard*, 512 U.S. 374, 114 S. Ct. 2309 (1994). (Rough proportionality prong).

#### *1. Essential nexus*

On the essential nexus prong, two fairly recent court cases present holdings relevant to the Polley application. First, in *Levin v. City and County of San Francisco*, 71 F.Supp.3d 1072 (2014), the court explained the required connection between project impacts and the local government's ability to exact money.<sup>1</sup> *Levin* involved local regulations to address the documented housing crisis in the Bay area. In summary, if an owner of rental property that was registered in the City's rent control program desired to remove their property from the rental market, they had to provide certain notices terminating the tenancies and obtain a permit to withdraw. The regulations required the owner, as a condition of getting a permit to withdraw, to pay a lump sum to evicted tenants roughly equal to two years' worth of the alleged gap between the reduced rent the tenant was paying under the City's rent control regulations and the market rent for a comparable unit (the "Rental Payment Differential"). The Rental Payment Differential was not a small amount. One

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<sup>1</sup> The District Court ruled that the City and County regulations requiring owners of rental properties to pay tenants a Rent Payment Differential as a condition to a permit allowing that owner to withdraw their property from the rental market was an exaction that failed both the *Nollan* essential nexus test and the *Dolan* rough proportionality test. The City and County appealed, but while the appeal was pending, they amended the regulations rendering the appeal moot. In an unpublished memorandum decision, the 9<sup>th</sup> Circuit remanded the case to the District Court to determine whether the dismissal of the appeal on mootness grounds required vacation of the underlying decision. *Levin v. City and County of San Francisco*, 680 Fed. App. 610 (2017).

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of the plaintiffs who owned a small rental property would have had to pay a tenant \$117,000.00 to withdraw their property. *Levin*, 71 F. Supp.3d at 1078.

The court began its analysis highlighting the basic concept underpinning the *Nollan/Dolan* essential nexus/rough proportionality test. It explained:

In other words, the doctrine comes into play when the government demands a private payment in exchange for granting a landowner permission to make a different use of their property. A predicate for any unconstitutional condition claim is that the government could not have constitutionally, ordered the person asserting the claim to do what it attempted to pressure that person into doing. *Levin*, 71 F. Supp.3d at 1081, citing *Koontz v. St. Johns Water Management District*, 133 S. Ct at 2598.

The court went on to discuss the burden on the government when it seeks to attach an exaction to a permit explaining that, “*Nollan* determined that the permit could be conditioned on the exaction only if the exaction had an essential nexus to the government interest that would furnish a valid ground for denial of the permit; in short, unless the permit condition serves the same governmental purpose as the development ban, the building restriction is not a valid regulation of land use but an out-and-out plan of extortion.” *Levin*, 71 F.Supp.3d at 1082, citing *Nollan*, 483 US at 837, 107 S. Ct. at 3141.

In *Dan Hill v. City of Portland*, 293 Or App 283, 428 P3d 986 (2018), the court held that a local government cannot avoid the required constitutional impact analysis by writing code that purports to eliminate it. That translates to this case. A local government does not satisfy the essential nexus test simply by showing a future street on a plan. It must establish that the plan embodies a legitimate governmental interest and how impacts from the project will substantially impede that interest to the point it has a valid basis to deny the application.

## 2. *Rough Proportionality*

The law is clear that even if a local government satisfies its burden under the essential nexus prong of the *Nollan/Dolan* test, it must also satisfy the rough proportionality test. To justify an exaction, and, thus, under *Koontz*, be in a position where it could deny an application, a local government must demonstrate that the exaction it wants is roughly proportionate, which means it must relate in nature and extent to the impacts generated by the proposed development. *Art Piculell Group v. Clackamas County*, 142 Or App 327, 922 P2d 1227 (1996). In explaining the greatest obstacle to affirming a government decision to condition approval on an exaction (or deny because applicants will not give property) is the specificity required in findings, the court quoted from *Dolan v. City of Tigard*:

Non precise mathematical calculation is required but there must be an individualized determination and some effort to quantify the findings.



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The court in *Levin* explained how *Dolan* refined this requirement by explaining that there must be rough proportionality between the exactions imposed by the city and the projected impacts of the proposed development. Critically, the court confirmed what *Nollan* and *Dolan* established:

the burden is a significant one, in which the city must make some effort to quantify its findings in support of the dedication ... beyond the conclusory statement that it could offset some of the development's negative impacts. *Levin*, 71 F. Supp. at 1082.

3. *Denying an application because an applicant refused to give an exaction violates the 5<sup>th</sup> Amendment*

Because it appears staff is trying to avoid the required test by recommending denial as opposed to recommending approval with a condition requiring Polley to dedicate right-of-way and construct Tonquin Court, it is important to observe that in *Koontz*, the Supreme court announced that denying an application because an applicant refuses to give an exaction is no less of a violation of the 5<sup>th</sup> Amendment than imposing a condition that requires the applicant to give the exaction. In other words, under the constitution, if a local government cannot satisfy its burden to take property, it cannot deny an application if the applicant elects not to voluntarily give the property.

There is no question that if the city were to condition an approval of the Polley application upon Polley dedicating right-of-way for Tonquin Court, and/or requiring Polley to give money towards the construction of that off-site public improvement, it would be an exaction. Thus, if the city has any legal basis to deny the application, it must meet its burden of demonstrating that it has a legitimate basis to deny the application.

**The City Must Be Able to Identify One or More Legitimate Governmental Interest and Demonstrate How Project Impacts Substantially Impede That Interest to a Degree the City Has a Valid Basis to Deny the Application**

The first step in the 5<sup>th</sup> Amendment analysis is to identify the legitimate governmental interest the city is trying to advance. The city has yet to articulate to the applicants exactly what legitimate governmental interest it believes supports an exaction of property for Tonquin Court, and, thus, supports a denial of the application. The staff report includes a section on page 32 directed at the rough proportionality test but not on the essential nexus test. The city engineer included a memorandum labeled Proportionality Analysis, but it does not identify or discuss what legitimate interest the city believes the Polley application will substantially impede. The engineering department quotes from SDC 16.106.020, however, nothing in the provision quoted identify any link between perceived impacts of the proposal and some requirement the city can impose related to new streets. That section begins by clearly stating that streets required by Chapter 16.104 shall be dedicated and improved consistent with Chapter 6 of the community development plan. Under the text in SDC 16.104.020, the only street improvements required are improvements on adjacent street that lack standard improvements and street proposed in an application. SDC 16.104.020

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cannot be used as establishing a legitimate governmental interest in constructing a future Tonquin Court on the Polley parcel. Relying solely on the provisions is SDC 16.106 is no different than the position Portland took in the *Hill* case and the court rejected.

The city cannot advance a position that approving the application will substantially impede any interest in the operation of current facilities or to provide access to properties south of the Polley parcel. It must admit that it will approve the Polley application and the SCC application with direct access to Oregon Street when there is no plan for when long-term access out to Ice Age will be accomplished. Further, even if Polley dedicated property for Tonquin Court, the city has no time frame for when it will be completed. Under staff's position, development on the Polley parcel and the SCC parcel could be operating for years with the existing facilities and without access to the southern properties. One conclusion is inescapable; development on the Polley parcel with interim direct access to Oregon Street will not generate any impacts that substantially impede a legitimate governmental interest related to the existing facilities.<sup>2</sup>

#### **The City's Interest in Long-Term Access Within the TEA that Meets Standards**

Although it does not appear in the context of an essential nexus analysis under the 5<sup>th</sup> Amendment, and as the applicants will show it has many flaws, the staff report appears to articulate a legitimate city interest in creating a transportation network within the TEA that meets applicable standards. When it attempts to justify the DKS memo as the equivalent of an approval criterion under ORS 227.173 on pages 69 through 72, staff discusses provisions in its comprehensive plan and TSP that support creating long-term access within the TEA.

However, staff never adequately address the more critical component of the essential nexus test. Staff does not demonstrate how the application, without the dedication for Tonquin Court, substantially impedes that interest. That is a fatal omission. In *Brown v. City of Medford*, 251 Or App 42, 283 P3d 367 (2021) and *Hill v. City of Portland*, the court made it clear that identifying a legitimate governmental interest alone is not legally sufficient to support an exaction. As the court in *Brown* stated:

On appeal, the city contends that the trial court erred because there is in fact a nexus “between the City of Medford’s imposed condition and the city’s policies sought

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<sup>2</sup> Under the 5<sup>th</sup> Amendment, owning property that the city views as an opportunity to solve an unrelated problem is not the nexus that permits the taking of private property. The city seems to confuse an opportunity to coerce an owner to give up property with project impacts. As we noted, the city cannot claim that Mr. Polley needs Tonquin Court to provide access for an approval. It is prepared to approve his project without the construction of Tonquin Court based on a dedication of property that may in the future benefit other owners who lack access. As it relates to access, the properties to the south are in no different position whether Mr. Polley develops his parcel as proposed or leaves it to sit for years.

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to be advanced by the condition.” The city’s argument, however, proceeds from a fundamental misconception about the nexus that is required by *Nollan* and *Dolan*. The question is not whether the city can identify a connection between the condition and some legitimate public policy that the city seeks to advance. Indeed, the Court in *Nollan* and *Dolan* never “question(ed) whether the exactions would substantially advance *some* legitimate state interest. Rather, the issue was whether the exactions substantially advanced the *same* interests that land-use authorities asserted would allow them to deny the permit altogether.” *Lingle*, 544 U.S. at 547, 125 S. Ct. 2074 (citations omitted; emphasis in original).

There is no question that the city cannot deny the application because it proposes immediate access that does not meet all of the standards that apply to access onto Oregon Street. Indeed, staff supports the SCC application that also proposes access directly onto Oregon Street via a private entrance. Furthermore, staff is prepared to accept interim access for multiple parcels using Tonquin Court as depicted in the TEA concept plan even though that access does not meet the spacing standards. Staff takes the position, however, that the city can deny the application because without showing dedication for a future Tonquin Court as depicted in the TEA concept plan, the applicants have not shown how future access for their parcel and other property in the TEA can be provided consistent with city and county standards.

Staff’s position is based on a faulty foundation. Moreover, in an effort to build support for its position, staff decide to not provide the Planning Commission with the November 9, 2021 alternative street plan Polley provided. This plan clearly demonstrates how the Polley proposal will not substantially impede any governmental interest in creating long-term, compliant access within the TEA. The applicants proposed alternative street plan demonstrated that long-term access to all properties in the TEA can be achieved consistent with applicable standards and without creating disparate impacts on the Polley parcel. Unfortunately, it appears that staff is unwilling to admit that the product it paid for may not ultimately be the best answer and has put on institutional blinders to avoid that reality.

Staff begins on page 68 depicting one figure from the TEA implementation plan that depicts Tonquin Court extending from Oregon Street over the Polley parcel and ending in a cul de sac at the south end of TL 600. However, that illustration does not show how the long-term access plan that meets standards will be accomplished. Staff further ignores that Tonquin Court, as depicted on that illustration, violates County access standards just as much as the private driveway in the application does. A local street cannot directly access an arterial.

The applicants’ alternative street plan memo dated November 9, 2021, goes further, and demonstrates how Tonquin Court can be extended east and north to provide compliant access to the same properties that would use the Tonquin Court in Figure 17. One important question for staff is why would it not include the Polley alternative street plan in the staff report? The answer is that its inclusion demonstrates the merits of the applicants’ alternative street plan and shows that staff criticism of the application is unfounded. Staff simply refuses to admit that it is the DKS



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AMP memo and the SCC application that would really impede the legitimate interest in compliant long-term access. If staff really wanted to move that interest further, it would get the dedication for the northern extension of Tonquin Court from SCC now.

Over and above ignoring the applicants' November 9, 2021 alternative street plan memo, staff mischaracterizes the applicants' proposal referring to a prior illustration in a June 2021 TIA that was intended only to evaluate impacts from the volume of anticipated trips. It was never intended to demonstrate how long-term compliant access would be achieved. That is the reason the applicants provided staff with the November 9, 2021 alternative AMP. Staff relies on that earlier access plan to assert:

- The applicants propose an east/west extension of Tonquin Court that cuts through the middle of TL 600 creating smaller parcels that are not consistent with the objectives in the TEA plan. Staff Report, p. 79.
- The applicants propose to retain the private driveway as a permanent unrestricted access. Staff Report. p. 60.

Those statements are not accurate. In two meetings with staff, one on October 21 and a second on October 29, 2021, the applicants and their consultants introduced the Polley alternative street plan illustrating its long-term benefits to the TEA. On November 9, 2021, the applicants formally submitted the alternative street plan. That proposed access plan confirms that the applicants' access plan that is entirely consistent with the long-range access objectives for the TEA. The east/west extension of Tonquin Court is depicted at the southern boundary of TL 600 and does not result in cutting it into smaller parcels. Further, as to long-term access to the Polley parcel, the applicants stated clearly in their alternative street plan memo that "future development of the alternative Tonquin Court could allow restricted or closure of the interim Oregon Street access to Mr. Polley's property... Mr. Polley accepts the possibility of restricted access or closure of the interim access..." It is not possible to accept staff's representation on page 80 that the applicants' alternative street plan shows the full access intersection for the east/west collector but assumes the applicants' site will be granted a full movement, permanent direct access driveway along SW Oregon Street. The applicants expressly accept the possibility of closing the driveway access.

Staff refuses to give any meaningful consideration of the Polley alternative street plan. Staff has the ability to acquire dedication along the east side of TL 600 to further the city's interest in the long-term compliant access. Instead, staff ignores glaring deficiencies in the DKS AMP and continues to support the SCC application without considering requiring needed dedication. We will show that by not requiring SCC to dedicate property now, staff is making it more challenging and thus, less likely that compliant, long-term access will be created. Unlike the applicants' November 9, 2021 proposal for future access, DKS did nothing to show how Tonquin Court, that it shows ending in a cul de sac at the property owned by the Gun Club, will ever extend out to the future collector. Staff recites that at final configuration, SW Tonquin Court will connect to SW Ice Age Drive and eliminate the long cul de sac created by the interim access. Staff did not cite to



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anything that supports its statement. As noted, The DKS AMP memo offers no possibilities. The Polley alternative shows how that connection can be accelerated by obtaining dedication now for a northern extension across the east side of TL 600. If the comprehensive plan and TSP provisions staff cites in its argument allow the city to require the applicants to dedicate property, they would also allow the city to require that SCC dedicate property for that future street section. Why would staff not apply the city plans and policies to two applicants in an impartial manner consistent with the Equal Protection Clause?

The SCC future access plan fares no better. That plan is not consistent with the implementation plan. It reflects the extension of Tonquin Court from the interim cul de sac east cutting through a few larger parcels resulting in smaller developable pieces of land. The fact that staff supports the SCC application with that plan shows (1) staff comment that the applicants' proposal would cut parcels into smaller pieces (even if true, which it is not) is not a legitimate criticism, and (2) staff is not treating equally situated applicants in the same manner.

The DKS memo, which is obviously intended to support the TEA that ignored the topography, is woefully deficient to support an exaction from Polley. The DKS memo confirms that Tonquin Court is not consistent with the city's interest in developing access to properties within the TEA that complies with access management standards. Tonquin Court, a local street, is an interim access until access to the east is created. The main problem with the DKS memo is that it confirms nothing about the Polley development that impacts the city's apparent interest and that exacting land for Tonquin Court has no nexus to any legitimate governmental interest.

No aspect of Mr. Polley's proposed development will impact the city's governmental interest in developing the "Ultimate Access" as DKS labels it. In fact, the Polley application demonstrates how the city can more efficiently and expeditiously move the long-term access, as reflected in the implementation plan, toward reality. The applicants' unwillingness to dedicate property for the Tonquin Court alternative shown on the TEA concept plan is not a legitimate basis to deny the application. It is an unlawful exaction and will expose the city to damages for violating the 5<sup>th</sup> Amendment.

### **Rough Proportionality**

As we discussed above, to meet its burden under the rough proportionality test, the city must demonstrate that the exaction is roughly proportionate in nature and extent to impacts of the proposed development. Looking at whether the exaction of property for a future Tonquin Court is proportionate in nature to project impacts, the city must be able to identify specific impacts from the proposed development that relate to the exaction. From a transportation standpoint, the only impacts of the proposed development will be adding vehicle trips to Oregon Street and Tonquin Road. The staff proposes exactions for frontage on Oregon Street and a proportionate share contribution for other improvements for the impacts on existing streets and intersections. Staff's discussion on rough proportionality could not be less informing. It recited: "The proposed development will create new demand on all three existing streets and planned frontages. Staff

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Report, p. 101. All development will create some demand. The 5<sup>th</sup> Amendment requires some effort to quantify them.

As to each exaction for improvements to existing streets/intersections, the city's analysis is deficient. There was no effort to quantify the impacts and no assessment of how they are proportionate to the impact on the applicants. However, with the exception of the dedication and proportionate share for Tonquin Court, the applicants were prepared to accept the exactions.

Tonquin Court presents an entirely different situation because the application does not propose any impacts on it. Staff claims that Tonquin Court is not built so it has no capacity. That is a ridiculous point. The Polley application does not rely on Tonquin Court extending over the Polley parcel for any access and, thus, will never place any demand on it. Interim access will be the same as SCC and long-term access will come from the alternative Tonquin Court depicted on the November 9, 2021 alternative street plan. That fact helps illustrate that staff is insisting on Tonquin Court dedication not to serve the Polley application but to provide interim access for Kerr and others until the compliant long-term system is in place. The point is the proposed exaction is not proportionate in nature to any impacts from the Polley proposal.

As we noted, the fact that the Kerr property and others south of Polley do not currently have access to Oregon Street is not a project impact. It is a pre-existing condition having nothing to do with the Polley proposal. The exaction of property to provide access for other owners to the south is not related in nature to those impacts. If the city's concern is vehicle impacts on Oregon Street, or Tonquin Road, creating Tonquin Court will not get traffic off Oregon Street. In fact, it will increase them for an undefined length of time until the city completes significant acquisition and construction of multiple streets to the east.

Looking at whether the exaction is proportionate in extent, the city has to quantify the impacts of the proposed development on the city's infrastructure. We know that the number of vehicle trips from the Polley proposal will not have a significant impact on Oregon Street because the city is prepared to approve the development, and apparently more development to the south, adding trips for an undefined period. We have demonstrated above that it is not impacts from the Polley proposal that drives the exaction for a future Tonquin Court, rather, it is the city's desire to assist the Kerr ownership and others to the south who do not have direct access to Oregon Street.

The city must also identify and quantify all impacts on the applicants. The Engineering Department Proportionality Analysis has not been shared with the Applicants. The engineering department calculated the SDC charges it believes will be assessed against the proposed development without the impacts on the project from the exaction. According to the city the SDCs are calculated based on the full 120,815 square feet proposed. Applying all of the city charges, the city determined that number to be \$951,005. The city approximated the value of just the land it seeks to exact at \$836,825.51. It concluded that since the value of the raw land was less than the total SDC's, the exaction was proportionate.



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The first flaw in the city's analysis is that SDCs cannot be used to substitute for an individualized determination of project impacts. While SDCs are intended to offset general impacts of development, they do not substitute for an individualized assessment of impacts from a specific development. SDCs are driven by formulas that use typical impacts, so local governments do not have to satisfy the more rigorous standards for exactions. *Rogers Machinery, Inc. v. Washington County*, 181 Or App 369, 45 P3d 966 (2002). *Rogers* illustrates that local governments use SDC provisions to calculate fees based on categories of development and average trips as opposed to individualized impact analysis specifically to avoid the rough proportionality test. The city's rough proportionality analysis that uses SDC to determine impacts of a specific proposal is fundamentally flawed under the law.

The second problem with the city's rough proportionality analysis, even if one were to accept the city's flawed methodology, is that staff limited the impacts it used to the raw value of just the dedication for a future right-of-way. It failed to account for the loss of building floor area that is a direct result of the dedication. As we noted, due to the configuration of the Polley parcel, Mr. Polley has to place the most intense development-greatest amount of building footprint-on the east property line. The dedication the city wants will require a significant reduction in the number of square feet.

The applicants' project engineers and planners prepared a preliminary alternative site plan that, unlike anything the city or SCC has cited, depicts the activity on the ground that would have to occur to dedicate and construct a future Tonquin Court where the city wants it. The preliminary alternative illustrates that the applicants will lose approximately 45,000 square feet of floor space as a direct result of the city's exaction for the future Tonquin Court. The loss of floor space dramatically impacts the city's analysis in multiple ways. First, the SDC's for the reduced floor area after the Tonquin dedication will be \$618,431.47. Thus, even if the staff's methodology had merit, staff used completely inaccurate numbers to quantify the project impacts. After the dedication the city, even using its analysis must weigh the land value of \$836,825.51 against \$618,431.47. The impact on the applicants would greatly exceed impact of the proposed development even under the city's legally flawed methodology.

Second, the loss of floor space is compensable damage under the 5<sup>th</sup> Amendment. That loss thus, has to be factored into any rough proportionality analysis. As noted, the dedication and future construction of Tonquin Court as the city desires will cost the applicants about 45,000 square feet of rentable floor area. The rental value based on current market conditions is \$12.00 per foot. Using a range for capitalization rates between 5.5 and 6.0% the damages range between \$9,000,000 and \$11,000,000. A fairly conservative estimate of the damages the applicants will incur thus, is \$10,000,000.

Under a legally correct application of the rough proportionality test, the impact on the applicant will be the land value of \$836,825.51 (accepting the city's number) and \$10,000,000 in lost rental value. The project impacts would be the individualized impacts the city can demonstrate that the proposal will place on city facilities. The city has not attempted to provide that required impact



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assessment, instead using the flawed SDC analysis. Nevertheless, even if one accepts that SDC analysis, based on the reduced floor area, the impacts are \$618,431.47. Thus, even if one accepts the city's position that an exaction is proportionate if the land value taken is less than the SDCs, the city fails its own test—\$836,825.51 in land value vs \$618,431.47 in project impacts. When the proper impact assessment is applied, including the enormous loss in rentable floor area, there is no way the city can claim the impact on the applicant is close to proportionate. The impact on the applicant is \$10,836,825.51 vs \$618,431.47 in project impacts.

Another way to look at rough proportionality in this matter is to examine the impacts on the Polley parcel and the SCC parcel resulting from the competing plans for long-term access management. If the access management plan the city applies adopts the Polley alternative, SCC will not lose any development potential. All of the proposed buildings can be developed as planned. SCC will have to dedicate an additional 1.67% of its site to provide the alternate Tonquin Court with this application. The alternative does not differ from what is currently proposed beyond the Polley/SCC southern boundaries. The alternative, however, allows for more proportional impacts to neighboring properties and greatly improved traffic circulation throughout this portion of the Tonquin Employment Area.

In contrast, a dedication on the Polley parcel for a future Tonquin Court will take about 13.26% of the Polley parcel. It will also leave an uneconomic remainder east of the intersection of the future Tonquin Court and Oregon Street that Polley could otherwise use. A dedication renders that property entirely useless. As noted, the dedication will not only take a higher proportion of the Polley parcel, but it will also reduce the amount of building area Polley can develop imposing significant financial impact on Polley.

Very truly yours,

HATHAWAY LARSON LLP

*s/ Christopher P. Koback*

Christopher P. Koback

CPK/ep



November 9, 2021

Eric Rutledge  
City of Sherwood  
22560 SW Pine Street  
Sherwood, OR 97140

**RE: LU 2021-015 SP Oregon Street Business Park – Tonquin Court Alternative Alignment**

Dear Eric:

AKS Engineering & Forestry, LLC is representing Bruce Polley as part of Site Plan Review application LU 2021-015. The Oregon Street Business Park land use application was submitted on June 25, 2021 with completeness of the application established on September 21, 2021. AKS Engineering, Mr. Polley, and Mr. Polley's legal representative met with City staff on October 21 and October 29, 2021 to discuss Oregon Street access issues and alternatives to those previously presented. A Tonquin Court Alternative Alignment was presented to City staff for discussion on October 29<sup>th</sup>. As we discussed, Mr. Polley looks forward to working with the City in coming to a reasonable and rational access solution.

In meeting with the City regarding the Tonquin Court Alternative, our aim was to provide the proposal and clarify Mr. Polley's stance and willingness to work towards a common solution. This letter serves as a companion to the attached Tonquin Court Alternative Proposal Plan drawing (previously shared with staff) and modified in response to staff requests for clarification and comments received. Our team is interested in working with the City and surrounding property owners to find a solution amenable to all parties. We believe that this alternative is the most logical, fair, constructable, and least impactful option to all parties involved.

### **Incompatible Existing Design**

The alignment of Tonquin Court as laid out in the Sherwood Oregon Street Access Management Plan (AMP) prepared by DKS Associates, as a conceptual document, does not account for elevation differences between the properties it serves.

As proposed, the current alignment of Tonquin Court [as demonstrated within the plans for Sherwood Commerce Center (Map 2S 1 23C Tax Lot 600)] does not provide adequate access for Mr. Polley's property. The current shared property line between the Sherwood Commerce Center (SCC) and Polley properties stands at about 185 feet in elevation. Mr. Polley's property gradually declines for the majority of its width from east to west, dropping to  $\pm 140$  feet towards the western edge near the intersection of SW Oregon Street and SW Tonquin Road.

The SCC property experiences much the same transition, sitting at  $\pm 230$  feet in elevation along its eastern edge, remaining fairly level as you traverse the property westerly, and declining sharply  $\pm 250$  feet from the shared property line. As seen within SCC's land use application materials (LU 2021-012), an alignment for Tonquin Court following the common property line has an inordinate amount of grade differences to account for, as SW Oregon Street at the proposed intersection sits at  $\pm 195$  feet in elevation.

In addition to the grade changes, the location of Tonquin Court as shown in the AMP and SCC land use application, eliminates a significant portion of Mr. Polley's developable property. Dedication of Tonquin

Court, SW Oregon Street, and SW Tonquin Road right-of-way, together with grading necessary for those improvements (as shown within LU 2021-012) eliminates approximately 29% of Mr. Polley's property by area and a significant portion of the most developable area on the property: the high, flat vicinity near the eastern property boundary. By comparing both submitted plans, Mr. Polley stands to lose three planned buildings, totaling ±42,250 square feet of building space (out of a planned ±120,815 square feet). This also does not include the grading necessary to access Tonquin Court, which would be approximately 15 to 20 feet higher than the Polley property for much of its length.

### **Tonquin Court Alternative**

The Polley project team has prepared an alternative alignment for Tonquin Court (attached "Tonquin Court Realignment" exhibit) that addresses both the grade challenges and proportionality. The proposed alternative will connect to Ice Age Drive/Blake Road near the southeastern most point of the Vandomelen property (Map 2S 1 28 C TL 700). From there it is proposed to follow existing easements across the northeastern corner of the Sherwood Commerce Center property and that property's eastern property line. Following this alignment, access could be easily provided to properties east of the SCC property (Map 2S 1 28D Tls 600, 601, 602), which would otherwise not have a nearby Local Street connection as currently planned within the TEA Implementation Plan or the Oregon Street AMP.

Future development of the alternative Tonquin Court could allow the restriction or closure of interim Oregon Street accesses to Mr. Polley's property. In order to maintain the developability of the property, Mr. Polley accepts the possibility of restricted access or closure of the interim access as solutions to Oregon Street access issues. Within the attached plan, this access is shown as turn-restricted and emergency access.

As currently configured, the Sherwood Commerce Center project could dedicate a 3/4 right-of-way along these areas and have interim access to SW Oregon Street as currently planned. This area maintains a relatively level grade along its length, leading to SCC's southern "expansion properties" (Map 2S 1 33 Tls 200, 201, 300, 400, 401, and 403) not currently planned for development, and the Woodburn Industrial Capital Group LLC (Kerr) properties to the south (described below). Development of the SCC properties, Kerr properties, or Munger property (Map 2S 1 28D TL 602) could help fund this section of roadway with an appropriate, to-be-determined percentage funded by Mr. Polley's project.

### **Access to Woodburn Industrial Capital Group (Kerr) Properties (Map 2S 1 33 Tls 100 & 400)**

The Tonquin Court Alternative does not significantly differ from the current plan along the Kerr properties. Grading along the SCC expansion/Kerr shared property line is planned to meet both the current and proposed locations of Tonquin Court, as demonstrated by Preliminary Plans included as part of land use application LU 2021-014. These areas will be at a similar elevation to those currently at the southeastern corner of the Polley property and northeastern corner of the Kerr property, ±195 feet, and following the shared property lines to an elevation of approximately 220 feet.

The applications submitted for the site demonstrate that the site can be graded to easily provide access along this route, with interim access via the "unnamed road" south of Mr. Polley's property.

### **Emergency Access**

The alternative Tonquin Court cul-de-sac length may be reduced following future development of sites east of the proposed alternative Tonquin Court. Secondary emergency access will be available through Mr. Polley's property from SW Oregon Street and via the "unnamed road" to the south of the property.



Through-connections via the Sherwood Commerce Center and SCC expansion property could also provide additional access to southern portions of Tonquin Court. These connections to Tonquin Court will allow emergency access to areas where development timing may not allow the immediate construction of portions of Tonquin Court, including existing homes on properties now owned by Sherwood Commerce Center.

#### **Access to Other TEA/Urban Reserve Properties**

The proposed alternative alignment of Tonquin Court expands access to other Tonquin Employment Area (TEA) properties and those within the City's Urban Reserve.

As shown within the DKS AMP, current plans for Tonquin Court end at the furthest extent of the Kerr Property (TL 400) with eventual connection to an East-West Collector. This original alignment did not plan to connect properties east of the SCC property or other properties along and beyond Dahlke Lane/the Bonneville Power Administration corridor and left such connections to future planning decisions. Because Dahlke Lane would require significant dedications and realignment itself, it will not probably serve as a potential Local Street serving to connect properties to Ice Age Drive.

The alternative alignment connects these properties for transportation and utility needs more expediently and efficiently. Connections south could allow Urban Reserve properties to connect to points north or extend to SW Tonquin Road, as shown on the attached plan. The alternative also allows easier expansion to properties within the eastern portion of the TEA the Tri-County Gun Club (Tualatin Valley Sportsmen's Club) properties, should those properties be brought into the Urban Growth Boundary in the future.

#### **Comparison to Current AMP**

While the length of right-of-way has increased from those illustrated within the AMP, grading and other efficiencies from timing with development may lead to significantly easier and less costly construction of the Tonquin Court Alternative. Significantly less grading is required with the alternative proposal than would be required with the original alignment of Tonquin Court. The SCC project could be easily shifted west to accommodate the right-of-way eliminated on the west property line and added to the east property line with minimal changes to the site plan. In our estimate, shifting the SCC site results in a reduction of total building area of less than 1% while maintaining all building widths, drive aisles, loading areas, and much of the parking, while also leaving a buffer for grading and retaining wall construction. Alignment of Ice Age Drive follow the previously prescribed route, meandering east from SW Oregon Street following the BPA corridor and other existing utility corridors, to make future connection to SW 124<sup>th</sup> Avenue. The addition of the alternative Tonquin Court allows easier connection to properties within and south of the Tonquin Employment Area.

#### **Further Coordination/Next Steps**

Mr. Polley is attempting to contact Harsch Investment Properties in order to determine their willingness to meet and discuss the alternative plan. We are confident that we will be able to present a persuasive argument that demonstrates the positive potential of the proposed alignment.

Mr. Polley is also open to working with Woodburn Investment Capital Group/Kerr to determine how the change in alignment can best benefit all adjacent parties, while having little effect on the developability of the Kerr property.

Additional materials will be created as needed to support these efforts.

Please feel free to contact me if you have any questions or comments about the proposal. We look forward to working collaboratively with the City and other property owners to come to a mutually beneficial solution.

Sincerely,

**AKS ENGINEERING & FORESTRY, LLC**

A handwritten signature in blue ink, appearing to read 'John Christiansen', with a long horizontal stroke extending to the right.

John Christiansen, PE - Associate  
12965 SW Herman Road, Suite 100  
Tualatin, OR 97062  
503-563-6151 | [johnc@aks-eng.com](mailto:johnc@aks-eng.com)

Attachment: Tonquin Court Alternative Plan (TEA Implementation Plan)  
Harsch Site (Tonquin Court) Alternative Plan



# SHERWOOD-TONQUIN EMPLOYMENT AREA AND SW TUALATIN IMPLEMENTATION PLAN

Washington County, OR

FIGURE 18

**LEGEND:**

- SHERWOOD-TUALATIN JOINT PLAN AREA BOUNDARY
- CONCEPT PLAN ROAD ALIGNMENTS
- PHASE 1
- PHASE 2
- PHASE 3
- PHASE 4
- CONSTRAINED AREAS REQUIRING FURTHER DISCUSSION AND POLICY GUIDANCE
- PROPOSED REFINED ROAD ALIGNMENTS
- WETLANDS AND 50 FOOT BUFFER
- ANTICIPATED ACCESS
- DEVELOPMENT NODE

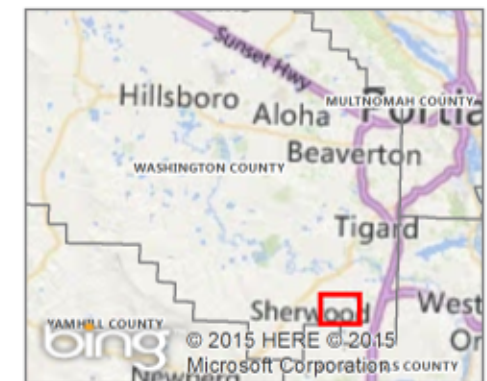


1 inch = 800 feet

SOURCE DATA:  
Metro RUS Lite Base Data,  
Nov 2014

GEOGRAPHIC PROJECTION:  
NAD 83 HARN, Oregon North  
Lambert Conformal Conic

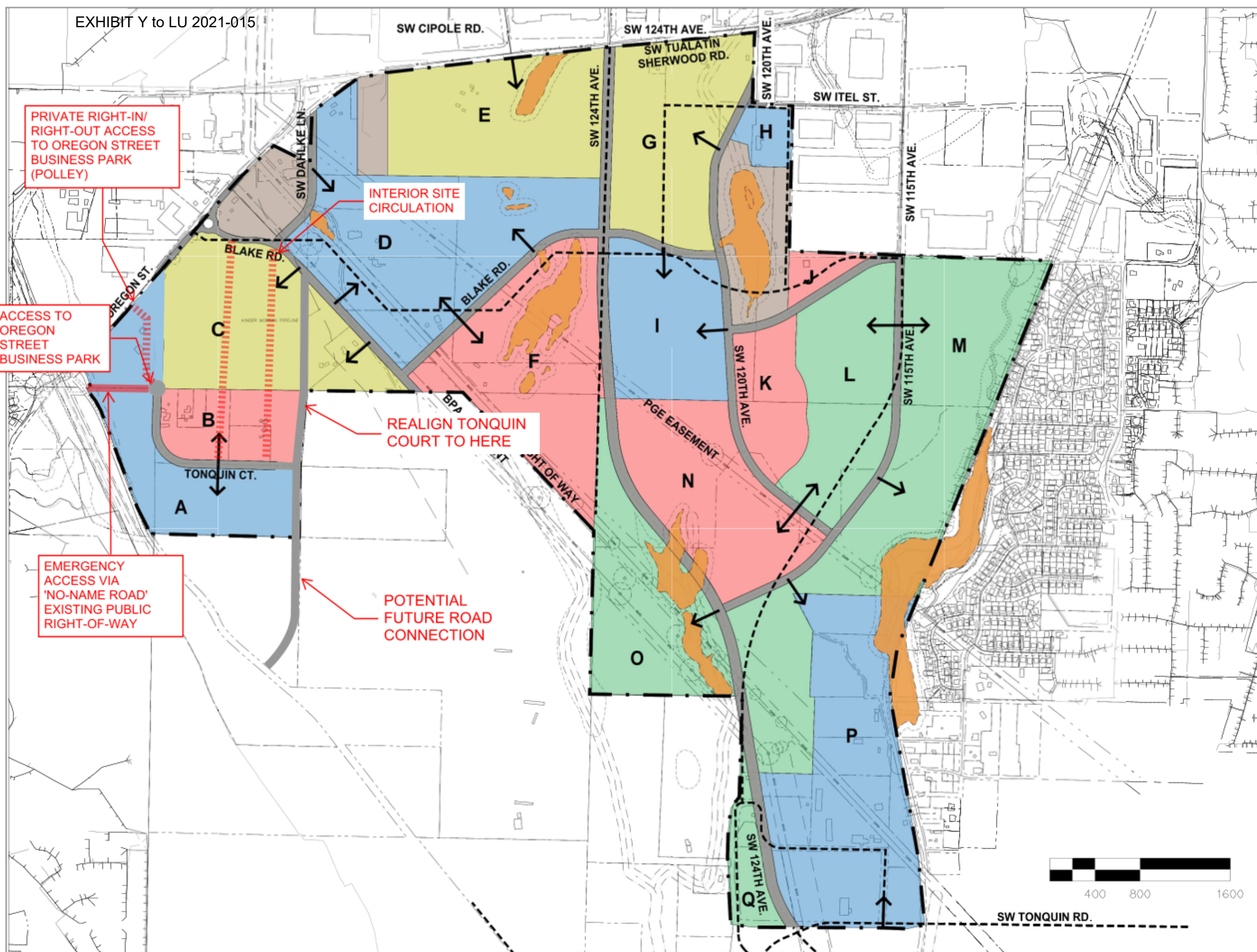
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File: TEA\_SWCP\_implementationPlan Project No: 2130069.04



## MACKENZIE.

P 503.224.9560 • F 503.228.1285 • W MCKENZIE.COM  
RiverEast Center, 1515 SE Water Avenue, #100, Portland, OR 97214

Portland, Oregon • Vancouver, Washington • Seattle, Washington



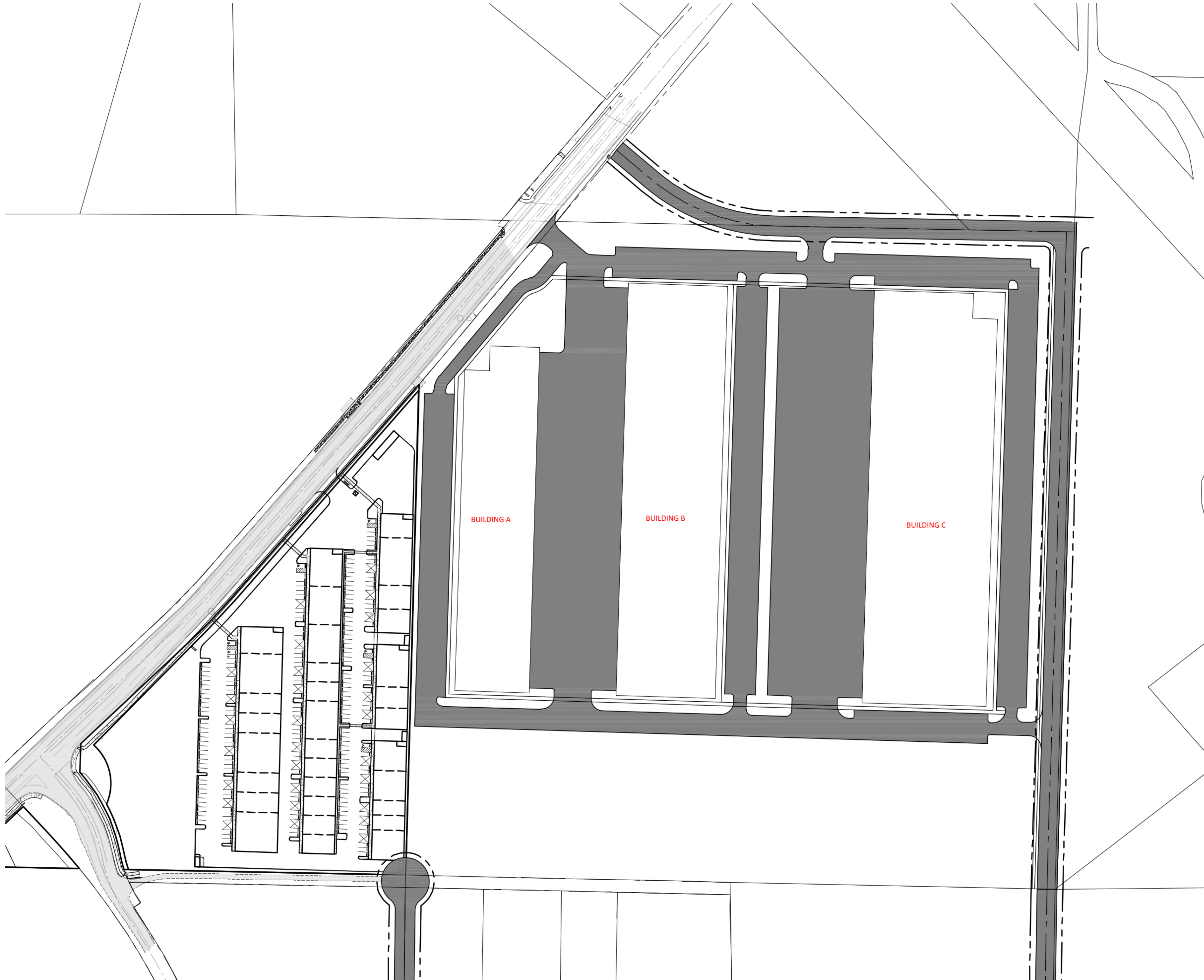
SW TONQUIN RD.





AKS ENGINEERING & FORESTRY, LLC  
12965 SW HERMAN RD., STE. 100  
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503.563.6151  
WWW.AKS-ENG.COM

ENGINEERING - SURVEYING - NATURAL RESOURCES  
FORESTRY - PLANNING - LANDSCAPE ARCHITECTURE



**TONQUIN COURT REALIGNMENT**

**OREGON STREET BUSINESS PARK  
SHERWOOD, OR**



RENEWAL DATE: 12/31/21

JOB NUMBER: 7971

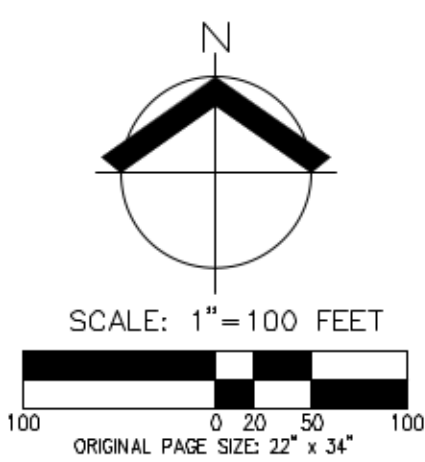
DATE: 08/27/2021

DESIGNED BY: JDS

DRAWN BY: BDL

CHECKED BY: JPC

**EX A**







AKS ENGINEERING & FORESTRY, LLC  
12965 SW HERMAN RD., STE. 100  
TUALATIN, OR 97062  
503.563.6151  
WWW.AKS-ENG.COM

ENGINEERING - SURVEYING - NATURAL RESOURCES  
FORESTRY - PLANNING - LANDSCAPE ARCHITECTURE

**TONQUIN COURT REALIGNMENT**

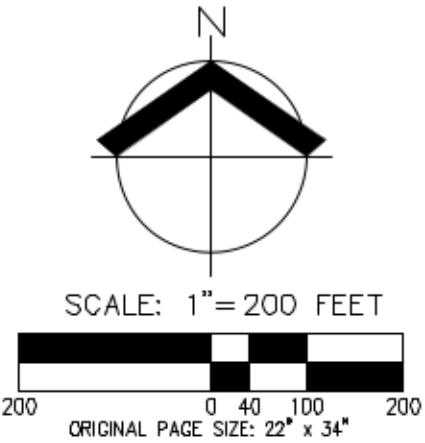
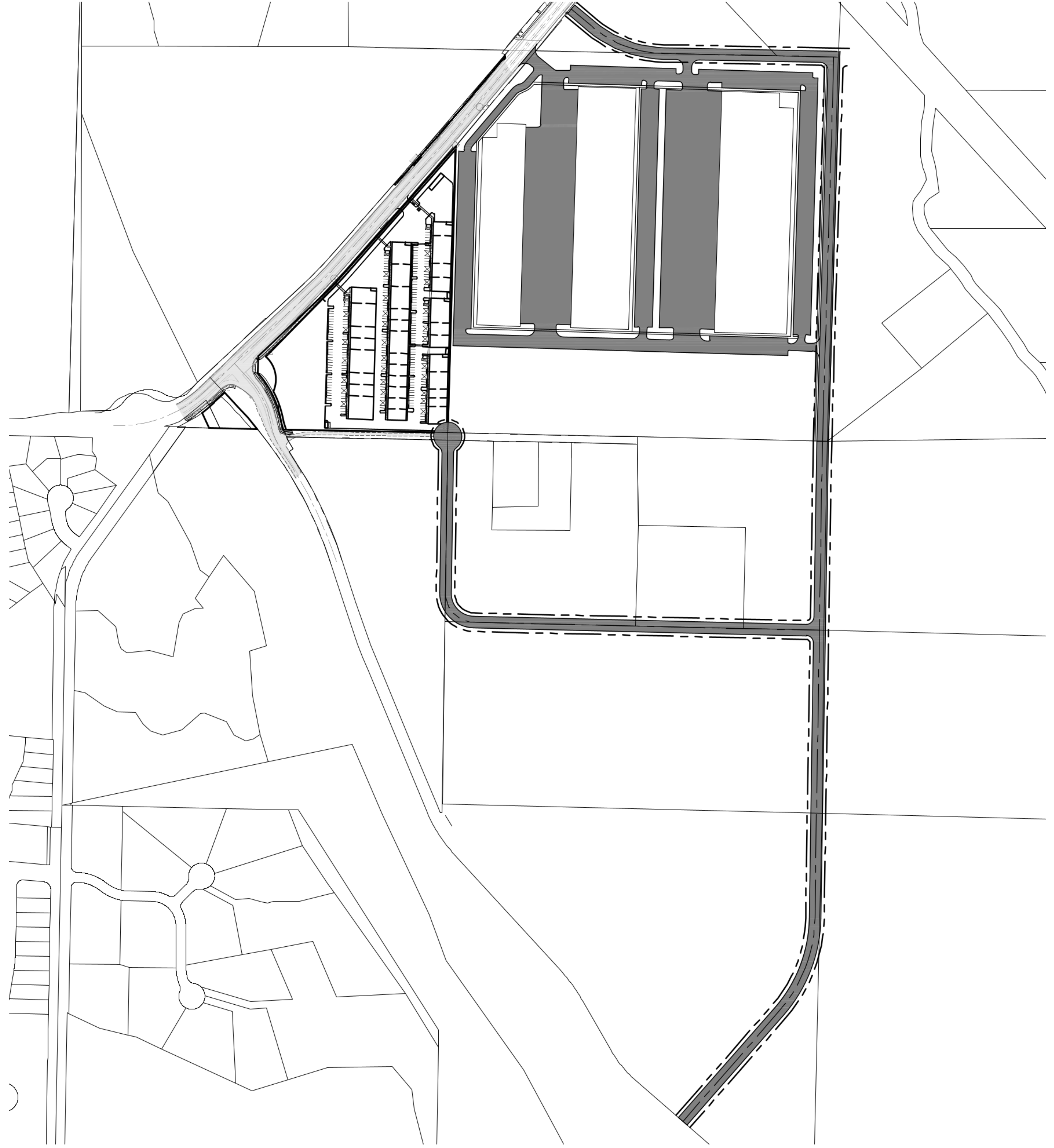
**OREGON STREET BUSINESS PARK  
SHERWOOD, OR**



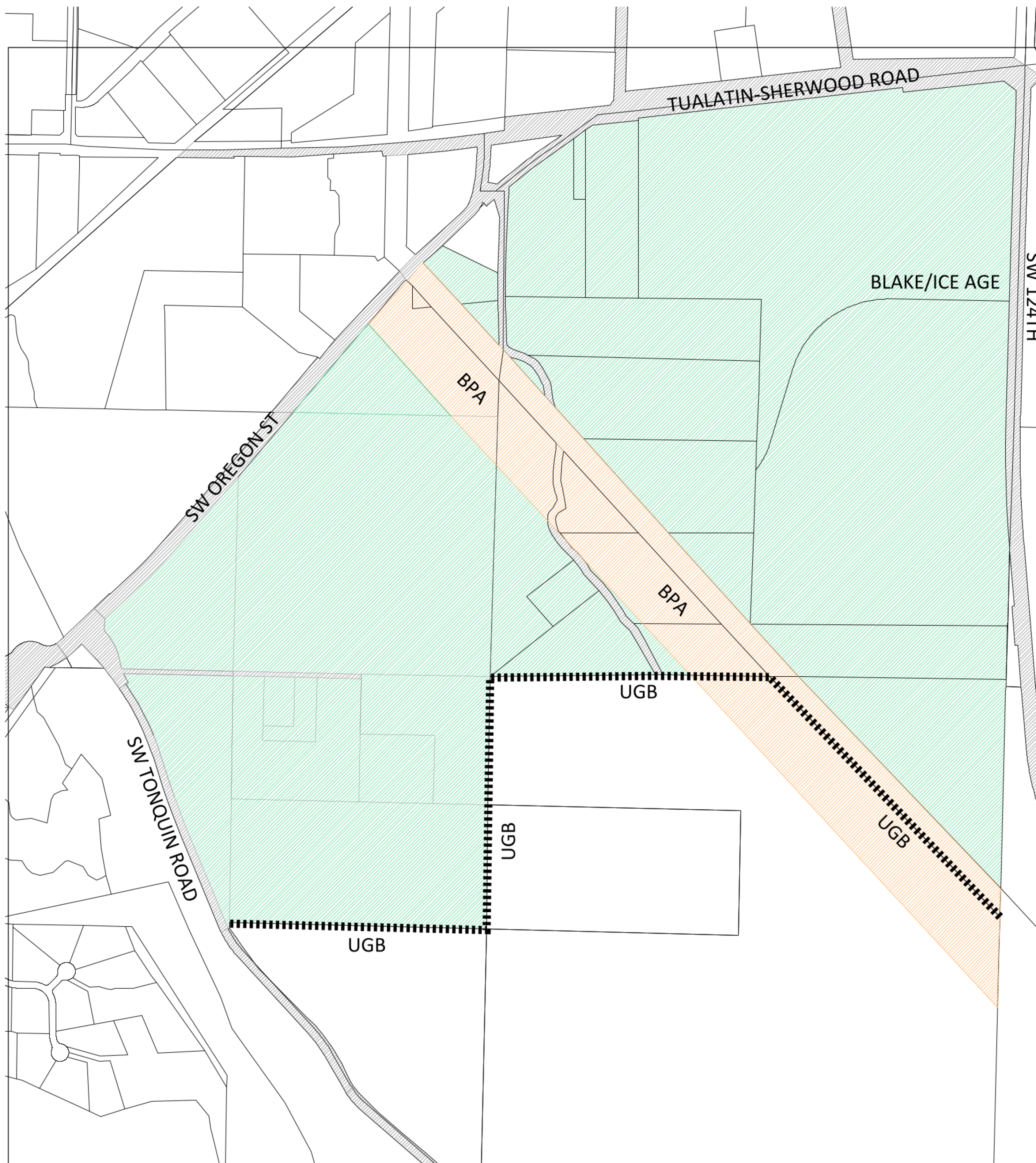
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JOB NUMBER: 7971  
DATE: 08/27/2021  
DESIGNED BY: JDS  
DRAWN BY: BDL  
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**EX B**





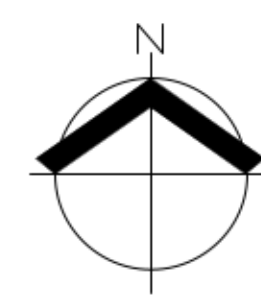
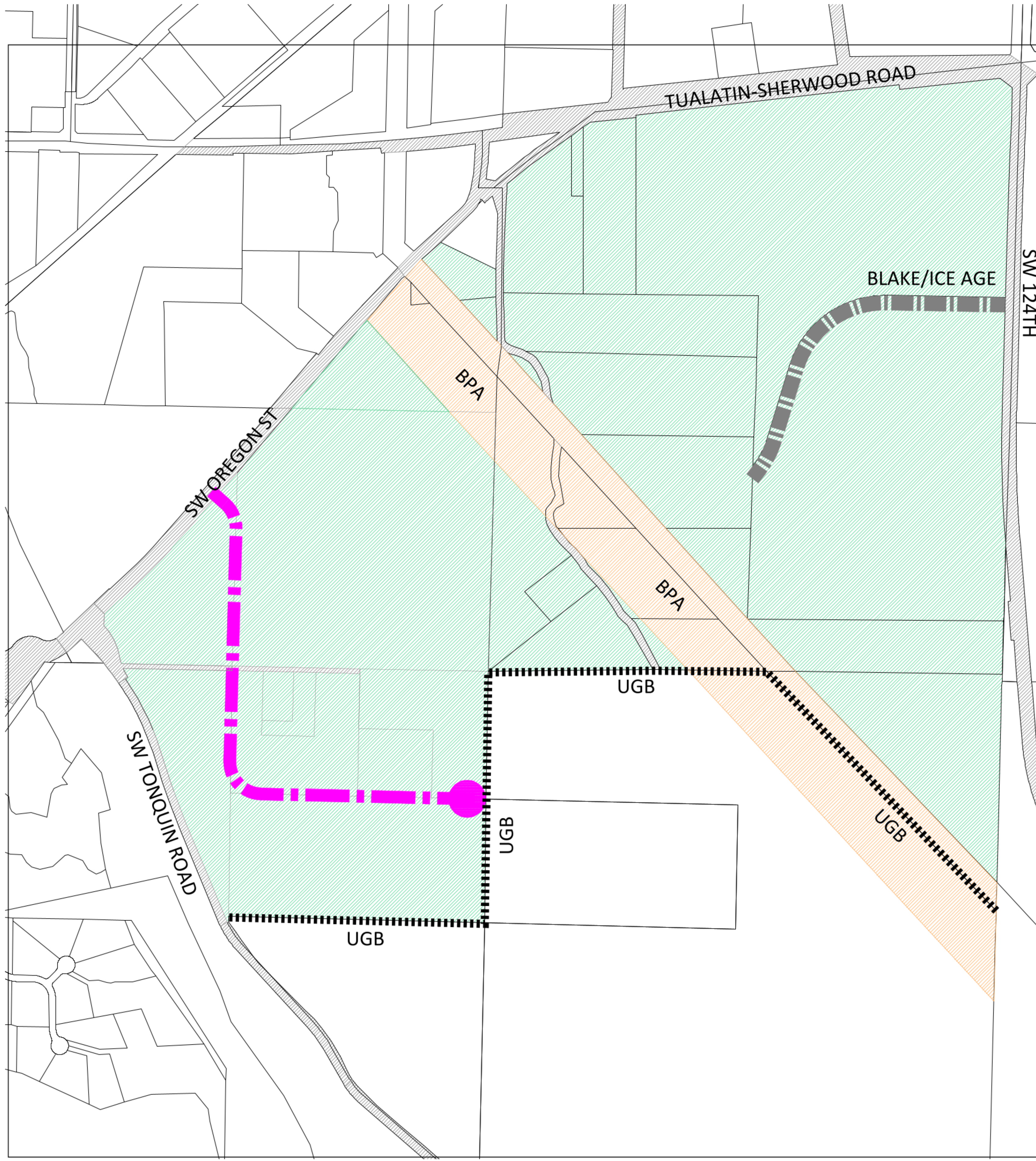


**TONQUIN COURT REALIGNMENT  
 TEA AREA PLAN  
 OREGON STREET BUSINESS PARK  
 SHERWOOD, OR**



RENEWAL DATE:	12/31/23
JOB NUMBER:	7971
DATE:	08/27/2021
DESIGNED BY:	JDS
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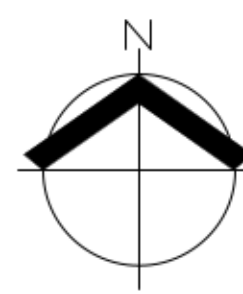
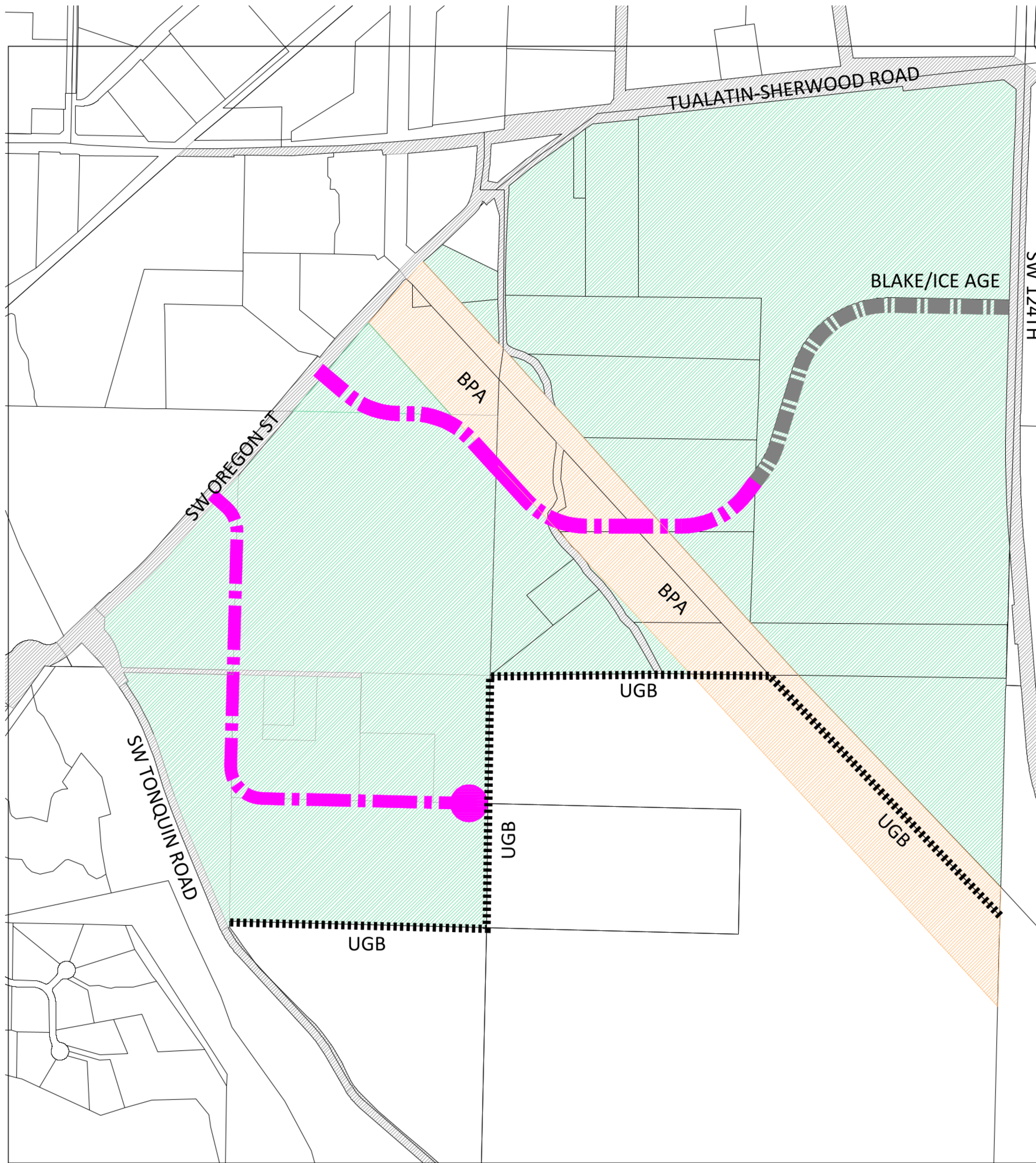


**TONQUIN COURT REALIGNMENT  
 CITY AMP - PHASE 2  
 OREGON STREET BUSINESS PARK  
 SHERWOOD, OR**



RENEWAL DATE:	12/31/23
JOB NUMBER:	7971
DATE:	08/27/2021
DESIGNED BY:	JDS
DRAWN BY:	BOL
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**TONQUIN COURT REALIGNMENT  
 CITY AMP - PHASE 3  
 OREGON STREET BUSINESS PARK  
 SHERWOOD, OR**



RENEWAL DATE: 12/31/23

JOB NUMBER:	7971
DATE:	08/27/2021
DESIGNED BY:	JDS
DRAWN BY:	BDL
CHECKED BY:	JPC

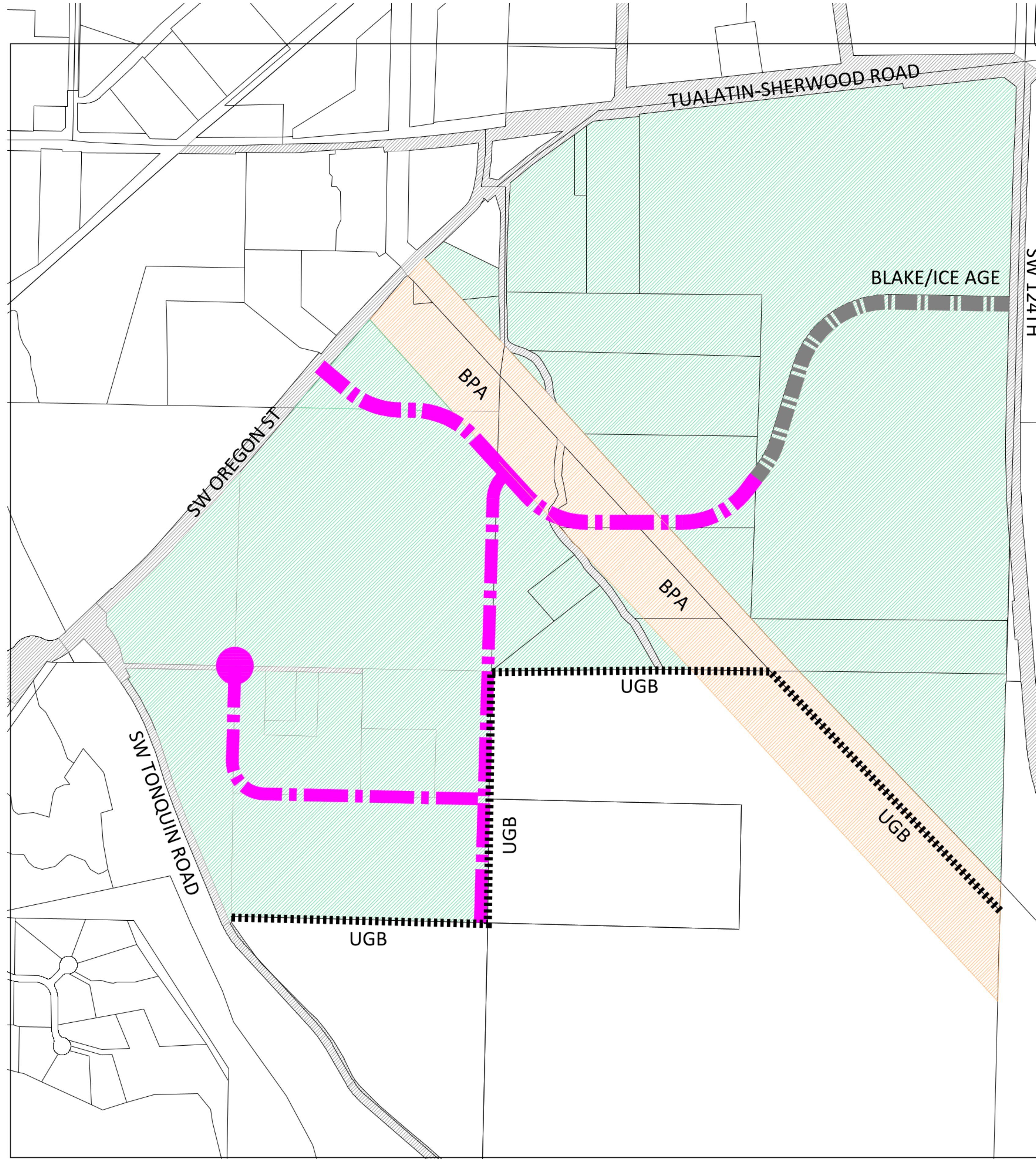
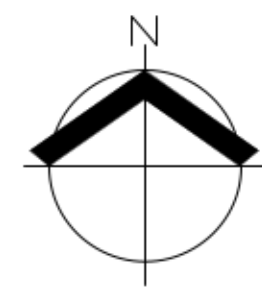


**TONQUIN COURT REALIGNMENT  
 AKS REGIONAL CIRCULATION PLAN - PHASE 3  
 OREGON STREET BUSINESS PARK  
 SHERWOOD, OR**



RENEWAL DATE: 12/31/23

JOB NUMBER: 7971  
 DATE: 08/27/2021  
 DESIGNED BY: JDS  
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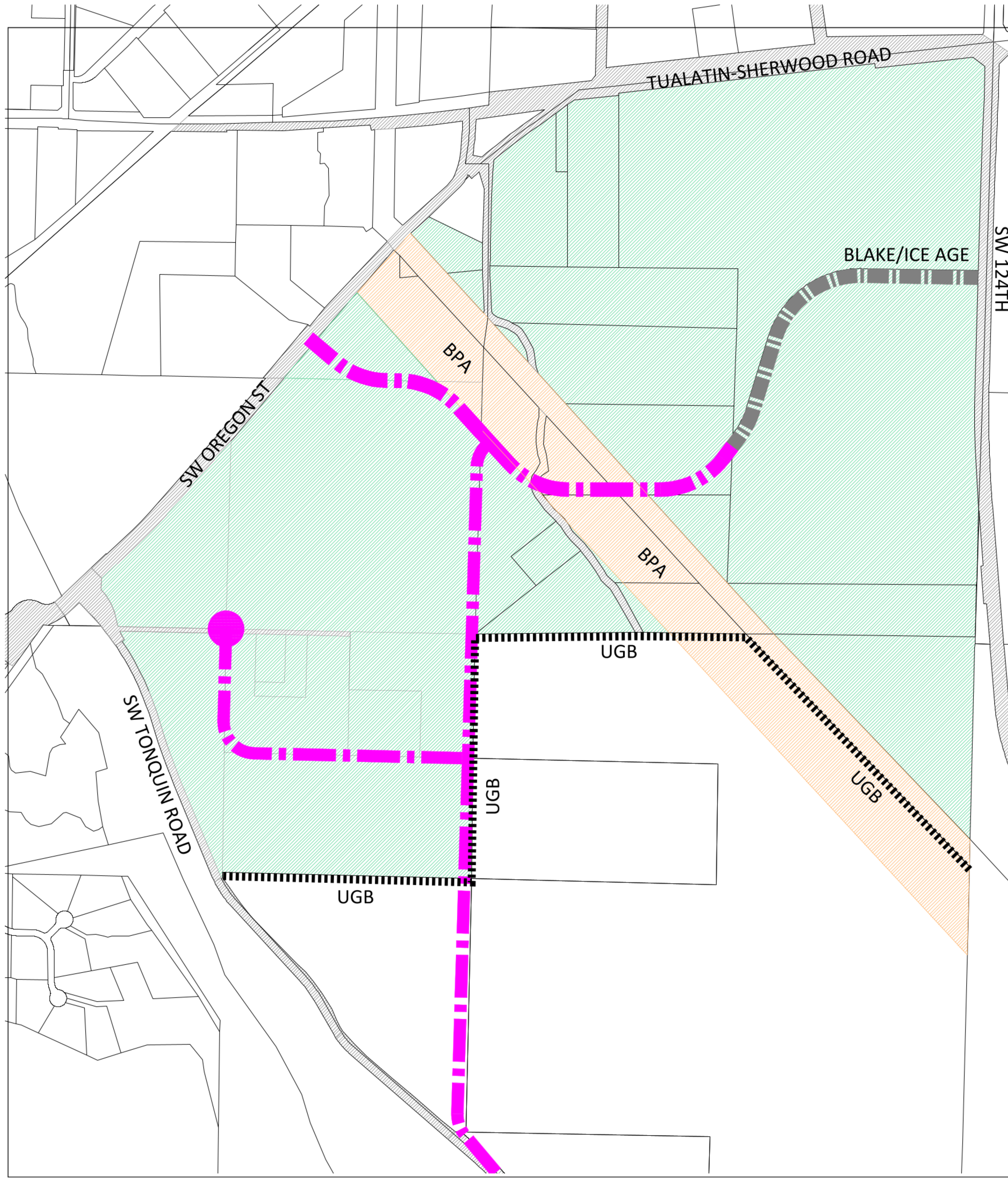
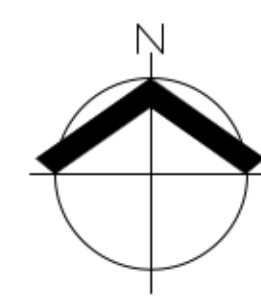


**TONQUIN COURT REALIGNMENT  
 AKS REGIONAL CIRCULATION PLAN - FUTURE  
 OREGON STREET BUSINESS PARK  
 SHERWOOD, OR**



RENEWAL DATE: 12/31/23  
 JOB NUMBER: 7971  
 DATE: 08/27/2021  
 DESIGNED BY: JDS  
 DRAWN BY: BDL  
 CHECKED BY: JPC

**EX 5**





Tonquin Court				Harsch Site			
Polley Site				Harsch Site			
	Area - Square Feet	Area - Acres	% Total Site Area		Area - Square Feet	Area - Acres	% Total Site Area
<b>Polley Site Area*</b>	388,907 Sq. Ft.	8.93 Acres	100	<b>Harsch Site Area</b>	1,687,572 Sq. Ft.	38.74 Acres	100
<b>Tonquin Court Dedication</b>				<b>Tonquin Court Dedication</b>			
<b>Harsch Site Plan - 12/3/2021</b>				<b>Harsch Site Plan - 12/3/2021</b>			
Tonquin Court ROW	37,736 Sq. Ft.	0.87 Acres	9.70%	Tonquin Court ROW	29,732 Sq. Ft.	0.68 Acres	1.76%
Tonquin Court Grading & ROW <sup>^</sup>	51,579 Sq. Ft.	1.18 Acres	13.26%	Tonquin Court Grading & ROW	37,170 Sq. Ft.	0.85 Acres	2.20%
<b>Harsch Site Plan - 8/10/2021</b>				<b>Harsch Site Plan - 8/10/2021</b>			
Tonquin Court ROW	37,736 Sq. Ft.	0.87 Acres	9.70%	Tonquin Court ROW	29,732 Sq. Ft.	0.68 Acres	1.76%
Tonquin Court Grading & ROW	77,965 Sq. Ft.	1.79 Acres	20.05%				
Tonquin Court Grading & ROW**	98,418 Sq. Ft.	2.26 Acres	25.31%				
<b>SW Oregon Street Dedication</b>	10,461 Sq. Ft.	0.24 Acres	2.69%	<b>SW Oregon Street Dedication<sup>◆</sup></b>	0 Sq. Ft.	0.00 Acres	0.00%
<b>SW Tonquin Road Dedication</b>	5,725 Sq. Ft.	0.13 Acres	1.47%	<b>Ice Age Drive Dedication</b>	45,243 Sq. Ft.	1.04 Acres	2.68%
				Ice Age Drive ROW			
<b>Total ROW Dedication Area</b>	67,765 Sq. Ft.	1.56 Acres	17.42%	<b>Total ROW Dedication Area</b>	82,413 Sq. Ft.	1.89 Acres	4.88%
<b>Tonquin Court ROW Dedication Area</b>	51,579 Sq. Ft.	1.18 Acres	13.26%	<b>Tonquin Court ROW Dedication Area</b>	37,170 Sq. Ft.	0.85 Acres	2.20%

City staff has proposed relocating the Tonquin Court ROW ten feet further to the east, pending denial of the Polley project. This may affect the future dedication and grading needs for a portion of the right-of-way.

Figures are approximate

\*Does not include portion west of SW Tonquin Road

\*\*Assumed extension of grading shown

<sup>^</sup>Includes remnant parcel NE of Tonquin Court (±5,043 SF)

<sup>◆</sup> No dedication proposed

Tonquin Court Alternative				Harsch Site			
Polley Site				Harsch Site			
	Area - Square Feet	Area - Acres	% Total Site Area		Area - Square Feet	Area - Acres	% Total Site Area
<b>Polley Site Area*</b>	388,907 Sq. Ft.	8.93 Acres	100	<b>Harsch Site Area</b>	1,687,572 Sq. Ft.	38.74 Acres	100
<b>SW Oregon Street Dedication</b>	10,461 Sq. Ft.	0.24 Acres	2.69%	<b>SW Oregon Street Dedication</b> ♦	0 Sq. Ft.	0.00 Acres	0.00%
<b>SW Tonquin Road Dedication</b>	5,725 Sq. Ft.	0.13 Acres	1.47%	<b>Ice Age Drive Dedication</b>			
				Ice Age Drive ROW <sup>^</sup>	45,243 Sq. Ft.	1.04 Acres	2.68%
<b>East Ice Age Connection</b> ♦	0 Sq. Ft.	0.00 Acres	0.00%	<b>East Ice Age Connection</b>	37,664 Sq. Ft.	0.86 Acres	2.23%
<b>Tonquin Court Dedication</b>				<b>Tonquin Court Dedication</b>			
Proposed Cul-de-sac Est.	3,000 Sq. Ft.	0.07 Acres	0.77%	Proposed Cul-de-sac Est.	3,000 Sq. Ft.	0.07 Acres	0.18%
				Alternative Dedication	38,173 Sq. Ft.	0.88 Acres	2.26%
<b>Total ROW Dedication Area</b>	19,186 Sq. Ft.	0.44 Acres	4.93%	<b>Total ROW Dedication Area</b>	124,080 Sq. Ft.	2.85 Acres	7.35%
<b>Alternative ROW Dedication Area</b>	3,000 Sq. Ft.	0.07 Acres	0.77%	<b>Alternative ROW Dedication Area</b>	41,173 Sq. Ft.	0.95 Acres	2.44%

Moving Tonquin Court east of the Harsch site allows for proportional impacts to both Harsch and Polley and a commonsense approach to providing the Tonquin Employment Area with access to surrounding Collector and Arterial Streets.

Figures are approximate

\*Does not include portion west of SW Tonquin Road

\*\*Assumed extension of grading shown

<sup>^</sup>Does not include easement area north of Ice Age Drive

♦ No dedication proposed





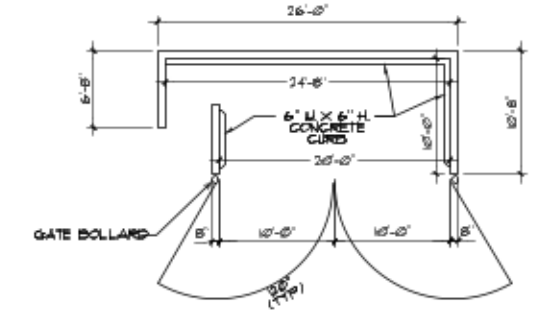
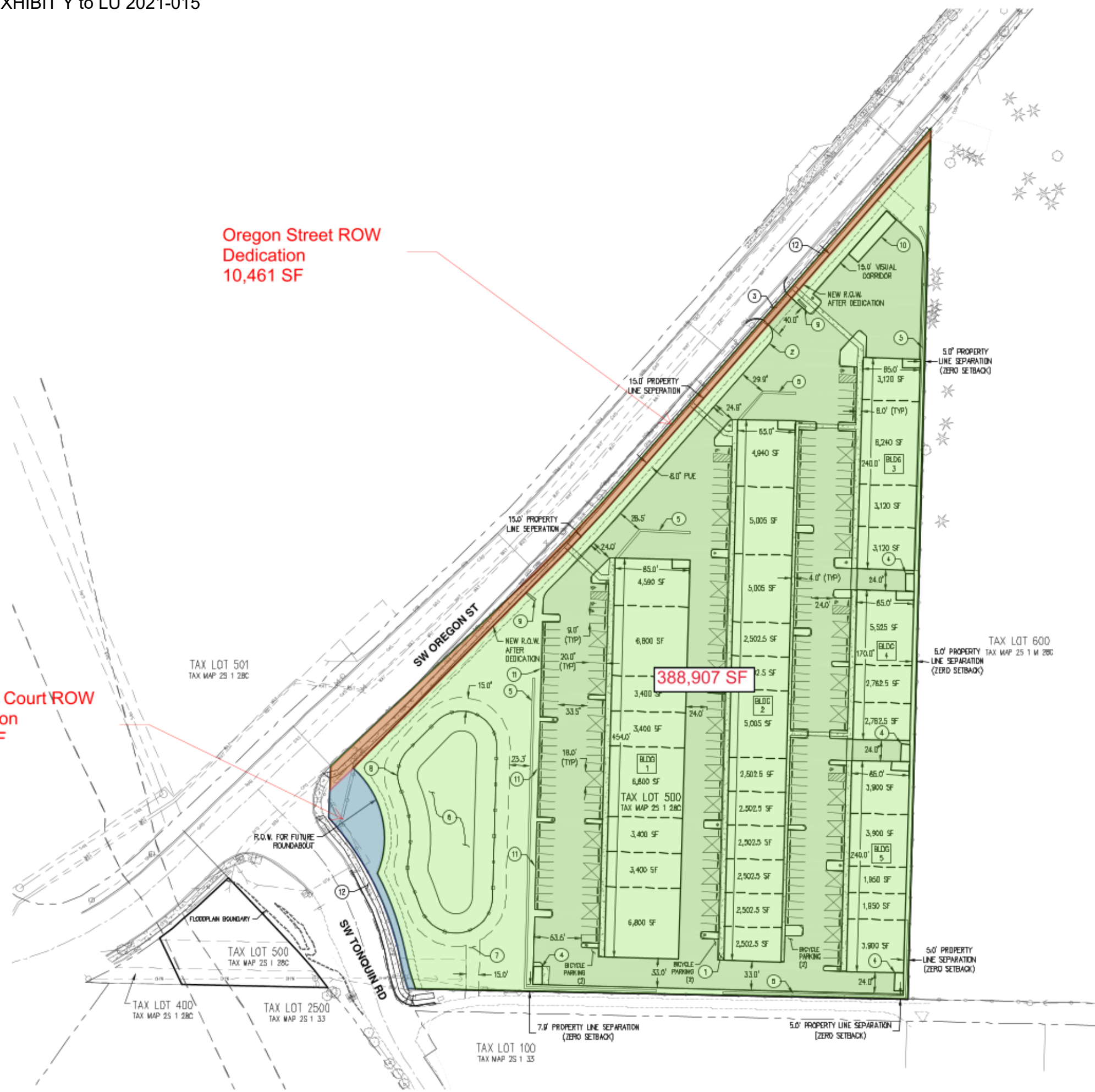




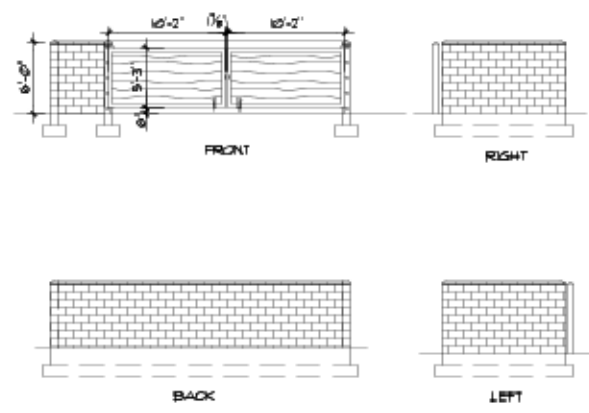


Oregon Street ROW  
 Dedication  
 10,461 SF

Tonquin Court ROW  
 Dedication  
 5,725 SF



1 TYPICAL TRASH ENCLOSURE PLAN VIEW  
 NOT TO SCALE DETAILS PER TILAND SCHMIDT



2 TYPICAL TRASH ENCLOSURE ELEVATIONS  
 NOT TO SCALE DETAILS PER TILAND SCHMIDT

4 KEYED NOTES

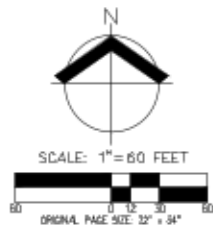
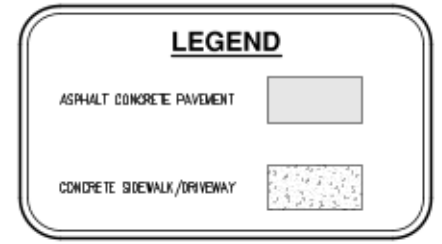
1. NEW PORTLAND CEMENT CONCRETE (PCC) SIDEWALK (TYP).
2. NEW STANDARD CURB (TYP).
3. NEW 40' COMMERCIAL DRIVEWAY.
4. NEW TRASH ENCLOSURE.
5. NEW RETAINING WALL.
6. NEW STORMWATER FACILITY.
7. NEW ASPHALT ACCESS ROAD.
8. NEW FENCE.
9. NEW ENTRY MONUMENT.
10. NEW LOADING RAMP.
11. NEW LIGHT POLE.
12. PUBLIC IMPROVEMENTS SEE SHEET P06.

BUILDING AREAS:

- BUILDING 1: 36,590 SF
- BUILDING 2: 39,975 SF
- BUILDING 3: 15,800 SF
- BUILDING 4: 11,050 SF
- BUILDING 5: 15,600 SF
- TOTAL: 120,815 SF

PARKING SPACES:

- STANDARD: 181
- ADA: 8 (1 VAN ACCESSIBLE)
- VANPOOL: 1
- TOTAL: 188 SPACES



**PRELIMINARY SITE PLAN**  
**OREGON STREET BUSINESS PARK**  
**SHERWOOD, OR**



RENEWAL DATE: 12/31/21  
 JOB NUMBER: 7871  
 DATE: 08/27/2021  
 DESIGNED BY: JDS  
 DRAWN BY: BDL  
 CHECKED BY: JPC







January 25, 2022

Jean Simson, City of Sherwood Planning Commission Chairperson  
c/o: Erika Palmer – Planning Manager  
City of Sherwood  
22560 SW Pine Street  
Sherwood, OR 97140

RE: LU 2012-015 Oregon Street Business Park and LU 2012-012 Sherwood Commerce Center

Dear Chair Simson and Planning Commissioners:

I am an owner of a construction company that has operated in Washington County for over 29 years and support the Oregon Street Business Park project.

The City is requiring the construction of a street (Tonquin Court) that will severely disrupt traffic using Oregon Street. Requiring the Oregon Street Business Park to construct Tonquin Court that will result in adding a signal will severely disrupt traffic on a busy street with a lot of truck traffic. Trucks currently use an acceleration lane to climb out of the Oregon Street/Tonquin Road intersection because of Oregon Street's steep grade and adding a signal will frustrate both truck drivers and the general public. It takes a long time for a loaded truck to get going on a steep grade.

The Oregon Street Business Park street plan option does not require this public street intersection and signal and is therefore the better option.

Please approve the Oregon Street Business Park without requiring Tonquin Court along the east side of their property.

Sincerely,



Phillip Rissel  
Flying H Construction, Inc  
PO Box 2533  
Wilsonville, OR 97070



**From:** [Colleen Resch](#)  
**To:** [Eric Rutledge](#)  
**Subject:** Fwd: LU 2012-015 & LU 2012-012 - eliminate Tonquin Ct. & Signal on slope  
**Date:** Wednesday, January 26, 2022 9:17:12 AM

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FYI.

Get [Outlook for iOS](#)

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**From:** Colleen Resch <ReschC@SherwoodOregon.gov>  
**Sent:** Wednesday, January 26, 2022 7:36:08 AM  
**To:** Erika Palmer <PalmerE@SherwoodOregon.gov>  
**Subject:** Fwd: LU 2012-015 & LU 2012-012 - eliminate Tonquin Ct. & Signal on slope

I am forwarding you Matt Langers request to have his communication forwarded to the Planning Commission.

Get [Outlook for iOS](#)

---

**From:** Colleen Resch <ReschC@SherwoodOregon.gov>  
**Sent:** Wednesday, January 26, 2022 7:34:40 AM  
**To:** Matt Langer <matt.langer04@gmail.com>  
**Cc:** Erika Palmer <PalmerE@SherwoodOregon.gov>; Doug Scott <ScottD@SherwoodOregon.gov>  
**Subject:** Re: LU 2012-015 & LU 2012-012 - eliminate Tonquin Ct. & Signal on slope

Yes. I will forward to Erika Palmer for distribution. Thank you.

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**From:** Matt Langer <matt.langer04@gmail.com>  
**Sent:** Wednesday, January 26, 2022 6:48:23 AM  
**To:** Colleen Resch <ReschC@SherwoodOregon.gov>  
**Cc:** Erika Palmer <PalmerE@SherwoodOregon.gov>; Colleen Resch <ReschC@SherwoodOregon.gov>; Doug Scott <ScottD@SherwoodOregon.gov>  
**Subject:** Re: LU 2012-015 & LU 2012-012 - eliminate Tonquin Ct. & Signal on slope

**CAUTION:** This email originated from outside of the organization. Do not click links or open attachments unless you are expecting this email and/or know the content is safe.

Colleen-

Can you please share the following testimony/observations from the planning commission meeting last night with the Planning Commission?

Something just doesn't feel right here where we've got a big, out-of-Sherwood developer buying property in Sherwood next to a small family parcel then the City starts talking about Condemning the family property if the smaller family project doesn't comply. This sure doesn't feel like the Sherwood I know and I hope our Planning Commission can find a solution here that is best for all of Sherwood rather than just one large development.



**1) Proportionality** - Tonquin Court is no where near proportional impact to Polley and Schnitzer. The Polley impact is nearly 50% of his building square footage while the impact to Schnitzer is less than 5%.

**2) Cul-De-Sac Length** - The original Tonquin Court is a cul-de-sac that dead-ends up against the UGB and Gun Club and it's well over the Maximum Length permitted for cul-de-sac's so to say the newly suggested solution for a cul-de-sac is too long simply does not make any sense. In both cases the cul-de-sac is longer than the maximum.

**3) Gun Club & UGB Expansion** - To think the intersection at Tonquin Court won't need a signal or will be somewhat temporary doesn't make any sense since the cul-de-sac dead-ends up against the UGB which happens to be the Tri-County Gun Club.

Regardless of how we got here something just doesn't seem right and having an intersection with or without a signal on a slope just doesn't make any sense. Please find a feasible solution that is a win-win for all Polley, Schnitzer, Kerr, Sherwood and all the other impacted properties as the current solution only seems to benefit one or two property owners while **negatively impacting other neighbors and all of Sherwood** who now have two signals on Oregon Street which simply is a big fail and does not represent Sherwood well.

We need a real solution here for Sherwood.

Thanks for all your volunteer time.

Matt Langer  
Langer's since 1879  
21650 SW Langer Farms Parkway  
Sherwood, OR 97140  
503-956-9220

On Mon, Jan 24, 2022 at 8:30 AM Matt Langer <[matt.langer04@gmail.com](mailto:matt.langer04@gmail.com)> wrote:

Colleen-

Please accept the attached as written testimony for entry into the record for **both projects LU 2012-015 and LU 2012-012** as I see their respective hearings are scheduled for tomorrow at the 6:00pm Planning Commission meeting.

Additionally, can you please put me on the list for both projects to provide **oral testimony** during the hearing tomorrow night? Please accept this as my request to testify and receive the 'dial-in instructions' for each Land Use hearing above.

Matt Langer



Langer's since 1879  
21650 SW Langer Farms Parkway  
Sherwood, OR 97140  
503-956-9220





February 1, 2022

Jean Simson, City of Sherwood Planning Commission Chairperson  
c/o: Erika Palmer – Planning Manager  
City of Sherwood  
22560 SW Pine Street  
Sherwood, OR 97140

**RE: LU 2021-012 SP/CUP/VAR Sherwood Commerce Center and LU 2021-015 SP Oregon Street  
Business Park Land Use Application Memorandum**

Dear Chair Simson and Planning Commissioners:

This letter and its attachments are intended as testimony and supplement to land use applications LU 2012-012 and LU 2021-015.

Following the first evidentiary hearing for LU 2021-012 and LU 2021-015 on January 25, 2022, Bruce Polley, AKS Engineering & Forestry, LLC, and Chris Koback of Hathaway Larson have attempted to reach an amicable solution with Schnitzer Properties, John Niemeyer, Kirk Olsen, and Tim Kerr regarding alternatives to Tonquin Court and future access to the properties. While we are currently in talks with Mr. Kerr and the Sherwood Commerce Center team on these issues, all parties are working towards a solution that allows both applications to move forward. We request that the Planning Commission revise the conditions of approval for the Sherwood Commerce Center to reflect the changes needed to relocate the Tonquin Court right-of-way and provide a logical solution to the issues raised at the public hearing.

The attached information demonstrates the technical feasibility of the proposed solution, updates the Traffic Impact Analyses for both the Oregon Street Business Park and the Sherwood Commerce Center project, updates the Oregon Street Access Management Plan, and proposes amended Conditions of Approval for LU 2021-012 based upon this information.

### **Updated TIA/AMP Memo**

Lancaster Mobley, traffic consultant for Mr. Polley, has prepared a memorandum (attached) addressing the transportation analyses for the Oregon Street Business Park and Sherwood Commerce Center, as well as updating the relevant information contained within the Oregon Street Access Management Plan to reflect the alternative to Tonquin Court discussed at the January 25, 2022 public hearing for the land use applications listed above.

The updates allow consideration of the proposed alternative street alignment by both the City and Washington County.

### **Proposed Condition of Approval**

The attached proposed Conditions of Approval for LU 2021-012 center around the following language to accomplish the goals of providing a reasonable alternative to Tonquin Court:

*Prior to the Final Site Plan Approval, the applicant shall revise the plans to remove the Tonquin Court right-of-way dedication and include a 40' right-of-way dedication along the eastern boundary of the subject site.*



This proposed solution meets all of the regional transportation goals of the TEA Implementation Plan and the overall connectivity goals of the Oregon Street Access Management Plan by providing connection to Ice Age Drive and SW 124<sup>th</sup> Avenue. Tonquin Court, as shown within the Oregon Street AMP, does not address these issues and creates additional complications both for adjacent property owners and those travelling on Oregon Street. The alternative solution also solves significant engineering challenges not considered by the Oregon Street AMP.

### **Conclusion**

We believe that we have provided a viable, reasonable alternative to the Oregon Street AMP, which is more equitable to all properties in the Tonquin Employment Area, but also improves overall regional circulation. Please revise the conditions of approval for LU 2021-012 as proposed, eliminating Tonquin Court and relocating the right-of-way to the eastern boundary of the Sherwood Commerce Center project site.

Sincerely,

**AKS ENGINEERING & FORESTRY, LLC**



Mimi Doukas, AICP, RLA - Principal  
12965 SW Herman Road, Suite 100  
Tualatin, OR 97062  
503-563-6151 | MimiD@aks-eng.com

Attachments:   Hathaway Larson Letter  
                  Proposed LU 2021-012 Conditions of Approval  
                  Updated Site Plan/Street Alignment Exhibits  
                  Lancaster Mobley Technical Memorandum "Tonquin Court Alignment Transportation  
                  Update [...]"



HATHAWAY LARSON

Koback · Connors · Heth

February 1, 2022

Planning Commission Members  
City of Sherwood

Re: LU 2021-012 SP/CUP/VAR Sherwood Commerce Center and LU 2021-015 SP Oregon  
Street Business Park

Dear Planning Commission Members:

This firm represents Bruce and Karen Polley, the applicants for LU 2021-015 SP Oregon Street Business Park, and neighbors to the LU 2021-012 SP/CUP/VAR Sherwood Commerce Center project site. We are writing to provide additional written testimony in these matters and address the staff's recommendation that the application in this matter be denied.

The issue that received the most attention at the January 25, 2022 hearing on both the Polley application and the Sherwood Commerce Center ("SCC") application was the location of a future local street referred to on a concept plan as Tonquin Court. As was pointed out, while extremely valuable in future planning, a concept plan is just that. It illustrates a concept for what may happen. What actually happens depends on many factors, some of which cannot be anticipated when a concept plan is adopted. Mr. Polley made it clear that he feels it is unfair to construct Tonquin Court such that half of it is on his parcel. His engineers illustrated that even without the grading required the three buildings Mr. Polley proposes to build on the most developable part of his property will be eliminated. That is a loss of 42,250 square feet of rentable space, or 30% of his development potential. Mr. Polley and others explained that even if Tonquin Court were constructed, because the ultimate access to Ice Age Drive and SW 124<sup>th</sup> Avenue is going to take years if the city ever gets the property to develop that street network, there will be a stop light at a very poor location. Mr. Polley and his development team created an alternative that places Tonquin Court on the east side of Tax Lot 600 and presented a future street plan to show how the ultimate access plan can be achieved.

Following the hearing, the stakeholders, Mr. Polley, SCC, and Mr. Kerr renewed discussions on a possible path to allow both applications to be approved based on a revised location for the local street referred to in the TEA implantation plan as Tonquin Court. Those discussions have been productive and, based on them, Mr. Polley is presenting a proposed condition of approval for the SCC application that he feels embodies the outcome of the parties' discussions. If SCC ultimately

**Christopher P. Koback**  
1331 NW Lovejoy Street, Suite 950  
Portland, OR 97209  
[chris@hathawaylarson.com](mailto:chris@hathawaylarson.com)  
(503) 303-3107 direct  
(503) 303-3101 main



February 1, 2022  
Page 2

agrees to the condition, its application can be approved finally this month and there should not be any unreasonable delay in its development plans. The condition allows staff to revisit the Polley application and recommend approval with conditions. In sum, it can produce a win for both applicants, Mr. Kerr, and the City.

#### Proposed Condition of Approval

Should the Planning Commission find that the SCC application can meet the code requirements of the Sherwood Zoning and Community Development Code with the relocation of the local street access, we propose the addition of a condition of approval for the SCC which would move the proposed Tonquin Court to the eastern property boundary, provide greater access to the Tonquin Employment Area, support appropriate future connections to Ice Age Drive/SW 124<sup>th</sup> Avenue, and eliminate unneeded traffic signals. The following language, minus some other global changes to the Conditions of Approval which refer to Tonquin Court, will appropriately accomplish these goals:

*Prior to the Final Site Plan Approval, the applicant shall revise the plans to remove the Tonquin Court right-of-way dedication and include a 48' right-of-way dedication along the eastern boundary of the subject site.*

This solution provides an equitable access to all involved property owners as well as meeting all of the regional transportation goals of the TEA Implementation Plan and the overall connectivity goals of the Oregon Street Access Management Plan by providing connection to Ice Age Drive and SW 124<sup>th</sup> Avenue. Tonquin Court, as shown within the Oregon Street AMP, does not address these issues. The alternative solution also solves significant engineering challenges not considered by the Oregon Street AMP, the result of which includes a reduction in the estimated overall construction costs of this roadway and the possible addition of building area back to the SCC project that was previously lost.

Very truly yours,

HATHAWAY LARSON LLP

*s/ Christopher P. Koback*

Christopher P. Koback

CPK/ep

**A. General Conditions**

1. Compliance with the Conditions of Approval is the responsibility of the developer or its successor in interest.
2. The development shall substantially comply with the submitted preliminary plans and narrative except as indicated in the conditions of the Notice of Decision. Additional development or change of use may require a new development application and approval.
3. This approval is valid for a period of two (2) years from the date of the Notice of Decision. Extensions may be granted by the City as afforded by the Sherwood Zoning and Community Development Code.
4. The continual operation of the property shall comply with the applicable requirements of the Sherwood Zoning and Community Development Code and Municipal Code.
5. This approval does not negate the need to obtain permits, as appropriate from other local, state or federal agencies even if not specifically required by this decision.
6. All new utilities to be installed for the development of the subject property shall be underground.
7. Retaining walls within public easements or the public right-of-way shall require engineering approval.
8. Any departure from approved plans not authorized by the Hearing Authority shall be cause for revocation of applicable building and occupancy permits.
9. The site shall conform to all local building and fire code regulations, in addition to any applicable state and federal regulations, for hazardous materials storage on the site.
10. The applicant shall comply with conditions described in the CWS Memorandum dated December 27, 2021, the CWS Service Provider Letter in the applicant's submittal and all applicable CWS Design and Construction Standards (R&O 19- 5).

**B. Prior to Final Site Plan Approval**

1. Prior to Final Site Plan Approval, provide the final height of each building using the Building Height definition in SZCDC § 16.10. The final height shall be less than 50 ft.
2. Prior to Final Site Plan Approval, show the required clear vision areas required by SZCDC § 16.58.010.
3. Prior to Final Site Plan Approval and Approval of the Engineering Public Improvement Plans, the applicant shall obtain written approval from Kinder Morgan for the final alignment of SW Ice Age Dr. and any on-site improvements within the easement.
4. Prior to Final Site Plan Approval and Approval of the Engineering Public Improvement Plans, the applicant shall obtain BPA approval for the final alignment of SW Ice Age Dr. and any on-site improvements within the easement.
5. Prior to Final Site Plan Approval, provide the percentage of window glazing for all portions of the development subject to the industrial design standards in SZCDC § 16.90.020(D)(7).
6. Prior to Final Site Plan approval, provide Canopy Factor calculations for the parking lot trees.
7. Prior to Final Site Plan Approval, the landscape plans show the proposed form of irrigation as required by SZCDC § 16.92.040(C).
8. Prior to Final Site Plan Approval, revise the plans to show preferential carpool and vanpool spaces for each tenant space with forty or more employees. If no single tenant space is anticipated to carry more than 40 employees, no carpool spaces are required.



9. Prior to Final Site Plan Approval, show the location of all short and long term bicycle parking. The quantity and location shall meet the requirements of SZCDC § 16.94.020(C).
10. Prior to Final Site Plan approval, provide details on the proposed trash enclosures. The enclosures shall meet Pride Disposal standards and the requirements of SZCDC § 16.98.020.
11. Prior to Final Site Plan Approval, the applicant shall provide the information required by the fire department's letter dated June 22, 2021.
12. Prior to Final Site Plan Approval, show the final location of the required visual corridors along SW Oregon St. (15 ft.) and SW Ice Age Dr. (10 ft.). The visual corridor shall be on private property after any required right-of-way dedication.
13. Prior to Final Site Plan approval, provide revised plans that show street trees for ~~SW Oregon St. and SW Tonquin Ct.~~ all adjacent streets in conformance with SZCDC § 16.142.060.
14. Prior to Final Site Plan Approval, revise the landscape plans to provide 30% tree canopy over the net development site. Street trees shall not be included in the calculations.
- ~~14.~~ 15. Prior to the Final Site Plan Approval, the applicant shall revise the plans to remove the Tonquin Court right-of-way dedication and include a 48' right-of-way dedication along the eastern boundary of the subject site.

**C. Prior to Approval of the Engineering Public Improvement Plans / Issuance of the Engineering Compliance Agreement**

1. Prior to Approval of the Engineering Plans, the local street along the eastern boundary of the subject site currently known as SW Tonquin Ct. shall be re-named SW Laurelwood Way or an alternative meeting the requirements of SZCDC § 16.106.010(B) – (D).
2. Prior to Approval of Engineering Public Improvement Plans, the findings and recommendations presented in the AMP Technical Memorandum, prepared by the City's consultant transportation engineering firm, DKS Associates (dated June 25, 2021), and the supplemental analysis by Lancaster Mobley (dated February 1, 2022) shall be taken in whole and with consideration of the eastern alternative to Tonquin Court to serve the subject and adjacent properties shall be requirements and conditions placed on the subject site development.
3. Prior to Approval of Engineering Public Improvement Plans, construction plans shall show a ~~Tonquin Court~~ right-of-way dedication section along the property's eastern boundary of 64-foot minimum meeting the City's standard for a 40'-42' Standard Commercial/Industrial Not Exceeding 3,000 Vehicles Per Day.
4. Prior to Approval of Engineering Public Improvement Plans, the ~~Tonquin Court~~ right-of-way dedication section shall be located relative to the west-east property line of the subject site, such that the pavement width from the property line to the east face of curb shall be a minimum of 30-feet.
5. Prior to Issuance of Engineering Compliance Agreement, the applicant shall pay a fee in-lieu-of construction of ~~Tonquin Court~~ the eastern local street based on 125% of the construction estimate provided by the applicant and reviewed and approved by the Sherwood Engineering Department for the following:
  - i. 4" thick Level 2, ½" dense HMAC pavement (edge of pavement to face of curb)
  - ii. Concrete curb and gutter for one side of the road
  - iii. 4.5-foot wide planter strip, including ground cover, street trees, and irrigation system
  - iv. 6-foot wide 4-inch thick concrete sidewalk

- v. Cobrahead street lighting
  - vi. 2-inches of ¾"-0" crushed aggregate leveling course
  - vii. 8-inches of 1½"-0" crushed aggregate base course
  - viii. Geotextile Fabric between base course and subgrade
  - viii. Cut and Fill quantities to establish appropriate road grades
  - ix. Planter strip irrigation system, including controller, electronically controlled valves, piping and sprinkler heads
  - x. Retaining walls (if needed)
6. Prior to Approval of Engineering Public Improvement Plans, construction plans shall show an Ice Age Drive right-of-way dedication section of 76-feet minimum meeting the City's standard for a 3-Lane Collector Road Without On-Street Parking, modified as follows:
- i. 2 – 13-foot wide drive lanes
  - ii. 1 – 14-foot wide center turn lane
  - iii. 2 – 5-foot wide planter strips
  - iv. 2 – 12-foot wide multi-use paths
  - v. 2 – 1-foot clear to right-of-way line
7. Prior to Approval of Engineering Public Improvement Plans, the Ice Age Drive right-of-way dedication section shall be centered on the north property line, excepting where the centerline alignment deviates south so that its entire right-of-way dedication section shall be located west of, and parallel and adjacent to the BPD/PGE overhead power line easements.
8. Prior to Issuance of Engineering Compliance Agreement, the applicant shall pay a fee in-lieu-of construction of Ice Age Drive improvements based on 125% of the construction estimate provided by the applicant and reviewed and approved by the Sherwood Engineering Department for the following:
- i. 5" thick Level 2, ½" dense HMA pavement (edge of pavement or face of curb to face of curb)
  - ii. Concrete curb and gutter for one side of the road
  - iii. 4.5-foot wide planter strip, including ground cover, street trees, and irrigation system
  - iv. 12-foot wide 4-inch thick concrete sidewalk
  - v. Cobrahead street lighting
  - vi. 2-inches of ¾"-0" crushed aggregate leveling course
  - vii. 10-inches of 1½"-0" crushed aggregate base course
  - viii. Geotextile Fabric between base course and subgrade
  - ix. Cut and Fill quantities to establish appropriate road grades
  - x. Street trees with approved root barriers and ground vegetation
  - xi. Planter strip irrigation system, including controller, electronically controlled valves, piping and sprinkler heads
  - xii. Retaining walls (if needed)
9. Prior to Approval of Engineering Public Improvement Plans, construction plans shall include frontage improvements along the full lot length along Oregon Street consistent with AMP Technical Memorandum, WACO and City standards as follows:



- i. A 12-foot wide concrete sidewalk & ADA ramps (if needed)
  - ii. A 5-foot wide planter strip, measured between street side face of curb and street side edge of sidewalk.
  - iii. Street trees, with approved root barrier
  - iv. Planter strip ground cover plantings
  - v. Planter strip irrigation system, including controller, electronically controlled valves, piping and sprinkler heads
  - vi. Street lighting system
  - vii. Right turn lane northbound at driveway entrance off Oregon Street
  - viii. Left turn lane southbound at driveway entrance off Oregon Street
10. Prior to Approval of Engineering Public Improvement Plans, the applicant shall submit a separate design modification request form for any nonconforming public infrastructure design element(s) that were not submitted under the Land Use process, to the City Engineer for review and approval. Public infrastructure design modification request reviews and approvals are taken on a case-by-case basis with any decision rendered by the City Engineer being final.
  11. Prior to Approval of Engineering Public Improvement Plans, engineering plans shall show minimum pavement sections conforming to the City standard for a local road and a collector road, or as recommended by a geotechnical pavement design based on local site soils conditions which shall be submitted to the City as part of the plan review process. The design life of the geotechnical pavement design shall be 25-years.
  12. Prior to Approval of Engineering Public Improvement Plans, the street lighting plans for the Tonquin Court and Ice Age Drive shall show PGE Option "B" cobrahead style street lighting systems.
  13. Prior to Approval of Engineering Public Improvement Plans, the applicant shall record any slopes easements necessary to support the ~~Tonquin Court~~ eastern local street and Ice Age Drive section/alignment. Slope easements shall be based on a 2 horizontal to 1 vertical finish slope grade.
  14. Prior to Approval of the Engineering Public Improvement Plans, the proposed development transportation system design shall comply with all the relevant conditions of CWS SPL File No. 20-001006.
  15. Prior to Issuance of an Engineering Compliance Agreement, applicant shall pay a proportionate share mitigation amount of 5.15% towards the design and construction of a roundabout at the intersection of Oregon Street and Tonquin Road. The value of the mitigation amount shall be estimated by the applicant, submitted to the City Engineering Department for review, and if acceptable approved by the City Engineering Department.
  16. Prior to Approval of the Engineering Public Improvement Plans, the proposed development shall design to extend the public sanitary sewer within Tax Lot 600, Oregon Street, Tonquin Road, the unnamed public access drive and within the future ~~Tonquin Court~~ eastern local street right-of-way, conforming to CWS design and construction standards and meeting the approval of the Sherwood Engineering Department.
  17. Prior to Approval of the Engineering Public Improvement Plans, the proposed development sanitary sewer design shall comply with all the relevant conditions of CWS SPL File No. 20-001006.

18. Prior to Approval of Engineering Public Improvement Plans, the proposed development shall prepare a sanitary sewer design report which provides information on the proposed site development sanitary sewer discharge, and how the proposed system and existing downstream system (extending a minimum of 200' north of 414NSAN) will meet conveyance and capacity requirements, meeting with approval of the Sherwood Engineering Department.
- ~~19. Prior to Approval of the Engineering Public Improvement Plans, the alignment of a 12-inch diameter public waterline along the west property line of the subject site shall be located within boundaries of the existing site (proposed right-of-way for Tonquin Court and public utility easement). The waterline shall be located on the east or south side of any public sanitary and storm sewer mains, meeting separation distance requirements.~~
- ~~20-19.~~ Prior to approval of the Engineering Public Improvement Plans, the alignment of a 16-inch diameter public waterline along the north and east property line of the subject site shall be located within the boundaries of the existing site (proposed right-of-way for Ice Age Drive and public utility easement). The waterline shall be located on east or south side of any public sanitary and storm sewer mains, meeting separation distance requirements.
- ~~21-20.~~ Prior to Approval of the Engineering Public Improvement Plans, the proposed development shall design to provide water service to supply domestic, irrigation and fire water (if required) of the subject development at a location meeting the approval of the Sherwood Engineering Department.
- ~~22-21.~~ Prior to Approval of the Engineering Public Improvement Plans, water flows calculations (domestic, irrigation and fire) shall be provided by the developer.
- ~~23-22.~~ Prior to Approval of the Engineering Public Improvement Plans, the proposed development water system design shall comply with all the relevant conditions of CWS SPL File No. 20-001006.
- ~~24-23.~~ Prior to Approval of the Engineering Public Improvement Plans, the proposed development shall design for the installation of Reduced Pressure Backflow Assemblies meeting Sherwood Engineering Department standards.
- ~~25-24.~~ Prior to Approval of the Engineering Public Improvement Plans, if on-site fire protection is to be installed, the proposed development shall design for the installation of backflow protection meeting Sherwood Engineering Department standards.
- ~~26-25.~~ Prior to Approval of the Engineering Public Improvement Plans, the proposed development shall design to provide a separate storm sewer for ~~Tonquin Court~~ the adjacent eastern local street meeting the approval of the Sherwood Engineering Department.
- ~~27-26.~~ Prior to Approval of the Engineering Public Improvement Plans, a final stamped storm drainage report in compliance with Clean Water Service standards shall be submitted meeting the approval of the Sherwood Engineering Department.
- ~~28-27.~~ Prior to Approval of the Engineering Public Improvement Plans, the proposed development storm water system design shall comply with all the relevant conditions of CWS SPL File No. 20-001006.
- ~~29-28.~~ Prior to Approval of the Engineering Public Improvement Plans, if the final stamped storm drainage report indicates any downstream deficiencies, then the subject development shall either correct the downstream deficiencies or provide detention meeting the approval of the Sherwood Engineering Department.



- ~~30-29.~~ Prior to Approval of the Engineering Public Improvement Plans, the proposed development shall design to supply storm sewer service to all areas of the subject development site meeting the approval of the Sherwood Engineering Department.
- ~~31-30.~~ Prior to Approval of the Engineering Public Improvement Plans, the proposed development shall design to provide storm water quality treatment and hydromodification in compliance with Clean Water Services' standards meeting the approval of the Sherwood Engineering Department for all new impervious area constructed/modified by the subject development including any required improvements within Washington County right-of-way.
- ~~32-31.~~ Prior to Approval of the Engineering Public Improvement Plans, the Public Improvement Plans shall provide design of stormwater treatment/hydromodification facilities for a single lot site development.
- ~~33-32.~~ Prior to Approval of the Engineering Public Improvement Plans, applicant shall obtain any necessary facilities permits from WACO to construction public stormwater system improvements within WACO right-of-way (Tonquin Road and Oregon Street).
- ~~34-33.~~ Prior to Approval of Engineering Public Improvement Plans, the applicant shall obtain any necessary permits from the US Department of Fish and Wildlife, for the discharge of stormwater to the Cedar Creek stream corridor (Tax Lot 2S133002500).
- ~~35-34.~~ Prior to Approval of the Engineering Public Improvement Plans, a Service Provider Letter from Clean Water Services shall be obtained.
- ~~36-35.~~ Prior to Approval of the Engineering Public Improvement Plans, a Storm Water Connection Permit Authorization from Clean Water Services shall be obtained.
- ~~37-36.~~ Prior to Approval of the Engineering Public Improvement Plans or Issuance of Building Permits, an Engineering Compliance Agreement shall be obtained from the City of Sherwood Engineering Department.
- ~~38-37.~~ Prior to Approval of the Engineering Public Improvement Plans, the proposed development shall design for vegetative corridor enhancements in compliance with the CONDITIONS imposed by Clean Water Services meeting the approval of the Sherwood Engineering Department.
- ~~39-38.~~ Prior to Approval of the Engineering Public Improvement Plans, the applicant shall obtain written approval from Washington County that Condition of Approval (I)(A) described in the written comments dated December 23, 2021 has been satisfied.

**D. Prior to Issuance of a Grading Permit**

1. Prior to issuance of a Grading Permit, the subject development shall submit a phased mass grading plan/erosion control plan meeting the approval of the Sherwood Engineering Department.
2. Prior to issuance of a Grading Permit, the proposed site development plans shall comply with all the relevant conditions of CWS SPL File No. 20-001006.
3. Prior to Grading Permit, the subject development shall obtain a DEQ NPDES 1200-C permit.
4. Prior to Issuance of a Site Grading Permit (if blasting is desired), the applicant shall obtain a Blasting Permit from TVF&R and include it with any submittal to obtain a City issued Blasting Permit. The City Blasting Permit only covers the blasting process and does not replace the need to obtain a site grading permit.

5. Prior to Issuance of a Grading Permit, the applicant shall provide a final tree protection plan that demonstrates how the trees identified for protection in the land use decision will be protected from construction activities through site development.
6. Prior to Issuance of a Grading Permit, the applicant shall obtain applicable state and federal wetland permits for the stormwater discharge to Rock Creek.
7. Prior to Issuance of Site Grading Permit, the applicant shall obtain written approval from Washington County that Condition of Approval (II)(A) described in the written comments dated December 23, 2021 has been satisfied.

**E. Prior to Issuance of Building Permits**

1. Prior to Issuance of Building Permits the applicant shall obtain Final Site Plan approval.
2. Prior to Approval of the Engineering Public Improvement Plans or Issuance of Building Permits, an Engineering Compliance Agreement shall be obtained from the City of Sherwood Engineering Department.
3. Prior to Issuance of a Plumbing Permit, the proposed development shall design and construct all the private sanitary sewer shall be in compliance with the current Oregon Plumbing Specialty Code.
4. Prior to Issuance of a Plumbing Permit, the proposed development shall design for private water lines shall be in compliance with the current Oregon Plumbing Specialty Code.
5. Prior to Issuance of a Plumbing Permit, the proposed development shall design for private storm water runoff within the subject property shall be collected and conveyed in accordance with the current Oregon Plumbing Specialty Code.

**F. Prior to Acceptance of Public Improvements**

1. Prior to Final Acceptance of Constructed Public Improvements, applicant shall record an 8-foot wide public utility easement (PUE) along all public street frontages, land shall be located adjacent to and outside the public street right-of-way.
2. Prior to Acceptance of Constructed Public Improvements, the applicant shall record an 8-foot wide PUE along ~~the Oregon Street, Tonquin Road and Ice Age Drive~~ all public street alignment frontages that lays within the subject site.
3. Prior Acceptance of Constructed Public Improvements, applicant shall provide a two (2) year maintenance warranty for deficient workmanship and/or materials associated with the public improvements.
4. Prior to Final Acceptance of the Constructed Public Improvements, any public sanitary sewer facilities located on-site or off-site within any private property outside of public right-of-way, shall have a recorded public sanitary sewer easement encompassing the related public sanitary sewer improvements meeting the approval of the Sherwood Engineering Department.
5. Prior to Final Acceptance of the Constructed Public Improvements, any public sanitary sewer facilities located within the unnamed public road easement located south and west of the site, shall have a recorded public sanitary sewer easement encompassing the related public sanitary sewer improvements meeting the approval of the Sherwood Engineering Department.
6. Prior to Final Acceptance of the Constructed Public Improvements, any public water facilities located on private property shall have a recorded public water line easement encompassing the related public water improvements meeting Sherwood Engineering standards.



7. Prior to Final Acceptance of the Constructed Public Improvements, private stormwater treatment/hydromodification facilities will be provided to the site development under private ownership. The City and CWS will be granted access rights to the facility for the purpose of inspection to ensure compliance with the required maintenance operations. The applicant will be required to sign a City Standard Access and Maintenance Covenant. The stormwater runoff from the public right-of-way Tenquin Court for the eastern street will not be included with the private site stormwater treatment/hydromodification system, and therefore a separate public stormwater treatment/hydromodification system will be provided to meet treatment/hydromodification requirements. This requirement will include dedication of any necessary additional right-of-way to allow for the placement of the public stormwater facility.
8. Prior to Final Acceptance of the Constructed Public Improvements, any public storm sewer located on or across private property shall have a recorded public storm sewer easement encompassing the related public storm sewer improvements meeting Sherwood Engineering standards.
9. Prior to Final Acceptance of the Constructed Public Improvements, any public stormwater facilities located on-site or off-site within any private property outside of public right-of-way, shall have a recorded public stormwater system easement encompassing the related public stormwater system improvements meeting the approval of the Sherwood Engineering Department.
10. Prior to Final Acceptance of the Constructed Public Improvements, any public stormwater system facilities located within the unnamed public road easement located south and west of the site, shall have a recorded public stormwater system easement encompassing the related public stormwater system improvements meeting the approval of the Sherwood Engineering Department.
11. Prior to Acceptance of Public Improvements, the proposed development shall dedicate a minimum 8-foot wide PUE along the subject property frontage of all public right-of-way meeting the approval of the Sherwood Engineering Department unless otherwise approved by the City Engineer.
12. Prior to Acceptance of Public Improvements, the proposed development shall set all monumentation and record the subdivision plat with the Washington Count Surveyor's Office.
13. Prior to Acceptance of the Constructed Public Improvements, the proposed development shall provide an access easement to the City of Sherwood and CWS over each natural resource area.

**G. Prior to Receiving Occupancy**

1. Prior to Occupancy, all landscaping must be installed and have an irrigation system in accordance with SZCDC § 16.92.040(C).
2. Prior to Receiving Occupancy, all parking, loading or maneuvering areas including ADA and loading stalls shall be clearly marked and signed.
3. Prior to Receiving Occupancy, bicycle parking shall be installed in accordance with the Final Site Plan approval and SZCDC § 16.94.020(C)(2) including a space 2x6' for each bicycle.
4. Prior to Final Occupancy, the site shall conform to Tualatin Valley Fire & Rescue standards and obtain final written approval from the agency.

5. Prior to Receiving Occupancy, the applicant shall obtain written approval from Washington County that Condition of Approval (III)(A)-(B) described in the written comments dated December 23, 2021 have been satisfied.



Summary	Tonquin West		Tonquin East	
	OSBP	SCC	OSBP	SCC
ROW Dedication (SF)	24,315	42,665	2,123	41,556
Building Area (SF)	78,543	435,107	120,013	435,107
Future Development Area (SF)	N/A	390,951	N/A	392,478

Notes:  
 1. OSBP = Oregon Street Business Park (Polley)  
 2. SCC = Sherwood Commercial Center (Harsch/Schnitzer)  
 3. ROW dedication is defined only as it relates to Tonquin Court

Kerr Evaluation  
 1. Tonquin West: Access to the Kerr property is dependent on development of TL 500 (Polley) and the southern half of TL 600 (Harsch). 2. Tonquin East: Access to the Kerr property is dependent on the development of tax Lot 700 (Vandomelen) or Construction of Ice Age and the southern half of TL 600 (Harsch). **Finding: Kerr access remains dependent on development from 2 adjacent properties.**  
 2. Right-of-way dedication on the Kerr site for Tonquin Court is substantially similar under both scenarios

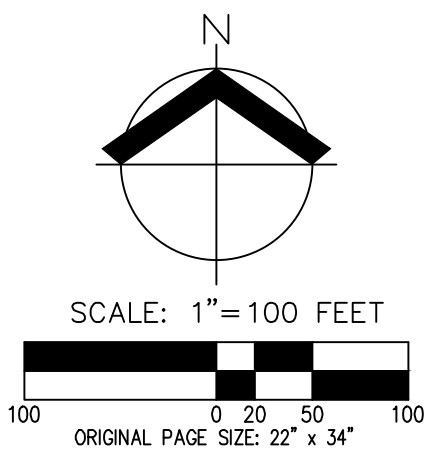


Temporary access to Kerr/SCC until Ice Age is constructed to 124th. 34-ft paved width

3/4-street improvement in accordance with City' 40' Standard Commercial/Industrial road section. 48-ft dedication provides for 34-ft paved width.

42-ft ROW Dedication to meet City condition of approval for 30-ft paved width and provide sidewalk and landscape in accordance with City' 40' Standard Commercial/Industrial road section. Shown for reference

Tonquin Court West (AMP Alignment) shown for reference



**TONQUIN COURT REALIGNMENT**  
**OREGON STREET BUSINESS PARK**  
**SHERWOOD, OR**



RENEWAL DATE: 12/31/23  
 JOB NUMBER: 7971  
 DATE: 02/01/2022  
 DESIGNED BY: JDS  
 DRAWN BY: BDL  
 CHECKED BY: JPC

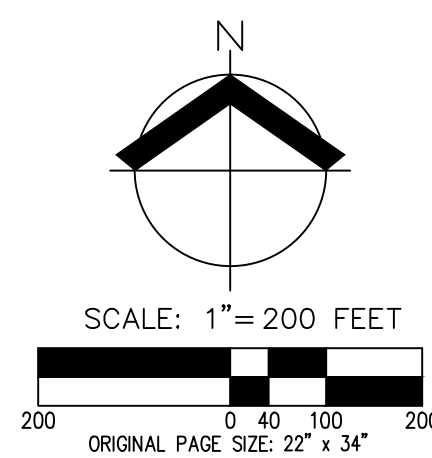
**EX A**





AKS ENGINEERING & FORESTRY, LLC  
12865 SW HERMAN RD, STE 100  
TUALATIN, OR 97062  
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WWW.AKS-ENG.COM

ENGINEERING - SURVEYING - NATURAL RESOURCES  
FORESTRY - PLANNING - LANDSCAPE ARCHITECTURE



SCALE: 1" = 200 FEET

ORIGINAL PAGE SIZE: 22" x 34"

TONQUIN COURT REALIGNMENT

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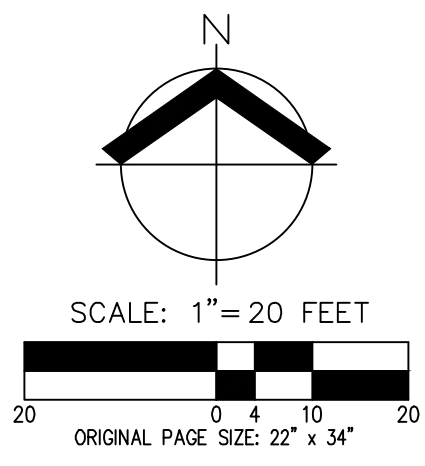
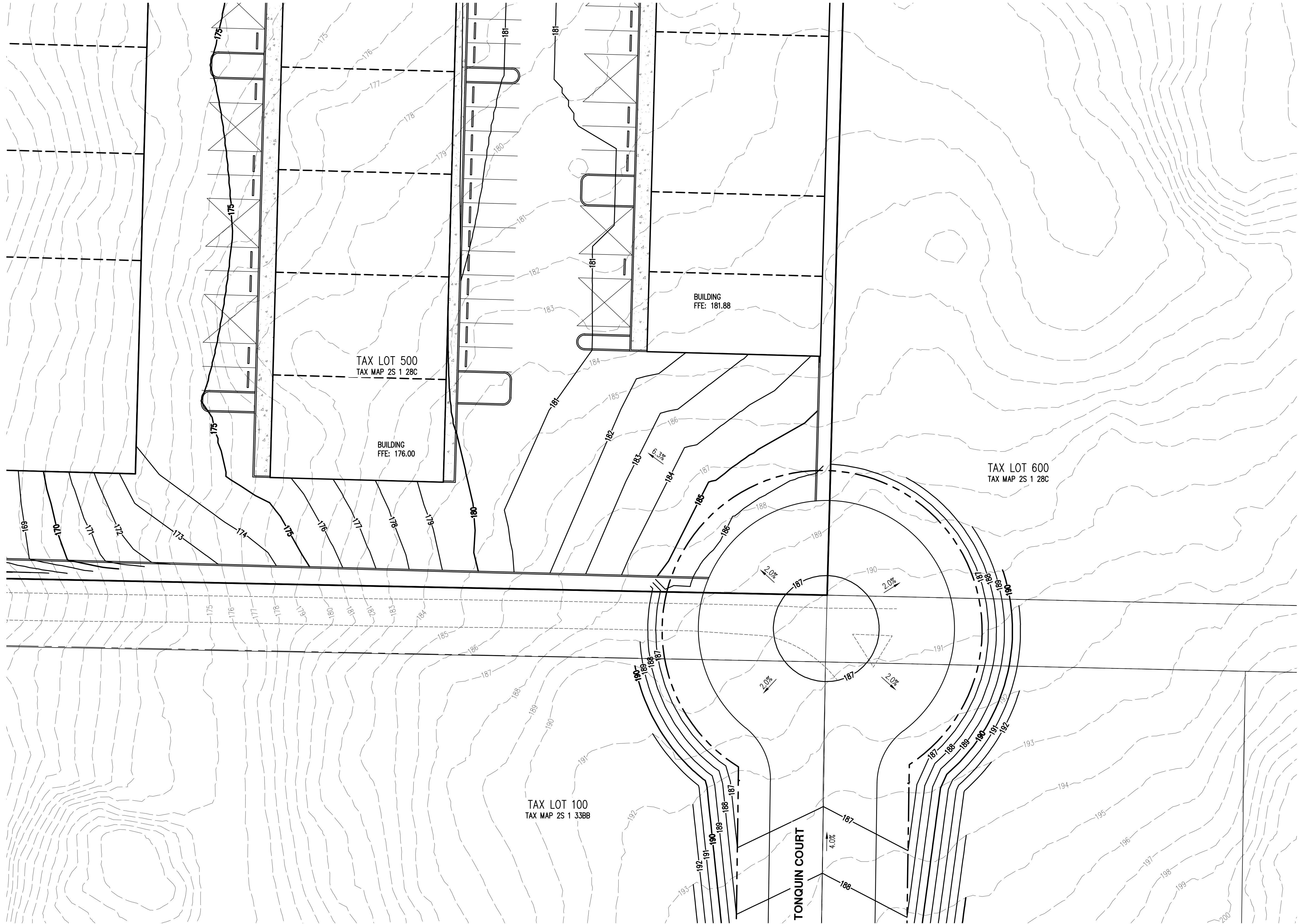
EX B





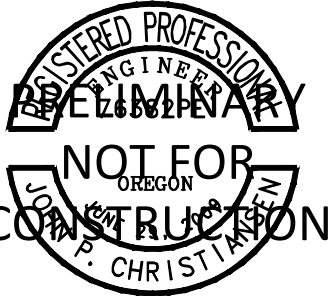
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**TONQUIN COURT REALIGNMENT**

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SHERWOOD, OR**



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DRAWN BY:	BDL
CHECKED BY:	JPC

**EX C**

## Technical Memorandum

To: **Eric Rutledge, City of Sherwood**

From: **Todd E. Mobley, PE**

Date: **January 31, 2022**

Subject: **Tonquin Court Alignment: Transportation Update**  
**Oregon Street Business Park – LU 2021-015 SP**  
**Sherwood Commerce Center – LU 2021-012 SP / CUP / VAR**  
**Oregon Street Access Management Plan Revision**



EXPIRES **12/31/2022**

### Introduction

This memorandum is written to provide updated transportation analysis that is relevant to the following three matters:

1. Oregon Street Business Park application (current land use application with continued Planning Commission hearing on February 8, 2022);
2. Sherwood Commerce Center application (current land use application in the first week of a three-week open-record period); and
3. Oregon Street Access Management Plan (completed plan not in a current adoption process).

The subject of this memo is the currently proposed Tonquin Court future alignment that will serve developing properties south of Oregon Street and east of Tonquin Road. The proposed alignment has been entered into the land use records and discussed in detail for the first two developments identified above. The proposed alignment is shown in Figure 1.

This memo provides updated traffic analysis for each of the three identified matters above. Each is updated to reflect the proposed Tonquin Court alignment and the removal of the intersection of Tonquin Court with Oregon Street.

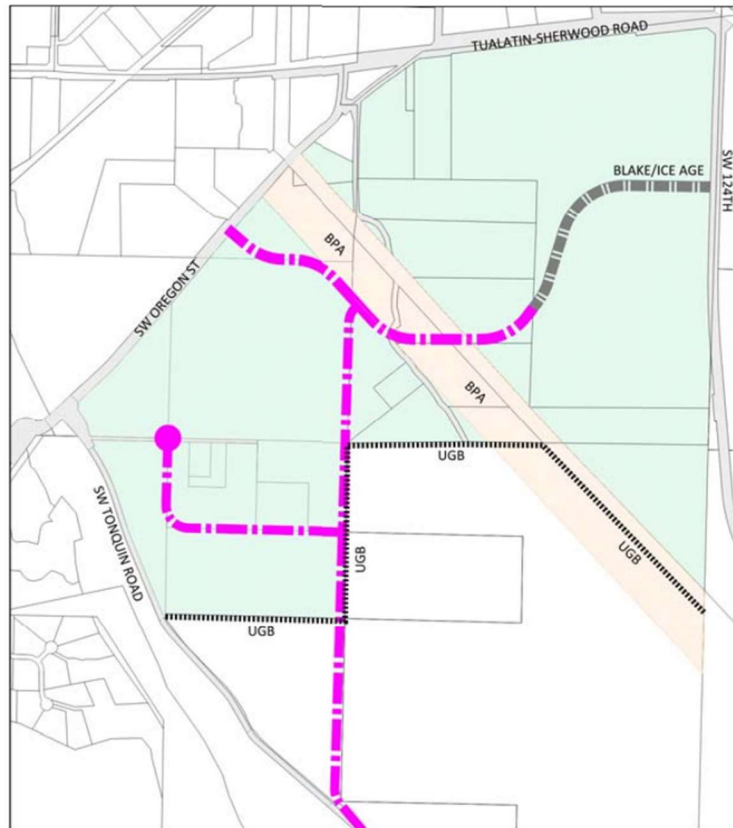


Figure 1: Proposed Tonquin Court Alignment



## Amendment to Oregon Street Business Park TIA

The Oregon Street Business Park Transportation Impact Analysis (TIA)<sup>1</sup> proposes a direct full-movement access to Oregon Street to serve the site. This proposal is consistent with Alternative 1 of the Oregon Street Access Management Plan (AMP), where properties that front Oregon Street will take direct access to the arterial until other public street connections are available.

Figure 2 shows an excerpt from the TIA that identifies the proposed direct access as well as the lane configuration of the driveway and its intersection with Oregon Street.

Because the access configuration used in the TIA is consistent with both Alternative 1 of the AMP as well as the proposed Tonquin Court alignment that is addressed in this memo, no revisions to the TIA are necessary. All findings for trip generation, trip distribution, traffic impacts, and the performance of all intersections in the TIA are still valid and reliable.

For long-term traffic operations with the proposed Tonquin Court configuration, see the *Amendment to Oregon Street Access Management Plan* section in this memorandum.

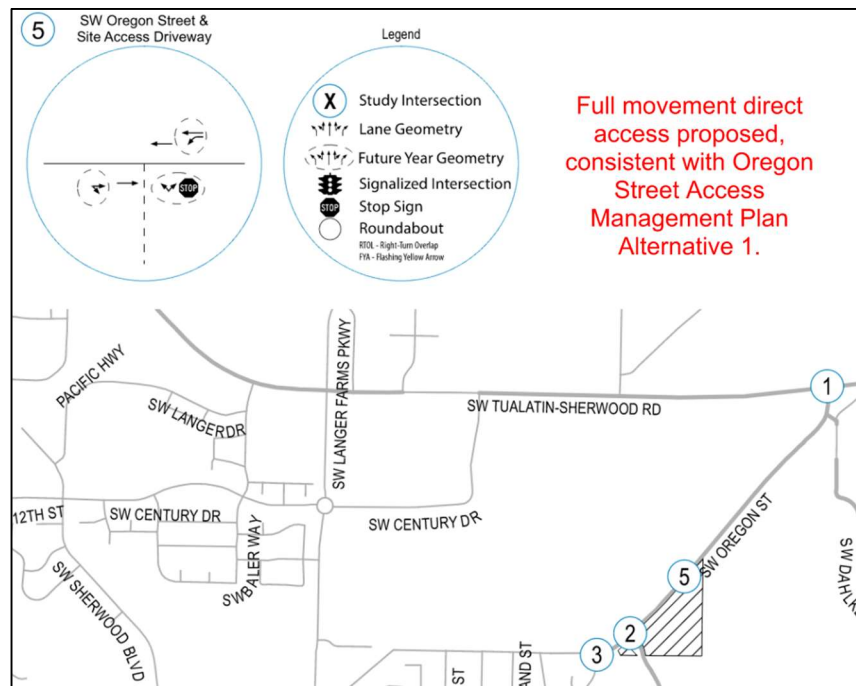


Figure 2: Excerpt from Oregon Street Business Park TIA

## Amendment to Sherwood Corporate Center TIA

The Sherwood Corporate Center Traffic Impact Analysis (TIA)<sup>2</sup> assumed access to Oregon Street in two locations. First, a direct access to Oregon Street near the northern end of the site frontage to Oregon Street is proposed. The TIA recognizes that this access is temporary and will be removed in the future when Ice Age Drive is constructed to its intersection with Oregon Street. At that time, access will be taken to Ice Age Drive.

Second, the TIA assumes that Tonquin Court will be constructed along the western boundary of the site, including a complete, full movement intersection with Oregon Street. This assumption is made despite the intersection with Oregon Street being completely off the Sherwood Corporate Center site. The intersection assumed in the TIA lies on the Oregon Street Business Park site. Despite the assumption that this intersection

<sup>1</sup> Oregon Street Business Park, Transportation Impact Analysis, June 2021 by Lancaster Mobley

<sup>2</sup> Sherwood Corporate Center, Traffic Impact Analysis, November 2021 by Kittelson & Associates

will be constructed and fully operational at build out of the first phase of the Sherwood Corporate Center, the TIA does *not* assume development or the Oregon Street Business Park or include trips from that project.

Accordingly, the Sherwood Corporate Center TIA is amended here to reflect the following:

1. Removal of the intersection of Tonquin Court and Oregon Street. As shown in Figure 3, this necessitates moving all Sherwood Corporate Center trips from access 'B' to access 'A', and
2. Including site-generated trips from Oregon Street Business Park.
3. Analyze the Sherwood Corporate Center access 'A' with a northbound right-turn lane on Oregon Street, as required by Condition of Approval C.9.vii in the staff report for LU 2021-012 SP / CUP / VAR. The TIA did not include analysis with the right-turn lane in place.

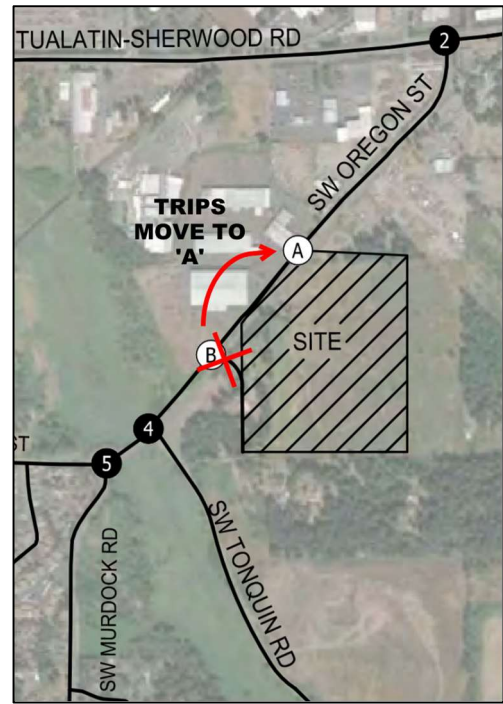


Figure 3: Excerpt from Sherwood Corporate Center TIA

To reflect the changes above, an updated capacity analysis was conducted to determine the peak hour operations at both the direct access serving the Oregon Street Business Park as well as the direct access serving the Sherwood Corporate Center. The results of that updated analysis are shown in Table 1.

It is noted that both accesses will be temporary and will be closed at such time that other public street accesses are available. As such, both accesses are compliant with the Oregon Street AMP.

Table 1: Updated Intersection Capacity Analysis: Oregon Street AMP Alternative 1 (Direct Access)

Intersection	Scenario	Morning Peak Hour			Evening Peak Hour		
		v/c	LOS	Delay	v/c	LOS	Delay
Oregon Street at Oregon Street Business Park Access	OSBP & SCC Buildout	0.05	B	14.5	0.19	C	16.8
Oregon Street at Sherwood Corporate Center Access	OSBP & SCC Buildout	0.35	B	13.6	0.37	B	13.9

As shown in the table above, both direct accesses to Oregon Street will operate acceptably with both projects in place. Detailed capacity analysis calculations are included in the attached technical appendix.

It should also be noted that this analysis and the change in access described here does *not* change any of the TIA's analysis and findings at other off-site study area intersections. All other analyses and findings in the TIA remain unchanged.





## Amendment to Oregon Street Access Management Plan

While the two sections above describe the near-term operation with the Oregon Street Business Park and the Sherwood Corporate Center in place, the Oregon Street AMP<sup>3</sup> includes a long-term analysis (2035) that examines traffic operations with surrounding properties also developed. The AMP is updated here to show the impacts of not connecting Tonquin Court to Oregon Street.

### Trip Generation & Distribution

The Oregon Street AMP was commissioned by the City of Sherwood and conducted its own analysis of future year conditions, including potential trip generation from development of industrial properties in the area and determination of how these trips will be distributed to the transportation system. The update in this memo does not change any of these underlying analysis assumptions. Rather, this memo simply moves Tonquin Court trips from the intersection with Oregon Street to Ice Age Drive and its intersection with Oregon Street.

### Impacts to Ice Age Drive at SW 124<sup>th</sup> Avenue

The proposed Tonquin Court alignment is not expected to have any operational impact at the intersection of Ice Age Drive with SW 124<sup>th</sup> Avenue. A traffic signal is planned at that intersection (the recent PGE project in Tualatin constructed the east leg and included underground traffic signal infrastructure) and the configuration of Tonquin Court will not result in any change to the timing of when signal warrants would be satisfied at this intersection.

### Ice Age Drive at Oregon Street

Table 2 below shows the updated capacity analysis results at the signalized intersection of Ice Age Drive with Oregon Street in 2035 with no connection of Tonquin Court to Oregon Street. As shown in the table, the intersection will still operate favorably with the proposed Tonquin Court alignment rather than that considered in the original Oregon Street AMP. Detailed capacity analysis calculations are included in the attached technical appendix.

**Table 2: Updated Intersection Capacity Analysis: Oregon Street AMP Alternative 3**

Intersection	Scenario	Morning Peak Hour			Evening Peak Hour		
		v/c	LOS	Delay	v/c	LOS	Delay
Ice Age Drive at Oregon Street	Alt 3: Year 2035 conditions w/ signal	0.74	B	12.5	0.89	C	20.7

The lane configuration at the intersection of Ice Age Drive and Oregon Street is shown in Figure 4. While not clearly displayed in that document, this is the same intersection configuration considered in the Oregon Street AMP and no additional lanes are necessary to accommodate the proposed Tonquin Court alignment.

Table 3 on the following page provides a summary matrix comparing the Oregon Street AMP with the proposed Tonquin Court alignment.

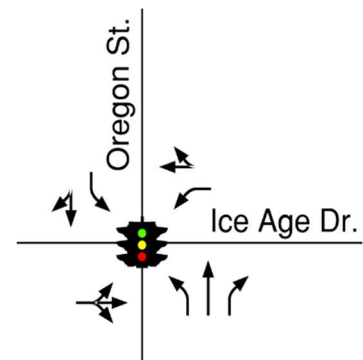


Figure 4: Lane Configuration

<sup>3</sup> Sherwood Oregon Street Access Management Plan (AMP), June 25, 2021, by DKS Associates



Table 3: Oregon Street AMP Compliance & Comparison

Alternative	Oregon Street AMP	Proposed Tonquin Court Alignment	Notes
1 – Near Term	Direct access to Oregon Street for both OSBP & SCC	Direct access to Oregon Street for both OSBP & SCC	Proposed Tonquin Court alignment complies with AMP. Interim access approval required for both projects.
2 – Interim	Tonquin Ct. (local street) intersects Oregon Street (arterial). OSBP access moves to Tonquin Ct.	Tonquin Ct. (local street) intersects Ice Age (collector). OSBP moves to Tonquin Ct.	AMP does not comply with County code that disallows a local street intersection with an arterial. Proposed plan complies with code by bringing a local street to a collector. No Design Exception required.
3 – Ultimate	Ice Age intersects Oregon Street at signalized collector/arterial intersection. Tonquin Court restricted to right-in/right-out at Oregon Street. <i>Permanent Design Exception required from County.</i>	Ice Age intersects Oregon Street at signalized collector/arterial intersection. Tonquin Court connects to Ice Age. <i>No Design Exception needed from County.</i>	The proposed Tonquin Court alignment provides a clear path for the connection of Tonquin Court with Ice Age Drive. The proposed configuration meets Washington County standards and provides a logical connection between local streets, collectors, and arterials. No revisions to the Oregon Street AMP are necessary to accommodate the proposed configuration and no additional long-term transportation infrastructure is needed.

## Summary & Conclusions

As demonstrated here, the proposed Tonquin Court alignment still maintains acceptable intersection operation and serves to reduce the amount of access on Oregon Street. The following points are noted:

1. When the proposed alignment of Tonquin Court is connected to Ice Age Drive, the direct access to Oregon Street from the Oregon Street Business Park will be restricted to an emergency vehicle access and closed to all other traffic.
2. Sherwood Corporate Center does not require the direct connection of Tonquin Court to Oregon Street and will operate acceptably with a single temporary point of access directly to Oregon Street. When Ice Age Drive is constructed, this direct access will be closed.
3. The Oregon Street AMP does not comply with Washington County code, which does not allow a local street (Tonquin Court) to intersect an arterial (Oregon Street). The AMP would require a permanent Design Exception to allow the intersection of Tonquin Court with Oregon Street. The proposed Tonquin Court alignment would not intersect Oregon Street, would meet Washington County code, and would not require a Design Exception.
4. The proposed Tonquin Court alignment removes the option of having a traffic signal on Oregon Street in a problematic location that has a significant grade.





5. The proposed Tonquin Court alignment provides a clear path for the connection of Tonquin Court to Ice Age Drive and would remove the possibility of having two traffic signals in place on Oregon Street (at Tonquin Court and at Ice Age Drive) if no there were no connection of Tonquin Court to Ice Age Drive.
6. The intersection of Ice Age Drive with Oregon Street will have sufficient capacity and will operate favorably in the future, even without the connection of Tonquin Court to Oregon Street. No additional lanes or infrastructure are required at this intersection beyond what is already considered in the AMP.

**Attachments:**












Technical Appendix:

1. Sherwood Commerce Center TIA
2. Capacity analysis calculations for Oregon Street at Sherwood Corporate Center driveway 'B', updating the project's TIA.
3. Capacity analysis calculations for Oregon Street at Ice Age Drive reflecting the proposed Tonquin Court alignment, updating the Oregon Street AMP.



HCM Unsignalized Intersection Capacity Analysis  
 1: SW Oregon Street & Sherwood Commerce Center Site Access






















01/31/2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	24	523	52	97	310
Future Volume (Veh/h)	12	24	523	52	97	310
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	14	27	594	59	110	352
<b>Pedestrians</b>						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage (veh)	2			2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1166	594			653	
vC1, stage 1 conf vol	594					
vC2, stage 2 conf vol	572					
vCu, unblocked vol	1166	594			653	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	95			88	
cM capacity (veh/h)	396	499			920	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>	<b>SB 2</b>	
Volume Total	41	594	59	110	352	
Volume Left	14	0	0	110	0	
Volume Right	27	0	59	0	0	
cSH	459	1700	1700	920	1700	
Volume to Capacity	0.09	0.35	0.03	0.12	0.21	
Queue Length 95th (ft)	7	0	0	10	0	
Control Delay (s)	13.6	0.0	0.0	9.4	0.0	
Lane LOS	B			A		
Approach Delay (s)	13.6	0.0		2.2		
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			1.4			
Intersection Capacity Utilization			46.2%	ICU Level of Service	A	
Analysis Period (min)			15			
























HCM 6th Signalized Intersection Summary  
 1: SW Oregon Street & Ice Age Drive

01/31/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	0	1	147	0	24	12	473	397	121	280	27
Future Volume (veh/h)	4	0	1	147	0	24	12	473	397	121	280	27
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	4	0	1	165	0	27	13	531	446	136	315	30
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	175	0	10	489	0	395	547	719	609	384	949	90
Arrive On Green	0.04	0.00	0.04	0.12	0.00	0.25	0.38	0.38	0.38	0.09	0.56	0.56
Sat Flow, veh/h	1136	0	284	1781	0	1585	1036	1870	1585	1781	1681	160
Grp Volume(v), veh/h	5	0	0	165	0	27	13	531	446	136	0	345
Grp Sat Flow(s),veh/h/ln	1420	0	0	1781	0	1585	1036	1870	1585	1781	0	1842
Q Serve(g_s), s	0.2	0.0	0.0	4.0	0.0	0.6	0.4	11.8	11.6	1.9	0.0	4.9
Cycle Q Clear(g_c), s	0.2	0.0	0.0	4.0	0.0	0.6	0.4	11.8	11.6	1.9	0.0	4.9
Prop In Lane	0.80		0.20	1.00		1.00	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	185	0	0	489	0	395	547	719	609	384	0	1039
V/C Ratio(X)	0.03	0.00	0.00	0.34	0.00	0.07	0.02	0.74	0.73	0.35	0.00	0.33
Avail Cap(c_a), veh/h	663	0	0	939	0	1329	803	1181	1001	433	0	1544
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.5	0.0	0.0	17.1	0.0	13.8	9.3	12.8	12.7	8.8	0.0	5.6
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.4	0.0	0.1	0.0	1.5	1.7	0.6	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	1.5	0.0	0.2	0.1	4.1	3.6	0.6	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.6	0.0	0.0	17.5	0.0	13.9	9.3	14.3	14.5	9.3	0.0	5.8
LnGrp LOS	C	A	A	B	A	B	A	B	B	A	A	A
Approach Vol, veh/h		5			192			990			481	
Approach Delay, s/veh		22.6			17.0			14.3			6.8	
Approach LOS		C			B			B			A	
Timer - Assigned Phs	1	2	3	4		6		8				
Phs Duration (G+Y+Rc), s	8.7	23.1	10.3	6.2		31.8		16.6				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5		4.5		4.5				
Max Green Setting (Gmax), s	5.5	30.5	18.0	18.0		40.5		40.5				
Max Q Clear Time (g_c+I1), s	3.9	13.8	6.0	2.2		6.9		2.6				
Green Ext Time (p_c), s	0.0	4.8	0.3	0.0		2.2		0.1				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				12.5								
HCM 6th LOS				B								

HCM 6th Signalized Intersection Summary  
 1: SW Oregon Street & Ice Age Drive

01/31/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	0	19	420	0	152	0	238	201	32	659	0
Future Volume (veh/h)	17	0	19	420	0	152	0	238	201	32	659	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	19	0	21	472	0	171	0	267	226	36	740	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	115	13	55	531	0	453	106	896	759	525	1088	0
Arrive On Green	0.07	0.00	0.07	0.15	0.00	0.29	0.00	0.48	0.48	0.04	0.58	0.00
Sat Flow, veh/h	507	186	766	1781	0	1585	719	1870	1585	1781	1870	0
Grp Volume(v), veh/h	40	0	0	472	0	171	0	267	226	36	740	0
Grp Sat Flow(s),veh/h/ln	1459	0	0	1781	0	1585	719	1870	1585	1781	1870	0
Q Serve(g_s), s	0.5	0.0	0.0	10.0	0.0	5.9	0.0	5.9	5.9	0.6	18.6	0.0
Cycle Q Clear(g_c), s	1.6	0.0	0.0	10.0	0.0	5.9	0.0	5.9	5.9	0.6	18.6	0.0
Prop In Lane	0.47		0.52	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	184	0	0	531	0	453	106	896	759	525	1088	0
V/C Ratio(X)	0.22	0.00	0.00	0.89	0.00	0.38	0.00	0.30	0.30	0.07	0.68	0.00
Avail Cap(c_a), veh/h	359	0	0	531	0	759	106	896	759	618	1088	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.9	0.0	0.0	26.1	0.0	19.4	0.0	10.7	10.7	7.7	9.8	0.0
Incr Delay (d2), s/veh	0.6	0.0	0.0	16.9	0.0	0.5	0.0	0.2	0.2	0.1	3.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0	9.8	0.0	2.1	0.0	2.1	1.9	0.2	6.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.5	0.0	0.0	43.0	0.0	19.9	0.0	10.9	11.0	7.7	13.3	0.0
LnGrp LOS	C	A	A	D	A	B	A	B	B	A	B	A
Approach Vol, veh/h		40			643			493			776	
Approach Delay, s/veh		30.5			36.8			10.9			13.0	
Approach LOS		C			D			B			B	
Timer - Assigned Phs	1	2	3	4		6		8				
Phs Duration (G+Y+Rc), s	7.0	37.0	14.5	9.4		44.0		23.9				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5		4.5		4.5				
Max Green Setting (Gmax), s	6.0	24.5	10.0	13.5		39.5		32.5				
Max Q Clear Time (g_c+I1), s	2.6	7.9	12.0	3.6		20.6		7.9				
Green Ext Time (p_c), s	0.0	2.1	0.0	0.1		5.0		1.0				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				20.7								
HCM 6th LOS				C								
<b>Notes</b>												
User approved pedestrian interval to be less than phase max green.												



## Sherwood Commerce Center

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Date: November 30, 2021 Project #: 26314  
To: Bob Galati, PE, City of Sherwood  
From: Kristine Connolly, PE, Diego Arguea, PE, & Michael Ruiz-Leon  
Cc: Garth Appanaitis, PE – DKS Associates  
Project: Sherwood Commerce Center – Sherwood, Oregon  
Subject: Traffic Impact Analysis



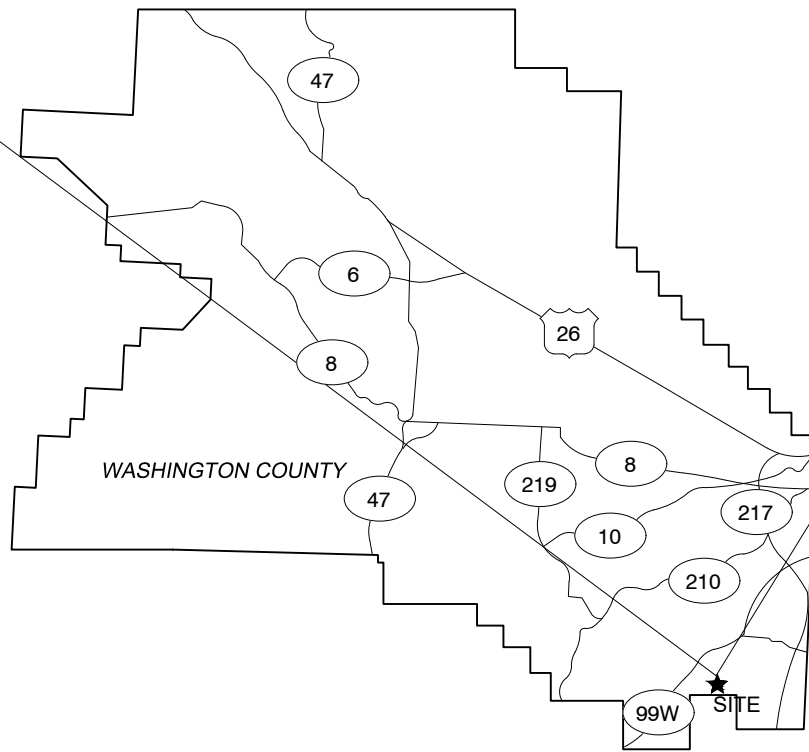
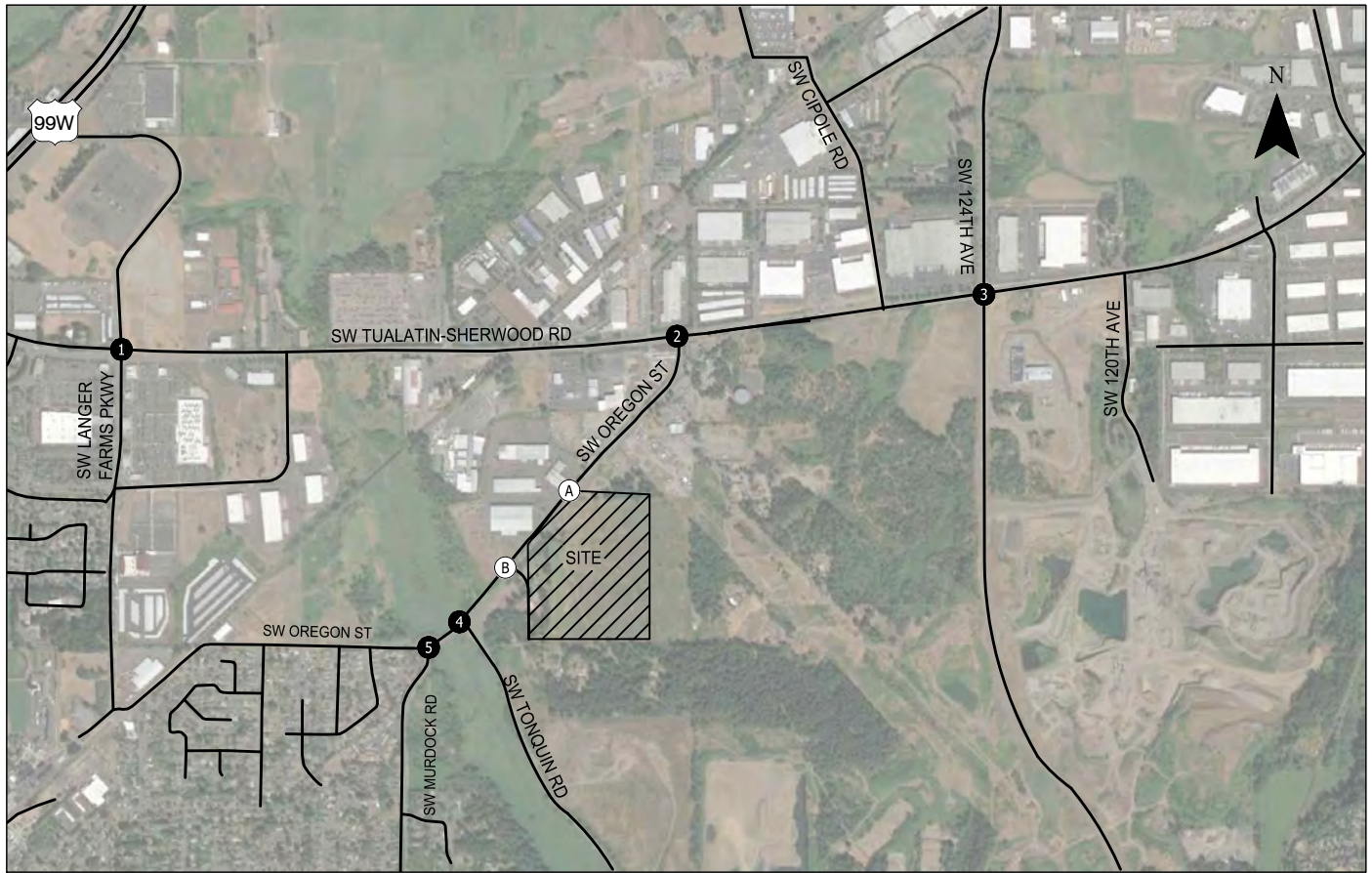
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This report presents the traffic impact analysis (TIA) completed for Phase 1 of the proposed Sherwood Commerce Center development, to be located on the northeast quadrant of the SW Oregon Street and SW Tonquin Road intersection in Sherwood, Oregon. Based on the results of this TIA, the proposed Sherwood Commerce Center can be developed while maintaining acceptable levels of mobility at the study intersections, assuming provision of the recommended mitigation measures. Additional details of the operational analysis, findings, and recommendations are included herein.

## INTRODUCTION

The Applicant, Harsch Investment Properties, is proposing to construct up to 468,000 square-feet of industrial park as Phase 1 development of the subject property. The site is currently vacant and is bordered by SW Oregon St to the west, future industrial land uses to the east, SW Tonquin Road to the south, and a planned future east-west connector to the north, Ice Age Drive (connection from SW Oregon Street to SW 124<sup>th</sup> Avenue). Ice Age Drive will not be in place upon Phase 1 development, and therefore was not assumed for this analysis.

Figure 1 displays a site vicinity map and Figure 2 displays the proposed site plan. This traffic study analyzes the northern half (Phase 1) of the site including buildings A, B, and C. During Phase 1 of the development the site will be served initially by a single temporary access along SW Oregon Street on the north end of the site. Access will also be provided to a future roadway connection SW Tonquin Court (timeline unknown at the time of this report) to the south. The temporary northern driveway will be closed with the construction of a future east-west connector, Ice Age Drive (timeline unknown at the time of preparation of this report) and replaced by direct access to Ice Age Drive. A separate traffic land use application will be prepared for Phase 2.



Site Vicinity Map  
Sherwood, Oregon

Figure  
1

H:\2626314 - Sherwood Commerce Center\report\figs\26314 Figures.dwg Nov 23, 2021 - 4:48am - mruiz-leon Layout Tab: Site Vicinity Map





## Scope of Report

This study evaluates transportation conditions for the following scenarios:

- Year 2019 existing traffic conditions within the study area during the weekday AM and PM peak hours;
- Year 2022 background traffic conditions (without the proposed development) during the weekday AM and PM peak hours; and
- Year 2022 total traffic conditions (with full build-out of the proposed development) during the weekday AM and PM peak hours.

The following study intersections were identified in scoping discussions with the City of Sherwood:

- SW Langer Farms Parkway/SW Tualatin-Sherwood Road;
- SW Oregon Street/SW Tualatin-Sherwood Road;
- SW 124<sup>th</sup> Avenue/SW Tualatin-Sherwood Road;
- SW Oregon Street/SW Tualatin-Sherwood Road; and
- SW Oregon Street/SW Murdock Road.

*Appendix "A" contains the transportation scoping correspondence.*

## EXISTING CONDITIONS

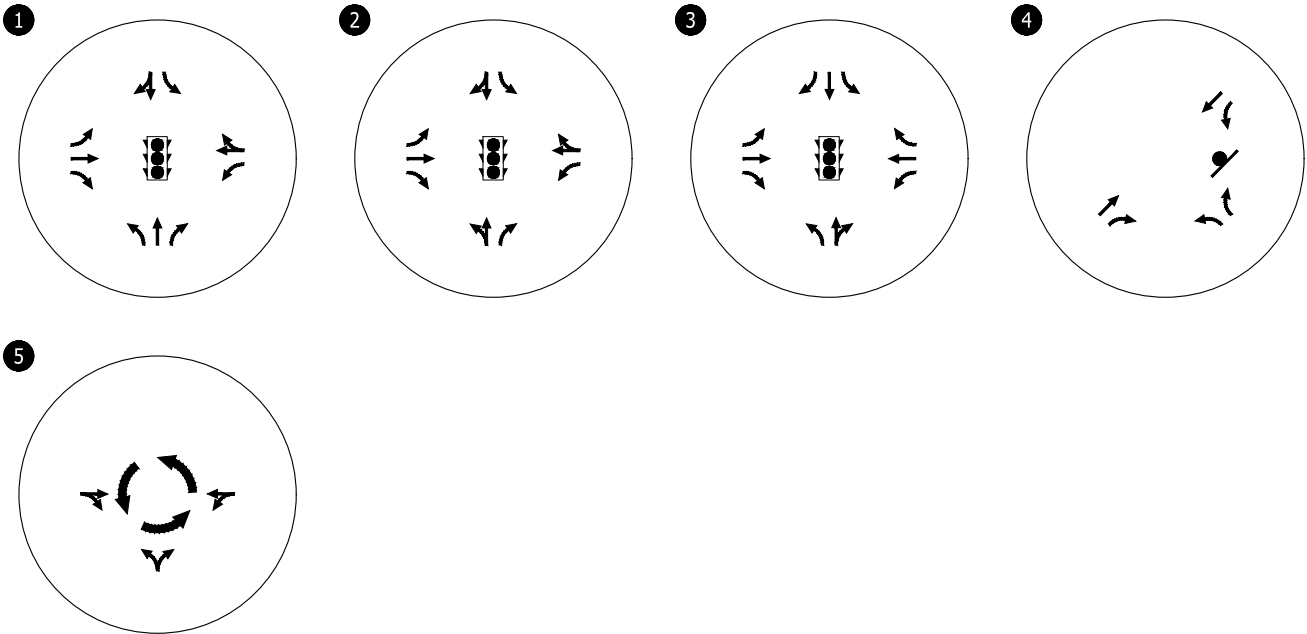
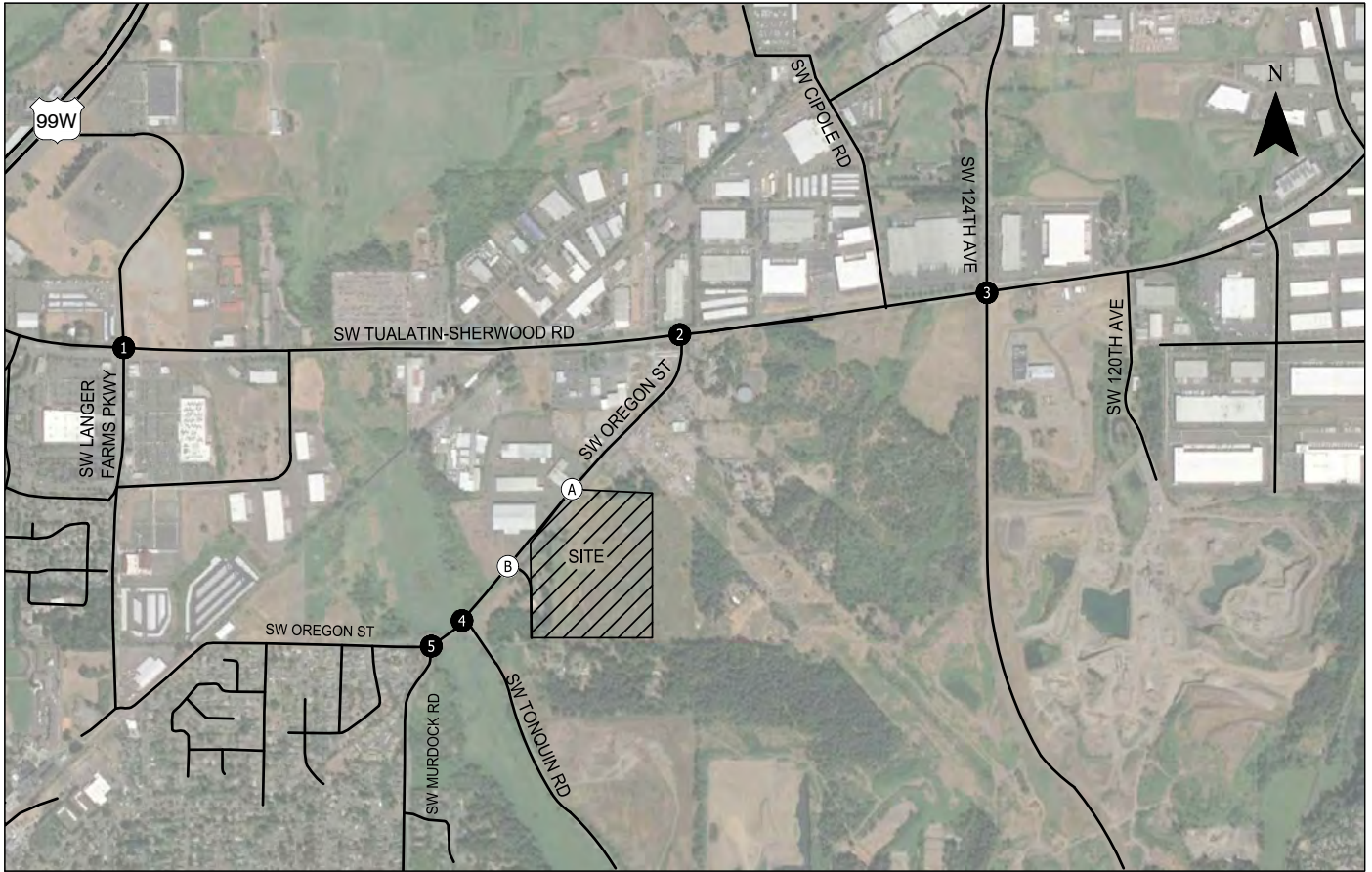
This section summarizes the existing characteristics of the transportation system and adjacent land uses in the vicinity of the proposed development, including an inventory of the existing multi-modal transportation facilities, an evaluation of existing intersection operations for motor vehicles at the study intersections, and a summary of recent crash history.

The site vicinity was visited and inventoried in February 2019. At that time, site conditions, adjacent land uses, existing traffic operations, and transportation facilities in the study area were collected. Figure 3 illustrates the existing lane configurations and traffic control devices at each of the study intersections. It should be emphasized that all observations and traffic counts were completed after the SW 124<sup>th</sup> Avenue extension became operational.

### Site Conditions and Adjacent Land Uses

The site is currently vacant and is bordered by SW Oregon St to the west, future industrial land uses to the east, SW Tonquin Road to the south, and a planned future east-west connector to the north, Ice Age Drive (connection from SW Oregon Street to SW 124<sup>th</sup> Avenue). Ice Age Drive will not be in place upon Phase 1 development, and therefore was not assumed for this analysis.





- Traffic Signal
- Lane Configuration
- Stop Sign
- Roundabout

Existing Lane Configurations & Traffic Control Devices  
 Sherwood, Oregon

Figure  
 3

H:\2626314 - Sherwood Commerce Center\report\figs\26314 Figures.dwg Nov 23, 2021 - 4:48am - mruiz-leon - Layout Tab: ELC&TC

## Transportation Facilities

Table 1 summarizes the existing attributes of the key transportation facilities in the study area.

**Table 1. Existing Transportation Facilities and Roadway Designations**

Roadway	Functional Classification	Number of Lanes	Posted Speed (mph)	Sidewalks?	Bicycle Lanes?	On-Street Parking?
SW Tualatin-Sherwood Road	Arterial <sup>1</sup>	3	45	Yes	Yes	No
SW Langer Farms Parkway	Collector <sup>1</sup>	3	25-30 <sup>2</sup>	Yes	No	No
SW Oregon Street	Arterial <sup>1</sup>	3	35	Partial <sup>3</sup>	Partial <sup>4</sup>	No
SW 124 <sup>th</sup> Avenue	Arterial <sup>1</sup>	2 - 5	45	Partial <sup>5</sup>	Partial <sup>6</sup>	No
SW Tonquin Road	Arterial <sup>1</sup>	2	45	No	No	No
SW Murdock Road	Arterial <sup>1</sup>	2	35	Partial <sup>7</sup>	No	Partial <sup>8</sup>

<sup>1</sup> Per City of Sherwood Transportation System Plan (Reference 1);

<sup>2</sup> Posted speed limit on SW Langer Farms Parkway is 30 mph north of SW Tualatin-Sherwood Road and 25 mph south of SW Tualatin-Sherwood Road;

<sup>3</sup> Sidewalk exists only on the west side of SW Oregon Street;

<sup>4</sup> A bike lane exists on SW Oregon Street from SW Murdock Road to approximately 800 feet south of SW Tualatin-Sherwood Road;

<sup>5</sup> Sidewalk exists on both sides of SW 124<sup>th</sup> Avenue, north of SW Tualatin-Sherwood Road. No sidewalk is provided south of SW Tualatin-Sherwood Road;

<sup>6</sup> Striped bicycle lanes are provided along SW 124<sup>th</sup> Avenue, north of SW Tualatin-Sherwood Road. South of SW Tualatin-Sherwood Road, 7-foot wide paved shoulders are available to cyclists;

<sup>7</sup> Sidewalk exists only on the west side of SW Murdock Road;

<sup>8</sup> On-street parking is provided on the west side of SW Murdock Road.

### Non-Motorized Facilities

As shown in Table 1, SW Tualatin-Sherwood Road and the west side of SW Oregon Street have sidewalks in the immediate site vicinity. Sidewalks are not provided on the east side of SW Oregon Street. Bicycle access within the study area is primarily provided with on-street bicycle lanes. SW Tualatin-Sherwood Road has buffered bicycle lanes. All signalized and roundabout study intersections have marked crosswalks.

### Transit Facilities

Local transit service is currently provided within the site vicinity by TriMet (Reference 2). TriMet Line 97 provides service between Sherwood and the Tualatin WES Station via SW Tualatin-Sherwood Road, Monday through Friday from 6:20 AM to 9:30 AM and 3:10 PM to 7:00 PM on 30-minute headways. Line 97 does not have scheduled service on Saturday or Sunday. Line 97 transit stops are located within 200 feet of the SW Tualatin-Sherwood Road / SW Oregon Street intersection, less than ½-mile from the site.

TriMet Line 93 provides service between Sherwood and the Tigard Transit Center via SW Sherwood Boulevard, SW Langer Drive, SW Baler Way, and SW Tualatin-Sherwood Road (west of SW Baler Way) Monday through Sunday from 4:30 AM to 1:00 AM on approximately 45-minute headways. The closest Line 93 transit stop is located approximately 1.4 miles west of the study site. TriMet Line 94 follows a similar route, with additional weekday express service from Sherwood and Tigard to Portland City Center.



### Traffic Safety

The reported crash history at the existing study intersections was reviewed to identify potential safety issues. Oregon Department of Transportation (ODOT) provided crash records for the study intersections for the five-year period from January 1, 2013 through December 31, 2017. Table 2 summarizes the reported crash data at the study intersections over the five-year period and shows the calculated crash rates per million entering vehicles for each study intersection. *Appendix “B” contains the crash data obtain from ODOT.*

**Table 2: Intersection Crash History (January 1, 2013 – December 31, 2017)**

#	Intersection	Collision Type				Severity			Total Crashes	Crash Rate (per MEV <sup>2</sup> )
		Rear-End	Turning	Angle	Other	PDO <sup>1</sup>	Injury	Fatal		
1	SW Langer Farms Parkway/ SW Tualatin-Sherwood Road	13	9	1	-	11	12	0	23	0.52
2	SW Oregon Street/ SW Tualatin-Sherwood Road	16	23	1	1	23	18	0	41	0.96
3	SW 124 <sup>th</sup> Avenue/SW Tualatin-Sherwood Road	28	3	-	1	12	20	0	32	0.82 <sup>3</sup>
4	SW Oregon Street/ SW Tonquin Road	1	3	-	-	3	1	0	4	0.18
5	SW Oregon Street/ SW Murdock Road	1	-	-	-	1	0	0	1	0.05

<sup>1</sup> PDO = Property Damage Only

<sup>2</sup> MEV = Million Entering Vehicles, calculated using 2019 PM peak hour volumes

<sup>3</sup> MEV calculation for SW 124<sup>th</sup> Avenue / SW Tualatin-Sherwood road intersection does not include counted vehicles to/from the south leg, as that approach opened to traffic in late 2018, and is therefore not represented in crash data.

Table 3 provides a comparison between the calculated crash rates for each intersection and the published 90<sup>th</sup> percentile crash rates from the *Assessment of Statewide Intersection Safety Performance* (Reference 3) per ODOT methodology as described in the *Analysis Procedure Manual* (Reference 4).

**Table 3: Intersection Crash Rate Assessment**

#	Intersection	Total Crashes	90 <sup>th</sup> Percentile Crash Rate	Observed Crash Rate at Intersection	Observed Crash Rate > 90 <sup>th</sup> Percentile Crash Rate?
1	SW Langer Farms Parkway/SW Tualatin-Sherwood Road	23	0.86	0.52	No
2	SW Oregon Street/SW Tualatin-Sherwood Road	41	0.86	0.96	Yes
3	SW 124 <sup>th</sup> Avenue/SW Tualatin-Sherwood Road <sup>1</sup>	32	0.509 <sup>1</sup>	0.82	Yes
4	SW Oregon Street/ SW Tonquin Road	4	0.293	0.18	No
5	SW Oregon Street/ SW Murdock Road	1	0.509 <sup>2</sup>	0.05	No

<sup>1</sup>Compared to 3-leg signalized intersection rate.

<sup>2</sup>3-leg roundabout rates not published, therefore comparing to 3-leg signalized intersection rate.

As highlighted in Table 3, the observed crash rate exceeds the applicable 90<sup>th</sup> percentile crash rate at the following study intersections:

- SW Oregon Street/SW Tualatin-Sherwood Road
- SW 124<sup>th</sup> Avenue/SW Tualatin-Sherwood Road

### ***SW Oregon Street/SW Tualatin-Sherwood Road***

Of the 41 reported crashes at this intersection, 16 were rear-end crashes and 23 involved turning movement crashes (left-turns on the mainline and turn movements from the minor street approach).

The SW Oregon Street/SW Tualatin-Sherwood Road intersection currently operates permitted-only northbound and southbound left-turn movements. The eastbound/westbound left-turn movements are permitted-protected and incorporate Flashing Yellow Arrow (FYA) operations on the mainline street of SW Tualatin-Sherwood Road. Implementation of the Washington County project to widen SW Tualatin-Sherwood Road from three to five lanes is expected to provide additional throughput capacity and the flexibility to re-evaluate the signal timing to enable left-turning vehicles with longer green times. As such, no development related mitigation measures are recommended.

### ***SW 124<sup>th</sup> Avenue/SW Tualatin-Sherwood Road***

A fourth (northbound) approach was added to the SW 124<sup>th</sup> Avenue/SW Tualatin-Sherwood Road intersection in late 2018 as well as additional intersection modifications such as permitted-protected left-turn movements with FYA left-turn for all approaches. These improvements are not reflected in the most recent 5-year crash data analyzed above. These improvements along with the SW Tualatin Road widening are expected to address the existing crash patterns. As such, no development related mitigation measures are recommended.

### ***ODOT and Washington County SPIS Review***

ODOT and Washington County maintain Safety Priority Index System (SPIS) lists to identify existing hazardous intersections for potential safety improvements. The SPIS lists consider the crash data for the 3 prior years. The ODOT-published 2017 Washington County SPIS list (Reference 5) and the Washington County maintained 2014-2016 SPIS list (Reference 6) were reviewed to determine if any study intersections were identified as having an SPIS score in the top 10 percent and ranking amongst other projects. The SPIS score is calculated based on three factors:

- Frequency of crashes (25% of the SPIS score)
- Rate of crashes (25% of the SPIS score)
- Severity of crashes (50% of the SPIS score)

#### ***ODOT Published 2017 Washington County SPIS List***

No study intersections were identified on the ODOT published Washington County SPIS list.

#### ***Washington County SPIS List 2014-2016***

Three study intersections are identified on the Washington County maintained SPIS 2014-2016 list, with ranking and SPIS scores as follows:



- SW 124<sup>th</sup> Avenue and SW Tualatin-Sherwood Road is ranked 20<sup>th</sup> on the list, with an SPIS score of 78.3 out of 100;
- SW Oregon Street and SW Tualatin-Sherwood Road is ranked 30<sup>th</sup> on the list, with an SPIS score of 75.7 out of 100; and,
- SW Langer Farms Parkway and SW Tualatin-Sherwood Road is ranked 146<sup>th</sup> on the list, with an SPIS score of 42.0 out of 100.

As stated previously, the two intersections identified with observed crash rates greater than the ODOT 90<sup>th</sup> percentile crash rates and the three intersections identified on the Washington County SPIS list will be impacted by Washington County's planned widening of SW Tualatin-Sherwood Road from three lanes to five lanes, which will add capacity to the corridor and provide Washington County with an opportunity for incorporating design elements to improve safety.

### Traffic Operations Analysis Methodology

All level-of-service analyses described in this report were performed in accordance with the procedures stated in the *2000 Highway Capacity Manual* (HCM) (Reference 7). The peak 15-minute flow rates were used in the evaluation of all intersection level-of-service (LOS) and volume-to-capacity (V/C) ratios. For this reason, the analyses reflect conditions that are only likely to occur for the peak 15 minutes out of each average peak hour. Traffic conditions during non-peak weekday hours are expected to operate with lower levels of delay than those described in this report. The signalized and stop-controlled intersection operations analyses presented in this report were completed using Synchro 10 software. The roundabout intersection operations analyses were completed using SIDRA 7 software, based on the procedures stated in the *Highway Capacity Manual, 6th Edition* (HCM 6th Ed., Reference 8).

### Traffic Operating Standards

Per Section 8 of Sherwood's 2014 Transportation System Plan (TSP, Reference 1), "The City target for signalized, all way stop (AWSC), or roundabout intersections is level of service D or volume to capacity ratio equal to or less than 0.85. The target for unsignalized two way stop control (TWSC) intersections is level of service E or a volume to capacity ratio equal to or less than 0.90."

For those streets owned by Washington County or city-owned streets that are labeled on the Arterial and Throughway Network Map of Metro's 2014 Regional Transportation Plan (Reference 9), a Regional 0.99 volume to capacity (V/C) operating standard applies. The Arterial and Throughway Network Map identifies SW Tualatin-Sherwood Road as a Major Arterial and SW Oregon Street as a Minor Arterial. As all existing study intersections are along SW Tualatin-Sherwood Road or SW Oregon Street, the 0.99 V/C operating standard will be used.

### Existing Traffic Operations

Given current impacts to travel patterns due to the COVID-19 pandemic, previously collected traffic counts were used in this analysis and assumed to represent reasonable pre-COVID-19 weekday traffic volumes. The volumes were collected in February 2019 and no further COVID-19 related adjustments were applied per direction of City of Sherwood engineering staff. The February 2019 volumes were collected when local area schools were in session and after the new extension of SW 124<sup>th</sup> Avenue was operational. All the weekday counts were conducted on a typical mid-week day during the morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak time periods. From the counts, the weekday AM peak hour was found to occur from 7:20 to 8:20 AM and the PM peak hour occurs from 4:45 to 5:45 PM. *Appendix “C” contains the February 2019 traffic count worksheets.*

Table 4, Figure 4, and Figure 5 summarize the operational analysis for the study intersections under existing traffic conditions for the weekday AM and PM peak hours. As shown, all study intersections currently operate at acceptable levels and meet the jurisdictional mobility standards. However, as observed in the field, and reported within the queuing outputs in the Synchro worksheets, vehicle queuing is prevalent in the east-west directions along the SW Tualatin-Sherwood Road corridor during both AM and PM peak hours indicating oversaturated conditions.

*Appendix “D” contains the year 2019 existing traffic level-of-service and queuing worksheets.*

**Table 4: Existing Conditions Operational Analysis Results**

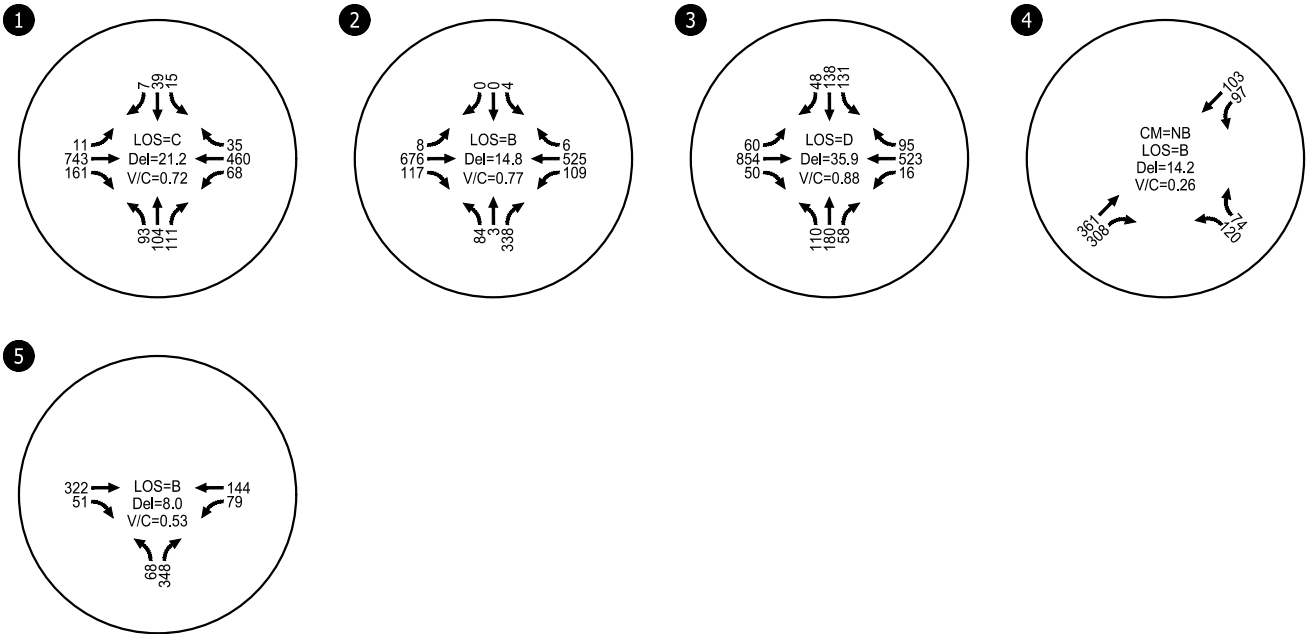
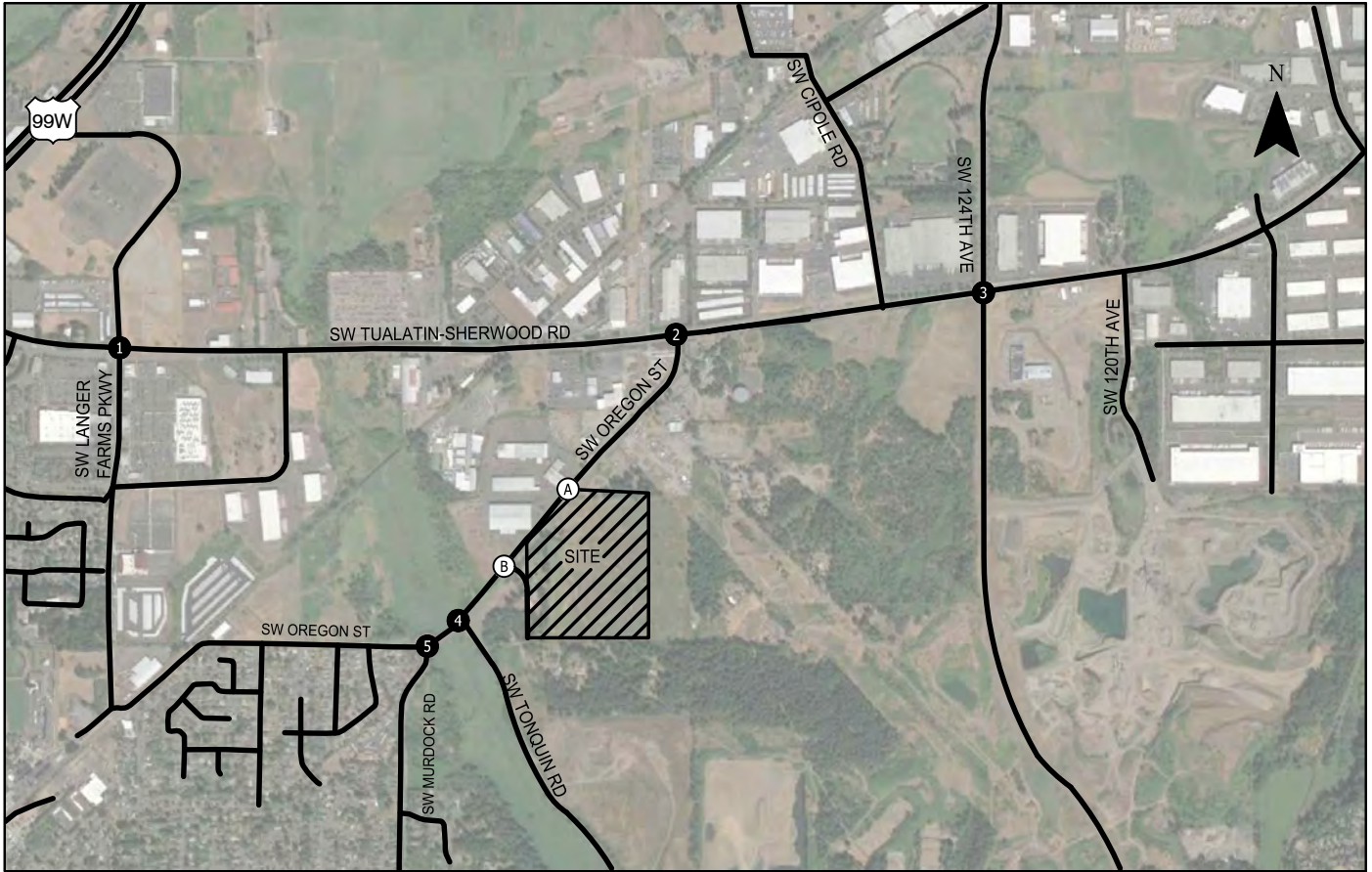
#	Intersection	LOS <sup>1</sup>		V/C <sup>2</sup>		Jurisdiction <sup>3</sup>	Standard	Met?
		AM	PM	AM	PM			
1	SW Langer Farms Parkway/SW Tualatin-Sherwood Road	C (21.2)	C (26.1)	0.72	0.82	Regional	V/C of 0.99	Yes
2	SW Oregon Street/SW Tualatin-Sherwood Road	B (14.8)	C (28.2)	0.77	0.96	Regional	V/C of 0.99	Yes
3	SW 124 <sup>th</sup> Avenue/SW Tualatin-Sherwood Road	D (35.9)	C (27.7)	0.88	0.71	Regional	V/C of 0.99	Yes
4	SW Oregon Street/ SW Tonquin Road	B (14.2)	E (46.2)	0.26	0.85 (NB)	Regional	V/C of 0.99	Yes
5	SW Oregon Street/ SW Murdock Road	A (8.0)	A (8.7)	0.53	0.62	Regional	V/C of 0.99	Yes

<sup>1</sup> HCM 2000 Level-of-Service and average delay per vehicle in seconds (signalized) or critical movement delay (TWSC), HCM 6<sup>th</sup> Ed. Level-of-Service and average delay per vehicle in seconds (roundabout);

<sup>2</sup> HCM 2000 Volume-to-Capacity ratio. For TWSC intersections, the critical movement is shown in parenthesis;

<sup>3</sup> Regional jurisdiction is governed by the Regional Transportation Functional Plan (RTFP);



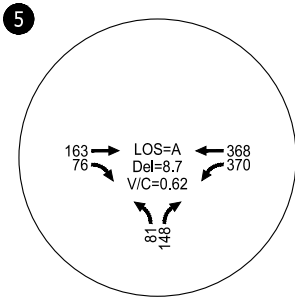
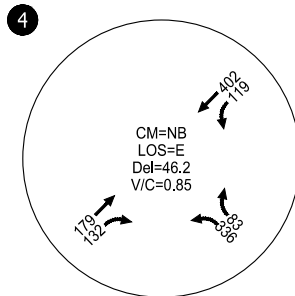
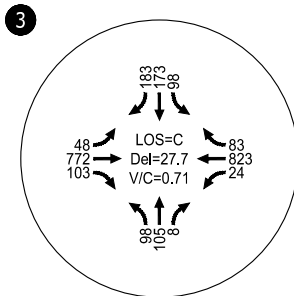
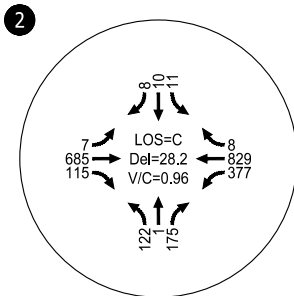
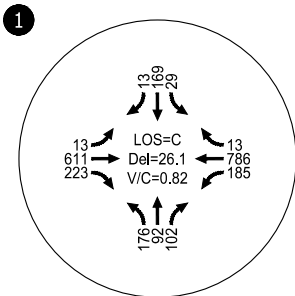


CM = Critical Movement (Unsignalized)  
 LOS = Intersection Level of Service (Signalized) / Critical Movement Level of Service (Unsignalized)  
 Del = Intersection Average Control Delay (Signalized) / Critical Movement Control Delay (Unsignalized)  
 V/C = Volume-to-Capacity Ratio

Existing Year 2019 Traffic Operations  
 Weekday AM Peak Hour  
 Sherwood, Oregon

Figure 4

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Existing Year 2019 Traffic Operations  
Weekday PM Peak Hour  
Sherwood, Oregon

Figure  
5

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## TRAFFIC IMPACT ANALYSIS

The future conditions analysis identifies how the transportation facilities within the study area will operate in the proposed project completion year of 2022. The following elements were analyzed to account for the impacts of the proposed development:

- Year 2022 background traffic conditions (without the proposed development) during the weekday AM and PM peak hours;
- Trips generated by the proposed development and assigned to the street network; and
- Year 2022 total traffic conditions (with full build-out of the proposed development) during the weekday AM and PM peak hours.

### Year 2022 Background Traffic Conditions

The year 2022 background traffic conditions analysis identifies how the study area's transportation system will operate during the buildout year of the development without the proposed development traffic volumes. This analysis includes trips from traffic attributed to general growth in the region (application of a 1.5 percent annual growth rate) and approved in-process developments, but does not include traffic from the proposed development. As such, the background traffic volumes represent a 1.5-percent annual growth for three years (2019 to 2022).

In-process trips from the following developments were also included in the background traffic volumes:

- Parkway Village South (SW Langer Farms Parkway)
- Spring Creek Industrial
- Four-S Corporate Warehouse
- IPT Tualatin
- Majestic SW 115<sup>th</sup> Avenue Industrial Park
- Hedges C Building
- Tualatin Business Park
- T-S Corporate Park

There is a planned future east-west connector to the north of the site, which will ultimately connect SW Oregon Street to SW 124<sup>th</sup> Avenue (Ice Age Drive). Ice Age Drive will not be in place upon Phase 1 development, and therefore was not assumed for this analysis.

The future year analyses assume the re-coordination of the traffic signals in the SW Tualatin-Sherwood Road corridor at the SW 124<sup>th</sup> Avenue intersection. While existing signal timing parameters provided by Washington County show that during the AM peak hour, the SW 124<sup>th</sup> Avenue signals operate with a coordinated 120 second cycle length, the future year analysis assumed that the signal would be coordinated with 150 second cycle length during the AM peak, accounting for the addition of the northbound approach at the SW 124<sup>th</sup> Avenue intersection and regional growth. No cycle length changes were assumed in the future year PM peak hour analysis, as Washington County recently implemented

changes at the Tualatin-Sherwood Road/SW 124<sup>th</sup> Avenue intersection, such that the intersection now operates as a fully actuated, uncoordinated signal, with AutoMax enabled during the PM peak hour. The coordination offset for the other coordinated signals was optimized to account for future traffic patterns.

Table 5, and Figures 6 and 7 summarize the operational analysis for the study intersections under the weekday AM and PM peak hour background 2022 traffic conditions. As indicated in Table 5, all study intersections are forecast to operate at levels which meet the jurisdictional mobility standards during both weekday AM and PM peak hours, except:

- The SW Oregon Street / SW Tualatin-Sherwood Road intersection is forecast to operate with a volume to capacity ratio greater than 1.0 during the PM peak hour.
- The SW 124<sup>th</sup> Avenue / SW Tualatin-Sherwood Road intersection is forecast to operate with a volume to capacity ratio greater than 1.0 during the AM peak hour.
- The SW Oregon Street / SW Tonquin Road intersection is forecast to operate with a volume to capacity ratio greater than 1.0 during the PM peak hour.

However, when SW Tualatin-Sherwood Road is widened to five lanes by year 2025, the SW Oregon Street / SW Tualatin-Sherwood Road and SW 124<sup>th</sup> Avenue / SW Tualatin-Sherwood Road intersections will meet jurisdictional operating standards. *Appendix “E” contains the year 2022 background traffic level-of-service worksheets, including Figures E-1 and E-2 detailing the in-process trips.*

**Table 5: Year 2022 Background Conditions Operational Analysis Results**

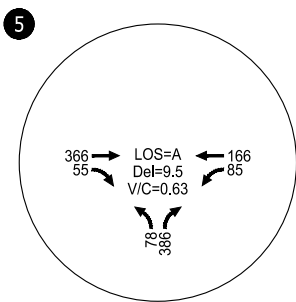
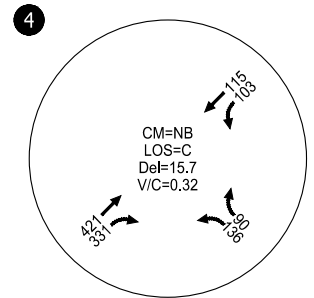
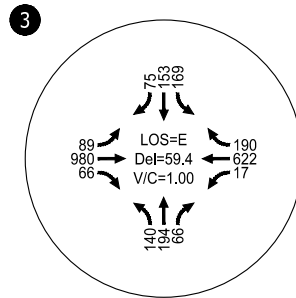
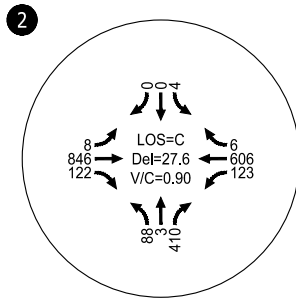
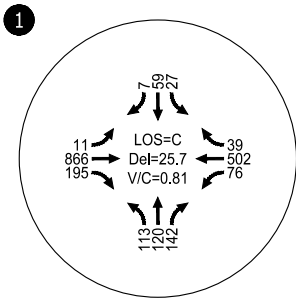
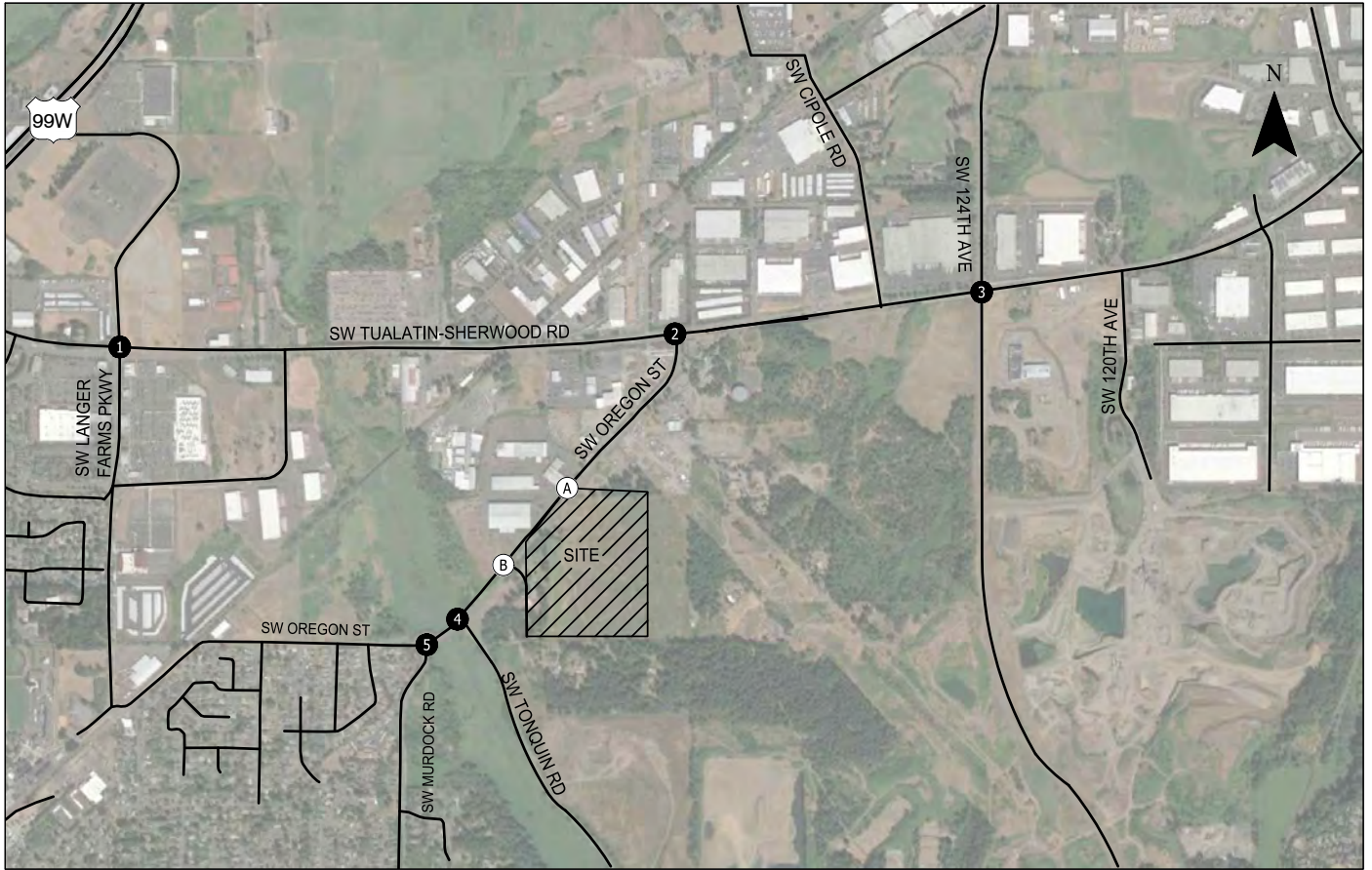
#	Intersection	LOS <sup>1</sup>		V/C <sup>2</sup>		Jurisdiction <sup>3</sup>	Operating Standard	Standard Met?
		AM	PM	AM	PM			
1	SW Langer Farms Parkway/SW Tualatin-Sherwood Road	C (25.7)	D (35.0)	0.81	0.95	Regional	V/C of 0.99	Yes
2	SW Oregon Street/SW Tualatin-Sherwood Road	C (27.6)	D (51.7)	0.90	<b>1.19</b>	Regional	V/C of 0.99	<b>No</b>
3	SW 124 <sup>th</sup> Avenue/SW Tualatin-Sherwood Road	E (59.4)	D (39.8)	<b>1.00</b>	0.87	Regional	V/C of 0.99	<b>No</b>
4	SW Oregon Street/ SW Tonquin Road	C (NB) (15.7)	F (NB) (95.6)	0.32	<b>1.06</b>	Regional	V/C of 0.99	<b>No</b>
5	SW Oregon Street/ SW Murdock Road	A (9.5)	B (10.4)	0.63	0.70	Regional	V/C of 0.99	Yes

<sup>1</sup> HCM 2000 Level-of-Service and average delay per vehicle in seconds (signalized) or critical movement delay (TWSC), HCM 6<sup>th</sup> Ed. Level-of-Service and average delay per vehicle in seconds (roundabout);

<sup>2</sup> HCM 2000 Volume-to-Capacity ratio. For TWSC intersections, the critical movement is shown in parenthesis;

<sup>3</sup> Regional jurisdiction is governed by the Regional Transportation Functional Plan (RTFP).



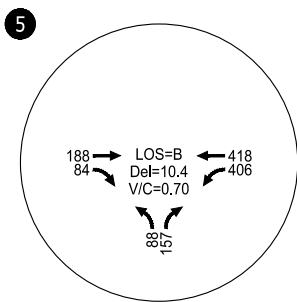
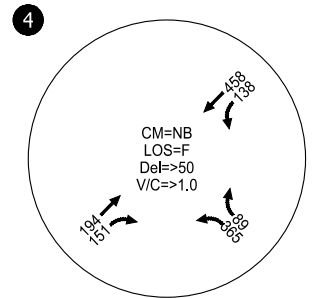
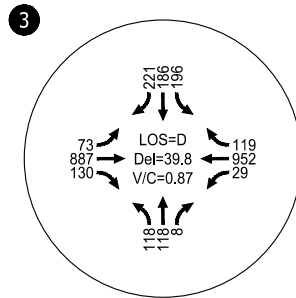
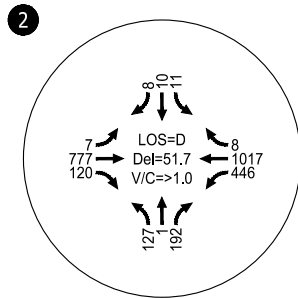
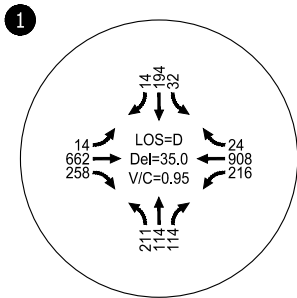
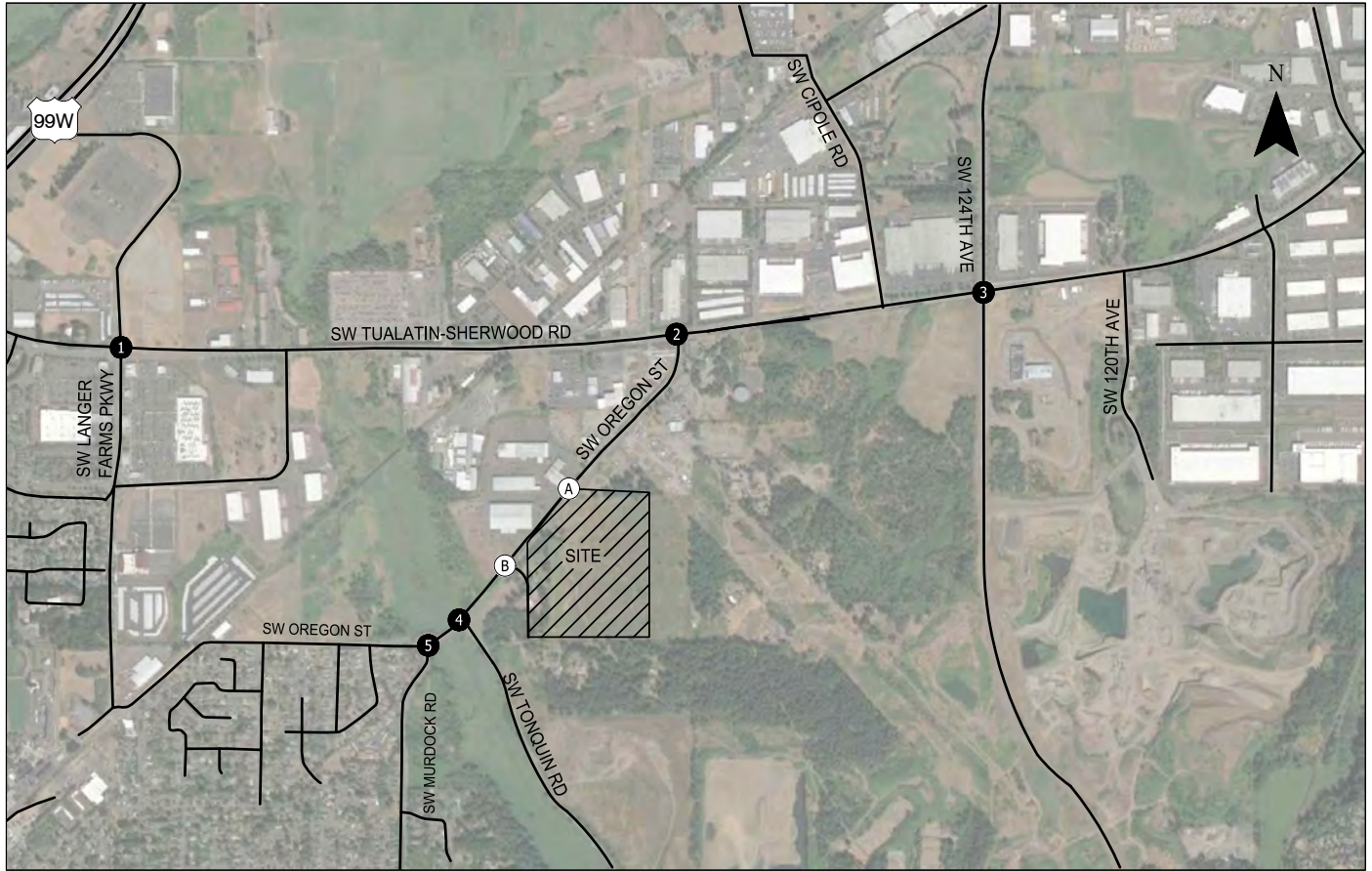


CM = Critical Movement (Unsignalized)  
 LOS = Intersection Level of Service (Signalized) / Critical Movement Level of Service (Unsignalized)  
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 V/C = Volume-to-Capacity Ratio

Year 2022 Background Traffic Operations  
 Weekday AM Peak Hour  
 Sherwood, Oregon

Figure  
 6

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CM = Critical Movement (Unsignalized)  
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Year 2022 Background Traffic Operations  
 Weekday PM Peak Hour  
 Sherwood, Oregon

Figure  
 7



**Proposed Development Plan**

The proposed development consists of up to 468,000 square-feet of industrial park as part of Phase 1 development including Buildings A, B and C. During Phase 1 of the development the site will be served initially by a single temporary access along SW Oregon Street on the north end of the site. Access will also be provided to a future roadway connection SW Tonquin Court (timeline unknown at the time of this report) to the south. The temporary northern driveway will be closed with the construction of a future east-west connector, Ice Age Drive (timeline unknown at the time of preparation of this report) and replaced by direct access to Ice Age Drive.

**Trip Generation**

A trip generation estimate for the proposed development was prepared based on the Institute of Transportation Engineers’ (ITE) *Trip Generation Manual*, 10<sup>th</sup> Edition (Reference 10). Table 6 displays the anticipated trip generation for the proposed site.

**Table 6. Preliminary Trip Generation Estimate**

Land Use Category	ITE Code	Size (SF)	Total Daily Trips	Weekday AM Peak Hour			Weekday PM Peak Hour		
				Total	In	Out	Total	In	Out
Industrial Park	130	468,000	1,577	187	151	36	187	39	148

**Trip Distribution**

Based on a review of general traffic patterns in the region, the proposed land use and external site access patterns, and prior history of our firm’s involvement on other development projects in the City of Sherwood, the following site trip distribution was utilized:

- 25 percent to/from the west via SW Tualatin-Sherwood Road,
- 40 percent to/from the east via SW Tualatin-Sherwood Road,
- 15 percent to/from the southeast via SW Tonquin Road,
- 5 percent to/from the south via SW Murdock Road,
- 15 percent to/from the southwest via SW Oregon Street.

The trip distribution percentages and trip assignment patterns are shown in Figure 8 and 9.

Site truck traffic percentage and distribution was estimated by review of the nearby industrial development driveway counts heavy vehicle percentage and turning movement counts collected at the NE 115<sup>th</sup> Avenue / SW Tualatin-Sherwood Road intersection. It was estimated that 13 percent of the proposed development traffic would be heavy vehicles during the AM peak hour and 8 percent would be heavy vehicles during the PM peak hour. The east/west directional distribution of heavy vehicles at the NE 115<sup>th</sup> Avenue / SW Tualatin-Sherwood Road intersection was generally even, therefore the heavy percentages listed above were applied evenly to each movement to and from the study site.







### Year 2022 Total Traffic Conditions

The total traffic conditions analysis identifies how the study area’s transportation system will operate with the proposed development trips added to the background traffic volumes. Similar to the background year 2022 analysis, this analysis also assumed that Ice Age Drive is not in place.

Addition of the site generated trips shown in Figure 8 and 9 to the background 2022 volumes in Figure 6 and 7 results in the operational characteristics presented in Table 7 and shown in Figure 10 and 11. *Appendix “F” contains the year 2022 Total Traffic level-of-service worksheets.*

**Table 7: Year 2022 Total Traffic Conditions Operational Analysis Results**

#	Intersection	LOS <sup>1</sup>		V/C <sup>2</sup>		Jurisdiction <sup>3</sup>	Operating Standard	Standard Met?
		AM	PM	AM	PM			
1	SW Langer Farms Parkway/SW Tualatin-Sherwood Road	C (26.9)	D (37.3)	0.83	0.96	Regional	V/C of 0.99	Yes
2	SW Oregon Street/SW Tualatin-Sherwood Road	C (24.8)	E (69.7)	0.93	<b>1.31</b>	Regional	V/C of 0.99	<b>No</b>
3	SW 124 <sup>th</sup> Avenue/SW Tualatin-Sherwood Road	E (60.9)	D (42.3)	<b>1.01</b>	0.88	Regional	V/C of 0.99	<b>No</b>
4	SW Oregon Street/ SW Tonquin Road	C (16.4)	F (139.3)	0.33 (NB)	<b>1.17 (NB)</b>	Regional	V/C of 0.99	<b>No</b>
5	SW Oregon Street/ SW Murdock Road	B (10.1)	B (11.1)	0.65	0.72	Regional	V/C of 0.99	Yes
A	SW Oregon Street / Northern Site Access	B (13.0)	B (11.6)	0.05	0.14	Regional	V/C of 0.99	Yes
B	SW Oregon Street / SW Tonquin Court	B (13.1)	B (12.7)	0.04	0.13	Regional	V/C of 0.99	Yes

<sup>1</sup> HCM 2000 Level-of-Service and average delay per vehicle in seconds (signalized) or critical movement delay (TWSC), HCM 6<sup>th</sup> Ed. Level-of-Service and average delay per vehicle in seconds (roundabout);

<sup>2</sup> HCM 2000 Volume-to-Capacity ratio. For TWSC intersections, the critical movement is shown in parenthesis;

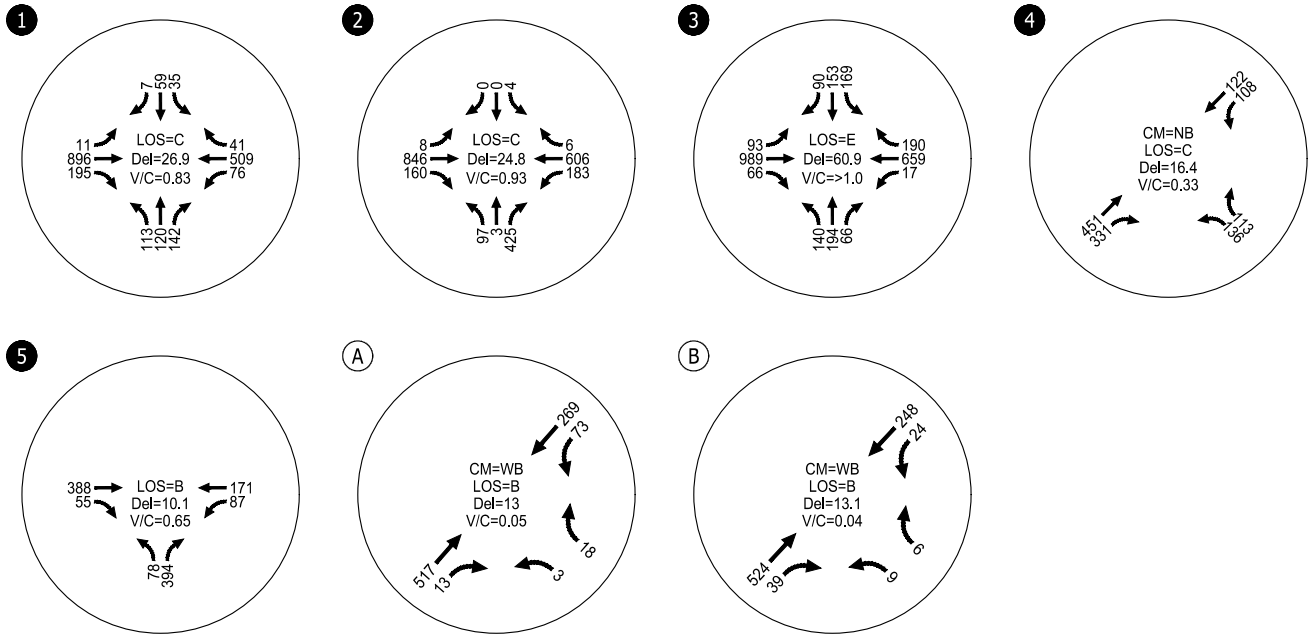
<sup>3</sup> Regional jurisdiction is governed by the Regional Transportation Functional Plan (RTFP).

As indicated in Tables 5 and 7, the SW Oregon Street / SW Tualatin-Sherwood Road and SW 124<sup>th</sup> Avenue/ SW Tualatin-Sherwood Road intersections v/c ratios are anticipated to exceed the jurisdictional operating standard during the PM peak hour, in year 2022 background conditions and with site development.

There is a planned and funded widening of SW Tualatin-Sherwood Road to five lanes, as identified as Project #318 in the Washington County Major Streets Transportation Improvement Program (MSTIP) 3e (Reference 11). A future year 2025 analysis that was carried out indicates the SW Oregon Street / SW Tualatin-Sherwood Road and SW 124<sup>th</sup> Avenue/ SW Tualatin-Sherwood Road intersections will meet jurisdictional operating standards after the SW Tualatin-Sherwood Road widening. *Appendix “G” contains the year 2025 Total Traffic level-of-service worksheets.* The future year 2025 analysis volumes on SW Tualatin-Sherwood Road and SW 124<sup>th</sup> Avenue were increased an additional 5 percent on top of regional growth, to account for increased future demand.

Additionally, as highlighted in Table 7, the SW Oregon Street / SW Tonquin Road TWSC intersection v/c ratio is anticipated to exceed the jurisdictional operating standard during the PM peak hour with site development.



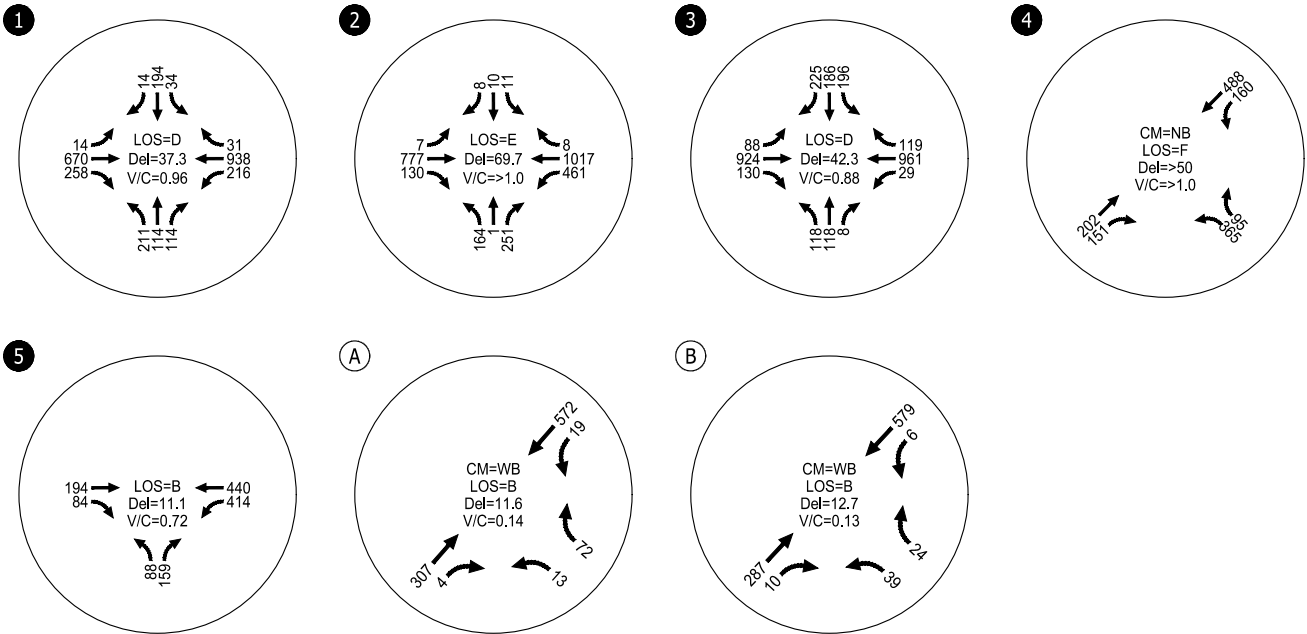


CM = Critical Movement (Unsignalized)  
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 V/C = Volume-to-Capacity Ratio

Year 2022 Total Traffic Operations  
 Weekday AM Peak Hour  
 Sherwood, Oregon

Figure  
 10

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CM = Critical Movement (Unsignalized)  
 LOS = Intersection Level of Service (Signalized) / Critical Movement Level of Service (Unsignalized)  
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Year 2022 Total Traffic Conditions  
 Weekday PM Peak Hour  
 Sherwood, Oregon

Figure  
 11

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**Year 2022 Total Traffic - Mitigation**

The City of Sherwood TSP and Five Year Capital Improvement Plan (CIP, Reference 13) identify the reconstruction of the SW Oregon Street / SW Tonquin Road intersection as a roundabout as a “short-term” improvement. Additionally, Washington County’s Transportation Development Tax (TDT) Road Project List (Reference 14) identifies the reconstruction of the SW Oregon Street / SW Tonquin Road intersection as a roundabout in the 2014 - 2024 timeframe.

However, as the timeframe and funding of the project is unclear, mitigation of the SW Oregon Street / SW Tonquin Road intersection with either the installation of a traffic signal or roundabout was investigated. As summarized in Table 8, the SW Oregon Street / SW Tonquin Road intersection can meet the jurisdictional operating standards as a signalized or roundabout intersection. *Appendix “H” contains the year 2022 total traffic conditions mitigation service worksheets for the Oregon/Tonquin Road intersection.*

**Table 8: Year 2022 Total Traffic Conditions – Mitigation Operational Analysis Results**

#	Intersection	LOS <sup>1</sup>		V/C <sup>2</sup>		Jurisdiction <sup>3</sup>	Operating Standard	Standard Met?
		AM	PM	AM	PM			
4	SW Oregon Street/ SW Tonquin Road (signal)	A (8.3)	B (10.7)	0.58	0.73	Regional	V/C of 0.99	Yes
4	SW Oregon Street/ SW Tonquin Road (roundabout)	A (3.0)	C (16.3)	0.62	0.90	Regional	V/C of 0.99	Yes

<sup>1</sup> HCM 2000 Level-of-Service and average delay per vehicle in seconds (signalized) or HCM 6<sup>th</sup> Ed. Level-of-Service and average delay per vehicle in seconds (roundabout);

<sup>2</sup> HCM 2000 Volume-to-Capacity ratio (signalized) or HCM 6<sup>th</sup> Ed. Volume-to-Capacity ratio (roundabout);

<sup>3</sup> Regional jurisdiction is governed by the Regional Transportation Functional Plan (RTFP).

**Site Traffic Impact at SW Oregon Street/SW Tonquin Road Intersection**

As the SW Oregon Street / SW Tonquin Road TWSC intersection v/c ratio is anticipated to exceed the jurisdictional operating standard during the PM peak hour in year 2022 with or without site development, this section summarizes the proposed development’s relative impact and influence at the intersection, to inform mitigation proportionality discussions.

The percentage of site traffic impact was calculated to show how much of the projected future total traffic at the intersection is attributable to the proposed site development. Table 9 summarizes the estimated number of site trips added, as compared to the future volumes entering at the intersection, and provides an estimate of resulting percentage traffic impact.

**Table 9: Estimated Percentage of Site Traffic Impact - SW Oregon Street / SW Tonquin Road Intersection**

#	Intersection	Site Trips Added to Intersection		Intersection Total Entering Trips <sup>1</sup>		Percentage Site Traffic Impact	
		AM	PM	AM	PM	AM	PM
4	SW Oregon Street/ SW Tonquin Road	65	66	1261	1461	5.15%	4.52%

<sup>1</sup>Year 2022 Total Traffic intersection peak hour volumes;

As shown in the table above, the estimated site traffic impact at the intersection ranges from 4.52% during the PM peak hour to 5.15% during the AM peak hour.

### Vehicle Queuing Analysis

A 95<sup>th</sup>-percentile vehicle queuing analysis was completed under the future build-out year 2022. For the SimTraffic analysis, four 15-minute periods were recorded, with the second period representative of the peak 15-minute period, with the report results averaging five runs. *Appendix “I” contains the Year 2022 Total Traffic SimTraffic worksheets.*

**Table 10: Year 2022 Total Traffic Conditions – SimTraffic 95<sup>th</sup> Percentile Queue Summary**

Intersection	Scenario		Eastbound			Westbound			Northbound			Southbound		
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
SW Oregon Street / SW Tualatin-Sherwood Road		Storage (feet)	250 <sup>1</sup>	2000	95	350 <sup>1</sup>	1075	-	-	200 <sup>2</sup>	200 <sup>2</sup>	75	-	-
	Total Traffic Conditions	AM Queue	18	415	161	325	764	-	-	<b>205</b>	<b>417</b>	31	-	-
		PM Queue	52	593	<b>179</b>	<b>446</b>	<b>1473</b>	-	-	<b>261</b>	<b>482</b>	28	-	-
SW 124 <sup>th</sup> Avenue / SW Tualatin-Sherwood Road		Storage (feet)	360 <sup>1</sup>	790	350	375	1180	375	460	1000	-	240 <sup>3</sup>	730	250
	Total Traffic Conditions	AM Queue	115	<b>1054</b>	314	73	529	282	263	359	-	<b>314</b>	494	131
		PM Queue	129	<b>1483</b>	<b>456</b>	228	<b>1962</b>	<b>463</b>	185	176	-	239	208	190

Notes:

95<sup>th</sup> percentile queue lengths are reported in feet and have been rounded up to the nearest car length, assuming one vehicle equals 25 feet;

**Bold** and highlighted cells indicate 95<sup>th</sup> percentile queue lengths greater than the storage length;

<sup>1</sup>Storage measured as the length of white gore stripe for turn lane, additional queue storage available in striped median;

<sup>2</sup>Northbound thru and right turn storage measured to first intersection to the south (SW Dahlke Lane), additional storage available to the south of the intersection;

<sup>3</sup>Storage measured as the length of white gore stripe for turn lane, additional queue storage available in left-most southbound through lane, as only the right southbound through lane continues through the intersection;

As shown in Table 10, under year 2022 total traffic conditions, some 95<sup>th</sup> percentile queues exceed the existing or assumed lane storage capacities. For instance, eastbound SW Tualatin-Sherwood Road through lane queues may extend to adjacent intersections during the AM peak hour and westbound through lane queues may extend to adjacent intersections during the PM peak hour. However, a future year 2025 analysis that was carried out indicates the storage at SW Oregon Street / SW Tualatin-Sherwood Road and SW 124<sup>th</sup> Avenue/ SW Tualatin-Sherwood Road intersections will meet future demand after the planned SW Tualatin-Sherwood Road widening to five lanes. *Appendix “G” contains the Year 2025 Total Traffic SimTraffic worksheets.*



**Table 11: Year 2025 Total Traffic Conditions – SimTraffic 95th Percentile Queue Summary**

Intersection	Scenario		Eastbound			Westbound			Northbound			Southbound		
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
SW Oregon Street / SW Tualatin-Sherwood Road		Storage (feet)	250 <sup>1</sup>	2000	200	350 <sup>1</sup>	1075	1075	200 <sup>2</sup>	200 <sup>2</sup>	-	75	75	-
	Total Traffic Conditions	AM Queue	25	239	122	164	214	225	141	<b>233</b>	-	31	0	-
		PM Queue	53	300	173	305	313	303	<b>274</b>	121	-	37	45	-
SW 124 <sup>th</sup> Avenue / SW Tualatin-Sherwood Road		Storage (feet)	250 <sup>1</sup>	790	375	375	1180	375	300	1000	-	240 <sup>3</sup>	730	-
	Total Traffic Conditions	AM Queue	140	354	110	106	416	113	145	232	-	<b>333</b>	287	-
		PM Queue	90	296	96	83	279	79	130	126	-	228	237	-

Notes:

95<sup>th</sup> percentile queue lengths are reported in feet and have been rounded up to the nearest car length, assuming one vehicle equals 25 feet;

**Bold** and highlighted cells indicate 95<sup>th</sup> percentile queue lengths greater than the storage length;

<sup>1</sup>Storage measured as the length of white gore stripe for turn lane, additional queue storage available in striped median;

<sup>2</sup>Northbound thru and right turn storage measured to first intersection to the south (SW Dahlke Lane), additional storage available to the south of the intersection;

<sup>3</sup>Storage measured as the length of white gore stripe for turn lane, additional queue storage available in left-most southbound through lane, as only the right southbound through lane continues through the intersection;

As detailed in Table 11, under year 2025 total traffic conditions, including the planned widening of SW Tualatin-Sherwood Road, 95<sup>th</sup> percentile queues can be accommodated by the planned lane configuration storage capacity, with the exception of:

- The northbound left-turn and through-right turn movements at the SW Tualatin-Sherwood Road/SW Oregon Street intersection.
  - The northbound left-turn and through-right 95<sup>th</sup> percentile queues are estimated at 274 feet during the PM peak and 233 feet during the AM peak, respectively, whereas the distance to the nearest driveway is 200 feet. Inclusive of the TWLTL, there is adequate storage to accommodate longer queues in both lanes that on rare occasion extend past the first southern intersection (SW Dahlke Lane).
- The southbound left-turn movement at the SW Tualatin Sherwood Road/SW 124<sup>th</sup> Avenue intersection.
  - The southbound left-turn 95<sup>th</sup> percentile queue is estimated at 333 feet during the AM peak hour, whereas the striped turn bay storage, as measured by the length of the white gore stripe, is 240 feet. Inclusive of the taper length, there is adequate storage to accommodate a 275-foot-long queue before a raised median limits additional storage. Additional queue storage may be available depending upon ultimate Washington County SW Tualatin-Sherwood Road Widening project intersection lane modifications. No site-generated trips are added to this movement.

**Sight Distance**

Table 12 summarizes the Washington County Community Development Code (CDC) section 501 8.5.F requirements for intersection sight distance (ISD). In addition to the Washington County passenger vehicle sight distance requirements, Table 12 also provides truck sight distance requirements per the methodology described in the 7th Edition of American Association of State Highway Transportation Officials' (AASHTO) *A Policy on Geometric Design of Highways and Streets*.

The proposed site plan was reviewed to assess whether adequate sight distance can be provided at the proposed site access. For the analysis, observations of intersection sight distance (ISD) were obtained in the field from the location of each proposed access in accordance with the methodology described in AASHTO: from a viewpoint 14.5 feet behind the edge of the traveled way and from a height of 3.5 feet above the ground, looking toward an object that is 3.5 feet above the ground along the travel way. Truck sight distance measurements were taken from a height of 7.6 feet above the ground, looking toward an object that is 3.5 feet above the ground along the traveled way.

Based on field observations, sight distance measurements are documented at each of the proposed access locations in Table 12. *Corresponding sight triangles for the two proposed access locations are shown in Appendix "J"*. These sight triangles are based on the AASHTO truck standards, to accommodate both trucks and cars. *Supporting photographs taken from the access locations are also included in Appendix "J"*.

**Table 12: Site Driveway Required Sight Distances**

#	Site Driveway	Posted Roadway Speed	Washington County CDC Minimum Requirement (ISD <sup>1</sup> )	AASHTO Truck Sight Distance Standards	Preliminary Observed Sight Distance (ISD Cars/Trucks)	Satisfies Washington County Requirements? (ISD)
A	SW Oregon Street / Northern Site Access	35 MPH	350 feet	Right turn from a stop: 545 feet Left turn from a stop: 595 feet	Facing northeast: 540/650 feet Facing southwest: 530/600 feet	Yes
B	SW Oregon Street / SW Tonquin Court	35 MPH	350 feet	Right turn from a stop: 545 feet Left turn from a stop: 595 feet	Facing east: 430/650 feet Facing west: >1000 feet	Yes

<sup>1</sup> ISD: Intersection Sight Distance

Based on a review of the site plan and field observations, it appears that sight distance requirements can be met for both automobiles and trucks. The rising grade along the site frontage will require modification within the sight triangles in order to achieve the observed sight distances in Table 12. On-site landscaping, as well as any above ground utilities and signage, should be located and maintained at the site driveways to provide adequate intersection sight distance.



## Turn Lane Warrants

Right-turn lane warrants were conducted at two proposed site access locations on SW Oregon Street. A left-turn lane warrant was not conducted as there is a two-way left-turn lane on SW Oregon Street. The warrants were analyzed per the guidance in ODOT's *Analysis Procedures Manual* (APM – Reference 4). It was found that the right-turn lane warrant is not met for either access. *Appendix "K" includes the right-turn lane warrant worksheet.*

## Access Location and Phasing

The locations of the proposed site accesses are consistent with Alternative/Phase 1 of the *Sherwood Oregon Street Access Management Plan (AMP)* prepared by DKS in June of 2021, while minimizing the likelihood of access relocation with future Phases. *The AMP is included as Appendix "L".* Alternative/Phase 1 provides near-term access for TL 600 (proposed site) to SW Oregon Street before the future SW Tonquin Court and Ice Age Drive are constructed. Additional access to the site will be provided via SW Tonquin Court with Alternative/Phase 2 of the AMP when TL 500 is developed (timeline unknown at the time of this report). If additional parcels along SW Tonquin Court are developed prior to the construction of Ice Age Drive (Alternative/Phase 2 of the AMP), a temporary traffic signal will likely be warranted at the intersection of SW Oregon Street and SW Tonquin Court. If SW Tonquin Court is signalized, Site Access A will be limited to right-in/right-out movements only.

The spacing requirement for driveways along an arterial road is 600 feet per Washington County CDC 501-8.5.B(4). The future SW Tonquin Court (Access B) and the proposed interim northern site access (Access A) are offset by 477 feet and therefore do not meet the recommended 600-foot spacing. However, Access A aligns with the existing Allied Systems driveway on the west side of SW Oregon Street and will be removed when Ice Age Drive is constructed and replaced by direct access to Ice Age Drive (Alternative/Phase 3 of the AMP) when TL 700 is developed. The future spacing between SW Tonquin Court (Access B) and Ice Age Drive will satisfy the 600-foot spacing requirement (see Exhibit 1).

When Ice Age Drive is constructed with Alternative/Phase 3 of the AMP, the temporary signal at SW Tonquin Court will be removed and access will be limited to right-in/right-out only. At this time, a northbound right-turn deceleration lane will likely be warranted on SW Oregon Street approaching SW Tonquin Court.

**Exhibit 1. Proposed Site Access Spacing**

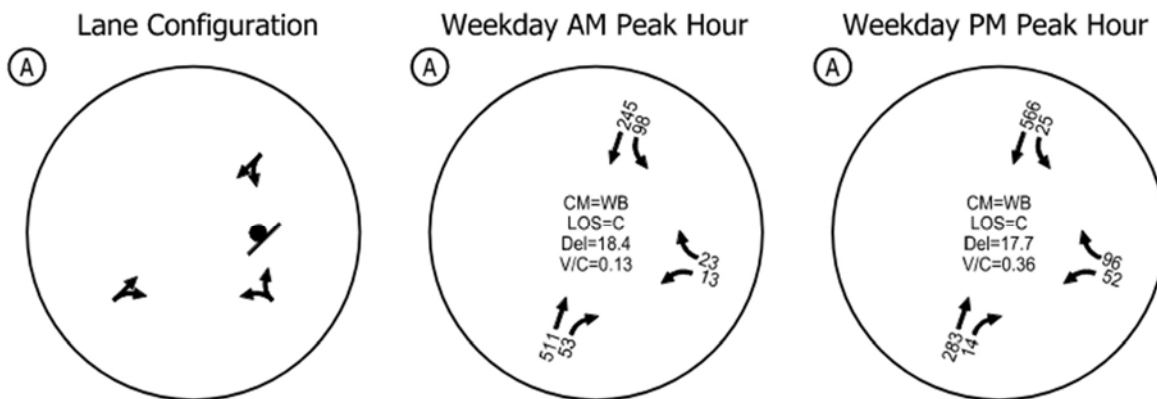


**Supplemental Analysis of Opening Day Operations with a Single Access**

Access at the location of the future Tonquin Court may not be feasible upon opening day. This section provides a supplemental analysis of trips accessing the site via a single interim access location on SW Oregon Street (Site Access A).

Build-out year 2022 total traffic conditions with all trips accessing the site via Site Access A were analyzed for the weekday AM and PM peak hours. Figure 12 shows the lane configuration and traffic operations.

**Figure 12: SW Oregon Street/Site Access A Lane Configurations and 2022 Total Traffic Operations**



As shown in Figure 12, Site Access A is anticipated to meet the jurisdictional operating standard during the weekday AM and PM peak hours. Appendix "M" includes the traffic operational worksheets.



A right-turn lane warrant was conducted assuming all site trips use a single interim access on SW Oregon Street (Site Access A). It was found that the right-turn lane warrant is met for Site Access A under this opening day access scenario. *Appendix "M" includes the right-turn lane warrant worksheet.* When Ice Age Drive is constructed, Site Access A will be removed. Therefore, installation of a right-turn lane is not recommended at the interim Site Access A.

Based on the results of this supplemental analysis, there is adequate capacity for Phase 1 of the proposed Sherwood Commerce Center project to develop with a single interim site access prior to implementation of the planned future SW Tonquin Court and Ice Age Drive.

## FINDINGS AND RECOMMENDATIONS

Based on the analysis herein, the following findings and recommendations are associated with the proposed development of the Sherwood Commerce Center project:

### Findings

#### *Year 2019 Existing Conditions*

- Crash History:
  - The observed crash rates exceed the ODOT published 90th percentile crash rate at two study intersections:
    - SW Oregon Street/SW Tualatin-Sherwood Road
    - SW 124<sup>th</sup> Avenue/SW Tualatin-Sherwood Road
  - Three study intersections are identified on the Washington County maintained SPIS 2014-2016 list, with ranking and SPIS scores as follows:
    - SW 124<sup>th</sup> Avenue and SW Tualatin-Sherwood Road is ranked 20<sup>th</sup> on the list, with an SPIS score of 78.3 out of 100;
    - SW Oregon Street and SW Tualatin-Sherwood Road is ranked 30<sup>th</sup> on the list, with an SPIS score of 75.7 out of 100; and,
    - SW Langer Farms Parkway and SW Tualatin-Sherwood Road is ranked 146<sup>th</sup> on the list, with an SPIS score of 42.0 out of 100.
- All study intersections currently operate acceptably and jurisdictional mobility standards during the weekday AM and PM peak hours.
  - However, as observed in the field, and reported within the queuing analysis, vehicle queueing is prevalent east-west along the SW Tualatin-Sherwood Road corridor during both AM and PM peak hours, which is indicative of over-saturated conditions.

### **Year 2022 Background Traffic Conditions**

- All study intersections are forecast to operate acceptably and meet jurisdictional mobility standards during the weekday AM and PM peak hours, except:
  - The SW Oregon Street / SW Tualatin-Sherwood Road intersection is forecast to operate with a volume to capacity ratio greater than 1.0 during PM peak hour.
  - The SW 124<sup>th</sup> Avenue / SW Tualatin-Sherwood Road intersection is forecast to operate with a volume to capacity ratio is 1.0 during the AM peak hour.
  - The SW Oregon Street / SW Tonquin Road intersection is forecast to operate with a volume to capacity ratio greater than 1.0 during the PM peak hour.

### **Proposed Development Plan**

- Phase 1 of the proposed development includes up to 468,000 square-feet of industrial buildings and is estimated to generate 1,577 net new weekday daily trips, 187 net new trips (151 inbound, 36 outbound) during the weekday AM peak hour and 187 net new trips (39 inbound, 148 outbound) during the weekday PM peak hour.
- The site will be served by one temporary access along SW Oregon Street on the north end of the site until construction of the planned future SW Tonquin Court and Ice Age Drive.

### **Year 2022 Total Traffic Conditions**

- All study intersections are forecast to continue to operate acceptably and meet jurisdictional mobility standards during the weekday AM and PM peak hours, except:
  - Similar to existing and background traffic conditions, the SW Oregon Street / SW Tualatin-Sherwood Road intersection is forecast to operate with a volume to capacity ratio greater than 1.0 during the PM peak hour.
  - Similar to the background traffic conditions, the SW 124<sup>th</sup> Avenue / SW Tualatin-Sherwood Road intersection is forecast to operate with a volume to capacity ratio greater than 1.0 during the AM peak hour.
  - Similar to the background traffic conditions, the SW Oregon Street / SW Tonquin intersection is forecast to operate with a volume to capacity ratio greater than 1.0 in the northbound movement during the PM peak hour.
- A *SimTraffic* queuing analysis showed that under year 2022 total traffic conditions, most 95<sup>th</sup> percentile queues can generally be accommodated by the existing or assumed lane storage capacities. However, east-west queues on SW Tualatin-Sherwood Road may extend to adjacent intersections during peak hours.
- The planned widening of SW Tualatin-Sherwood Road to five lanes (by 2025) will improve capacity and queuing conditions on SW Tualatin-Sherwood Road to meet jurisdictional mobility standards during the weekday AM and PM peak hours.



## Recommendations

Based on the analysis provided and documented herein, the proposed development can be constructed without further degrading the operational mobility standards and safety standards established for the surrounding transportation system. The following are recommended in conjunction with site development:

- Provide a proportionate cost share allocation towards the future conversion of the SW Tonquin/SW Oregon Street intersection either to a roundabout or signalized intersection.
- Coordinate with City and County staff as needed for the completion of the 5-lane widening of SW Tualatin-Sherwood Road (Washington County planned and funded project 318).
- Interim site access to SW Oregon Street aligning with the existing operational Allied Systems driveway shall be permitted until such time as the planned future east-west connector, Ice Age Drive, is constructed. At that time, the interim Site Access A will be closed and replaced by direct access to Ice Age Drive. If a traffic signal is installed at SW Tonquin Court before Ice Age Drive is constructed, turning movements at the interim Site Access A will be limited to right-in/right-out only.
- Shrubbery and landscaping, as well as above ground utilities and signage should be appropriately located and maintained on-site and at the proposed site access to provide adequate intersection sight distance.

## REFERENCES

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3. Oregon Department of Transportation. *SPR 667 Assessment of Statewide Intersection Safety Performance*. June 2011.
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6. Washington County. *Safety Priority Index System (SPIS) 2014 – 2016*. June 2019.
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## APPENDICES

- A. Scoping Correspondence
- B. Crash Data
- C. Traffic Counts
- D. Year 2019 Existing Conditions Worksheets
- E. Year 2022 Background Conditions Worksheets
- F. Year 2022 Total Traffic Conditions Worksheets
- G. Year 2025 Total Traffic Conditions Worksheets
- H. Year 2022 Total Traffic Conditions – Mitigation Worksheets
- I. Year 2022 SimTraffic Queuing Worksheets
- J. Sight Distance Triangles
- K. Right-Turn Lane Warrant Worksheet
- L. Sherwood Oregon Street AMP
- M. Supplemental Analysis of Opening Day Operations with a Single Access

## Appendix A Scoping Correspondence



**Kristine Connolly**

**From:** Garth Appanaitis <gaa@dksassociates.com>  
**Sent:** Thursday, March 18, 2021 11:30 AM  
**To:** Kristine Connolly  
**Cc:** Bob Galati  
**Subject:** Re: FW: Sherwood Commerce Center TIA

Hi Kristine,

Good chatting with you this morning. It sounded like there may be some uncertainty about what taxlots would be included in the land use application. If only the single lot adjacent to Oregon Street (2S128C000600) is included, only a single phase traffic study would be needed at this time with the proposed use and access. If that lot or adjacent lots include additional development at a later time that changes/impacts the site access, those phases and conditions would be analyzed at that time.

Thanks

**Garth Appanaitis, PE (OR)** | Project Manager, Portland Planning Group Manager  
 Direct: 503.972.1212 | Cell: 971.570.4709 | [gaa@dksassociates.com](mailto:gaa@dksassociates.com)



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On Wed, Mar 17, 2021 at 5:29 PM Garth Appanaitis <[gaa@dksassociates.com](mailto:gaa@dksassociates.com)> wrote:

Hi Kristine,

Thanks for the call and talking through these items this afternoon. As discussed, the assumptions you laid out below are fine.

**Bob** - We discussed potential analysis related to future development adjacent to the site. For the proposed use (three buildings on the north side of the site) does the traffic study only need to analyze the initial direct loading to Oregon Street via the site driveway? The preliminary site plan indicates future loading to Tonquin Court and the east-west collector (identified as Blake Street), but would you want to see that configuration analyzed now or through a future process?

Kristine - As discussed we are currently working with the City and County on an access management plan to explore phased access to properties within TEA. There will likely be more updates as that work continues to evolve.

Thanks,  
Garth

**Garth Appanaitis, PE (OR)** | Project Manager, Portland Planning Group Manager  
Direct: 503.972.1212 | Cell: 971.570.4709 | [gaa@dksassociates.com](mailto:gaa@dksassociates.com)



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On Wed, Mar 17, 2021 at 2:47 PM Garth Appanaitis <[gaa@dksassociates.com](mailto:gaa@dksassociates.com)> wrote:

Hi Kristine,

I left you a voicemail on your cell. The general assumptions you've outlined below look fine.

Confirmed that no new count data needs to be collected.

Give me a call when you have a few minutes. I'd like to understand what you are proposing to use for trip distribution and access/phasing.

Thanks,  
Garth

---

**From:** Kristine Connolly <[kconnolly@kittelton.com](mailto:kconnolly@kittelton.com)>  
**Sent:** Friday, February 26, 2021 10:59 AM  
**To:** Bob Galati <[GalatiB@SherwoodOregon.gov](mailto:GalatiB@SherwoodOregon.gov)>  
**Cc:** Diego Arguea <[darguea@kittelton.com](mailto:darguea@kittelton.com)>  
**Subject:** Sherwood Commerce Center TIA

**CAUTION:** This email originated from outside of the organization. Do not click links or open attachments unless you are expecting this email and/or know the content is safe.

Hi Bob –

Harsch Investment Properties is getting their application prepared for the Sherwood Commerce Center (see attached site plan). I believe you're familiar with the site based on recent conversations surrounding the location of the future Blake connection to Oregon. It is our understanding that the connection will not be constructed with this project, but the ROW will be dedicated for a future City project. As part of the project, the applicant is proposing access via a new Tonquin Ct connection as well as an interim full access driveway on Oregon until Blake is constructed.

The land use is almost identical to the Sherwood Industrial Park project at 124<sup>th</sup> (approx. 468,000 SF of industrial buildings), so we are planning plan to generate trips similarly using ITE land use code 130.

Are the current COVID-related traffic levels still well below 'typical' conditions? If so, we have February 2019 counts collected for the Sherwood Industrial Park Project at the following locations:

1. SW Langer Farms Parkway/SW Tualatin-Sherwood Road
2. SW Oregon Street/SW Tualatin-Sherwood Road
3. SW 124<sup>th</sup> Avenue/SW Tualatin-Sherwood Road
4. SW Oregon Street/SW Tonquin Road
5. SW Oregon Street/SW Murdock Road

We are proposing to study these intersections (plus the two proposed accesses), and, if we don't collect new data, we can apply a 1.5% annual growth rate to get these up to 2021 existing (and beyond). Regarding in-process trips, we'll include trips from the Sherwood Industrial Park project and other approved developments. Please let us know if any additional developments have been approved that were not included in the Sherwood Industrial Park TIA.

We're happy to formalize this in a memo, if needed, but wanted to get the scoping process rolling on the analysis and confirm that no new count data will be necessary. Please review and let us know if you agree with the study intersections and methodology. We'd like to get started as soon as possible!

Thanks,

Kristine Connolly, PE  
Senior Engineer

I'm working from home in response to COVID-19, but Kittelson is fully operational and responsive to all projects. Please [visit our website](#) for more information, and connect with us before sending hard copy mail.

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## Appendix B Crash Data

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
 CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Intersectional Crashes at SW Tualatin-Sherwood Rd & SW Oregon St  
 January 1, 2013 through December 31, 2017

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
YEAR: 2017														
REAR-END	0	3	2	5	0	4	0	2	3	5	0	5	0	0
TURNING MOVEMENTS	0	3	6	9	0	7	4	8	1	6	3	9	0	0
2017 TOTAL	0	6	8	14	0	11	4	10	4	11	3	14	0	0
YEAR: 2016														
HEAD-ON	0	1	0	1	0	2	0	1	0	0	1	1	0	0
REAR-END	0	2	1	3	0	2	0	2	1	3	0	3	0	0
TURNING MOVEMENTS	0	3	3	6	0	4	2	3	3	5	1	6	0	0
2016 TOTAL	0	6	4	10	0	8	2	6	4	8	2	10	0	0
YEAR: 2015														
REAR-END	0	1	2	3	0	1	0	3	0	3	0	3	0	0
TURNING MOVEMENTS	0	2	0	2	0	5	0	2	0	1	1	2	0	0
2015 TOTAL	0	3	2	5	0	6	0	5	0	4	1	5	0	0
YEAR: 2014														
REAR-END	0	0	2	2	0	0	0	2	0	2	0	2	0	0
TURNING MOVEMENTS	0	1	0	1	0	4	0	1	0	0	1	1	0	0
2014 TOTAL	0	1	2	3	0	4	0	3	0	2	1	3	0	0
YEAR: 2013														
ANGLE	0	1	0	1	0	2	0	1	0	1	0	1	0	0
REAR-END	0	1	2	3	0	2	0	2	1	3	0	3	0	0
TURNING MOVEMENTS	0	0	5	5	0	0	1	5	0	4	1	5	0	0
2013 TOTAL	0	2	7	9	0	4	1	8	1	8	1	9	0	0
FINAL TOTAL	0	18	23	41	0	33	7	32	9	33	8	41	0	0

**Disclaimers:** Effective 2016, collection of "Property Damage Only" (PDO) crash data elements was reduced for vehicles and participants. Age, Gender, License, Error and other elements are no longer available for PDO crash reporting. Please keep this in mind when comparing 2016 PDO crash data to prior years.

A higher number of crashes may be reported as of 2011 compared to prior years. This does not necessarily reflect an increase in annual crashes. The higher numbers may result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics. For all disclaimers, see [https://www.oregon.gov/ODOT/Data/documents/Crash\\_Data\\_Disclaimers.pdf](https://www.oregon.gov/ODOT/Data/documents/Crash_Data_Disclaimers.pdf).



OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
 CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Intersectional Crashes at SW Oregon St & SW Murdock Rd  
 January 1, 2013 through December 31, 2017

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
YEAR: 2014														
REAR-END	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2014 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
FINAL TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0

**Disclaimers:** Effective 2016, collection of “Property Damage Only” (PDO) crash data elements was reduced for vehicles and participants. Age, Gender, License, Error and other elements are no longer available for PDO crash reporting. Please keep this in mind when comparing 2016 PDO crash data to prior years.

A higher number of crashes may be reported as of 2011 compared to prior years. This does not necessarily reflect an increase in annual crashes. The higher numbers may result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics. For all disclaimers, see [https://www.oregon.gov/ODOT/Data/documents/Crash\\_Data\\_Disclaimers.pdf](https://www.oregon.gov/ODOT/Data/documents/Crash_Data_Disclaimers.pdf).

Intersectional Crashes at SW Oregon St & SW Tonquin Rd  
 January 1, 2013 through December 31, 2017

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
YEAR: 2017														
TURNING MOVEMENTS	0	1	1	2	0	2	0	2	0	2	0	2	0	0
2017 TOTAL	0	1	1	2	0	2	0	2	0	2	0	2	0	0
YEAR: 2015														
REAR-END	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2015 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
YEAR: 2013														
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2013 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
FINAL TOTAL	0	1	3	4	0	2	0	4	0	4	0	4	0	0

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
 CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Intersectional Crashes at SW Tualatin-Sherwood Rd & SW 112th Ave / SW Avery St  
 January 1, 2013 through December 31, 2017

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
YEAR: 2017														
REAR-END	0	2	1	3	0	3	0	2	1	2	1	3	0	0
TURNING MOVEMENTS	0	1	5	6	0	1	0	2	4	5	1	6	0	0
2017 TOTAL	0	3	6	9	0	4	0	4	5	7	2	9	0	0
YEAR: 2016														
REAR-END	0	2	3	5	0	2	0	3	2	4	1	5	0	0
TURNING MOVEMENTS	0	0	1	1	0	0	0	0	1	0	1	1	0	0
2016 TOTAL	0	2	4	6	0	2	0	3	3	4	2	6	0	0
YEAR: 2015														
REAR-END	0	1	1	2	0	2	0	1	0	2	0	2	0	0
2015 TOTAL	0	1	1	2	0	2	0	1	0	2	0	2	0	0
YEAR: 2014														
ANGLE	0	1	0	1	0	5	0	1	0	0	1	1	0	0
REAR-END	0	9	3	12	0	20	0	6	5	11	1	12	0	0
2014 TOTAL	0	10	3	13	0	25	0	7	5	11	2	13	0	0
YEAR: 2013														
REAR-END	0	1	0	1	0	3	0	1	0	1	0	1	0	0
TURNING MOVEMENTS	0	0	2	2	0	0	0	2	0	2	0	2	0	0
2013 TOTAL	0	1	2	3	0	3	0	3	0	3	0	3	0	0
FINAL TOTAL	0	17	16	33	0	36	0	18	13	27	6	33	0	0

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
 CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Intersectional Crashes at SW Tualatin-Sherwood Rd & SW 115th Ave  
 January 1, 2013 through December 31, 2017

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
YEAR: 2017														
REAR-END	0	2	0	2	0	3	0	1	1	2	0	2	0	0
2017 TOTAL	0	2	0	2	0	3	0	1	1	2	0	2	0	0
YEAR: 2016														
REAR-END	0	1	0	1	0	1	0	1	0	0	1	1	0	0
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2016 TOTAL	0	1	1	2	0	1	0	2	0	1	1	2	0	0
YEAR: 2015														
REAR-END	0	2	0	2	0	3	1	2	0	2	0	2	0	0
2015 TOTAL	0	2	0	2	0	3	1	2	0	2	0	2	0	0
YEAR: 2014														
TURNING MOVEMENTS	0	2	0	2	0	3	0	2	0	1	1	2	0	0
2014 TOTAL	0	2	0	2	0	3	0	2	0	1	1	2	0	0
YEAR: 2013														
REAR-END	0	2	0	2	0	3	0	2	0	2	0	2	0	0
TURNING MOVEMENTS	0	1	0	1	0	2	0	0	1	1	0	1	0	0
2013 TOTAL	0	3	0	3	0	5	0	2	1	3	0	3	0	0
FINAL TOTAL	0	10	1	11	0	15	1	9	2	9	2	11	0	0

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
 CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Intersectional Crashes at SW Tualatin-Sherwood Rd & SW 124th Ave  
 January 1, 2013 through December 31, 2017

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
YEAR: 2017														
REAR-END	0	6	2	8	0	9	1	6	2	5	3	8	0	0
TURNING MOVEMENTS	0	2	0	2	0	2	0	1	1	2	0	2	0	0
2017 TOTAL	0	8	2	10	0	11	1	7	3	7	3	10	0	0
YEAR: 2016														
FIXED / OTHER OBJECT	0	0	1	1	0	0	0	1	0	1	0	1	0	1
REAR-END	0	2	4	6	0	2	1	6	0	6	0	6	0	0
TURNING MOVEMENTS	0	1	0	1	0	1	0	1	0	1	0	1	0	0
2016 TOTAL	0	3	5	8	0	3	1	8	0	8	0	8	0	1
YEAR: 2015														
REAR-END	0	2	2	4	0	3	0	4	0	4	0	4	0	0
2015 TOTAL	0	2	2	4	0	3	0	4	0	4	0	4	0	0
YEAR: 2014														
REAR-END	0	6	3	9	0	13	0	7	2	8	1	9	0	0
2014 TOTAL	0	6	3	9	0	13	0	7	2	8	1	9	0	0
YEAR: 2013														
REAR-END	0	1	0	1	0	2	0	0	1	1	0	1	0	0
2013 TOTAL	0	1	0	1	0	2	0	0	1	1	0	1	0	0
FINAL TOTAL	0	20	12	32	0	32	2	26	6	28	4	32	0	1

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Intersectional Crashes at SW Tualatin-Sherwood Rd & SW 120th Ave  
 January 1, 2013 through December 31, 2017

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
YEAR: 2017														
BACKING	0	1	0	1	0	3	1	0	1	1	0	1	0	0
REAR-END	0	1	0	1	0	1	0	1	0	1	0	1	0	0
TURNING MOVEMENTS	0	1	0	1	0	1	0	1	0	1	0	1	0	0
2017 TOTAL	0	3	0	3	0	5	1	2	1	3	0	3	0	0
YEAR: 2014														
REAR-END	0	0	1	1	0	0	0	0	1	1	0	1	0	0
2014 TOTAL	0	0	1	1	0	0	0	0	1	1	0	1	0	0
FINAL TOTAL	0	3	1	4	0	5	1	2	2	4	0	4	0	0

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Intersectional Crashes at SW Tualatin-Sherwood Rd & SW Cipole Rd  
 January 1, 2013 through December 31, 2017

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
YEAR: 2016														
REAR-END	0	1	1	2	0	1	0	2	0	2	0	2	0	0
TURNING MOVEMENTS	0	1	0	1	0	1	1	1	0	1	0	1	0	0
2016 TOTAL	0	2	1	3	0	2	1	3	0	3	0	3	0	0
YEAR: 2015														
BACKING	0	0	1	1	0	0	1	1	0	1	0	1	0	0
REAR-END	0	1	3	4	0	1	0	3	1	3	1	4	0	0
2015 TOTAL	0	1	4	5	0	1	1	4	1	4	1	5	0	0
YEAR: 2014														
REAR-END	0	4	0	4	0	8	0	2	2	3	1	4	0	0
2014 TOTAL	0	4	0	4	0	8	0	2	2	3	1	4	0	0
YEAR: 2013														
REAR-END	0	4	0	4	0	5	0	3	1	3	1	4	0	0
TURNING MOVEMENTS	0	1	0	1	0	1	0	1	0	0	1	1	0	0
2013 TOTAL	0	5	0	5	0	6	0	4	1	3	2	5	0	0
FINAL TOTAL	0	12	5	17	0	17	2	13	4	13	4	17	0	0

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 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
 CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Intersectional Crashes at SW Tualatin-Sherwood Rd & SW Langer Farms Pkwy  
 January 1, 2013 through December 31, 2017

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
YEAR: 2017														
REAR-END	0	2	1	3	0	4	1	2	1	3	0	3	0	0
TURNING MOVEMENTS	0	2	1	3	0	2	0	3	0	2	1	3	0	0
2017 TOTAL	0	4	2	6	0	6	1	5	1	5	1	6	0	0
YEAR: 2016														
ANGLE	0	1	0	1	0	1	0	1	0	1	0	1	0	0
REAR-END	0	4	0	4	0	4	0	2	2	3	1	4	0	0
TURNING MOVEMENTS	0	1	3	4	0	1	0	1	3	3	1	4	0	0
2016 TOTAL	0	6	3	9	0	6	0	4	5	7	2	9	0	0
YEAR: 2015														
REAR-END	0	0	3	3	0	0	0	2	1	2	1	3	0	0
2015 TOTAL	0	0	3	3	0	0	0	2	1	2	1	3	0	0
YEAR: 2014														
REAR-END	0	0	2	2	0	0	0	1	1	2	0	2	0	0
TURNING MOVEMENTS	0	1	0	1	0	2	0	1	0	1	0	1	0	0
2014 TOTAL	0	1	2	3	0	2	0	2	1	3	0	3	0	0
YEAR: 2013														
REAR-END	0	0	1	1	0	0	0	1	0	1	0	1	0	1
TURNING MOVEMENTS	0	1	0	1	0	2	0	1	0	1	0	1	0	0
2013 TOTAL	0	1	1	2	0	2	0	2	0	2	0	2	0	1
FINAL TOTAL	0	12	11	23	0	16	1	15	8	19	4	23	0	1

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 CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Intersectional Crashes at SW Tualatin-Sherwood Rd & SW Wildrose Pl  
 January 1, 2013 through December 31, 2017

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
YEAR: 2017														
FIXED / OTHER OBJECT	0	0	1	1	0	0	0	0	0	1	0	1	0	1
TURNING MOVEMENTS	0	1	0	1	0	2	0	1	0	1	0	1	0	0
2017 TOTAL	0	1	1	2	0	2	0	1	0	2	0	2	0	1
YEAR: 2014														
REAR-END	0	1	0	1	0	1	0	1	0	1	0	1	0	0
2014 TOTAL	0	1	0	1	0	1	0	1	0	1	0	1	0	0
YEAR: 2013														
TURNING MOVEMENTS	0	1	1	2	0	1	0	0	2	0	2	2	0	0
2013 TOTAL	0	1	1	2	0	1	0	0	2	0	2	2	0	0
FINAL TOTAL	0	3	2	5	0	4	0	2	2	3	2	5	0	1

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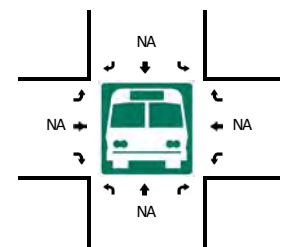
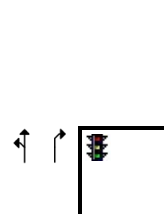
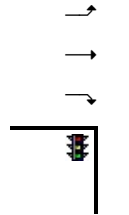
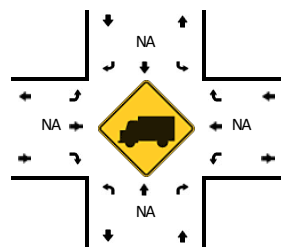
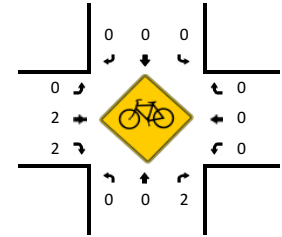
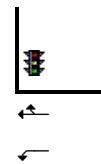
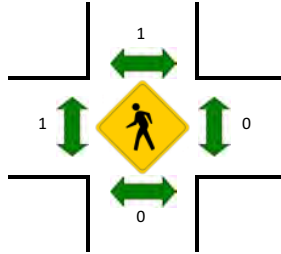
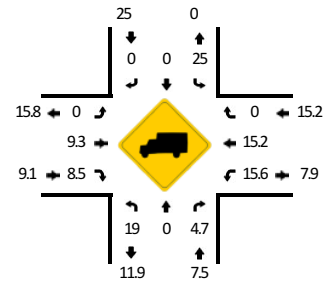
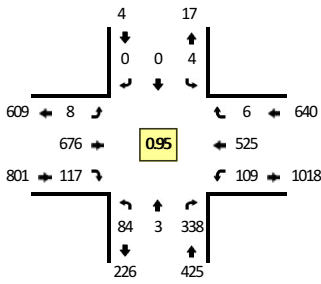
## Appendix C Traffic Counts

Type of peak hour being reported: User-Defined

LOCATION: Oregon St -- Tualatin-Sherwood Rd  
 CITY/STATE: Washington, OR

QC JOB #: 14898001  
 DATE: Wed, Feb 13 2019

Peak-Hour: 7:20 AM -- 8:20 AM  
 Peak 15-Min: 7:20 AM -- 7:35 AM

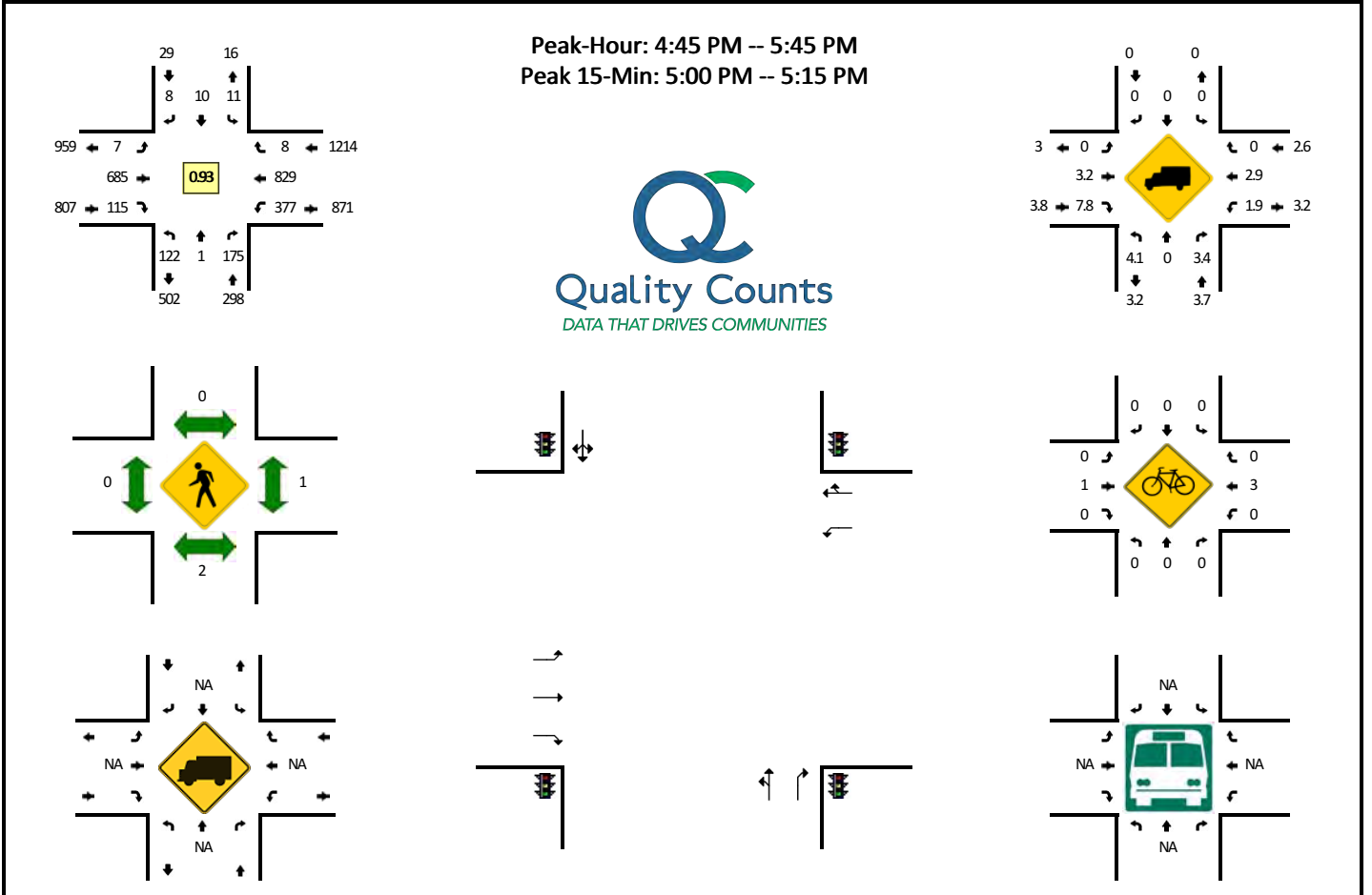


5-Min Count Period Beginning At	Oregon St (Northbound)				Oregon St (Southbound)				Tualatin-Sherwood Rd (Eastbound)				Tualatin-Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	4	0	35	0	0	0	0	0	0	73	9	0	9	37	0	0	167	
7:05 AM	9	0	37	0	0	0	1	0	0	45	5	0	8	37	0	0	142	
7:10 AM	2	0	24	0	1	0	0	0	1	69	9	0	1	42	0	0	149	
7:15 AM	7	1	45	0	0	0	0	0	0	47	10	0	10	29	0	0	149	
7:20 AM	5	0	34	0	0	0	0	0	2	60	7	0	12	35	0	0	155	
7:25 AM	9	1	17	0	0	0	0	0	0	61	13	0	10	60	0	0	171	
7:30 AM	5	0	25	0	1	0	0	0	0	63	18	0	8	45	0	0	165	
7:35 AM	9	0	29	0	0	0	0	0	0	43	11	0	9	32	0	0	133	
7:40 AM	6	0	29	0	0	0	0	0	0	64	4	0	5	41	2	0	151	
7:45 AM	7	0	27	0	0	0	0	0	2	44	13	0	13	50	0	0	156	
7:50 AM	8	0	33	0	0	0	0	0	2	61	5	0	11	44	1	0	165	
7:55 AM	8	1	33	0	0	0	0	0	1	62	7	0	10	39	0	0	161	1864
8:00 AM	11	1	28	0	0	0	0	0	0	58	12	0	6	42	3	0	161	1858
8:05 AM	5	0	34	0	2	0	0	0	1	54	8	0	10	49	0	0	163	1879
8:10 AM	8	0	22	0	0	0	0	0	0	62	6	0	3	40	0	0	141	1871
8:15 AM	3	0	27	0	1	0	0	0	0	44	13	0	12	48	0	0	148	1870
8:20 AM	7	0	16	0	0	0	0	0	0	62	12	0	3	39	1	0	140	1855
8:25 AM	8	0	19	0	1	0	0	0	0	60	10	0	16	34	4	0	152	1836
8:30 AM	5	0	24	0	0	1	0	0	0	54	8	0	15	44	1	0	152	1823
8:35 AM	7	1	21	0	0	0	0	0	0	62	7	0	8	41	0	0	147	1837
8:40 AM	12	0	18	0	0	0	0	0	0	56	5	0	7	54	2	0	154	1840
8:45 AM	6	0	39	0	0	0	0	0	1	53	8	0	8	43	0	0	158	1842
8:50 AM	6	0	24	0	0	0	0	0	0	45	4	0	11	42	1	0	133	1810
8:55 AM	8	1	8	0	0	0	0	0	1	58	1	0	7	43	1	0	128	1777
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	76	4	304	0	4	0	0	0	8	736	152	0	120	560	0	0	1964	
Heavy Trucks	12	0	8		4	0	0		0	72	20		16	88	0		220	
Pedestrians		0				4				4				0			8	
Bicycles		0	1			0	0			1	0			0	0		2	
Railroad																		
Stopped Buses																		

Comments:

**LOCATION:** Oregon St -- Tualatin-Sherwood Rd  
**CITY/STATE:** Washington, OR

**QC JOB #:** 14898002  
**DATE:** Wed, Feb 13 2019



5-Min Count Period Beginning At	Oregon St (Northbound)				Oregon St (Southbound)				Tualatin-Sherwood Rd (Eastbound)				Tualatin-Sherwood Rd (Westbound)				Total	Hourly Totals	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
4:00 PM	5	0	11	0	0	0	1	0	0	0	62	11	0	25	70	0	0	185	
4:05 PM	12	0	15	0	0	1	0	0	0	0	58	11	0	20	55	0	0	172	
4:10 PM	12	0	22	0	3	1	0	0	0	0	49	8	0	29	65	0	0	189	
4:15 PM	6	0	7	0	2	0	0	0	0	1	64	7	0	24	63	0	0	174	
4:20 PM	9	0	14	0	1	0	0	0	0	0	42	13	0	29	68	0	0	176	
4:25 PM	6	1	9	0	0	1	2	0	0	0	43	11	0	26	62	2	0	163	
4:30 PM	6	0	7	0	1	0	0	0	0	0	57	9	0	33	78	0	0	191	
4:35 PM	11	0	12	0	0	0	0	0	0	0	62	13	0	22	55	0	0	175	
4:40 PM	6	1	13	0	1	0	1	0	0	1	46	9	0	36	77	0	0	191	
4:45 PM	12	0	20	0	1	0	0	0	0	0	46	11	0	25	64	1	0	180	
4:50 PM	13	0	8	0	1	0	0	0	0	0	54	12	0	31	70	0	0	189	
4:55 PM	13	0	14	0	1	1	0	0	0	0	58	7	0	29	61	0	0	184	2169
5:00 PM	5	0	12	0	4	2	0	0	0	0	64	12	0	28	67	0	0	194	2178
5:05 PM	10	0	23	0	0	1	1	0	0	0	74	17	0	27	62	2	0	217	2223
5:10 PM	10	0	22	0	3	4	2	0	0	1	68	9	0	28	74	1	0	222	2256
5:15 PM	10	0	19	0	0	0	1	0	0	1	58	7	0	32	59	0	0	187	2269
5:20 PM	8	0	11	0	0	0	1	0	0	0	52	9	0	37	79	1	0	198	2291
5:25 PM	9	0	8	0	0	0	0	0	0	1	50	9	0	31	76	0	0	184	2312
5:30 PM	10	1	15	0	1	2	1	0	0	1	50	12	0	35	66	3	0	197	2318
5:35 PM	16	0	11	0	0	0	1	0	0	1	54	7	0	34	69	0	0	193	2336
5:40 PM	6	0	12	0	0	0	1	0	0	2	57	3	0	40	82	0	0	203	2348
5:45 PM	5	0	13	0	0	0	0	0	0	0	46	6	0	32	66	1	0	169	2337
5:50 PM	11	0	13	0	1	0	0	0	0	0	45	4	0	27	64	1	0	166	2314
5:55 PM	7	0	14	0	1	0	0	0	0	1	52	6	0	17	74	1	0	173	2303
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total		
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
All Vehicles	100	0	228	0	28	28	12	0	4	824	152	0	332	812	12	0	2532		
Heavy Trucks	4	0	8	0	0	0	0	0	0	40	20	0	4	8	0	0	84		
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Bicycles	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1		
Railroad																			
Stopped Buses																			

Comments:

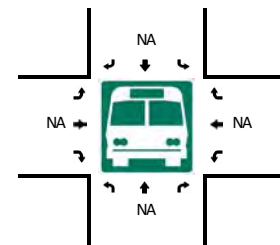
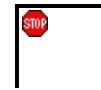
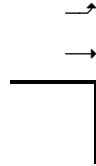
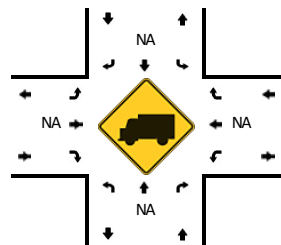
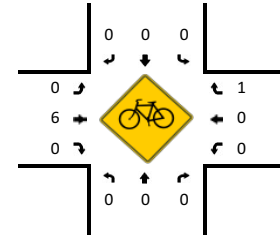
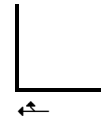
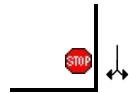
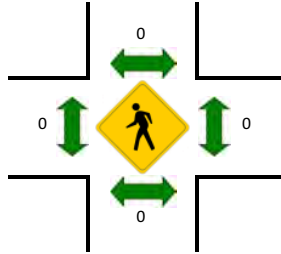
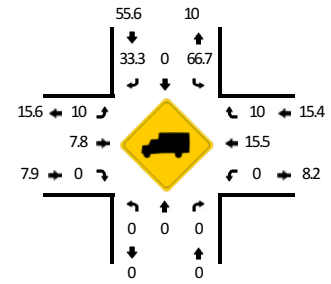
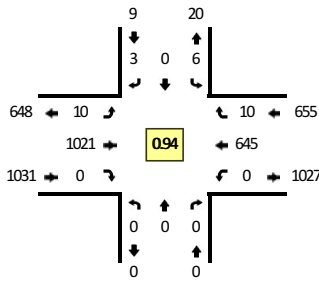


Type of peak hour being reported: User-Defined

LOCATION: Wildrose Pl -- Tualatin-Sherwood Rd  
 CITY/STATE: Washington, OR

QC JOB #: 14898003  
 DATE: Wed, Feb 13 2019

Peak-Hour: 7:20 AM -- 8:20 AM  
 Peak 15-Min: 7:50 AM -- 8:05 AM



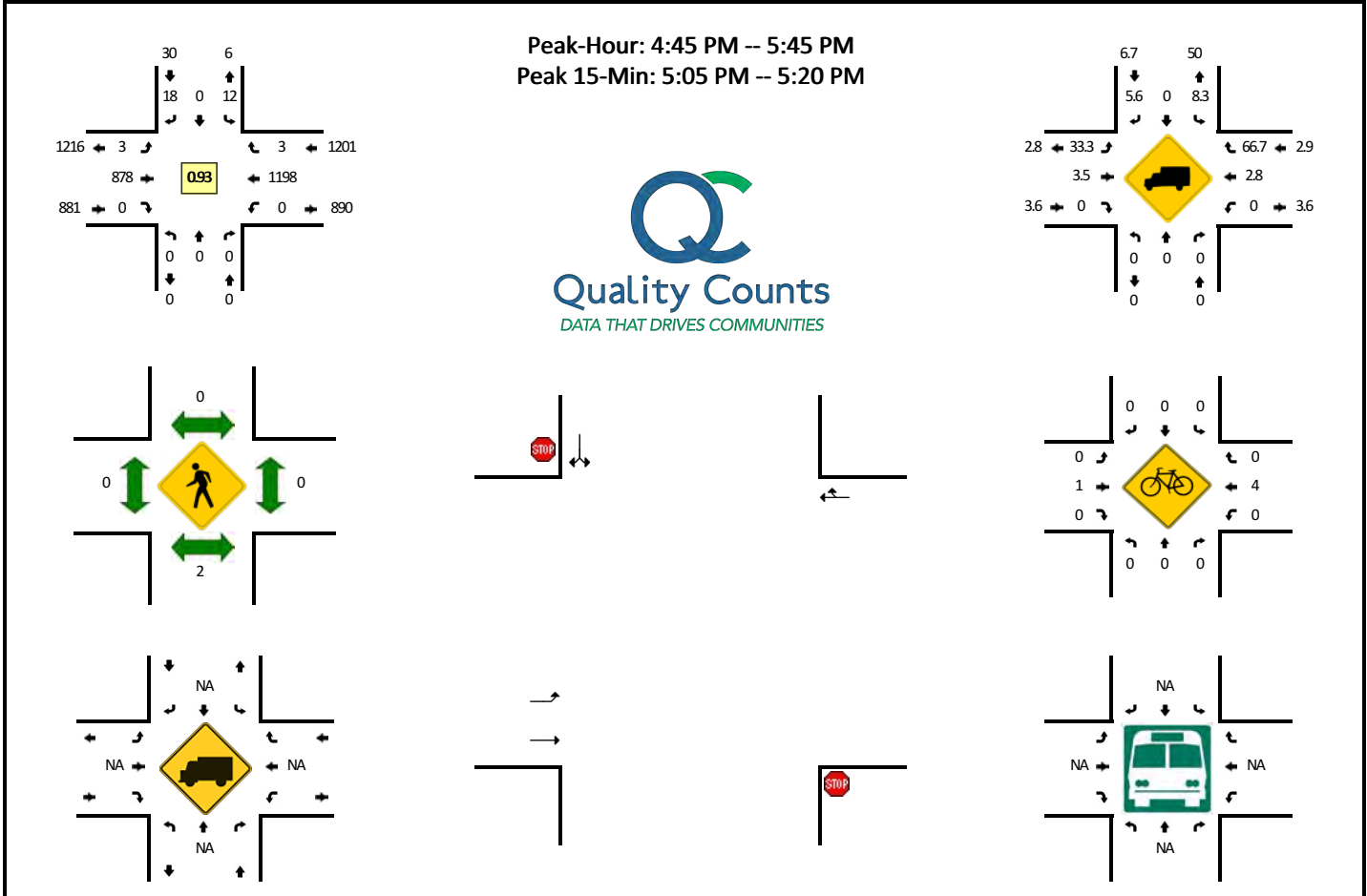
5-Min Count Period Beginning At	Wildrose Pl (Northbound)				Wildrose Pl (Southbound)				Tualatin-Sherwood Rd (Eastbound)				Tualatin-Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	0	0	0	2	96	0	0	0	43	1	0	142	
7:05 AM	0	0	0	0	0	0	2	0	0	83	0	0	0	47	1	0	133	
7:10 AM	0	0	0	0	0	0	1	0	2	87	0	0	0	40	3	0	133	
7:15 AM	0	0	0	0	1	0	2	0	0	95	0	0	0	46	0	0	144	
7:20 AM	0	0	0	0	1	0	0	0	0	93	0	0	0	47	0	0	141	
7:25 AM	0	0	0	0	0	0	0	0	0	80	0	0	0	64	0	0	144	
7:30 AM	0	0	0	0	1	0	1	0	0	81	0	0	0	53	0	0	136	
7:35 AM	0	0	0	0	1	0	0	0	1	79	0	0	0	40	0	0	121	
7:40 AM	0	0	0	0	1	0	0	0	1	94	0	0	0	52	1	0	149	
7:45 AM	0	0	0	0	0	0	0	0	0	74	0	0	0	62	1	0	137	
7:50 AM	0	0	0	0	0	0	0	0	2	89	0	0	0	63	1	0	155	
7:55 AM	0	0	0	0	1	0	0	0	3	89	0	0	0	51	3	0	147	1682
8:00 AM	0	0	0	0	0	0	1	0	0	88	0	0	0	59	1	0	149	1689
8:05 AM	0	0	0	0	1	0	0	0	1	87	0	0	0	51	0	0	140	1696
8:10 AM	0	0	0	0	0	0	0	0	1	81	0	0	0	48	1	0	131	1694
8:15 AM	0	0	0	0	0	0	1	0	1	86	0	0	0	55	2	0	145	1695
8:20 AM	0	0	0	0	0	0	0	0	1	78	0	0	0	46	1	0	126	1680
8:25 AM	0	0	0	0	3	0	1	0	0	78	0	0	0	55	0	0	137	1673
8:30 AM	0	0	0	0	1	0	0	0	1	78	0	0	0	59	0	0	139	1676
8:35 AM	0	0	0	0	0	0	0	0	0	79	0	0	0	57	1	0	137	1692
8:40 AM	0	0	0	0	0	0	0	0	1	76	0	0	0	59	1	0	137	1680
8:45 AM	0	0	0	0	1	0	1	0	1	88	0	0	0	51	3	0	145	1688
8:50 AM	0	0	0	0	0	0	0	0	0	73	0	0	0	51	0	0	124	1657
8:55 AM	0	0	0	0	1	0	0	0	1	66	0	0	0	53	1	0	122	1632
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	4	0	4	0	20	1064	0	0	0	692	20	0	1804	
Heavy Trucks	0	0	0	0	4	0	0	0	0	60	0	0	0	124	4	0	192	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	
Railroad																		
Stopped Buses																		

Comments:

Type of peak hour being reported: User-Defined

LOCATION: Wildrose Pl -- Tualatin-Sherwood Rd  
 CITY/STATE: Washington, OR

QC JOB #: 14898004  
 DATE: Wed, Feb 13 2019



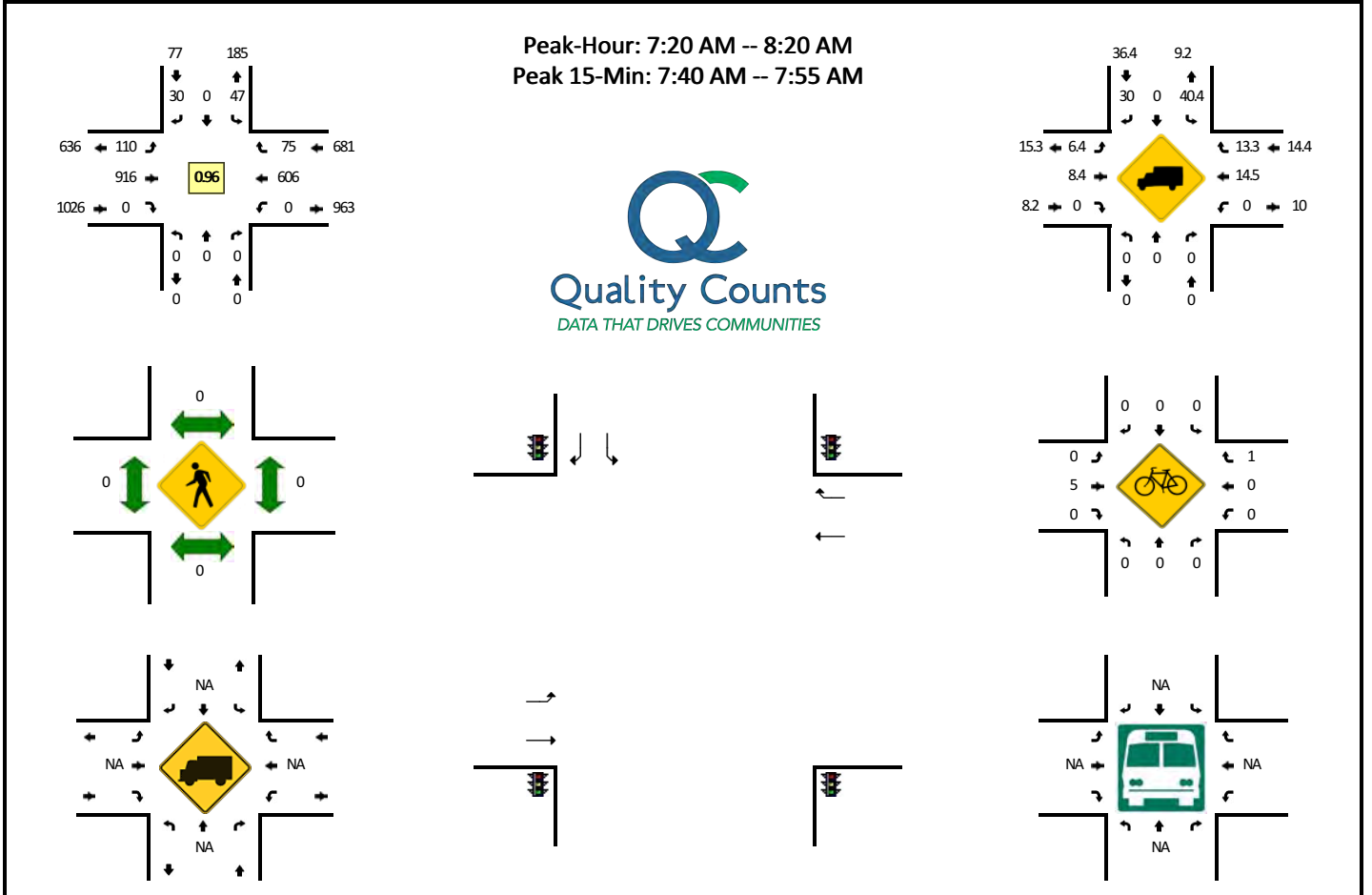
5-Min Count Period Beginning At	Wildrose Pl (Northbound)				Wildrose Pl (Southbound)				Tualatin-Sherwood Rd (Eastbound)				Tualatin-Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	1	0	1	0	0	75	0	0	0	90	0	0	167	
4:05 PM	0	0	0	0	1	0	1	0	1	69	0	0	0	79	0	0	151	
4:10 PM	0	0	0	0	1	0	2	0	0	76	0	0	0	91	1	0	171	
4:15 PM	0	0	0	0	1	0	2	0	1	77	0	0	0	84	0	0	165	
4:20 PM	0	0	0	0	0	0	1	0	0	60	0	0	0	95	1	0	157	
4:25 PM	0	0	0	0	2	0	1	0	0	54	0	0	0	90	0	0	147	
4:30 PM	0	0	0	0	1	0	0	0	1	66	0	0	0	109	1	0	178	
4:35 PM	0	0	0	0	1	0	1	0	0	67	0	0	0	86	0	0	155	
4:40 PM	0	0	0	0	0	0	0	0	0	67	0	0	0	104	1	0	172	
4:45 PM	0	0	0	0	0	0	2	0	1	65	0	0	0	92	0	0	160	
4:50 PM	0	0	0	0	0	0	1	0	0	67	0	0	0	98	0	0	166	
4:55 PM	0	0	0	0	3	0	2	0	1	70	0	0	0	95	0	0	171	1960
5:00 PM	0	0	0	0	2	0	3	0	0	76	0	0	0	84	0	0	165	1958
5:05 PM	0	0	0	0	2	0	1	0	0	96	0	0	0	97	0	0	196	2003
5:10 PM	0	0	0	0	2	0	0	0	0	94	0	0	0	99	0	0	195	2027
5:15 PM	0	0	0	0	0	0	1	0	0	80	0	0	0	94	0	0	175	2037
5:20 PM	0	0	0	0	1	0	2	0	0	66	0	0	0	109	1	0	179	2059
5:25 PM	0	0	0	0	1	0	0	0	1	60	0	0	0	105	0	0	167	2079
5:30 PM	0	0	0	0	1	0	3	0	0	67	0	0	0	103	1	0	175	2076
5:35 PM	0	0	0	0	0	0	1	0	0	67	0	0	0	110	1	0	179	2100
5:40 PM	0	0	0	0	0	0	2	0	0	70	0	0	0	112	0	0	184	2112
5:45 PM	0	0	0	0	0	0	1	0	1	57	0	0	0	94	0	0	153	2105
5:50 PM	0	0	0	0	0	0	1	0	0	60	0	0	0	95	0	0	156	2095
5:55 PM	0	0	0	0	0	0	3	0	2	70	0	0	0	92	0	0	167	2091
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	16	0	8	0	0	1080	0	0	0	1160	0	0	2264	
Heavy Trucks	0	0	0	0	0	0	0	0	0	52	0	0	0	28	0	0	80	
Pedestrians		8				0				0				0			8	
Bicycles	0	0	0		0	0	0		0	1	0		0	1	0		2	
Railroad																		
Stopped Buses																		

Comments:

Type of peak hour being reported: User-Defined

LOCATION: Cipole Rd -- Tualatin-Sherwood Rd  
 CITY/STATE: Washington, OR

QC JOB #: 14898005  
 DATE: Wed, Feb 13 2019



5-Min Count Period Beginning At	Cipole Rd (Northbound)				Cipole Rd (Southbound)				Tualatin-Sherwood Rd (Eastbound)				Tualatin-Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	3	0	2	0	8	91	0	0	0	39	13	0	156	
7:05 AM	0	0	0	0	7	0	4	0	8	73	0	0	0	45	4	0	141	
7:10 AM	0	0	0	0	3	0	1	0	2	85	0	0	0	44	10	0	145	
7:15 AM	0	0	0	0	3	0	3	0	9	83	0	0	0	43	9	0	150	
7:20 AM	0	0	0	0	6	0	5	0	8	86	0	0	0	47	5	0	157	
7:25 AM	0	0	0	0	5	0	0	0	5	75	0	0	0	59	5	0	149	
7:30 AM	0	0	0	0	4	0	2	0	10	79	0	0	0	45	6	0	146	
7:35 AM	0	0	0	0	7	0	1	0	10	67	0	0	0	36	10	0	131	
7:40 AM	0	0	0	0	2	0	2	0	11	82	0	0	0	50	11	0	158	
7:45 AM	0	0	0	0	4	0	4	0	10	68	0	0	0	59	4	0	149	
7:50 AM	0	0	0	0	4	0	2	0	7	79	0	0	0	56	9	0	157	
7:55 AM	0	0	0	0	5	0	3	0	11	65	0	0	0	53	5	0	142	
8:00 AM	0	0	0	0	2	0	1	0	12	84	0	0	0	59	7	0	165	
8:05 AM	0	0	0	0	3	0	5	0	7	78	0	0	0	41	3	0	137	
8:10 AM	0	0	0	0	1	0	3	0	8	79	0	0	0	49	5	0	145	
8:15 AM	0	0	0	0	4	0	2	0	11	74	0	0	0	52	5	0	148	
8:20 AM	0	0	0	0	1	0	3	0	7	88	0	0	0	43	7	0	149	
8:25 AM	0	0	0	0	1	0	9	0	6	73	0	0	0	49	1	0	139	
8:30 AM	0	0	0	0	3	0	4	0	8	69	0	0	0	47	9	0	140	
8:35 AM	0	0	0	0	3	0	1	0	4	72	0	0	0	62	3	0	145	
8:40 AM	0	0	0	0	4	0	3	0	4	71	0	0	0	54	8	0	144	
8:45 AM	0	0	0	0	4	0	5	0	6	84	0	0	0	45	11	0	155	
8:50 AM	0	0	0	0	3	0	1	0	4	77	0	0	0	56	0	0	141	
8:55 AM	0	0	0	0	3	0	2	0	4	63	0	0	0	43	2	0	117	
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	40	0	32	0	112	916	0	0	0	660	96	0	1856	
Heavy Trucks	0	0	0	0	16	0	8	0	12	60	0	0	0	44	12	0	152	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

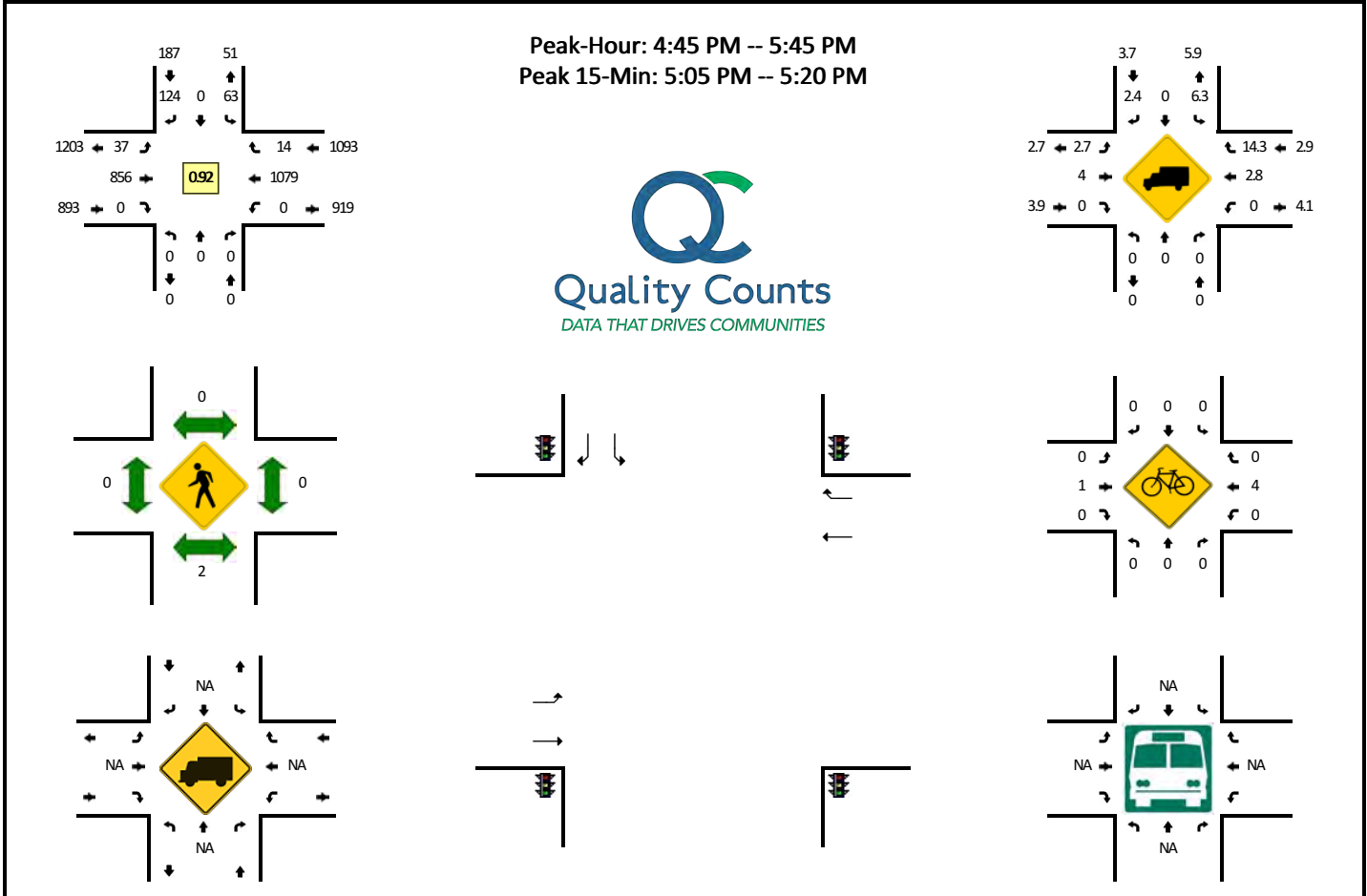
Comments:



Type of peak hour being reported: User-Defined

LOCATION: Cipole Rd -- Tualatin-Sherwood Rd  
 CITY/STATE: Washington, OR

QC JOB #: 14898006  
 DATE: Wed, Feb 13 2019

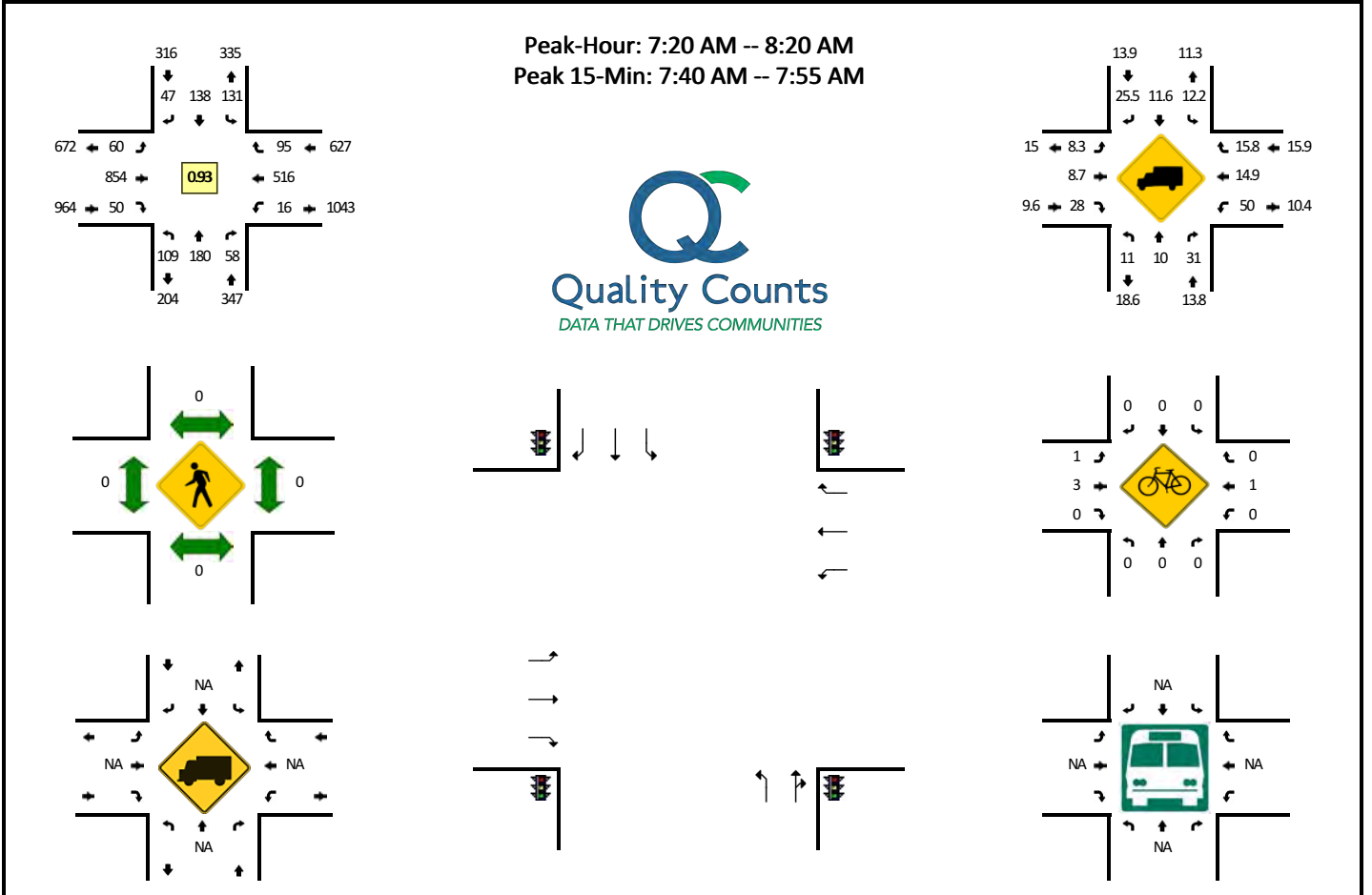


5-Min Count Period Beginning At	Cipole Rd (Northbound)				Cipole Rd (Southbound)				Tualatin-Sherwood Rd (Eastbound)				Tualatin-Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	22	0	14	0	4	66	0	0	0	75	3	0	184	
4:05 PM	0	0	0	0	18	0	12	0	5	62	0	0	0	73	2	0	172	
4:10 PM	0	0	0	0	10	0	16	0	2	78	0	0	0	71	7	0	184	
4:15 PM	0	0	0	0	11	0	14	0	6	72	0	0	0	77	2	0	182	
4:20 PM	0	0	0	0	9	0	6	0	3	50	0	0	0	81	4	0	153	
4:25 PM	0	0	0	0	5	0	8	0	3	68	0	0	0	92	2	0	178	
4:30 PM	0	0	0	0	6	0	12	0	1	62	0	0	0	90	1	0	172	
4:35 PM	0	0	0	0	3	0	8	0	2	67	0	0	0	86	3	0	169	
4:40 PM	0	0	0	0	7	0	12	0	4	58	0	0	0	87	4	0	172	
4:45 PM	0	0	0	0	10	0	9	0	3	64	0	0	0	85	1	0	172	
4:50 PM	0	0	0	0	5	0	7	0	1	70	0	0	0	85	4	0	172	
4:55 PM	0	0	0	0	6	0	11	0	5	71	0	0	0	89	1	0	183	2093
5:00 PM	0	0	0	0	8	0	12	0	2	65	0	0	0	77	0	0	164	2073
5:05 PM	0	0	0	0	9	0	15	0	8	81	0	0	0	82	1	0	196	2097
5:10 PM	0	0	0	0	3	0	11	0	7	92	0	0	0	86	2	0	201	2114
5:15 PM	0	0	0	0	7	0	11	0	4	86	0	0	0	87	0	0	195	2127
5:20 PM	0	0	0	0	2	0	12	0	3	63	0	0	0	94	1	0	175	2149
5:25 PM	0	0	0	0	3	0	8	0	1	69	0	0	0	95	1	0	177	2148
5:30 PM	0	0	0	0	3	0	11	0	1	53	0	0	0	102	0	0	170	2146
5:35 PM	0	0	0	0	4	0	8	0	1	78	0	0	0	100	1	0	192	2169
5:40 PM	0	0	0	0	3	0	9	0	1	64	0	0	0	97	2	0	176	2173
5:45 PM	0	0	0	0	1	0	8	0	0	63	0	0	0	90	3	0	165	2166
5:50 PM	0	0	0	0	5	0	7	0	3	58	0	0	0	89	1	0	163	2157
5:55 PM	0	0	0	0	1	0	4	0	1	67	0	0	0	91	0	0	164	2138
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	76	0	148	0	76	1036	0	0	0	1020	12	0	2368	
Heavy Trucks	0	0	0	0	8	0	0	0	4	52	0	0	0	24	8	0	96	
Pedestrians		8				0				0				0			8	
Bicycles	0	0	0		0	0	0		0	1	0		0	1	0		2	
Railroad																		
Stopped Buses																		

Comments:

**LOCATION:** 124th Ave -- Tualatin-Sherwood Rd  
**CITY/STATE:** Washington, OR

**QC JOB #:** 14898007  
**DATE:** Wed, Feb 13 2019

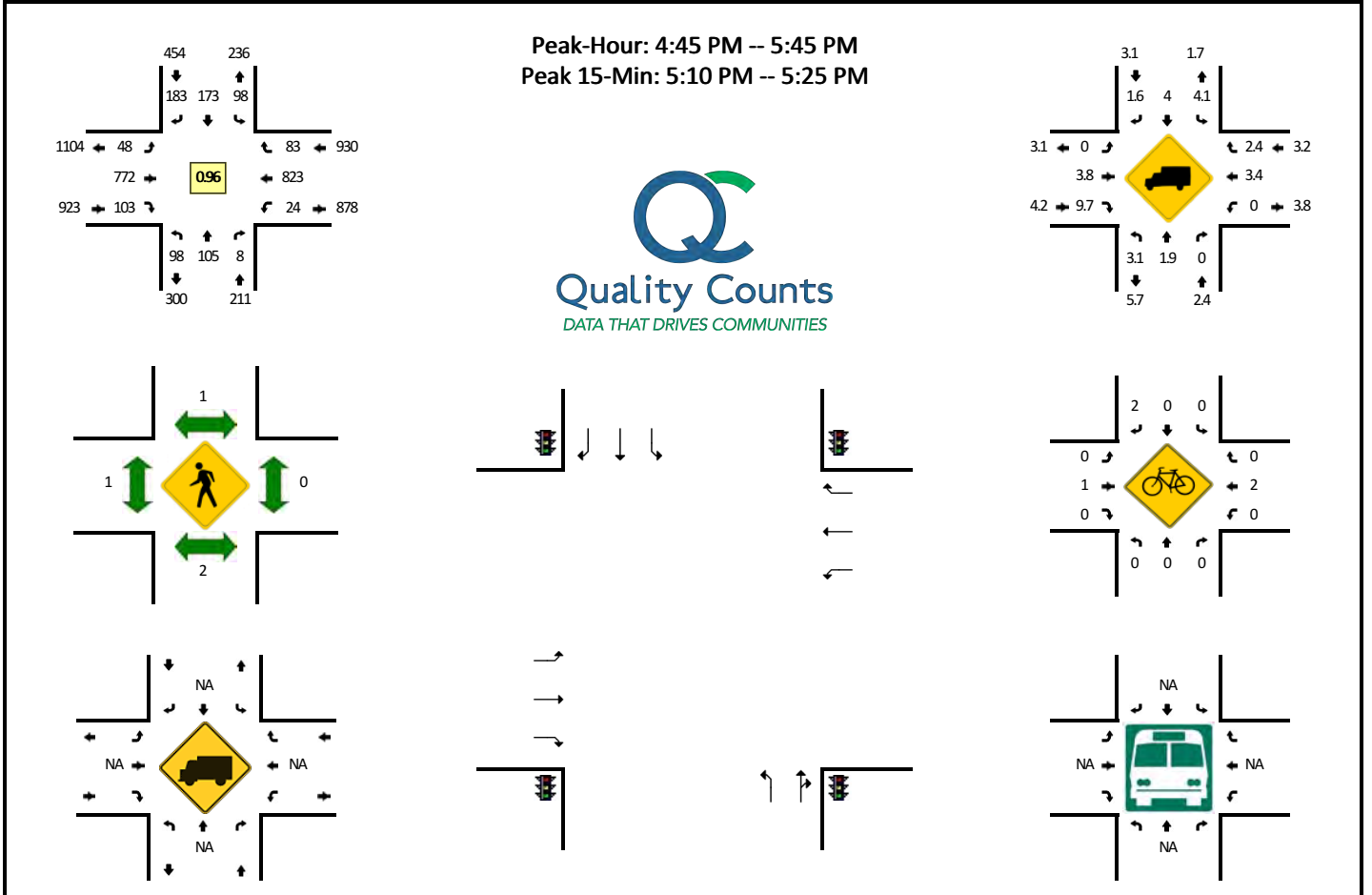


5-Min Count Period Beginning At	124th Ave (Northbound)				124th Ave (Southbound)				Tualatin-Sherwood Rd (Eastbound)				Tualatin-Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	8	15	8	0	10	8	3	0	6	81	6	0	0	42	5	0	192	
7:05 AM	10	21	3	0	8	3	0	0	9	60	4	0	1	39	8	0	166	
7:10 AM	5	10	4	0	6	8	1	0	16	81	1	0	0	51	9	0	192	
7:15 AM	10	5	4	0	9	9	2	0	7	80	4	0	1	42	8	0	181	
7:20 AM	11	9	5	0	8	15	2	0	7	80	4	0	0	41	6	0	188	
7:25 AM	9	15	7	0	11	16	4	0	7	71	3	0	2	50	6	0	201	
7:30 AM	5	17	5	0	11	9	2	0	3	65	5	0	0	39	6	0	167	
7:35 AM	10	13	3	0	20	20	3	0	5	67	5	0	1	31	5	0	183	
7:40 AM	11	24	6	0	11	12	3	0	2	66	7	0	0	47	13	0	202	
7:45 AM	15	14	7	0	13	14	4	0	8	74	1	0	2	53	10	0	215	
7:50 AM	10	15	7	0	8	10	7	0	7	68	5	0	1	43	6	0	187	
7:55 AM	8	17	5	0	13	15	9	0	5	69	2	0	3	42	14	0	202	2276
8:00 AM	11	16	3	0	6	8	5	0	3	79	8	0	1	45	7	0	192	2276
8:05 AM	5	13	3	0	9	7	4	0	7	68	4	0	1	33	11	0	165	2275
8:10 AM	7	15	2	0	9	8	2	0	4	73	2	0	1	48	6	0	177	2260
8:15 AM	7	12	5	0	12	4	2	0	2	74	4	0	4	44	5	0	175	2254
8:20 AM	7	9	1	0	8	6	2	0	9	75	5	0	0	41	8	0	171	2237
8:25 AM	9	16	0	0	11	11	4	0	4	65	2	0	0	40	8	0	170	2206
8:30 AM	4	14	3	0	3	3	4	0	7	68	7	0	1	44	9	0	167	2206
8:35 AM	5	8	4	0	8	7	5	1	5	61	7	0	0	61	4	0	176	2199
8:40 AM	14	9	2	0	4	6	5	0	12	55	3	0	2	38	5	0	155	2152
8:45 AM	8	11	0	0	6	6	5	0	14	70	4	0	0	46	7	0	177	2114
8:50 AM	5	13	2	0	11	8	5	0	9	67	4	0	0	45	6	0	175	2102
8:55 AM	4	15	1	0	10	3	4	0	4	63	3	0	1	35	8	0	151	2051
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	144	212	80	0	128	144	56	0	68	832	52	0	12	572	116	0	2416	
Heavy Trucks	8	16	12		12	8	12		0	56	12		4	48	4		192	
Pedestrians	0	0			0	0			0	0			0	0			0	
Bicycles	0	0			0	0			0	0			0	0			0	
Railroad																		
Stopped Buses																		

*Comments:*

**LOCATION:** 124th Ave -- Tualatin-Sherwood Rd  
**CITY/STATE:** Washington, OR

**QC JOB #:** 14898008  
**DATE:** Wed, Feb 13 2019



5-Min Count Period Beginning At	124th Ave (Northbound)				124th Ave (Southbound)				Tualatin-Sherwood Rd (Eastbound)				Tualatin-Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	7	7	1	0	5	12	11	0	4	66	9	0	3	62	3	0	190	
4:05 PM	9	4	1	0	10	13	15	0	5	68	15	0	2	58	5	0	205	
4:10 PM	9	11	0	0	8	12	11	0	8	63	13	0	4	63	10	0	212	
4:15 PM	8	6	1	0	5	13	8	0	4	73	12	0	2	61	10	0	203	
4:20 PM	9	16	0	0	13	11	15	1	3	50	8	0	3	57	6	0	192	
4:25 PM	4	9	2	0	5	7	8	0	3	58	13	0	8	83	7	0	207	
4:30 PM	4	5	1	0	9	12	16	0	1	58	10	0	2	81	4	0	203	
4:35 PM	8	6	1	0	9	22	18	0	6	58	3	0	1	61	11	0	204	
4:40 PM	11	8	3	0	12	18	20	0	10	46	9	0	4	57	12	0	210	
4:45 PM	7	2	1	0	9	20	17	0	7	63	12	0	3	63	6	0	210	
4:50 PM	12	17	0	0	16	15	11	0	1	48	9	0	1	70	6	0	206	
4:55 PM	8	9	0	0	9	14	16	0	5	80	7	0	1	69	7	0	225	2467
5:00 PM	6	4	1	0	10	16	11	0	6	53	10	0	1	65	8	0	191	2468
5:05 PM	5	5	2	0	10	14	12	0	4	81	9	0	1	64	8	0	215	2478
5:10 PM	8	11	0	0	8	17	16	0	5	80	14	0	1	69	13	0	242	2508
5:15 PM	4	11	1	0	2	13	17	0	8	63	9	0	4	53	9	0	194	2499
5:20 PM	10	9	0	0	7	11	22	0	3	73	6	0	2	75	2	0	220	2527
5:25 PM	8	10	1	0	5	11	13	0	2	56	9	0	4	69	4	0	192	2512
5:30 PM	20	10	0	0	10	14	16	0	2	56	4	0	3	70	4	0	209	2518
5:35 PM	5	6	1	0	8	9	10	0	0	62	8	0	2	84	11	0	206	2520
5:40 PM	5	11	1	0	4	19	22	0	5	57	6	0	1	72	5	0	208	2518
5:45 PM	9	11	3	0	6	14	12	0	2	53	7	0	2	68	6	0	193	2501
5:50 PM	8	4	0	0	3	6	3	0	3	57	10	0	0	85	7	0	186	2481
5:55 PM	4	6	0	0	2	10	9	0	0	62	3	0	0	92	4	0	192	2448
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	88	124	4	0	68	164	220	0	64	864	116	0	28	788	96	0	2624	
Heavy Trucks	0	4	0	0	0	4	4	0	0	40	16	0	0	48	0	0	116	
Pedestrians		8				0				0				0			8	
Bicycles		0				0	1			1	0			0	0		2	
Railroad																		
Stopped Buses																		

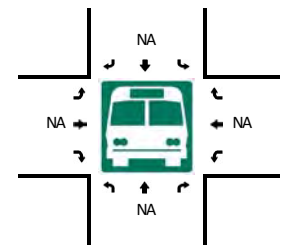
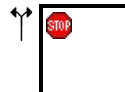
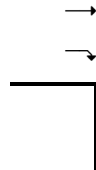
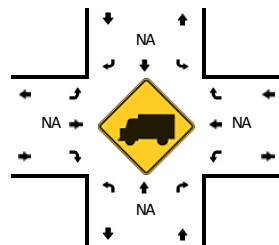
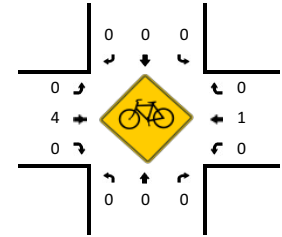
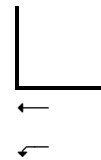
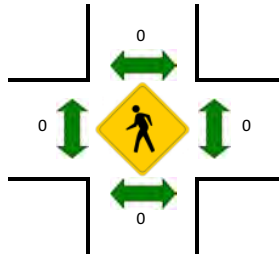
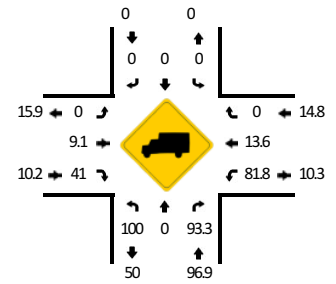
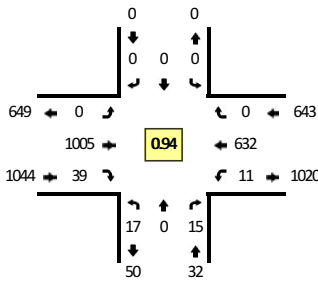
*Comments:*



**LOCATION:** 120th Ave -- Tualatin-Sherwood Rd  
**CITY/STATE:** Washington, OR

**QC JOB #:** 14898009  
**DATE:** Wed, Feb 13 2019

**Peak-Hour: 7:20 AM -- 8:20 AM**  
**Peak 15-Min: 7:40 AM -- 7:55 AM**

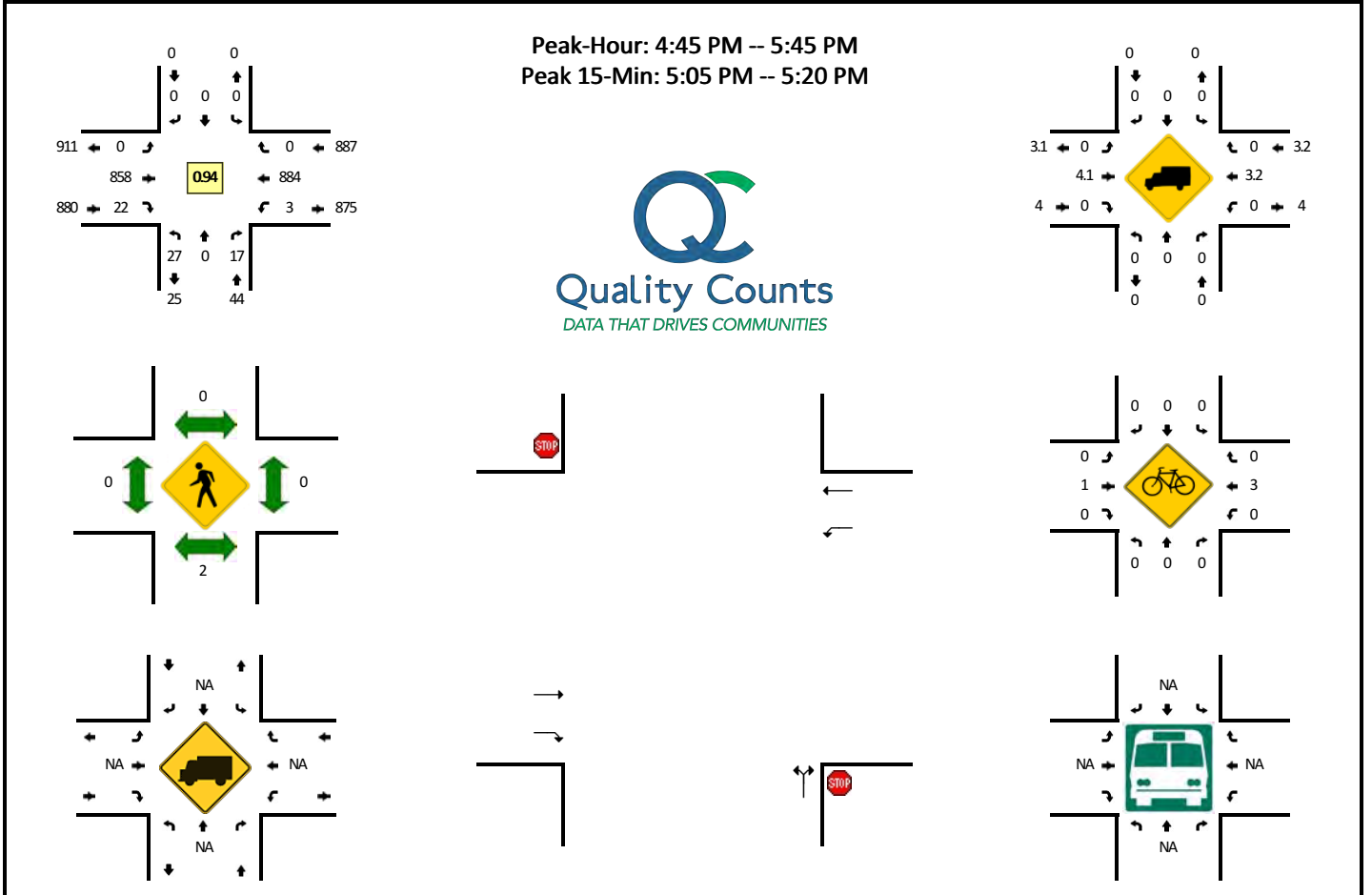


5-Min Count Period Beginning At	120th Ave (Northbound)				120th Ave (Southbound)				Tualatin-Sherwood Rd (Eastbound)				Tualatin-Sherwood Rd (Westbound)				Total	Hourly Totals	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
7:00 AM	1	0	0	0	0	0	0	0	0	0	86	6	0	2	42	0	0	137	
7:05 AM	0	0	0	0	0	0	0	0	0	0	79	3	0	1	54	0	0	137	
7:10 AM	2	0	1	0	0	0	0	0	0	0	74	6	0	0	49	0	0	132	
7:15 AM	1	0	1	0	0	0	0	0	0	0	97	1	0	0	52	0	0	152	
7:20 AM	3	0	2	0	0	0	0	0	0	0	74	4	0	1	47	0	0	131	
7:25 AM	3	0	0	0	0	0	0	0	0	0	93	3	0	0	61	0	0	160	
7:30 AM	2	0	0	0	0	0	0	0	0	0	87	1	0	1	38	0	0	129	
7:35 AM	1	0	1	0	0	0	0	0	0	0	87	1	0	0	42	0	0	132	
7:40 AM	0	0	3	0	0	0	0	0	0	0	85	2	0	1	63	0	0	154	
7:45 AM	1	0	0	0	0	0	0	0	0	0	84	4	0	2	60	0	0	151	
7:50 AM	0	0	0	0	0	0	0	0	0	0	80	6	0	4	61	0	0	151	
7:55 AM	1	0	1	0	0	0	0	0	0	0	75	8	0	0	56	0	0	141	1707
8:00 AM	1	0	1	0	0	0	0	0	0	0	91	2	0	0	46	0	0	141	1711
8:05 AM	1	0	4	0	0	0	0	0	0	0	76	1	0	0	48	0	0	130	1704
8:10 AM	2	0	2	0	0	0	0	0	0	0	76	4	0	2	55	0	0	141	1713
8:15 AM	2	0	1	0	0	0	0	0	0	0	97	3	0	0	55	0	0	158	1719
8:20 AM	1	0	2	0	0	0	0	0	0	0	86	2	0	1	39	0	0	131	1719
8:25 AM	1	0	0	0	0	0	0	0	0	0	76	0	0	1	55	0	0	133	1692
8:30 AM	1	0	4	0	0	0	0	0	0	0	71	4	0	1	51	0	0	132	1695
8:35 AM	0	0	1	0	0	0	0	0	0	0	72	3	0	1	60	0	0	137	1700
8:40 AM	2	0	3	0	0	0	0	0	0	0	61	1	0	3	52	0	0	122	1668
8:45 AM	2	0	0	0	0	0	0	0	0	0	65	3	0	1	46	0	0	117	1634
8:50 AM	2	0	1	0	0	0	0	0	0	0	76	0	0	2	46	0	0	127	1610
8:55 AM	1	0	1	0	0	0	0	0	0	0	74	4	0	1	52	0	0	133	1602
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total		
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
All Vehicles	4	0	12	0	0	0	0	0	0	996	48	0	28	736	0	0	1824		
Heavy Trucks	4	0	12	0	0	0	0	0	0	68	12	0	24	64	0	0	184		
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Railroad																			
Stopped Buses																			

Comments:

**LOCATION:** 120th Ave -- Tualatin-Sherwood Rd  
**CITY/STATE:** Washington, OR

**QC JOB #:** 14898010  
**DATE:** Wed, Feb 13 2019



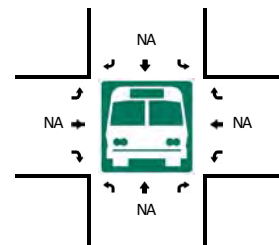
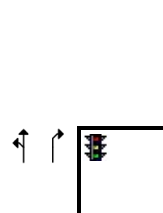
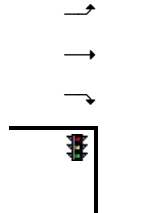
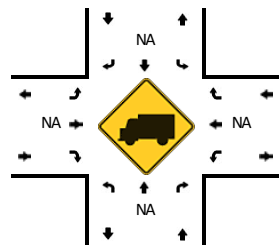
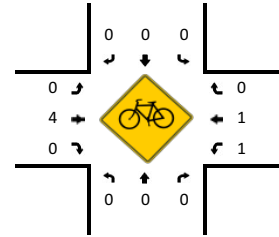
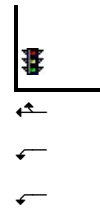
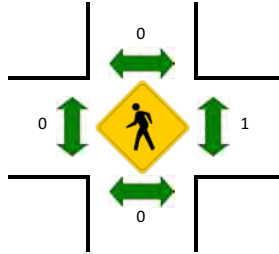
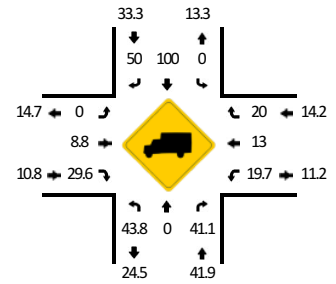
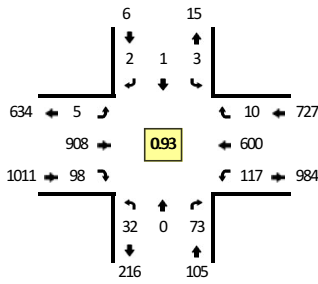
5-Min Count Period Beginning At	120th Ave (Northbound)				120th Ave (Southbound)				Tualatin-Sherwood Rd (Eastbound)				Tualatin-Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	8	0	4	0	0	0	0	0	0	62	1	0	0	67	0	0	142	
4:05 PM	0	0	3	0	0	0	0	0	0	78	2	0	1	61	0	0	145	
4:10 PM	3	0	2	0	0	0	0	0	0	70	0	0	0	61	0	0	136	
4:15 PM	1	0	0	0	0	0	0	0	0	83	4	0	0	73	0	0	161	
4:20 PM	3	0	0	0	0	0	0	0	0	65	0	0	0	65	0	0	133	
4:25 PM	1	0	0	0	0	0	0	0	0	55	2	0	0	92	0	0	150	
4:30 PM	1	0	1	0	0	0	0	0	0	63	3	0	1	81	0	0	150	
4:35 PM	4	0	2	0	0	0	0	0	0	65	2	0	1	73	0	0	147	
4:40 PM	2	0	1	0	0	0	0	0	0	64	1	0	0	75	0	0	143	
4:45 PM	2	0	2	0	0	0	0	0	0	70	2	0	0	69	0	0	145	
4:50 PM	4	0	0	0	0	0	0	0	0	57	0	0	1	62	0	0	124	
4:55 PM	1	0	1	0	0	0	0	0	0	89	0	0	0	83	0	0	174	1750
5:00 PM	2	0	1	0	0	0	0	0	0	58	3	0	0	72	0	0	136	1744
5:05 PM	1	0	3	0	0	0	0	0	0	92	4	0	0	64	0	0	164	1763
5:10 PM	2	0	2	0	0	0	0	0	0	87	4	0	0	71	0	0	166	1793
5:15 PM	4	0	2	0	0	0	0	0	0	71	4	0	1	68	0	0	150	1782
5:20 PM	3	0	0	0	0	0	0	0	0	72	2	0	1	76	0	0	154	1803
5:25 PM	1	0	0	0	0	0	0	0	0	55	2	0	0	80	0	0	138	1791
5:30 PM	3	0	4	0	0	0	0	0	0	67	0	0	0	79	0	0	153	1794
5:35 PM	4	0	2	0	0	0	0	0	0	70	1	0	0	80	0	0	157	1804
5:40 PM	0	0	0	0	0	0	0	0	0	70	0	0	0	80	0	0	150	1811
5:45 PM	3	0	0	0	0	0	0	0	0	62	1	0	1	78	0	0	145	1811
5:50 PM	0	0	0	0	0	0	0	0	0	53	3	0	1	82	0	0	139	1826
5:55 PM	1	0	1	0	0	0	0	0	0	54	3	0	0	78	0	0	137	1789
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	28	0	28	0	0	0	0	0	0	1000	48	0	4	812	0	0	1920	
Heavy Trucks	0	0	0	0	0	0	0	0	0	48	0	0	0	36	0	0	84	
Pedestrians		8				0				0				0			8	
Bicycles	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	
Railroad																		
Stopped Buses																		

*Comments:*

**LOCATION:** 115th Ave -- Tualatin-Sherwood Rd  
**CITY/STATE:** Washington, OR

**QC JOB #:** 14898011  
**DATE:** Wed, Feb 13 2019

**Peak-Hour: 7:20 AM -- 8:20 AM**  
**Peak 15-Min: 7:40 AM -- 7:55 AM**



5-Min Count Period Beginning At	115th Ave (Northbound)				115th Ave (Southbound)				Tualatin-Sherwood Rd (Eastbound)				Tualatin-Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	2	0	5	0	1	0	0	0	0	75	10	0	10	42	1	0	146	
7:05 AM	1	0	5	0	0	0	1	0	0	75	11	0	7	54	0	0	154	
7:10 AM	3	0	8	0	3	0	1	0	0	61	6	0	5	37	0	0	124	
7:15 AM	3	0	5	0	1	0	0	0	0	86	11	0	7	49	0	0	162	
7:20 AM	4	0	10	0	0	0	0	0	0	63	10	0	9	49	0	0	145	
7:25 AM	2	0	4	0	2	0	0	0	0	70	14	0	19	59	1	0	171	
7:30 AM	2	0	6	0	0	0	0	0	0	88	12	0	5	35	1	0	149	
7:35 AM	2	0	8	0	0	0	0	0	0	68	12	0	10	40	0	0	140	
7:40 AM	5	0	7	0	0	0	0	0	1	86	4	0	14	58	0	0	175	
7:45 AM	4	0	4	0	0	0	0	0	1	90	5	0	10	59	1	0	174	
7:50 AM	3	0	4	0	0	0	0	0	2	61	7	0	11	56	2	0	146	
7:55 AM	3	0	7	0	0	0	1	0	0	69	8	0	5	46	1	0	140	1826
8:00 AM	1	0	5	0	1	0	0	0	1	65	8	0	15	53	2	0	151	1831
8:05 AM	2	0	8	0	0	1	0	0	0	89	2	0	4	40	0	0	146	1823
8:10 AM	2	0	4	0	0	0	1	0	0	72	6	0	14	50	1	0	150	1849
8:15 AM	2	0	6	0	0	0	0	0	0	87	10	0	1	55	1	0	162	1849
8:20 AM	4	0	5	0	2	0	1	0	4	78	5	0	3	36	2	0	140	1844
8:25 AM	0	0	4	0	0	0	0	0	0	70	7	0	3	55	0	0	139	1812
8:30 AM	5	0	6	0	0	0	0	0	0	63	6	0	5	49	0	0	134	1797
8:35 AM	2	0	9	0	0	0	1	0	4	70	7	0	6	55	1	0	155	1812
8:40 AM	6	0	8	0	0	0	0	0	0	65	3	0	5	51	0	0	138	1775
8:45 AM	1	0	7	0	1	0	0	0	1	55	4	0	6	42	0	0	117	1718
8:50 AM	3	0	8	0	0	0	0	0	1	83	3	0	4	45	2	0	149	1721
8:55 AM	4	0	3	0	4	0	0	0	0	66	2	0	2	52	3	0	136	1717
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	48	0	60	0	0	0	0	0	16	948	64	0	140	692	12	0	1980	
Heavy Trucks	16	0	16	0	0	0	0	0	0	64	12	0	20	76	4	0	208	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	
Railroad																		
Stopped Buses																		

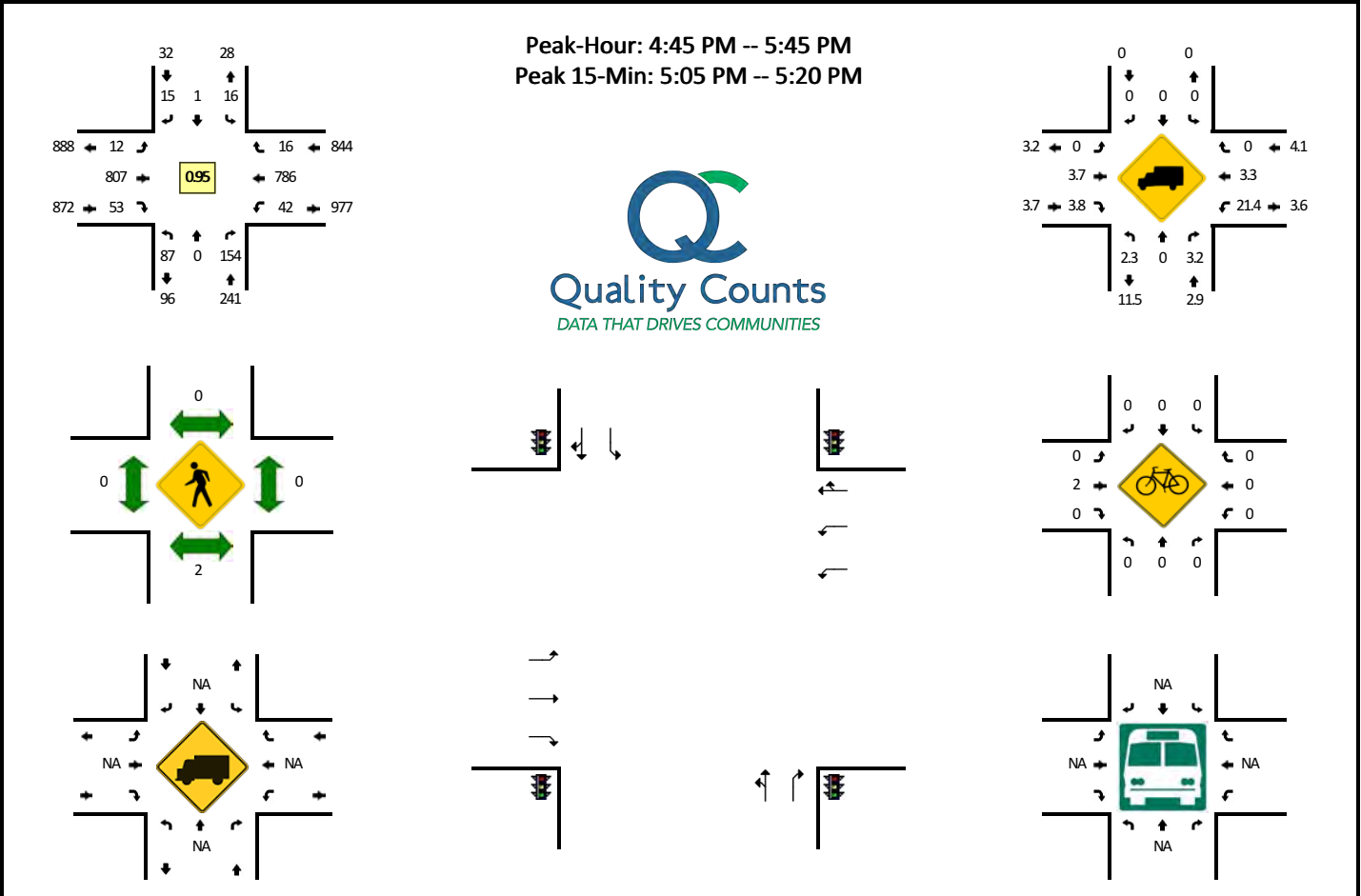
Comments:



Type of peak hour being reported: User-Defined

LOCATION: 115th Ave -- Tualatin-Sherwood Rd  
 CITY/STATE: Washington, OR

QC JOB #: 14898012  
 DATE: Wed, Feb 13 2019



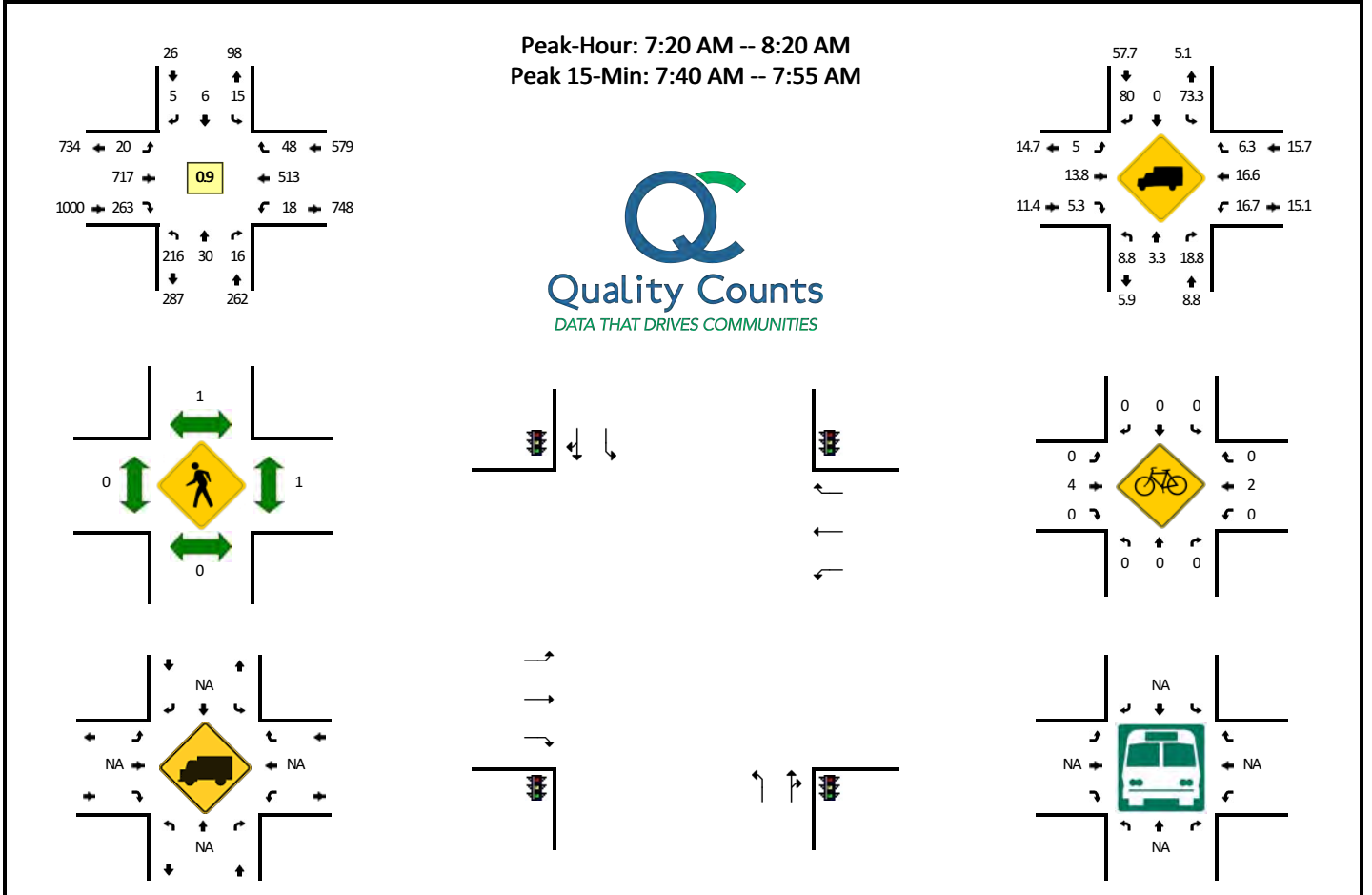
5-Min Count Period Beginning At	115th Ave (Northbound)				115th Ave (Southbound)				Tualatin-Sherwood Rd (Eastbound)				Tualatin-Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	4	0	13	0	1	0	1	0	0	65	2	0	2	66	2	0	156	
4:05 PM	15	0	31	0	3	0	2	0	1	63	4	0	0	47	1	0	167	
4:10 PM	7	0	9	0	0	0	0	0	0	76	1	0	0	51	1	0	145	
4:15 PM	5	0	12	0	2	0	1	0	2	79	3	0	8	72	1	0	185	
4:20 PM	2	1	6	0	0	0	0	0	1	67	5	0	2	61	0	0	145	
4:25 PM	10	0	14	0	2	0	1	0	0	56	2	0	4	75	2	0	166	
4:30 PM	6	0	13	0	2	0	1	0	0	56	2	0	3	80	0	0	163	
4:35 PM	17	0	12	0	0	0	0	0	1	59	4	0	4	63	1	0	161	
4:40 PM	8	0	10	0	1	0	1	0	3	68	2	0	4	61	1	0	159	
4:45 PM	9	0	7	0	0	0	1	0	2	60	7	0	5	64	1	0	156	
4:50 PM	3	0	11	0	2	0	1	0	0	56	6	0	1	58	3	0	141	
4:55 PM	3	0	12	0	1	0	3	0	2	82	5	0	4	75	2	0	189	1933
5:00 PM	4	0	13	0	1	0	1	0	0	57	1	0	3	70	1	0	151	1928
5:05 PM	14	0	17	0	2	0	2	0	0	68	8	0	6	50	1	0	168	1929
5:10 PM	7	0	20	0	1	0	2	0	2	89	6	0	2	52	1	0	182	1966
5:15 PM	10	0	12	0	0	0	0	0	1	72	3	0	3	72	0	0	173	1954
5:20 PM	2	0	11	0	0	1	1	0	1	70	3	0	1	70	3	0	163	1972
5:25 PM	7	0	13	0	3	0	1	0	0	59	1	0	2	71	2	0	159	1965
5:30 PM	3	0	9	0	1	0	1	0	1	60	5	0	4	72	1	0	157	1959
5:35 PM	18	0	14	0	2	0	2	0	2	53	4	0	7	53	0	0	155	1953
5:40 PM	7	0	15	0	3	0	0	0	1	81	4	0	4	79	1	0	195	1989
5:45 PM	8	0	12	0	0	0	1	0	0	62	2	0	0	74	1	0	160	1993
5:50 PM	2	0	7	0	0	0	1	0	1	44	3	0	3	80	2	0	143	1995
5:55 PM	2	0	6	0	1	0	0	0	3	59	0	0	4	60	1	0	136	1942
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	124	0	196	0	12	0	16	0	12	916	68	0	44	696	8	0	2092	
Heavy Trucks	8	0	4	0	0	0	0	0	0	40	4	0	4	32	0	0	92	
Pedestrians		8				0				0				0			8	
Bicycles		0	0			0	0			1	0			0	0		1	
Railroad																		
Stopped Buses																		

Comments:

Type of peak hour being reported: User-Defined

**LOCATION:** 112th Ave/Avery St -- Tualatin-Sherwood Rd  
**CITY/STATE:** Washington, OR

**QC JOB #:** 14898013  
**DATE:** Wed, Feb 13 2019



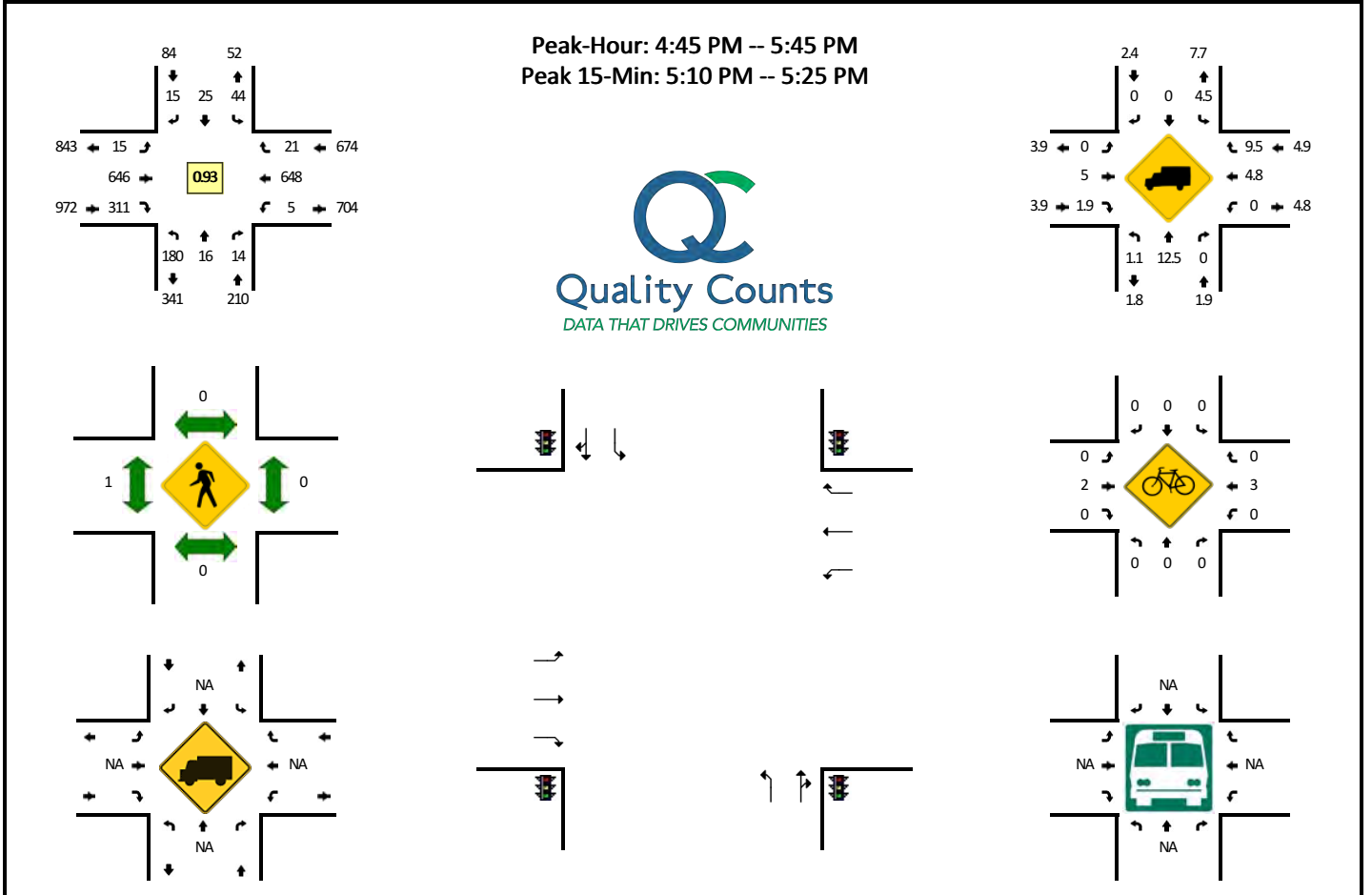
5-Min Count Period Beginning At	112th Ave/Avery St (Northbound)				112th Ave/Avery St (Southbound)				Tualatin-Sherwood Rd (Eastbound)				Tualatin-Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	15	4	1	0	0	1	0	0	4	61	19	0	0	45	1	0	151	
7:05 AM	13	3	1	0	0	0	0	0	1	49	23	0	0	49	4	0	143	
7:10 AM	18	4	0	0	0	0	0	0	1	63	13	0	0	21	3	0	123	
7:15 AM	16	3	0	0	0	0	1	0	3	63	22	0	0	39	4	0	151	
7:20 AM	16	2	1	0	0	0	0	0	2	61	18	0	0	47	3	0	150	
7:25 AM	28	0	0	0	2	0	0	0	1	50	22	0	2	48	5	0	158	
7:30 AM	9	5	1	0	1	2	0	0	0	68	22	0	0	30	2	0	140	
7:35 AM	11	3	0	0	1	1	1	0	3	58	21	0	1	42	4	0	146	
7:40 AM	21	2	2	0	2	0	0	0	2	53	38	0	2	56	3	0	181	
7:45 AM	16	2	1	0	1	1	0	0	3	57	34	0	1	45	8	0	169	
7:50 AM	24	2	3	0	3	1	2	0	1	52	17	0	2	53	11	0	171	
7:55 AM	26	3	2	0	0	0	0	0	1	53	25	0	2	31	1	0	144	1827
8:00 AM	19	3	3	0	2	0	0	0	1	58	13	0	1	47	4	0	151	1827
8:05 AM	16	6	2	0	0	0	0	0	1	79	21	0	2	28	2	0	157	1841
8:10 AM	19	1	1	0	2	0	2	0	3	54	8	0	4	39	2	0	135	1853
8:15 AM	11	1	0	0	1	1	0	0	2	74	24	0	1	47	3	0	165	1867
8:20 AM	15	2	0	0	1	0	0	0	1	72	13	0	0	30	0	0	134	1851
8:25 AM	9	0	1	0	2	1	1	0	0	51	15	0	1	44	7	0	132	1825
8:30 AM	15	0	0	0	0	1	1	0	1	63	8	0	0	46	2	0	137	1822
8:35 AM	9	1	0	0	1	0	0	0	2	56	18	0	1	50	0	0	138	1814
8:40 AM	11	0	2	0	1	1	2	0	0	71	9	0	0	43	4	0	144	1777
8:45 AM	8	0	0	0	1	0	1	0	1	46	17	0	3	39	5	0	121	1729
8:50 AM	10	3	1	0	2	0	3	0	0	69	20	0	0	39	4	0	151	1709
8:55 AM	11	2	1	0	2	2	2	0	0	56	13	0	1	44	5	0	139	1704
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	244	24	24	0	24	8	8	0	24	648	356	0	20	616	88	0	2084	
Heavy Trucks	8	0	4	0	16	0	8	0	0	76	16	0	8	88	0	0	224	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	
Railroad																		
Stopped Buses																		

Comments:

Type of peak hour being reported: User-Defined

LOCATION: 112th Ave/Avery St -- Tualatin-Sherwood Rd  
 CITY/STATE: Washington, OR

QC JOB #: 14898014  
 DATE: Wed, Feb 13 2019



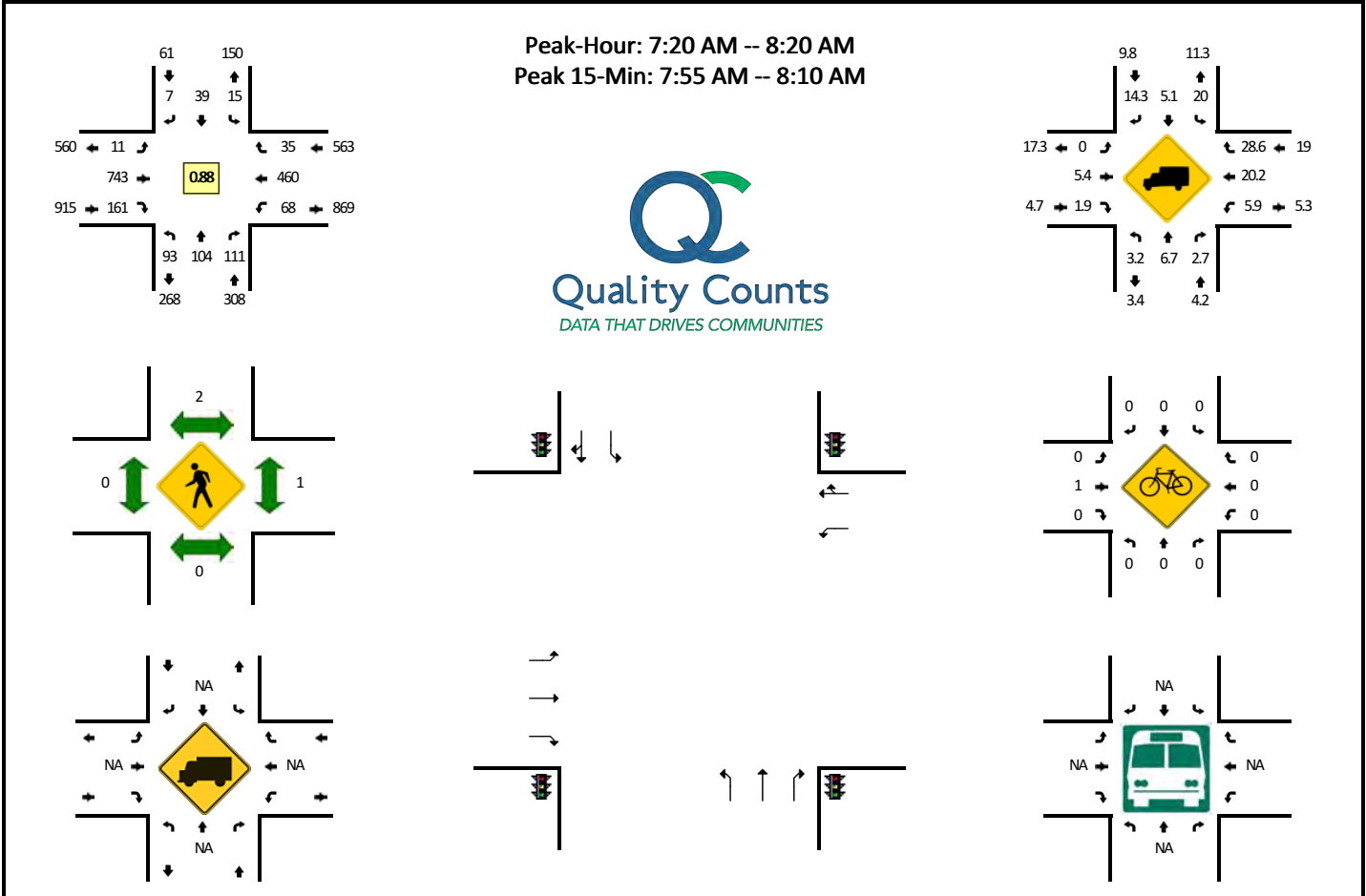
5-Min Count Period Beginning At	112th Ave/Avery St (Northbound)				112th Ave/Avery St (Southbound)				Tualatin-Sherwood Rd (Eastbound)				Tualatin-Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	11	0	0	0	7	2	0	0	1	46	23	0	0	54	1	0	145	
4:05 PM	24	1	0	0	5	4	3	0	2	55	34	0	0	37	0	0	165	
4:10 PM	15	1	2	0	1	1	1	0	1	63	23	0	1	31	2	0	142	
4:15 PM	15	3	1	0	0	3	2	0	2	72	26	0	1	53	3	0	181	
4:20 PM	11	2	0	0	2	2	1	0	3	48	22	0	0	58	5	0	154	
4:25 PM	20	0	1	0	5	3	0	0	1	45	28	0	0	55	5	0	163	
4:30 PM	13	0	0	0	4	3	4	0	0	56	19	0	1	64	2	0	166	
4:35 PM	38	4	6	0	8	6	1	0	0	44	23	0	0	37	1	0	168	
4:40 PM	19	1	1	0	3	4	1	0	1	61	25	0	0	41	3	0	160	
4:45 PM	25	1	0	0	1	2	1	0	0	37	25	0	0	43	0	0	135	
4:50 PM	10	4	1	0	4	2	0	0	0	44	27	0	0	52	3	0	147	
4:55 PM	12	0	1	0	5	2	1	0	0	55	30	0	1	61	0	0	168	1894
5:00 PM	13	2	0	0	4	0	1	0	1	50	25	0	2	67	5	0	170	1919
5:05 PM	28	1	2	0	6	4	4	0	3	57	23	0	0	36	1	0	165	1919
5:10 PM	12	0	2	0	6	2	1	0	1	76	32	0	0	32	1	0	165	1942
5:15 PM	22	4	1	0	6	2	0	0	2	53	25	0	1	56	3	0	175	1936
5:20 PM	11	2	2	0	4	2	5	0	0	58	34	0	0	58	5	0	181	1963
5:25 PM	13	1	2	0	2	0	1	0	1	55	24	0	0	61	1	0	161	1961
5:30 PM	8	0	2	0	2	2	0	0	3	47	18	0	0	62	0	0	144	1939
5:35 PM	11	1	0	0	3	6	0	0	2	43	21	0	1	53	1	0	142	1913
5:40 PM	15	0	1	0	1	1	1	0	2	71	27	0	0	67	1	0	187	1940
5:45 PM	22	1	1	0	1	3	1	0	1	41	31	0	0	48	2	0	152	1957
5:50 PM	19	1	0	0	3	0	0	0	0	44	13	0	1	58	1	0	140	1950
5:55 PM	15	2	1	0	3	0	4	0	0	47	14	0	0	45	4	0	135	1917
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	180	24	20	0	64	24	24	0	12	748	364	0	4	584	36	0	2084	
Heavy Trucks	4	4	0		8	0	0		0	48	8		0	44	4		120	
Pedestrians	0	0			0	0			0	0			0	0			0	
Bicycles	0	0			0	0			0	1	0		0	0			1	
Railroad																		
Stopped Buses																		

Comments:



**LOCATION:** Langer Farms Pkwy -- Tualatin-Sherwood Rd  
**CITY/STATE:** Not found, No

**QC JOB #:** 14898021  
**DATE:** Wed, Feb 13 2019



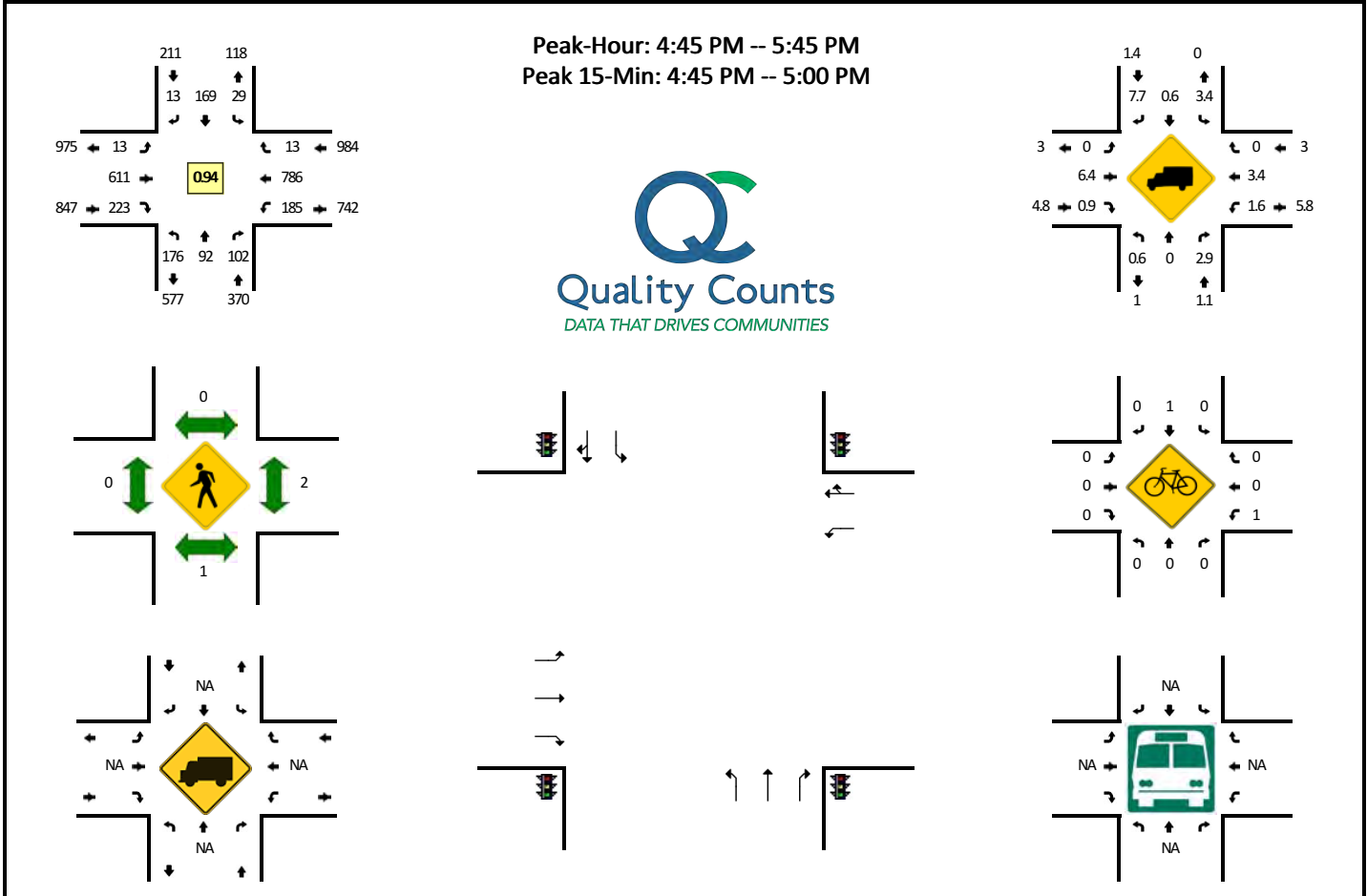
5-Min Count Period Beginning At	Langer Farms Pkwy (Northbound)				Langer Farms Pkwy (Southbound)				Tualatin-Sherwood Rd (Eastbound)				Tualatin-Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	9	2	7	0	3	1	0	0	1	95	12	0	4	27	6	0	167	
7:05 AM	8	9	5	0	3	2	0	0	0	82	12	0	1	32	4	0	158	
7:10 AM	3	7	9	0	1	0	0	0	1	62	15	0	1	40	3	0	142	
7:15 AM	7	7	11	0	4	3	0	0	0	49	10	0	4	31	2	0	128	
7:20 AM	5	8	14	0	0	2	1	0	0	73	11	0	5	30	4	0	153	
7:25 AM	8	11	8	0	0	1	2	0	0	61	9	0	5	40	2	0	147	
7:30 AM	7	8	7	0	1	6	0	0	0	55	20	0	6	41	3	0	154	
7:35 AM	6	7	11	0	0	4	0	0	0	60	10	0	9	34	3	0	144	
7:40 AM	3	7	9	0	1	4	2	0	2	61	16	0	0	24	5	0	134	
7:45 AM	11	11	15	0	3	5	0	0	1	63	11	0	6	42	2	0	170	
7:50 AM	10	9	9	0	0	5	0	0	1	56	21	0	3	42	2	0	158	
7:55 AM	9	8	9	0	0	4	2	0	1	67	14	0	6	42	3	0	165	1820
8:00 AM	10	12	10	0	3	3	0	0	0	77	13	0	8	42	3	0	181	1834
8:05 AM	9	11	10	0	2	0	0	0	2	76	12	0	9	42	3	0	176	1852
8:10 AM	10	8	3	0	3	4	0	0	1	50	14	0	3	39	3	0	138	1848
8:15 AM	5	4	6	0	2	1	0	0	3	44	10	0	8	42	2	0	127	1847
8:20 AM	5	8	7	0	3	2	0	0	0	71	15	0	7	35	2	0	155	1849
8:25 AM	3	7	9	0	4	4	0	0	2	56	10	0	5	45	4	0	149	1851
8:30 AM	11	5	8	0	6	2	0	0	0	55	12	0	3	24	0	0	126	1823
8:35 AM	8	5	6	0	3	4	0	0	0	62	10	0	11	44	2	0	155	1834
8:40 AM	10	8	9	0	2	4	0	0	2	52	6	0	9	34	4	0	140	1840
8:45 AM	3	4	5	0	2	2	0	0	0	52	6	0	8	40	2	0	124	1794
8:50 AM	5	5	7	0	2	7	0	0	0	61	11	0	5	31	1	0	135	1771
8:55 AM	4	6	7	0	2	2	0	0	0	50	7	0	9	43	1	0	131	1737
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	112	124	116	0	20	28	8	0	12	880	156	0	92	504	36	0	2088	
Heavy Trucks	8	8	0	0	0	4	0	0	0	60	4	0	4	108	16	0	212	
Pedestrians	0	0	0	0	0	8	0	0	0	0	0	0	0	4	0	0	12	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

Comments:

Type of peak hour being reported: User-Defined

LOCATION: Langer Farms Pkwy -- Tualatin-Sherwood Rd  
 CITY/STATE: Not found, No

QC JOB #: 14898022  
 DATE: Wed, Feb 13 2019



5-Min Count Period Beginning At	Langer Farms Pkwy (Northbound)				Langer Farms Pkwy (Southbound)				Tualatin-Sherwood Rd (Eastbound)				Tualatin-Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	8	5	6	0	6	17	0	0	0	59	23	0	13	74	5	0	216	
4:05 PM	15	9	8	0	3	8	1	0	1	43	12	0	10	58	3	0	171	
4:10 PM	11	3	10	0	3	4	1	0	2	51	16	0	8	73	1	0	183	
4:15 PM	14	9	6	0	5	13	2	0	1	40	11	0	6	58	3	0	168	
4:20 PM	10	7	5	0	3	16	0	0	0	51	20	0	10	57	1	0	180	
4:25 PM	8	11	14	0	2	11	3	0	1	47	16	0	18	67	5	0	203	
4:30 PM	12	6	5	0	1	9	1	0	0	47	12	0	18	66	2	0	179	
4:35 PM	12	9	5	0	1	18	1	0	0	49	16	0	16	60	3	0	190	
4:40 PM	8	7	6	0	3	13	2	0	0	47	16	0	13	54	5	0	174	
4:45 PM	10	14	8	0	3	12	0	0	0	57	19	0	16	70	3	0	212	
4:50 PM	13	8	11	0	4	14	0	0	0	62	26	0	15	71	1	0	225	
4:55 PM	13	2	9	0	4	21	0	0	1	62	11	0	14	69	0	0	206	2307
5:00 PM	18	8	16	0	4	12	1	0	0	48	11	0	15	68	1	0	202	2293
5:05 PM	19	8	7	0	3	18	1	0	3	54	18	0	18	57	2	0	208	2330
5:10 PM	18	7	5	0	1	11	1	0	0	62	20	0	13	77	2	0	217	2364
5:15 PM	17	6	10	0	2	11	1	0	2	53	19	0	17	68	0	0	206	2402
5:20 PM	14	11	9	0	2	17	3	0	0	40	18	0	12	61	0	0	187	2409
5:25 PM	13	7	8	0	0	9	3	0	3	45	19	0	24	67	0	0	198	2404
5:30 PM	16	7	9	0	4	14	1	0	3	39	21	0	19	57	1	0	191	2416
5:35 PM	11	8	5	0	1	14	1	0	0	46	19	0	13	48	1	0	167	2393
5:40 PM	14	6	5	0	1	16	1	0	1	43	22	0	9	73	2	0	193	2412
5:45 PM	13	10	10	0	2	11	3	0	2	39	15	0	23	66	1	0	195	2395
5:50 PM	10	8	9	0	3	14	1	0	0	44	18	0	19	54	3	0	183	2353
5:55 PM	13	8	11	0	1	13	1	0	1	49	17	0	9	67	1	0	191	2338
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	144	96	112	0	44	188	0	0	4	724	224	0	180	840	16	0	2572	
Heavy Trucks	0	0	4	0	0	0	0	0	0	52	0	0	0	48	0	0	104	
Pedestrians	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

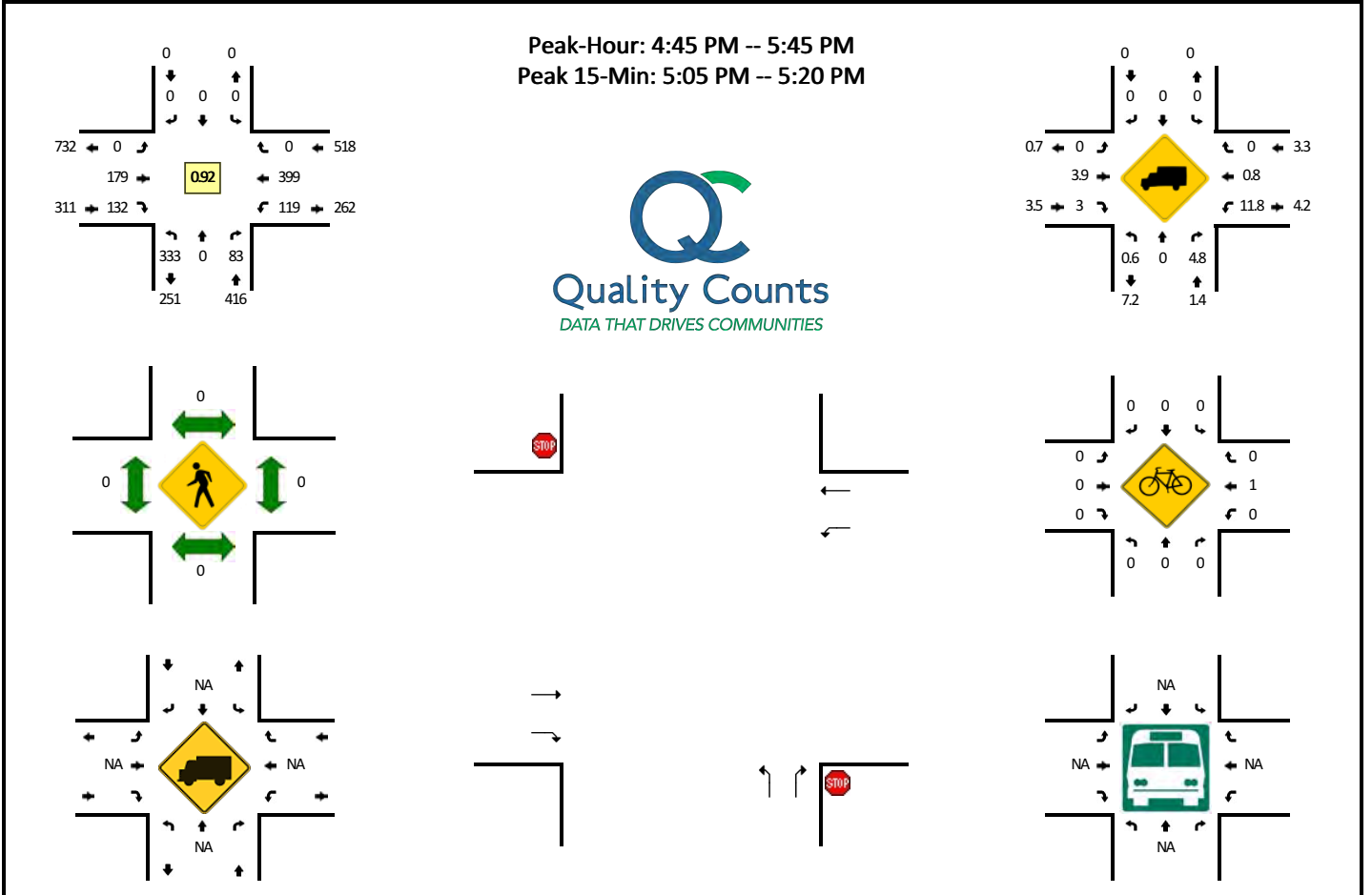
Comments:





**LOCATION:** Tonquin Rd -- Oregon St  
**CITY/STATE:** Washington, OR

**QC JOB #:** 14898024  
**DATE:** Wed, Feb 13 2019



5-Min Count Period Beginning At	Tonquin Rd (Northbound)				Tonquin Rd (Southbound)				Oregon St (Eastbound)				Oregon St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	21	0	9	0	0	0	0	0	0	10	13	0	13	24	0	0	90	
4:05 PM	20	0	7	0	0	0	0	0	0	13	10	0	10	28	0	0	88	
4:10 PM	25	0	7	0	0	0	0	0	0	19	10	0	10	28	0	0	99	
4:15 PM	21	0	7	0	0	0	0	0	0	12	11	0	11	23	0	0	85	
4:20 PM	31	0	6	0	0	0	0	0	0	8	8	0	10	34	0	0	97	
4:25 PM	31	0	4	0	0	0	0	0	0	12	16	0	9	20	0	0	92	
4:30 PM	25	0	10	0	0	0	0	0	0	7	14	0	12	30	0	0	98	
4:35 PM	23	0	5	0	0	0	0	0	0	16	18	0	6	26	0	0	94	
4:40 PM	16	0	8	0	0	0	0	0	0	14	12	0	7	44	0	0	101	
4:45 PM	26	0	4	0	0	0	0	0	0	10	8	0	11	31	0	0	90	
4:50 PM	42	0	9	0	0	0	0	0	0	13	10	0	10	23	0	0	107	
4:55 PM	23	0	13	0	0	0	0	0	0	10	9	0	10	34	0	0	99	1140
5:00 PM	27	0	2	0	0	0	0	0	0	17	5	0	13	29	0	0	93	1143
5:05 PM	19	0	7	0	0	0	0	0	0	23	16	0	17	28	0	0	110	1165
5:10 PM	25	0	8	0	0	0	0	0	0	24	8	0	15	44	0	0	124	1190
5:15 PM	35	0	7	0	0	0	0	0	0	12	12	0	8	31	0	0	105	1210
5:20 PM	27	0	9	0	0	0	0	0	0	14	15	0	7	32	0	0	104	1217
5:25 PM	26	0	4	0	0	0	0	0	0	10	8	0	10	37	0	0	95	1220
5:30 PM	24	0	8	0	0	0	0	0	0	17	18	0	10	34	0	0	111	1233
5:35 PM	33	0	9	0	0	0	0	0	0	14	12	0	6	38	0	0	112	1251
5:40 PM	26	0	3	0	0	0	0	0	0	15	11	0	2	38	0	0	95	1245
5:45 PM	14	0	5	0	0	0	0	0	0	13	7	0	6	38	0	0	83	1238
5:50 PM	24	0	9	0	0	0	0	0	0	16	7	0	2	27	0	0	85	1216
5:55 PM	25	0	5	0	0	0	0	0	0	15	11	0	9	22	0	0	87	1204
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	316	0	88	0	0	0	0	0	0	236	144	0	160	412	0	0	1356	
Heavy Trucks	0	0	4	0	0	0	0	0	0	0	4	0	12	4	0	0	24	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

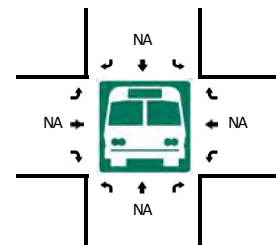
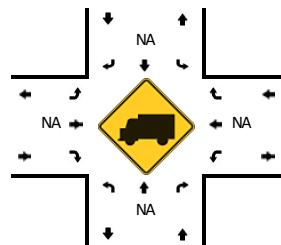
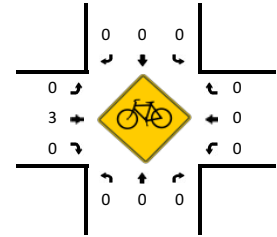
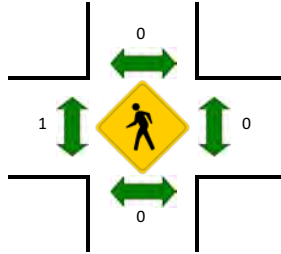
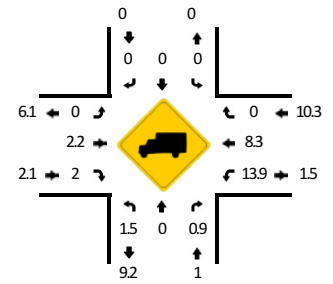
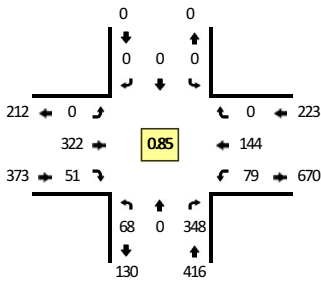
*Comments:*

Type of peak hour being reported: User-Defined

LOCATION: Murdock Rd -- Oregon St  
 CITY/STATE: Washington, OR

QC JOB #: 14898025  
 DATE: Wed, Feb 13 2019

Peak-Hour: 7:20 AM -- 8:20 AM  
 Peak 15-Min: 7:45 AM -- 8:00 AM

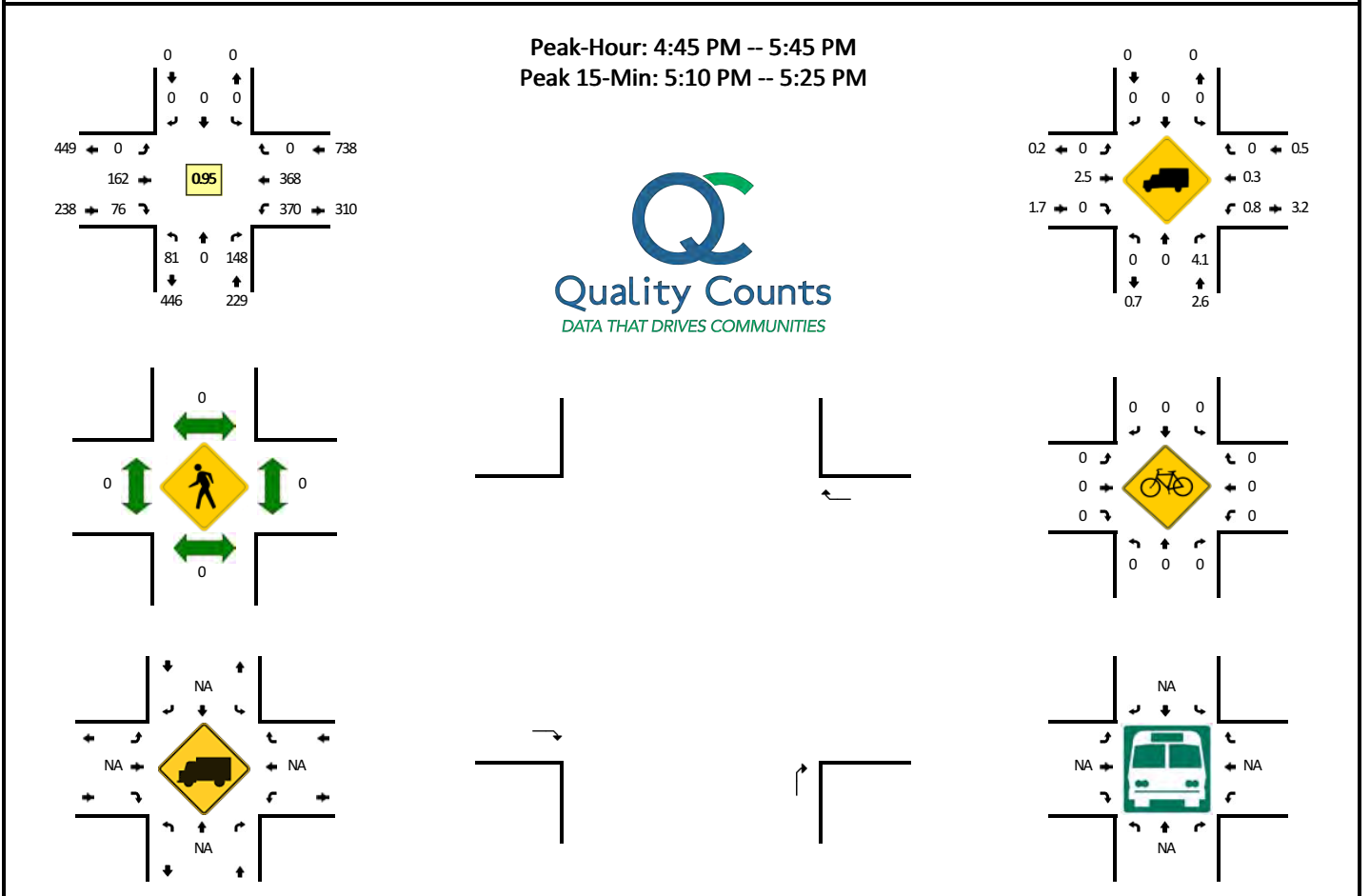


5-Min Count Period Beginning At	Murdock Rd (Northbound)				Murdock Rd (Southbound)				Oregon St (Eastbound)				Oregon St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	3	0	35	0	0	0	0	0	0	29	2	0	4	4	0	0	77	
7:05 AM	4	0	29	0	0	0	0	0	0	21	2	0	3	10	0	0	69	
7:10 AM	3	0	38	0	0	0	0	0	0	27	5	0	4	9	0	0	86	
7:15 AM	3	0	38	0	0	0	0	0	0	26	3	0	3	11	0	0	84	
7:20 AM	6	0	27	0	0	0	0	0	0	32	2	0	3	15	0	0	85	
7:25 AM	6	0	31	0	0	0	0	0	0	36	2	0	13	15	0	0	103	
7:30 AM	12	0	32	0	0	0	0	0	0	24	4	0	6	19	0	0	97	
7:35 AM	14	0	26	0	0	0	0	0	0	33	5	0	6	7	0	0	91	
7:40 AM	7	0	30	0	0	0	0	0	0	25	5	0	1	12	0	0	80	
7:45 AM	6	0	29	0	0	0	0	0	0	32	5	0	8	19	0	0	99	
7:50 AM	3	0	35	0	0	0	0	0	0	27	7	1	6	14	0	0	93	
7:55 AM	4	0	40	0	0	0	0	0	0	34	7	0	9	11	0	0	105	1069
8:00 AM	7	0	33	0	0	0	0	0	0	32	1	0	8	12	0	0	93	1085
8:05 AM	1	0	22	0	0	0	0	0	0	19	5	0	8	9	0	0	64	1080
8:10 AM	1	0	26	0	0	0	0	0	0	11	7	0	4	5	0	0	54	1048
8:15 AM	1	0	17	0	0	0	0	0	0	16	1	0	7	6	0	0	48	1012
8:20 AM	2	0	19	0	0	0	0	0	0	22	3	0	10	12	0	0	68	995
8:25 AM	7	0	25	0	0	0	0	0	0	13	1	0	11	9	0	0	66	958
8:30 AM	1	0	21	0	0	0	0	0	0	13	4	0	12	7	0	1	59	920
8:35 AM	5	0	18	0	0	0	0	0	0	10	2	0	13	6	0	0	54	883
8:40 AM	4	0	25	1	0	0	0	0	0	15	5	0	5	9	0	0	64	867
8:45 AM	2	0	30	0	0	0	0	0	0	11	2	0	12	10	0	0	67	835
8:50 AM	2	0	21	0	0	0	0	0	0	10	1	0	8	9	0	0	51	793
8:55 AM	8	0	8	0	0	0	0	0	0	2	2	0	8	10	0	0	38	726
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	52	0	416	0	0	0	0	0	0	376	76	4	92	176	0	0	1192	
Heavy Trucks	4	0	4	0	0	0	0	0	0	4	4	0	16	16	0	0	48	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	
Railroad																		
Stopped Buses																		

Comments:

**LOCATION:** Murdock Rd -- Oregon St  
**CITY/STATE:** Washington, OR

**QC JOB #:** 14898026  
**DATE:** Wed, Feb 13 2019



5-Min Count Period Beginning At	Murdock Rd (Northbound)				Murdock Rd (Southbound)				Oregon St (Eastbound)				Oregon St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	6	0	12	0	0	0	0	0	0	10	4	0	27	21	0	0	80	
4:05 PM	4	0	12	0	0	0	0	0	0	10	5	0	13	34	0	0	78	
4:10 PM	1	0	17	0	0	0	0	0	0	12	2	0	32	22	0	0	86	
4:15 PM	3	0	14	0	0	0	0	0	0	9	13	0	28	17	0	0	84	
4:20 PM	5	0	8	0	0	0	0	0	0	8	17	0	30	34	0	0	102	
4:25 PM	3	0	11	0	0	0	0	0	0	17	9	0	23	31	0	0	94	
4:30 PM	1	0	12	0	0	0	0	0	0	10	8	0	31	24	0	0	86	
4:35 PM	2	0	13	0	0	0	0	0	0	19	4	0	21	30	0	0	89	
4:40 PM	5	0	10	0	0	0	0	0	0	16	11	0	32	25	0	0	99	
4:45 PM	7	0	10	0	0	0	0	0	0	8	6	0	27	32	0	0	90	
4:50 PM	5	0	14	0	0	0	0	0	0	11	5	0	30	40	0	0	105	
4:55 PM	10	0	10	0	0	0	0	0	0	7	8	0	28	28	0	0	91	1084
5:00 PM	18	0	14	0	0	0	0	0	0	8	9	0	25	34	0	0	108	1112
5:05 PM	4	0	17	0	0	0	0	0	0	21	4	0	23	21	0	0	90	1124
5:10 PM	9	0	14	0	0	0	0	0	0	18	5	0	38	32	0	0	116	1154
5:15 PM	2	0	7	0	0	0	0	0	0	21	10	0	36	31	0	0	107	1177
5:20 PM	4	0	15	0	0	0	0	0	0	13	7	0	29	26	0	0	94	1169
5:25 PM	5	0	7	0	0	0	0	0	0	13	3	0	31	34	0	0	93	1168
5:30 PM	10	0	16	0	0	0	0	0	0	16	8	0	32	28	0	0	110	1192
5:35 PM	7	0	14	0	0	0	0	0	0	11	5	0	37	34	0	0	108	1211
5:40 PM	0	0	10	0	0	0	0	0	0	15	6	0	34	28	0	0	93	1205
5:45 PM	4	0	18	0	0	0	0	0	0	8	12	0	30	26	0	0	98	1213
5:50 PM	1	0	17	0	0	0	0	0	0	7	3	0	22	26	0	0	76	1184
5:55 PM	3	0	10	0	0	0	0	0	0	17	11	0	21	30	0	0	92	1185
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	60	0	144	0	0	0	0	0	0	208	88	0	412	356	0	0	1268	
Heavy Trucks	0	0	4	0	0	0	0	0	0	12	0	0	4	0	0	0	20	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

Comments:



Appendix D Existing 2019 Operational  
Worksheets

HCM Signalized Intersection Capacity Analysis  
 1: Langer Farms Pkwy & Tualatin-Sherwood Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	743	161	68	460	35	93	104	111	15	39	7
Future Volume (vph)	11	743	161	68	460	35	93	104	111	15	39	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	4.0	4.0	5.5		4.0	4.5	4.5	4.0	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	1795	1540	1703	1546		1751	1776	1568	1504	1739	
Flt Permitted	0.38	1.00	1.00	0.12	1.00		0.46	1.00	1.00	0.68	1.00	
Satd. Flow (perm)	724	1795	1540	222	1546		853	1776	1568	1078	1739	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	12	844	183	77	523	40	106	118	126	17	44	8
RTOR Reduction (vph)	0	0	46	0	2	0	0	0	103	0	6	0
Lane Group Flow (vph)	13	844	137	77	561	0	106	118	23	17	46	0
Confl. Peds. (#/hr)			2	2			1					1
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	0%	5%	2%	6%	20%	29%	3%	7%	3%	20%	5%	14%
Bus Blockages (#/hr)	0	2	2	0	2	2	0	0	0	0	0	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	49.1	48.4	59.3	56.1	51.9		22.0	16.1	16.1	9.0	7.1	
Effective Green, g (s)	49.1	48.4	59.3	56.1	51.9		22.0	16.1	16.1	9.0	7.1	
Actuated g/C Ratio	0.55	0.55	0.67	0.63	0.59		0.25	0.18	0.18	0.10	0.08	
Clearance Time (s)	4.0	5.5	4.0	4.0	5.5		4.0	4.5	4.5	4.0	4.5	
Vehicle Extension (s)	1.5	3.5	1.5	1.5	3.5		1.5	8.0	8.0	1.5	2.0	
Lane Grp Cap (vph)	409	980	1030	210	905		322	322	284	118	139	
v/s Ratio Prot	0.00	c0.47	0.02	c0.02	0.36		c0.04	c0.07		0.00	0.03	
v/s Ratio Perm	0.02		0.07	0.21			0.04		0.01	0.01		
v/c Ratio	0.03	0.86	0.13	0.37	0.62		0.33	0.37	0.08	0.14	0.33	
Uniform Delay, d1	9.2	17.2	5.3	13.5	11.9		26.7	31.8	30.1	36.2	38.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	8.0	0.0	0.4	1.3		0.2	3.0	0.5	0.2	0.5	
Delay (s)	9.2	25.3	5.3	13.9	13.3		27.0	34.8	30.6	36.4	39.0	
Level of Service	A	C	A	B	B		C	C	C	D	D	
Approach Delay (s)		21.6			13.3			30.9			38.4	
Approach LOS		C			B			C			D	

Intersection Summary		
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.72	
Actuated Cycle Length (s)	88.6	Sum of lost time (s) 18.0
Intersection Capacity Utilization	66.8%	ICU Level of Service C
Analysis Period (min)	15	

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 2: Oregon St & Tualatin-Sherwood Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	676	117	109	525	6	84	3	338	4	0	0
Future Volume (vph)	8	676	117	109	525	6	84	3	338	4	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5			5.0	4.0	4.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00		
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00			1.00	0.99	1.00		
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00		
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85	1.00		
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00	0.95		
Satd. Flow (prot)	1805	1729	1448	1556	1639			1531	1525	1442		
Flt Permitted	0.95	1.00	1.00	0.20	1.00			0.86	1.00	0.70		
Satd. Flow (perm)	1805	1729	1448	324	1639			1373	1525	1065		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	8	712	123	115	553	6	88	3	356	4	0	0
RTOR Reduction (vph)	0	0	41	0	0	0	0	0	148	0	0	0
Lane Group Flow (vph)	8	712	82	115	559	0	0	91	208	4	0	0
Confl. Peds. (#/hr)			1	1					1	1		
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	0%	9%	9%	16%	15%	0%	19%	0%	5%	25%	0%	0%
Bus Blockages (#/hr)	0	2	0	0	2	0	0	0	0	0	0	0
Turn Type	Prot	NA	Perm	pm+pt	NA		Perm	NA	pm+ov	Perm		
Protected Phases	5!	2!		1!	6!			8!	1		4!	
Permitted Phases			2	6!			8!		8	4!		
Actuated Green, G (s)	0.6	27.5	27.5	38.8	34.2			4.6	11.8	5.7		
Effective Green, g (s)	0.6	27.5	27.5	38.8	34.2			4.6	11.8	5.7		
Actuated g/C Ratio	0.01	0.51	0.51	0.72	0.63			0.09	0.22	0.11		
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5			5.0	4.0	4.0		
Vehicle Extension (s)	1.0	3.5	3.5	1.0	3.5			1.0	1.0	1.0		
Lane Grp Cap (vph)	20	882	738	397	1039			117	333	112		
v/s Ratio Prot	0.00	c0.41		0.04	0.34				c0.08			
v/s Ratio Perm			0.06	0.17				c0.07	0.05	0.00		
v/c Ratio	0.40	0.81	0.11	0.29	0.54			0.78	0.62	0.04		
Uniform Delay, d1	26.5	11.0	6.9	5.1	5.5			24.1	19.0	21.6		
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00		
Incremental Delay, d2	4.7	5.6	0.1	0.1	0.6			25.0	2.6	0.0		
Delay (s)	31.2	16.6	6.9	5.2	6.1			49.1	21.6	21.7		
Level of Service	C	B	A	A	A			D	C	C		
Approach Delay (s)		15.3			5.9			27.2			21.7	
Approach LOS		B			A			C			C	

Intersection Summary

HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	53.9	Sum of lost time (s)	14.5
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group



HCM Signalized Intersection Capacity Analysis  
 3: 124th Ave & Tualatin-Sherwood Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	60	854	50	16	523	95	110	180	58	131	138	48
Future Volume (vph)	60	854	50	16	523	95	110	180	58	131	138	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	4.0	4.0	5.5	4.0	4.0	5.5		4.0	5.5	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1671	1729	1228	1203	1639	1366	1626	1591		1612	1696	1282
Flt Permitted	0.30	1.00	1.00	0.08	1.00	1.00	0.59	1.00		0.31	1.00	1.00
Satd. Flow (perm)	521	1729	1228	105	1639	1366	1010	1591		520	1696	1282
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	65	918	54	17	562	102	118	194	62	141	148	52
RTOR Reduction (vph)	0	0	20	0	0	40	0	11	0	0	0	40
Lane Group Flow (vph)	65	918	34	17	562	62	118	245	0	141	148	12
Confl. Bikes (#/hr)			3			1						
Heavy Vehicles (%)	8%	9%	28%	50%	15%	16%	11%	10%	31%	12%	12%	26%
Bus Blockages (#/hr)	0	2	2	0	2	2	0	0	0	0	0	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8		7	4	5
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	71.6	66.4	75.5	65.8	63.5	73.3	31.6	22.5		33.0	23.2	28.4
Effective Green, g (s)	71.6	66.4	75.5	65.8	63.5	73.3	31.6	22.5		33.0	23.2	28.4
Actuated g/C Ratio	0.60	0.55	0.63	0.55	0.53	0.61	0.26	0.19		0.28	0.19	0.24
Clearance Time (s)	4.0	5.5	4.0	4.0	5.5	4.0	4.0	5.5		4.0	5.5	4.0
Vehicle Extension (s)	1.5	4.5	0.2	1.5	4.5	0.2	0.2	2.0		0.2	2.0	1.5
Lane Grp Cap (vph)	360	956	772	78	867	834	312	298		232	327	303
v/s Ratio Prot	c0.01	c0.53	0.00	0.00	0.34	0.01	0.03	c0.15		c0.05	0.09	0.00
v/s Ratio Perm	0.10		0.02	0.11		0.04	0.07			0.12		0.01
v/c Ratio	0.18	0.96	0.04	0.22	0.65	0.07	0.38	0.82		0.61	0.45	0.04
Uniform Delay, d1	12.6	25.5	8.5	22.2	20.2	9.5	35.1	46.8		35.2	42.8	35.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.1	20.9	0.0	0.5	3.7	0.0	0.3	15.9		3.1	0.4	0.0
Delay (s)	12.7	46.5	8.5	22.7	24.0	9.5	35.4	62.7		38.3	43.2	35.3
Level of Service	B	D	A	C	C	A	D	E		D	D	D
Approach Delay (s)		42.4			21.8			54.1			39.9	
Approach LOS		D			C			D			D	

Intersection Summary		
HCM 2000 Control Delay	38.1	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.88	D
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	82.6%	19.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		E

HCM Unsignalized Intersection Capacity Analysis  
 4: Tonquin Rd & 0/Oregon St

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Volume (veh/h)	361	308	97	103	120	74
Future Volume (Veh/h)	361	308	97	103	120	74
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	410	350	110	117	136	84
<b>Pedestrians</b>						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL		TWLTL			
Median storage (veh)	2		2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			410		747	410
vC1, stage 1 conf vol					410	
vC2, stage 2 conf vol					337	
vCu, unblocked vol			410		747	410
tC, single (s)			4.2		6.5	6.5
tC, 2 stage (s)					5.5	
tF (s)			2.3		3.6	3.5
p0 queue free %			90		74	86
cM capacity (veh/h)			1087		528	593
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	410	350	110	117	136	84
Volume Left	0	0	110	0	136	0
Volume Right	0	350	0	0	0	84
cSH	1700	1700	1087	1700	528	593
Volume to Capacity	0.24	0.21	0.10	0.07	0.26	0.14
Queue Length 95th (ft)	0	0	8	0	25	12
Control Delay (s)	0.0	0.0	8.7	0.0	14.2	12.1
Lane LOS			A		B	B
Approach Delay (s)	0.0		4.2		13.4	
Approach LOS					B	
<b>Intersection Summary</b>						
Average Delay			3.2			
Intersection Capacity Utilization			41.0%		ICU Level of Service	A
Analysis Period (min)			15			

## MOVEMENT SUMMARY

 Site: 10 [SW Oregon St & Murdock Rd]

Year 2019 - Existing AM Peak Hour Conditions  
 Site Category: (None)  
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Murdock Road												
3	L2	80	1.0	0.531	10.9	LOS B	4.3	109.2	0.69	0.74	0.91	30.4
18	R2	409	1.0	0.531	10.9	LOS B	4.3	109.2	0.69	0.74	0.91	28.9
Approach		489	1.0	0.531	10.9	LOS B	4.3	109.2	0.69	0.74	0.91	29.1
East: Oregon St												
1	L2	93	14.0	0.227	5.3	LOS A	1.1	28.6	0.24	0.11	0.24	32.6
6	T1	169	8.0	0.227	5.1	LOS A	1.1	28.6	0.24	0.11	0.24	32.1
Approach		262	10.1	0.227	5.2	LOS A	1.1	28.6	0.24	0.11	0.24	32.3
West: Oregon St.												
2	T1	378	2.0	0.360	6.4	LOS A	2.1	54.3	0.33	0.18	0.33	32.6
12	R2	60	2.0	0.360	6.4	LOS A	2.1	54.3	0.33	0.18	0.33	31.4
Approach		438	2.0	0.360	6.4	LOS A	2.1	54.3	0.33	0.18	0.33	32.4
All Vehicles		1189	3.4	0.531	8.0	LOS A	4.3	109.2	0.46	0.39	0.55	31.0

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

Roundabout LOS Method: Same as Sign Control.

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

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

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

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

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

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Project: Not Saved



HCM Signalized Intersection Capacity Analysis  
1: Langer Farms Pkwy & Tualatin-Sherwood Rd

Sherwood Commerce Center  
Year 2019 Existing PM Peak Hour Conditions

























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗		↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	13	611	223	185	786	13	176	92	102	29	169	13
Future Volume (vph)	13	611	223	185	786	13	176	92	102	29	169	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	4.0	4.0	5.5		4.0	4.5	4.5	4.0	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	1778	1586	1770	1826		1786	1900	1568	1752	1848	
Flt Permitted	0.14	1.00	1.00	0.18	1.00		0.29	1.00	1.00	0.69	1.00	
Satd. Flow (perm)	259	1778	1586	343	1826		554	1900	1568	1279	1848	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	14	650	237	197	836	14	187	98	109	31	180	14
RTOR Reduction (vph)	0	0	82	0	0	0	0	0	86	0	3	0
Lane Group Flow (vph)	14	650	155	197	850	0	187	98	23	31	191	0
Confl. Peds. (#/hr)	1					1	2					2
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	6%	1%	2%	3%	0%	1%	0%	3%	3%	1%	8%
Bus Blockages (#/hr)	0	2	2	0	2	2	0	0	0	0	0	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	44.8	43.2	53.4	55.4	49.8		27.2	19.9	19.9	16.3	13.0	
Effective Green, g (s)	44.8	43.2	53.4	55.4	49.8		27.2	19.9	19.9	16.3	13.0	
Actuated g/C Ratio	0.48	0.47	0.58	0.60	0.54		0.29	0.21	0.21	0.18	0.14	
Clearance Time (s)	4.0	5.5	4.0	4.0	5.5		4.0	4.5	4.5	4.0	4.5	
Vehicle Extension (s)	1.5	3.5	1.5	1.5	3.5		1.5	8.0	8.0	1.5	2.0	
Lane Grp Cap (vph)	152	829	914	331	982		298	408	336	241	259	
v/s Ratio Prot	0.00	0.37	0.02	c0.05	c0.47		c0.07	0.05		0.00	0.10	
v/s Ratio Perm	0.04		0.08	0.30			c0.11		0.01	0.02		
v/c Ratio	0.09	0.78	0.17	0.60	0.87		0.63	0.24	0.07	0.13	0.74	
Uniform Delay, d1	16.2	20.8	9.2	13.5	18.5		26.3	30.1	29.0	32.0	38.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	5.0	0.0	1.9	8.2		3.0	1.3	0.4	0.1	9.1	
Delay (s)	16.3	25.8	9.2	15.4	26.7		29.3	31.4	29.3	32.1	47.3	
Level of Service	B	C	A	B	C		C	C	C	C	D	
Approach Delay (s)		21.3			24.6			29.8			45.2	
Approach LOS		C			C			C			D	

Intersection Summary		
HCM 2000 Control Delay	26.1	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.82	
Actuated Cycle Length (s)	92.6	Sum of lost time (s) 18.0
Intersection Capacity Utilization	81.5%	ICU Level of Service D
Analysis Period (min)	15	

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
2: Oregon St & Tualatin-Sherwood Rd

Sherwood Commerce Center  
Year 2019 Existing PM Peak Hour Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	685	115	377	829	8	122	1	175	11	10	8
Future Volume (vph)	7	685	115	377	829	8	122	1	175	11	10	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5			5.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00			1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1803	1830	1464	1770	1827			1739	1568	1805	1755	
Flt Permitted	0.95	1.00	1.00	0.13	1.00			0.33	1.00	0.71	1.00	
Satd. Flow (perm)	1803	1830	1464	242	1827			611	1568	1357	1755	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	8	737	124	405	891	9	131	1	188	12	11	9
RTOR Reduction (vph)	0	0	40	0	0	0	0	0	111	0	8	0
Lane Group Flow (vph)	8	737	84	405	900	0	0	132	77	12	12	0
Confl. Peds. (#/hr)	2					2	1					1
Confl. Bikes (#/hr)			1			3						
Heavy Vehicles (%)	0%	3%	8%	2%	3%	0%	4%	0%	3%	0%	0%	0%
Bus Blockages (#/hr)	0	2	0	0	2	0	0	0	0	0	0	0
Turn Type	Prot	NA	Perm	pm+pt	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases	5!	2!		1!	6!			8!	1		4!	
Permitted Phases			2	6!			8!		8	4!		
Actuated Green, G (s)	0.6	37.2	37.2	49.4	44.8			11.9	27.4	5.6	5.6	
Effective Green, g (s)	0.6	37.2	37.2	49.4	44.8			11.9	27.4	5.6	5.6	
Actuated g/C Ratio	0.01	0.52	0.52	0.69	0.62			0.17	0.38	0.08	0.08	
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5			5.0	4.0	4.0	4.0	
Vehicle Extension (s)	1.0	3.5	3.5	1.0	3.5			1.0	1.0	1.0	1.0	
Lane Grp Cap (vph)	15	948	758	496	1139			101	598	105	136	
v/s Ratio Prot	0.00	0.40		c0.18	0.49				0.03		0.01	
v/s Ratio Perm			0.06	c0.39				c0.22	0.02	0.01		
v/c Ratio	0.53	0.78	0.11	0.82	0.79			1.31	0.13	0.11	0.09	
Uniform Delay, d1	35.5	14.0	8.8	16.8	10.0			29.9	14.4	30.8	30.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	17.0	4.2	0.1	9.5	3.8			192.6	0.0	0.2	0.1	
Delay (s)	52.5	18.1	8.9	26.4	13.8			222.5	14.5	31.0	30.8	
Level of Service	D	B	A	C	B			F	B	C	C	
Approach Delay (s)		17.1			17.7			100.3			30.9	
Approach LOS		B			B			F			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			28.2	HCM 2000 Level of Service				C				
HCM 2000 Volume to Capacity ratio			0.96									
Actuated Cycle Length (s)			71.8	Sum of lost time (s)				14.5				
Intersection Capacity Utilization			82.5%	ICU Level of Service				E				
Analysis Period (min)			15									
! Phase conflict between lane groups.												
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
3: 124th Ave & Tualatin-Sherwood Rd

Sherwood Commerce Center  
Year 2019 Existing PM Peak Hour Conditions



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	772	103	24	823	83	98	105	8	98	173	183
Future Volume (vph)	48	772	103	24	823	83	98	105	8	98	173	183
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	4.0	4.0	5.5	4.0	4.0	5.5		4.0	5.5	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1805	1812	1427	1805	1830	1550	1752	1843		1734	1827	1583
Flt Permitted	0.15	1.00	1.00	0.22	1.00	1.00	0.43	1.00		0.57	1.00	1.00
Satd. Flow (perm)	278	1812	1427	409	1830	1550	793	1843		1044	1827	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	50	804	107	25	857	86	102	109	8	102	180	191
RTOR Reduction (vph)	0	0	34	0	0	25	0	2	0	0	0	154
Lane Group Flow (vph)	50	804	73	25	857	61	102	115	0	102	180	37
Confl. Peds. (#/hr)	2		1	1		2			1	1		
Confl. Bikes (#/hr)			1			2						
Heavy Vehicles (%)	0%	4%	10%	0%	3%	2%	3%	2%	0%	4%	4%	2%
Bus Blockages (#/hr)	0	2	2	0	2	2	0	0	0	0	0	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8		7	4	5
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	85.3	79.1	87.8	78.5	75.7	85.2	26.4	17.7		28.0	18.5	24.7
Effective Green, g (s)	85.3	79.1	87.8	78.5	75.7	85.2	26.4	17.7		28.0	18.5	24.7
Actuated g/C Ratio	0.67	0.62	0.69	0.61	0.59	0.67	0.21	0.14		0.22	0.14	0.19
Clearance Time (s)	4.0	5.5	4.0	4.0	5.5	4.0	4.0	5.5		4.0	5.5	4.0
Vehicle Extension (s)	1.5	4.5	0.2	1.5	4.5	0.2	0.2	2.0		0.2	2.0	1.5
Lane Grp Cap (vph)	259	1118	978	281	1081	1030	228	254		279	263	305
v/s Ratio Prot	c0.01	c0.44	0.01	0.00	c0.47	0.00	c0.03	0.06		0.03	c0.10	0.01
v/s Ratio Perm	0.12		0.05	0.05		0.03	0.06			0.05		0.02
v/c Ratio	0.19	0.72	0.07	0.09	0.79	0.06	0.45	0.45		0.37	0.68	0.12
Uniform Delay, d1	16.1	16.9	6.7	13.5	20.2	7.5	43.0	50.8		41.6	52.0	42.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.1	2.6	0.0	0.1	4.5	0.0	0.5	0.5		0.3	5.8	0.1
Delay (s)	16.2	19.4	6.7	13.6	24.7	7.5	43.5	51.2		41.9	57.8	42.8
Level of Service	B	B	A	B	C	A	D	D		D	E	D
Approach Delay (s)		17.8			22.9			47.6			48.3	
Approach LOS		B			C			D			D	

Intersection Summary		
HCM 2000 Control Delay	27.7	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.71	C
Actuated Cycle Length (s)	128.1	Sum of lost time (s)
Intersection Capacity Utilization	71.3%	19.0
Analysis Period (min)	15	ICU Level of Service
		C

c Critical Lane Group



HCM Unsignalized Intersection Capacity Analysis  
 4: Tonquin Rd & Oregon St

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Volume (veh/h)	179	132	119	402	336	83
Future Volume (Veh/h)	179	132	119	402	336	83
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	195	143	129	437	365	90
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL		TWLTL			
Median storage (veh)	2		2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			195	890		195
vC1, stage 1 conf vol			195			
vC2, stage 2 conf vol			695			
vCu, unblocked vol			195	890		195
tC, single (s)			4.2	6.4		6.2
tC, 2 stage (s)			5.4			
tF (s)			2.3	3.5		3.3
p0 queue free %			90	15		89
cM capacity (veh/h)			1320	428		839
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	195	143	129	437	365	90
Volume Left	0	0	129	0	365	0
Volume Right	0	143	0	0	0	90
cSH	1700	1700	1320	1700	428	839
Volume to Capacity	0.11	0.08	0.10	0.26	0.85	0.11
Queue Length 95th (ft)	0	0	8	0	211	9
Control Delay (s)	0.0	0.0	8.0	0.0	46.2	9.8
Lane LOS			A			A
Approach Delay (s)	0.0		1.8	39.0		
Approach LOS			E			
Intersection Summary						
Average Delay			13.8			
Intersection Capacity Utilization			46.4%	ICU Level of Service		A
Analysis Period (min)			15			

# MOVEMENT SUMMARY

 Site: 10 [SW Oregon St & Murdock Rd]

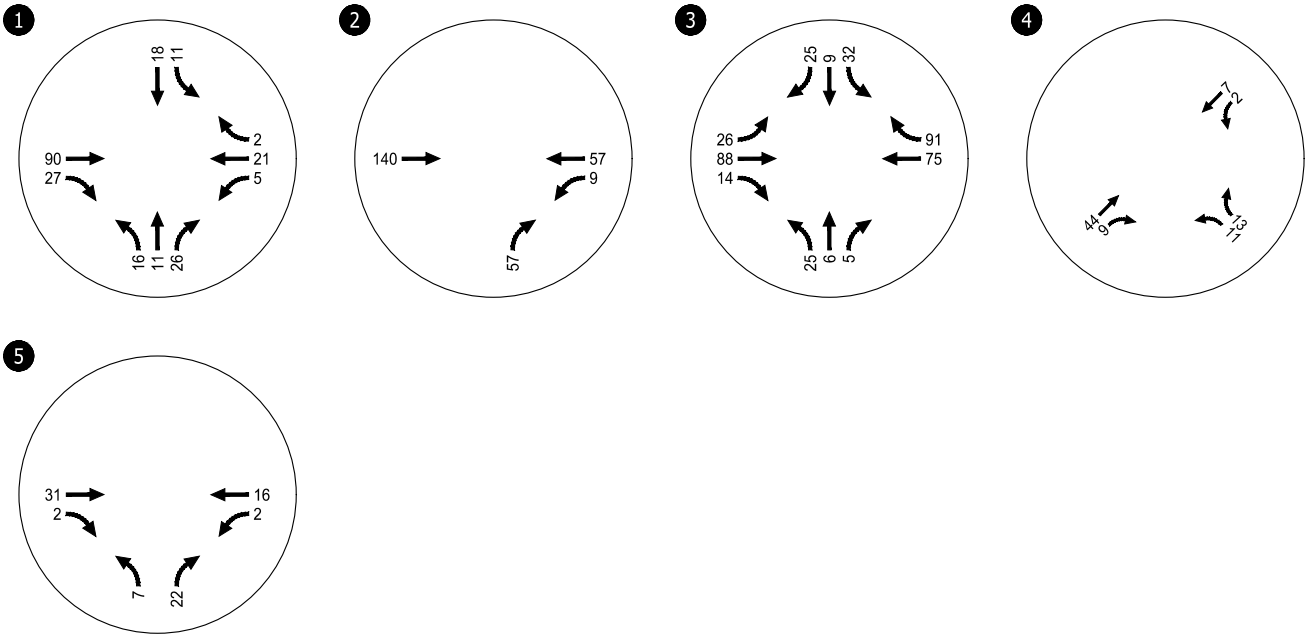
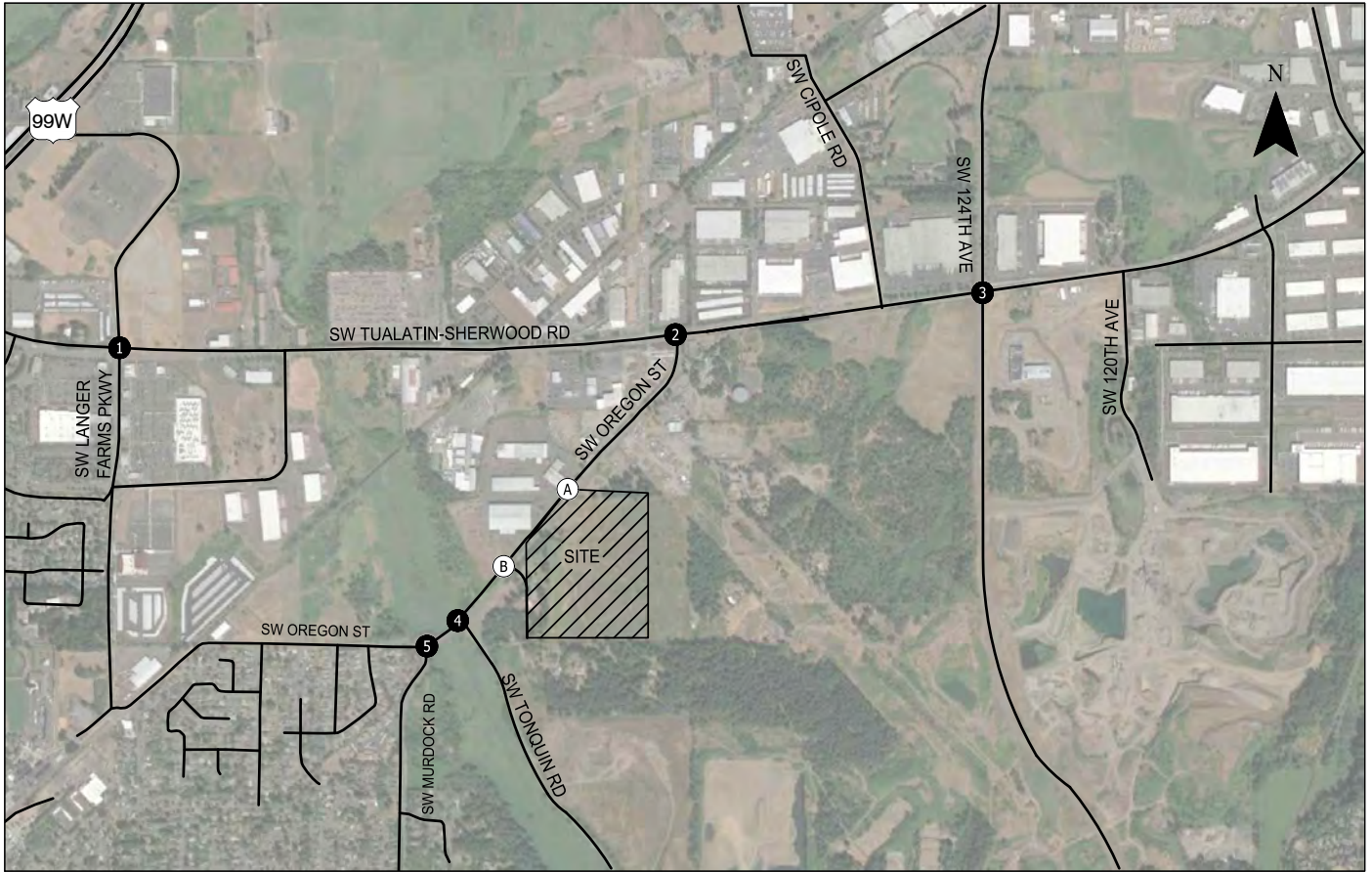
Year 2019 - Existing PM Peak Hour Conditions  
 Site Category: (None)  
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Murdock Road												
3	L2	85	0.0	0.214	5.1	LOS A	1.0	26.4	0.36	0.23	0.36	32.4
18	R2	156	4.0	0.214	5.2	LOS A	1.0	26.4	0.36	0.23	0.36	30.6
Approach		241	2.6	0.214	5.1	LOS A	1.0	26.4	0.36	0.23	0.36	31.2
East: Oregon St												
1	L2	389	1.0	0.617	10.5	LOS B	5.8	146.2	0.46	0.24	0.46	30.1
6	T1	387	0.0	0.617	10.4	LOS B	5.8	146.2	0.46	0.24	0.46	29.6
Approach		777	0.5	0.617	10.4	LOS B	5.8	146.2	0.46	0.24	0.46	29.8
West: Oregon St.												
2	T1	172	2.0	0.276	6.9	LOS A	1.3	33.3	0.55	0.48	0.55	32.3
12	R2	80	0.0	0.276	6.8	LOS A	1.3	33.3	0.55	0.48	0.55	31.2
Approach		252	1.4	0.276	6.8	LOS A	1.3	33.3	0.55	0.48	0.55	31.9
All Vehicles		1269	1.1	0.617	8.7	LOS A	5.8	146.2	0.46	0.29	0.46	30.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Roundabout LOS Method: Same as Sign Control.  
 Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.  
 LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).  
 Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).  
 Roundabout Capacity Model: US HCM 6.  
 HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.  
 Gap-Acceptance Capacity: Traditional M1.  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Appendix E Background 2022 Operational  
Worksheets

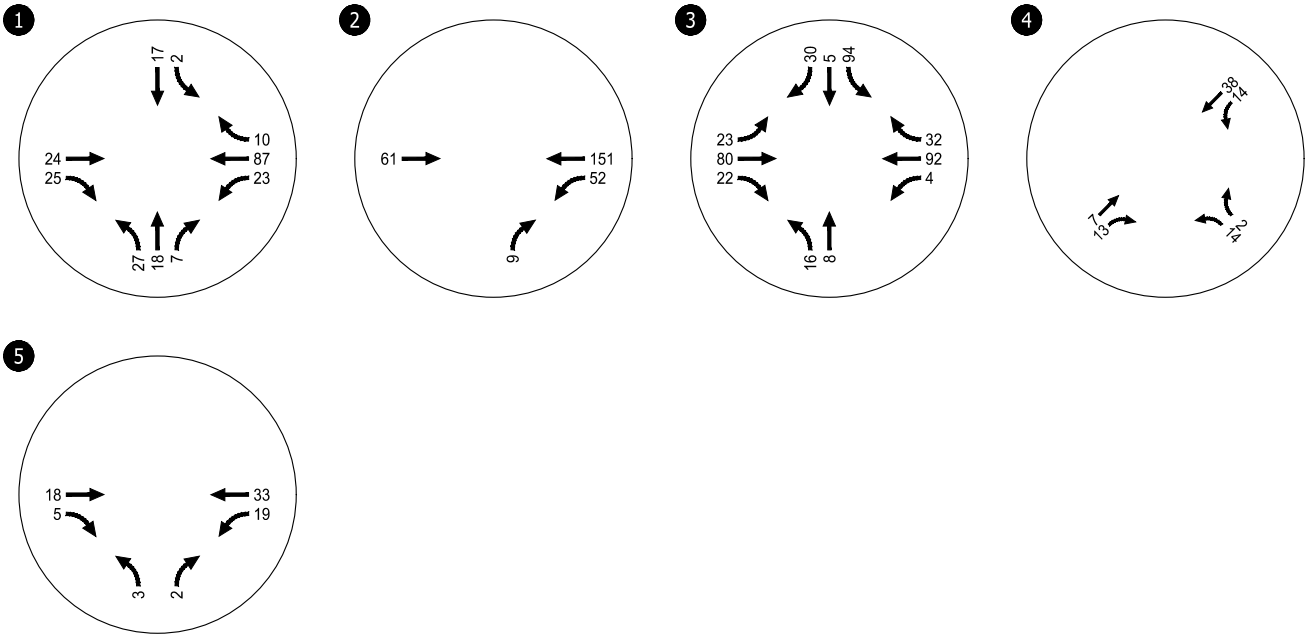




In-Process Trips  
Weekday AM Peak Hour  
Sherwood, Oregon

Figure  
E-1

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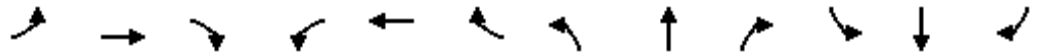
In-Process Trips  
Weekday PM Peak Hour  
Sherwood, Oregon

Figure  
E-2

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HCM Signalized Intersection Capacity Analysis  
1: Langer Farms Pkwy & Tualatin-Sherwood Rd

Sherwood Commerce Center  
Year 2022 Background AM Peak Hour Conditions



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗		↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	11	866	195	76	502	39	113	120	142	27	59	7
Future Volume (vph)	11	866	195	76	502	39	113	120	142	27	59	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	4.0	4.0	5.5		4.0	4.5	4.5	4.0	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	1795	1538	1703	1545		1751	1776	1568	1504	1760	
Flt Permitted	0.35	1.00	1.00	0.08	1.00		0.46	1.00	1.00	0.67	1.00	
Satd. Flow (perm)	673	1795	1538	151	1545		843	1776	1568	1061	1760	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	12	984	222	86	570	44	128	136	161	31	67	8
RTOR Reduction (vph)	0	0	42	0	2	0	0	0	138	0	4	0
Lane Group Flow (vph)	13	984	180	86	612	0	128	136	23	31	71	0
Confl. Peds. (#/hr)			2	2			1					1
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	0%	5%	2%	6%	20%	29%	3%	7%	3%	20%	5%	14%
Bus Blockages (#/hr)	0	2	2	0	2	2	0	0	0	0	0	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	64.3	62.6	74.0	70.5	65.7		22.7	15.0	15.0	11.0	7.3	
Effective Green, g (s)	64.3	62.6	74.0	70.5	65.7		22.7	15.0	15.0	11.0	7.3	
Actuated g/C Ratio	0.62	0.60	0.71	0.68	0.63		0.22	0.14	0.14	0.11	0.07	
Clearance Time (s)	4.0	5.5	4.0	4.0	5.5		4.0	4.5	4.5	4.0	4.5	
Vehicle Extension (s)	1.5	3.5	1.5	1.5	3.5		1.5	8.0	8.0	1.5	2.0	
Lane Grp Cap (vph)	434	1079	1093	173	975		283	255	225	127	123	
v/s Ratio Prot	0.00	c0.55	0.02	c0.02	0.40		c0.05	c0.08		0.01	0.04	
v/s Ratio Perm	0.02		0.10	0.31			0.05		0.01	0.02		
v/c Ratio	0.03	0.91	0.16	0.50	0.63		0.45	0.53	0.10	0.24	0.58	
Uniform Delay, d1	8.3	18.3	4.9	18.6	11.7		34.4	41.3	38.7	42.5	46.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	11.7	0.0	0.8	1.3		0.4	7.3	0.9	0.4	4.1	
Delay (s)	8.3	30.0	5.0	19.5	13.1		34.8	48.6	39.6	42.9	51.0	
Level of Service	A	C	A	B	B		C	D	D	D	D	
Approach Delay (s)		25.2			13.8			41.0			48.6	
Approach LOS		C			B			D			D	

Intersection Summary		
HCM 2000 Control Delay	25.7	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.81	
Actuated Cycle Length (s)	104.1	Sum of lost time (s) 18.0
Intersection Capacity Utilization	74.4%	ICU Level of Service D
Analysis Period (min)	15	

c Critical Lane Group



HCM Signalized Intersection Capacity Analysis  
2: Oregon St & Tualatin-Sherwood Rd

Sherwood Commerce Center  
Year 2022 Background AM Peak Hour Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	846	122	123	606	6	88	3	410	4	0	0
Future Volume (vph)	8	846	122	123	606	6	88	3	410	4	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5			5.0	4.0	4.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00		
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00			1.00	0.99	1.00		
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00		
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85	1.00		
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00	0.95		
Satd. Flow (prot)	1805	1729	1448	1556	1639			1531	1523	1442		
Flt Permitted	0.95	1.00	1.00	0.16	1.00			0.57	1.00	1.00		
Satd. Flow (perm)	1805	1729	1448	265	1639			916	1523	1518		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	8	891	128	129	638	6	93	3	432	4	0	0
RTOR Reduction (vph)	0	0	30	0	0	0	0	0	93	0	0	0
Lane Group Flow (vph)	8	891	98	129	644	0	0	96	339	4	0	0
Confl. Peds. (#/hr)			1	1					1	1		
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	0%	9%	9%	16%	15%	0%	19%	0%	5%	25%	0%	0%
Bus Blockages (#/hr)	0	2	0	0	2	0	0	0	0	0	0	0
Turn Type	Prot	NA	Perm	pm+pt	NA		Perm	NA	pm+ov	Perm		
Protected Phases	5!	2!		1!	6!			8!	1		4!	
Permitted Phases			2	6!			8!		8	4!		
Actuated Green, G (s)	0.6	45.7	45.7	53.1	48.5			6.9	15.8	2.4		
Effective Green, g (s)	0.6	45.7	45.7	53.1	48.5			6.9	15.8	2.4		
Actuated g/C Ratio	0.01	0.65	0.65	0.75	0.69			0.10	0.22	0.03		
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5			5.0	4.0	4.0		
Vehicle Extension (s)	1.0	3.5	3.5	1.0	3.5			1.0	1.0	1.0		
Lane Grp Cap (vph)	15	1120	938	362	1127			89	341	51		
v/s Ratio Prot	0.00	c0.52		0.04	0.39				c0.13			
v/s Ratio Perm			0.07	0.22				c0.10	0.10	0.00		
v/c Ratio	0.53	0.80	0.10	0.36	0.57			1.08	0.99	0.08		
Uniform Delay, d1	34.8	9.0	4.7	7.2	5.7			31.8	27.3	33.0		
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00		
Incremental Delay, d2	17.0	4.1	0.1	0.2	0.8			118.3	46.8	0.2		
Delay (s)	51.8	13.1	4.7	7.4	6.4			150.1	74.1	33.2		
Level of Service	D	B	A	A	A			F	E	C		
Approach Delay (s)		12.4			6.6			87.9			33.2	
Approach LOS		B			A			F			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			27.6			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.90									
Actuated Cycle Length (s)			70.5			Sum of lost time (s)			14.5			
Intersection Capacity Utilization			85.4%			ICU Level of Service			E			
Analysis Period (min)			15									
! Phase conflict between lane groups.												
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
3: 124th Ave & Tualatin-Sherwood Rd

Sherwood Commerce Center  
Year 2022 Background AM Peak Hour Conditions









Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	980	66	17	622	190	140	194	66	169	153	75
Future Volume (vph)	89	980	66	17	622	190	140	194	66	169	153	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	4.0	4.0	5.5	4.0	4.0	5.5		4.0	5.5	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1671	1729	1227	1203	1639	1367	1626	1585		1612	1696	1282
Flt Permitted	0.22	1.00	1.00	0.05	1.00	1.00	0.65	1.00		0.20	1.00	1.00
Satd. Flow (perm)	396	1729	1227	62	1639	1367	1117	1585		346	1696	1282
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	96	1054	71	18	669	204	151	209	71	182	165	81
RTOR Reduction (vph)	0	0	27	0	0	72	0	8	0	0	0	59
Lane Group Flow (vph)	96	1054	44	18	669	132	151	272	0	182	165	22
Confl. Bikes (#/hr)			3			1						
Heavy Vehicles (%)	8%	9%	28%	50%	15%	16%	11%	10%	31%	12%	12%	26%
Bus Blockages (#/hr)	0	2	2	0	2	2	0	0	0	0	0	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8		7	4	5
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	89.5	83.7	93.4	84.3	81.1	97.1	37.8	28.1		48.1	34.4	40.2
Effective Green, g (s)	89.5	83.7	93.4	84.3	81.1	97.1	37.8	28.1		48.1	34.4	40.2
Actuated g/C Ratio	0.60	0.56	0.62	0.56	0.54	0.65	0.25	0.19		0.32	0.23	0.27
Clearance Time (s)	4.0	5.5	4.0	4.0	5.5	4.0	4.0	5.5		4.0	5.5	4.0
Vehicle Extension (s)	1.5	4.5	0.2	1.5	4.5	0.2	0.2	2.0		0.2	2.0	1.5
Lane Grp Cap (vph)	285	964	764	59	886	884	314	296		245	388	343
v/s Ratio Prot	c0.01	c0.61	0.00	0.01	0.41	0.02	0.03	c0.17		c0.08	0.10	0.00
v/s Ratio Perm	0.19		0.03	0.16		0.08	0.09			0.16		0.01
v/c Ratio	0.34	1.09	0.06	0.31	0.76	0.15	0.48	0.92		0.74	0.43	0.06
Uniform Delay, d1	18.5	33.1	11.1	34.7	26.7	10.3	46.3	59.8		40.8	49.4	40.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.3	57.9	0.0	1.1	5.9	0.0	0.4	31.1		10.1	0.3	0.0
Delay (s)	18.7	91.0	11.1	35.8	32.7	10.4	46.7	90.9		51.0	49.6	40.9
Level of Service	B	F	B	D	C	B	D	F		D	D	D
Approach Delay (s)		80.7			27.6			75.4			48.5	
Approach LOS		F			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	59.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	95.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis  
4: Tonquin Rd & Oregon St

Sherwood Commerce Center  
Year 2022 Background AM Peak Hour Conditions

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Volume (veh/h)	421	331	103	115	136	90
Future Volume (Veh/h)	421	331	103	115	136	90
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	478	376	117	131	155	102
<b>Pedestrians</b>						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL		TWLTL			
Median storage (veh)	2		2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			478		843	478
vC1, stage 1 conf vol					478	
vC2, stage 2 conf vol					365	
vCu, unblocked vol			478		843	478
tC, single (s)			4.2		6.5	6.5
tC, 2 stage (s)					5.5	
tF (s)			2.3		3.6	3.5
p0 queue free %			89		68	81
cM capacity (veh/h)			1025		490	541
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	478	376	117	131	155	102
Volume Left	0	0	117	0	155	0
Volume Right	0	376	0	0	0	102
cSH	1700	1700	1025	1700	490	541
Volume to Capacity	0.28	0.22	0.11	0.08	0.32	0.19
Queue Length 95th (ft)	0	0	10	0	34	17
Control Delay (s)	0.0	0.0	9.0	0.0	15.7	13.2
Lane LOS			A		C	B
Approach Delay (s)	0.0		4.2		14.7	
Approach LOS					B	
<b>Intersection Summary</b>						
Average Delay			3.6			
Intersection Capacity Utilization			45.4%	ICU Level of Service	A	
Analysis Period (min)			15			



# MOVEMENT SUMMARY

 Site: 10 [SW Oregon St & Murdock Rd]

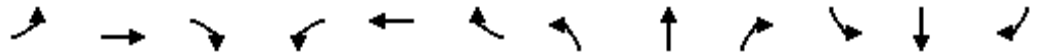
Year 2022 - Background AM Peak Hour Conditions  
 Site Category: (None)  
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Murdock Road												
3	L2	92	1.0	0.625	13.9	LOS B	6.6	165.7	0.78	0.97	1.26	29.2
18	R2	454	1.0	0.625	13.9	LOS B	6.6	165.7	0.78	0.97	1.26	27.8
Approach		546	1.0	0.625	13.9	LOS B	6.6	165.7	0.78	0.97	1.26	28.0
East: Oregon St												
1	L2	100	14.0	0.259	5.7	LOS A	1.2	33.5	0.27	0.13	0.27	32.5
6	T1	195	8.0	0.259	5.5	LOS A	1.2	33.5	0.27	0.13	0.27	32.0
Approach		295	10.0	0.259	5.5	LOS A	1.2	33.5	0.27	0.13	0.27	32.2
West: Oregon St.												
2	T1	431	2.0	0.411	7.1	LOS A	2.6	65.9	0.37	0.21	0.37	32.3
12	R2	65	2.0	0.411	7.1	LOS A	2.6	65.9	0.37	0.21	0.37	31.2
Approach		495	2.0	0.411	7.1	LOS A	2.6	65.9	0.37	0.21	0.37	32.1
All Vehicles		1336	3.4	0.625	9.5	LOS A	6.6	165.7	0.51	0.50	0.71	30.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Roundabout LOS Method: Same as Sign Control.  
 Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.  
 LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).  
 Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).  
 Roundabout Capacity Model: US HCM 6.  
 HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.  
 Gap-Acceptance Capacity: Traditional M1.  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

HCM Signalized Intersection Capacity Analysis  
1: Langer Farms Pkwy & Tualatin-Sherwood Rd

Sherwood Commerce Center  
Year 2022 Background PM Peak Hour Conditions



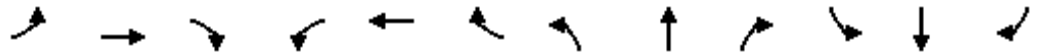
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗		↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	14	662	258	216	908	24	211	114	114	32	194	14
Future Volume (vph)	14	662	258	216	908	24	211	114	114	32	194	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	4.0	4.0	5.5		4.0	4.5	4.5	4.0	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	1778	1586	1770	1823		1786	1900	1568	1752	1850	
Flt Permitted	0.08	1.00	1.00	0.18	1.00		0.24	1.00	1.00	0.68	1.00	
Satd. Flow (perm)	143	1778	1586	338	1823		453	1900	1568	1253	1850	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	15	704	274	230	966	26	224	121	121	34	206	15
RTOR Reduction (vph)	0	0	57	0	1	0	0	0	97	0	2	0
Lane Group Flow (vph)	15	704	217	230	991	0	224	121	24	34	219	0
Confl. Peds. (#/hr)	1					1	2					2
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	6%	1%	2%	3%	0%	1%	0%	3%	3%	1%	8%
Bus Blockages (#/hr)	0	2	2	0	2	2	0	0	0	0	0	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	54.8	53.1	64.3	66.0	60.3		27.8	20.2	20.2	16.2	12.6	
Effective Green, g (s)	54.8	53.1	64.3	66.0	60.3		27.8	20.2	20.2	16.2	12.6	
Actuated g/C Ratio	0.53	0.51	0.62	0.64	0.58		0.27	0.19	0.19	0.16	0.12	
Clearance Time (s)	4.0	5.5	4.0	4.0	5.5		4.0	4.5	4.5	4.0	4.5	
Vehicle Extension (s)	1.5	3.5	1.5	1.5	3.5		1.5	8.0	8.0	1.5	2.0	
Lane Grp Cap (vph)	102	909	982	337	1059		265	369	305	212	224	
v/s Ratio Prot	0.00	0.40	0.02	c0.06	c0.54		c0.09	0.06		0.01	0.12	
v/s Ratio Perm	0.07		0.11	0.38			c0.14		0.02	0.02		
v/c Ratio	0.15	0.77	0.22	0.68	0.94		0.85	0.33	0.08	0.16	0.98	
Uniform Delay, d1	19.8	20.5	8.7	14.7	20.0		32.6	36.0	34.2	37.7	45.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	4.3	0.0	4.5	14.8		20.4	2.2	0.5	0.1	53.3	
Delay (s)	20.1	24.8	8.8	19.2	34.8		53.1	38.2	34.6	37.8	98.7	
Level of Service	C	C	A	B	C		D	D	C	D	F	
Approach Delay (s)		20.3			31.8			44.4			90.6	
Approach LOS		C			C			D			F	

Intersection Summary		
HCM 2000 Control Delay	35.0	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.95	D
Actuated Cycle Length (s)	103.8	Sum of lost time (s)
Intersection Capacity Utilization	91.9%	18.0
Analysis Period (min)	15	ICU Level of Service
		F

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
2: Oregon St & Tualatin-Sherwood Rd

Sherwood Commerce Center  
Year 2022 Background PM Peak Hour Conditions



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↑	↘	↙	↘			↑	↘	↙	↘	
Traffic Volume (vph)	7	777	120	446	1017	8	127	1	192	11	10	8
Future Volume (vph)	7	777	120	446	1017	8	127	1	192	11	10	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5			5.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00			1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1803	1830	1464	1770	1828			1739	1568	1805	1754	
Flt Permitted	0.95	1.00	1.00	0.11	1.00			0.20	1.00	0.67	1.00	
Satd. Flow (perm)	1803	1830	1464	202	1828			358	1568	1271	1754	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	8	835	129	480	1094	9	137	1	206	12	11	9
RTOR Reduction (vph)	0	0	42	0	0	0	0	0	69	0	8	0
Lane Group Flow (vph)	8	835	87	480	1103	0	0	138	137	12	12	0
Confl. Peds. (#/hr)	2					2	1					1
Confl. Bikes (#/hr)			1			3						
Heavy Vehicles (%)	0%	3%	8%	2%	3%	0%	4%	0%	3%	0%	0%	0%
Bus Blockages (#/hr)	0	2	0	0	2	0	0	0	0	0	0	0
Turn Type	Prot	NA	Perm	pm+pt	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases	5!	2!		1!	6!			8!	1		4!	
Permitted Phases			2	6!			8!		8	4!		
Actuated Green, G (s)	0.8	47.8	47.8	64.8	60.0			20.3	48.2	6.4	6.4	
Effective Green, g (s)	0.8	47.8	47.8	64.8	60.0			20.3	48.2	6.4	6.4	
Actuated g/C Ratio	0.01	0.50	0.50	0.68	0.63			0.21	0.50	0.07	0.07	
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5			5.0	4.0	4.0	4.0	
Vehicle Extension (s)	1.0	3.5	3.5	1.0	3.5			1.0	1.0	1.0	1.0	
Lane Grp Cap (vph)	15	915	732	594	1147			76	790	85	117	
v/s Ratio Prot	0.00	0.46		c0.24	c0.60				0.05		0.01	
v/s Ratio Perm			0.06	0.31				c0.39	0.04	0.01		
v/c Ratio	0.53	0.91	0.12	0.81	0.96			1.82	0.17	0.14	0.10	
Uniform Delay, d1	47.2	22.0	12.7	23.9	16.7			37.6	12.9	42.0	41.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	17.0	13.4	0.1	7.5	18.1			413.9	0.0	0.3	0.1	
Delay (s)	64.2	35.4	12.8	31.5	34.8			451.5	12.9	42.3	42.0	
Level of Service	E	D	B	C	C			F	B	D	D	
Approach Delay (s)		32.6			33.8			188.9			42.1	
Approach LOS		C			C			F			D	

Intersection Summary		
HCM 2000 Control Delay	51.7	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.19	D
Actuated Cycle Length (s)	95.6	Sum of lost time (s)
Intersection Capacity Utilization	91.4%	14.5
Analysis Period (min)	15	ICU Level of Service
		F

! Phase conflict between lane groups.  
c Critical Lane Group



HCM Signalized Intersection Capacity Analysis  
3: 124th Ave & Tualatin-Sherwood Rd

Sherwood Commerce Center  
Year 2022 Background PM Peak Hour Conditions









Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	887	130	29	952	119	118	118	8	196	186	221
Future Volume (vph)	73	887	130	29	952	119	118	118	8	196	186	221
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	4.0	4.0	5.5	4.0	4.0	5.5		4.0	5.5	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1805	1812	1426	1805	1830	1552	1752	1845		1734	1827	1583
Flt Permitted	0.06	1.00	1.00	0.10	1.00	1.00	0.64	1.00		0.43	1.00	1.00
Satd. Flow (perm)	110	1812	1426	189	1830	1552	1173	1845		781	1827	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	76	924	135	30	992	124	123	123	8	204	194	230
RTOR Reduction (vph)	0	0	49	0	0	41	0	3	0	0	0	76
Lane Group Flow (vph)	76	924	86	30	992	83	123	128	0	204	194	154
Confl. Peds. (#/hr)	2		1	1		2			1	1		
Confl. Bikes (#/hr)			1			2						
Heavy Vehicles (%)	0%	4%	10%	0%	3%	2%	3%	2%	0%	4%	4%	2%
Bus Blockages (#/hr)	0	2	2	0	2	2	0	0	0	0	0	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8		7	4	5
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	75.0	68.8	75.2	69.2	65.9	80.2	21.0	14.6		32.9	22.5	28.7
Effective Green, g (s)	75.0	68.8	75.2	69.2	65.9	80.2	21.0	14.6		32.9	22.5	28.7
Actuated g/C Ratio	0.62	0.57	0.63	0.58	0.55	0.67	0.18	0.12		0.27	0.19	0.24
Clearance Time (s)	4.0	5.5	4.0	4.0	5.5	4.0	4.0	5.5		4.0	5.5	4.0
Vehicle Extension (s)	1.5	4.5	0.2	1.5	4.5	0.2	0.2	2.0		0.2	2.0	1.5
Lane Grp Cap (vph)	156	1038	893	153	1004	1037	236	224		327	342	378
v/s Ratio Prot	c0.03	0.51	0.01	0.01	c0.54	0.01	0.03	0.07		c0.07	0.11	0.02
v/s Ratio Perm	0.28		0.06	0.11		0.04	0.06			c0.10		0.08
v/c Ratio	0.49	0.89	0.10	0.20	0.99	0.08	0.52	0.57		0.62	0.57	0.41
Uniform Delay, d1	26.7	22.3	8.9	20.0	26.7	7.0	44.0	49.8		36.1	44.3	38.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.9	11.4	0.0	0.2	25.7	0.0	1.0	2.2		2.7	1.3	0.3
Delay (s)	27.5	33.7	8.9	20.3	52.3	7.0	44.9	52.0		38.7	45.6	38.7
Level of Service	C	C	A	C	D	A	D	D		D	D	D
Approach Delay (s)		30.4			46.6			48.5			40.9	
Approach LOS		C			D			D			D	

Intersection Summary		
HCM 2000 Control Delay	39.8	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.87	D
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	88.2%	19.0
Analysis Period (min)	15	ICU Level of Service
		E

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis  
4: Tonquin Rd & Oregon St

Sherwood Commerce Center  
Year 2022 Background PM Peak Hour Conditions

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Volume (veh/h)	194	151	138	458	365	89
Future Volume (Veh/h)	194	151	138	458	365	89
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	211	164	150	498	397	97
<b>Pedestrians</b>						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL		TWLTL			
Median storage (veh)	2		2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			211		1009	211
vC1, stage 1 conf vol					211	
vC2, stage 2 conf vol					798	
vCu, unblocked vol			211		1009	211
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.3		3.5	3.3
p0 queue free %			88		0	88
cM capacity (veh/h)			1302		376	822
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	211	164	150	498	397	97
Volume Left	0	0	150	0	397	0
Volume Right	0	164	0	0	0	97
cSH	1700	1700	1302	1700	376	822
Volume to Capacity	0.12	0.10	0.12	0.29	1.06	0.12
Queue Length 95th (ft)	0	0	10	0	339	10
Control Delay (s)	0.0	0.0	8.1	0.0	95.6	10.0
Lane LOS			A		F	A
Approach Delay (s)	0.0		1.9		78.7	
Approach LOS					F	
<b>Intersection Summary</b>						
Average Delay			26.4			
Intersection Capacity Utilization			51.0%		ICU Level of Service A	
Analysis Period (min)			15			

# MOVEMENT SUMMARY

 Site: 10 [SW Oregon St & Murdock Rd]

Year 2022 - Background PM Peak Hour Conditions  
 Site Category: (None)  
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Murdock Road												
3	L2	93	1.0	0.236	5.4	LOS A	1.1	29.4	0.40	0.27	0.40	32.2
18	R2	165	4.0	0.236	5.5	LOS A	1.1	29.4	0.40	0.27	0.40	30.5
Approach		258	2.9	0.236	5.5	LOS A	1.1	29.4	0.40	0.27	0.40	31.1
East: Oregon St												
1	L2	427	1.0	0.698	12.8	LOS B	7.7	194.2	0.57	0.32	0.57	29.2
6	T1	440	1.0	0.698	12.8	LOS B	7.7	194.2	0.57	0.32	0.57	28.7
Approach		867	1.0	0.698	12.8	LOS B	7.7	194.2	0.57	0.32	0.57	28.9
West: Oregon St.												
2	T1	198	2.0	0.329	7.8	LOS A	1.6	40.6	0.59	0.54	0.59	31.9
12	R2	88	2.0	0.329	7.8	LOS A	1.6	40.6	0.59	0.54	0.59	30.8
Approach		286	2.0	0.329	7.8	LOS A	1.6	40.6	0.59	0.54	0.59	31.5
All Vehicles		1412	1.6	0.698	10.4	LOS B	7.7	194.2	0.54	0.35	0.54	29.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Roundabout LOS Method: Same as Sign Control.  
 Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.  
 LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).  
 Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).  
 Roundabout Capacity Model: US HCM 6.  
 HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.  
 Gap-Acceptance Capacity: Traditional M1.  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.



Appendix F Total 2022 Operational  
Worksheets

HCM Signalized Intersection Capacity Analysis  
 1: Langer Farms Pkwy & Tualatin-Sherwood Rd
























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↗		↖	↑	↗	↖	↗	
Traffic Volume (vph)	11	896	195	76	509	41	113	120	142	35	59	7
Future Volume (vph)	11	896	195	76	509	41	113	120	142	35	59	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	4.0	4.0	5.5		4.0	4.5	4.5	4.0	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	1795	1538	1703	1544		1751	1776	1568	1504	1760	
Flt Permitted	0.35	1.00	1.00	0.08	1.00		0.46	1.00	1.00	0.67	1.00	
Satd. Flow (perm)	670	1795	1538	136	1544		847	1776	1568	1061	1760	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	12	1018	222	86	578	47	128	136	161	40	67	8
RTOR Reduction (vph)	0	0	39	0	2	0	0	0	140	0	4	0
Lane Group Flow (vph)	13	1018	183	86	623	0	128	136	21	40	71	0
Confl. Peds. (#/hr)			2	2			1					1
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	0%	5%	2%	6%	20%	29%	3%	7%	3%	20%	5%	14%
Bus Blockages (#/hr)	0	2	2	0	2	2	0	0	0	0	0	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	68.4	66.6	77.8	74.8	69.8		22.6	14.4	14.4	11.6	7.4	
Effective Green, g (s)	68.4	66.6	77.8	74.8	69.8		22.6	14.4	14.4	11.6	7.4	
Actuated g/C Ratio	0.63	0.62	0.72	0.69	0.65		0.21	0.13	0.13	0.11	0.07	
Clearance Time (s)	4.0	5.5	4.0	4.0	5.5		4.0	4.5	4.5	4.0	4.5	
Vehicle Extension (s)	1.5	3.5	1.5	1.5	3.5		1.5	8.0	8.0	1.5	2.0	
Lane Grp Cap (vph)	442	1104	1105	166	996		270	236	208	130	120	
v/s Ratio Prot	0.00	c0.57	0.02	c0.02	0.40		c0.05	c0.08		0.01	0.04	
v/s Ratio Perm	0.02		0.10	0.33			0.05		0.01	0.02		
v/c Ratio	0.03	0.92	0.17	0.52	0.63		0.47	0.58	0.10	0.31	0.59	
Uniform Delay, d1	8.0	18.5	4.8	20.3	11.4		36.6	44.0	41.2	44.3	48.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	12.6	0.0	1.1	1.3		0.5	9.2	0.9	0.5	5.2	
Delay (s)	8.0	31.1	4.9	21.4	12.7		37.1	53.2	42.2	44.8	54.1	
Level of Service	A	C	A	C	B		D	D	D	D	D	
Approach Delay (s)		26.2			13.8			44.2			50.9	
Approach LOS		C			B			D			D	

Intersection Summary

HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	108.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		
























c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 2: Oregon St & Tualatin-Sherwood Rd







												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	846	160	183	606	6	97	3	425	4	0	0
Future Volume (vph)	8	846	160	183	606	6	97	3	425	4	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5			5.0	4.0	4.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00		
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00			1.00	0.99	1.00		
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00		
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85	1.00		
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00	0.95		
Satd. Flow (prot)	1805	1729	1447	1556	1639			1530	1524	1442		
Flt Permitted	0.95	1.00	1.00	0.12	1.00			0.42	1.00	1.00		
Satd. Flow (perm)	1805	1729	1447	203	1639			673	1524	1517		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	8	891	168	193	638	6	102	3	447	4	0	0
RTOR Reduction (vph)	0	0	32	0	0	0	0	0	84	0	0	0
Lane Group Flow (vph)	8	891	136	193	644	0	0	105	363	4	0	0
Confl. Peds. (#/hr)			1	1					1	1		
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	0%	9%	9%	16%	15%	0%	19%	0%	5%	25%	0%	0%
Bus Blockages (#/hr)	0	2	0	0	2	0	0	0	0	0	0	0
Turn Type	Prot	NA	Perm	pm+pt	NA		Perm	NA	pm+ov	Perm		
Protected Phases	5!	2!		1!	6!			8!	1		4!	
Permitted Phases			2	6!			8!		8	4!		
Actuated Green, G (s)	0.7	46.6	46.6	55.4	50.7			9.4	22.4	2.2		
Effective Green, g (s)	0.7	46.6	46.6	55.4	50.7			9.4	22.4	2.2		
Actuated g/C Ratio	0.01	0.62	0.62	0.74	0.67			0.12	0.30	0.03		
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5			5.0	4.0	4.0		
Vehicle Extension (s)	1.0	3.5	3.5	1.0	3.5			1.0	1.0	1.0		
Lane Grp Cap (vph)	16	1070	895	382	1103			84	453	44		
v/s Ratio Prot	0.00	c0.52		0.09	0.39				c0.14			
v/s Ratio Perm			0.09	0.28				c0.16	0.10	0.00		
v/c Ratio	0.50	0.83	0.15	0.51	0.58			1.25	0.80	0.09		
Uniform Delay, d1	37.1	11.3	6.0	10.3	6.6			32.9	24.4	35.6		
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00		
Incremental Delay, d2	8.7	5.8	0.1	0.4	0.8			179.6	9.3	0.3		
Delay (s)	45.8	17.1	6.1	10.7	7.5			212.6	33.6	35.9		
Level of Service	D	B	A	B	A			F	C	D		
Approach Delay (s)		15.6			8.2			67.7			35.9	
Approach LOS		B			A			E			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			24.8			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.93									
Actuated Cycle Length (s)			75.3			Sum of lost time (s)			14.5			
Intersection Capacity Utilization			86.4%			ICU Level of Service			E			
Analysis Period (min)			15									
! Phase conflict between lane groups.												
c Critical Lane Group												



HCM Signalized Intersection Capacity Analysis  
 3: 124th Ave & Tualatin-Sherwood Rd

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	93	989	66	17	659	190	140	194	66	169	153	90	
Future Volume (vph)	93	989	66	17	659	190	140	194	66	169	153	90	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	5.5	4.0	4.0	5.5	4.0	4.0	5.5		4.0	5.5	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00		1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	1671	1729	1227	1203	1639	1367	1626	1585		1612	1696	1282	
Flt Permitted	0.20	1.00	1.00	0.05	1.00	1.00	0.65	1.00		0.20	1.00	1.00	
Satd. Flow (perm)	348	1729	1227	62	1639	1367	1117	1585		346	1696	1282	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Adj. Flow (vph)	100	1063	71	18	709	204	151	209	71	182	165	97	
RTOR Reduction (vph)	0	0	27	0	0	72	0	8	0	0	0	71	
Lane Group Flow (vph)	100	1063	44	18	709	132	151	272	0	182	165	26	
Confl. Bikes (#/hr)			3			1							
Heavy Vehicles (%)	8%	9%	28%	50%	15%	16%	11%	10%	31%	12%	12%	26%	
Bus Blockages (#/hr)	0	2	2	0	2	2	0	0	0	0	0	0	
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	pm+ov	
Protected Phases	5	2	3	1	6	7	3	8		7	4	5	
Permitted Phases	2		2	6		6	8			4		4	
Actuated Green, G (s)	89.5	83.7	93.4	84.3	81.1	97.1	37.8	28.1		48.1	34.4	40.2	
Effective Green, g (s)	89.5	83.7	93.4	84.3	81.1	97.1	37.8	28.1		48.1	34.4	40.2	
Actuated g/C Ratio	0.60	0.56	0.62	0.56	0.54	0.65	0.25	0.19		0.32	0.23	0.27	
Clearance Time (s)	4.0	5.5	4.0	4.0	5.5	4.0	4.0	5.5		4.0	5.5	4.0	
Vehicle Extension (s)	1.5	4.5	0.2	1.5	4.5	0.2	0.2	2.0		0.2	2.0	1.5	
Lane Grp Cap (vph)	258	964	764	59	886	884	314	296		245	388	343	
v/s Ratio Prot	c0.01	c0.61	0.00	0.01	0.43	0.02	0.03	c0.17		c0.08	0.10	0.00	
v/s Ratio Perm	0.22		0.03	0.16		0.08	0.09			0.16		0.02	
v/c Ratio	0.39	1.10	0.06	0.31	0.80	0.15	0.48	0.92		0.74	0.43	0.08	
Uniform Delay, d1	19.8	33.1	11.1	34.7	27.9	10.3	46.3	59.8		40.8	49.4	41.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.4	61.3	0.0	1.1	7.5	0.0	0.4	31.1		10.1	0.3	0.0	
Delay (s)	20.2	94.5	11.1	35.8	35.4	10.4	46.7	90.9		51.0	49.6	41.1	
Level of Service	C	F	B	D	D	B	D	F		D	D	D	
Approach Delay (s)		83.7			29.9			75.4			48.3		
Approach LOS		F			C			E			D		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			60.9									HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio			1.01										
Actuated Cycle Length (s)			150.0									Sum of lost time (s)	19.0
Intersection Capacity Utilization			95.6%									ICU Level of Service	F
Analysis Period (min)			15										
c	Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis  
 4: Tonquin Rd & Oregon St

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Volume (veh/h)	451	331	108	122	136	113
Future Volume (Veh/h)	451	331	108	122	136	113
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	513	376	123	139	155	128
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL		TWLTL			
Median storage (veh)	2		2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			513		898	513
vC1, stage 1 conf vol					513	
vC2, stage 2 conf vol					385	
vCu, unblocked vol			513		898	513
tC, single (s)			4.2		6.5	6.5
tC, 2 stage (s)					5.5	
tF (s)			2.3		3.6	3.5
p0 queue free %			88		67	75
cM capacity (veh/h)			994		469	516
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	513	376	123	139	155	128
Volume Left	0	0	123	0	155	0
Volume Right	0	376	0	0	0	128
cSH	1700	1700	994	1700	469	516
Volume to Capacity	0.30	0.22	0.12	0.08	0.33	0.25
Queue Length 95th (ft)	0	0	11	0	36	24
Control Delay (s)	0.0	0.0	9.1	0.0	16.4	14.3
Lane LOS			A		C	B
Approach Delay (s)	0.0		4.3		15.4	
Approach LOS					C	
Intersection Summary						
Average Delay			3.8			
Intersection Capacity Utilization			47.3%	ICU Level of Service	A	
Analysis Period (min)			15			

# MOVEMENT SUMMARY

 Site: 10 [SW Oregon St & Murdock Rd]











Year 2022 - Total AM Peak Hour Conditions  
 Site Category: (None)  
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Murdock Road												
3	L2	92	1.0	0.653	15.1	LOS C	7.2	182.5	0.81	1.05	1.38	28.7
18	R2	464	1.0	0.653	15.1	LOS C	7.2	182.5	0.81	1.05	1.38	27.4
Approach		555	1.0	0.653	15.1	LOS C	7.2	182.5	0.81	1.05	1.38	27.6
East: Oregon St												
1	L2	102	14.0	0.266	5.7	LOS A	1.3	34.7	0.27	0.14	0.27	32.4
6	T1	201	8.0	0.266	5.6	LOS A	1.3	34.7	0.27	0.14	0.27	32.0
Approach		304	10.0	0.266	5.6	LOS A	1.3	34.7	0.27	0.14	0.27	32.1
West: Oregon St.												
2	T1	456	2.0	0.434	7.4	LOS A	2.8	71.6	0.38	0.22	0.38	32.1
12	R2	65	2.0	0.434	7.4	LOS A	2.8	71.6	0.38	0.22	0.38	31.0
Approach		521	2.0	0.434	7.4	LOS A	2.8	71.6	0.38	0.22	0.38	32.0
All Vehicles		1380	3.4	0.653	10.1	LOS B	7.2	182.5	0.53	0.54	0.76	30.1











Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Roundabout LOS Method: Same as Sign Control.  
 Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.  
 LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).  
 Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).  
 Roundabout Capacity Model: US HCM 6.  
 HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.  
 Gap-Acceptance Capacity: Traditional M1.  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.



HCM Unsignalized Intersection Capacity Analysis  
 101: Oregon St & Site Access A

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	18	517	13	73	269
Future Volume (Veh/h)	3	18	517	13	73	269
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	3	20	588	15	83	306
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL		TWLTL	
Median storage veh			2		2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1068	596			603	
vC1, stage 1 conf vol	596					
vC2, stage 2 conf vol	472					
vCu, unblocked vol	1068	596			603	
tC, single (s)	6.5	6.3			4.2	
tC, 2 stage (s)	5.5					
tF (s)	3.6	3.4			2.3	
p0 queue free %	99	96			91	
cM capacity (veh/h)	421	484			923	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	23	603	83	306		
Volume Left	3	0	83	0		
Volume Right	20	15	0	0		
cSH	475	1700	923	1700		
Volume to Capacity	0.05	0.35	0.09	0.18		
Queue Length 95th (ft)	4	0	7	0		
Control Delay (s)	13.0	0.0	9.3	0.0		
Lane LOS	B		A			
Approach Delay (s)	13.0	0.0	2.0			
Approach LOS	B					
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			45.4%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 102: Oregon St & Site Access B

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	6	524	39	24	248
Future Volume (Veh/h)	9	6	524	39	24	248
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	10	7	595	44	27	282
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage (veh)			2			2
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	953	617			639	
vC1, stage 1 conf vol	617					
vC2, stage 2 conf vol	336					
vCu, unblocked vol	953	617			639	
tC, single (s)	6.5	6.3			4.2	
tC, 2 stage (s)	5.5					
tF (s)	3.6	3.4			2.3	
p0 queue free %	98	99			97	
cM capacity (veh/h)	459	470			894	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	17	639	27	282		
Volume Left	10	0	27	0		
Volume Right	7	44	0	0		
cSH	464	1700	894	1700		
Volume to Capacity	0.04	0.38	0.03	0.17		
Queue Length 95th (ft)	3	0	2	0		
Control Delay (s)	13.1	0.0	9.2	0.0		
Lane LOS	B		A			
Approach Delay (s)	13.1	0.0	0.8			
Approach LOS	B					
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			39.9%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis  
 1: Langer Farms Pkwy & Tualatin-Sherwood Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	670	258	216	938	31	211	114	114	34	194	14
Future Volume (vph)	14	670	258	216	938	31	211	114	114	34	194	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	4.0	4.0	5.5		4.0	4.5	4.5	4.0	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	1778	1586	1770	1822		1786	1900	1568	1752	1850	
Flt Permitted	0.07	1.00	1.00	0.20	1.00		0.25	1.00	1.00	0.68	1.00	
Satd. Flow (perm)	129	1778	1586	368	1822		461	1900	1568	1253	1850	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	15	713	274	230	998	33	224	121	121	36	206	15
RTOR Reduction (vph)	0	0	57	0	1	0	0	0	99	0	2	0
Lane Group Flow (vph)	15	713	217	230	1030	0	224	121	22	36	219	0
Confl. Peds. (#/hr)	1					1	2					2
Heavy Vehicles (%)	0%	6%	1%	2%	3%	0%	1%	0%	3%	3%	1%	8%
Bus Blockages (#/hr)	0	2	2	0	2	2	0	0	0	0	0	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	60.9	59.1	70.2	71.9	66.1		27.4	19.6	19.6	16.1	12.3	
Effective Green, g (s)	60.9	59.1	70.2	71.9	66.1		27.4	19.6	19.6	16.1	12.3	
Actuated g/C Ratio	0.56	0.54	0.64	0.66	0.60		0.25	0.18	0.18	0.15	0.11	
Clearance Time (s)	4.0	5.5	4.0	4.0	5.5		4.0	4.5	4.5	4.0	4.5	
Vehicle Extension (s)	1.5	3.5	1.5	1.5	3.5		1.5	8.0	8.0	1.5	2.0	
Lane Grp Cap (vph)	99	961	1018	354	1101		250	340	281	201	208	
v/s Ratio Prot	0.00	0.40	0.02	c0.05	c0.57		c0.09	0.06		0.01	0.12	
v/s Ratio Perm	0.08		0.12	0.37			c0.13		0.01	0.02		
v/c Ratio	0.15	0.74	0.21	0.65	0.94		0.90	0.36	0.08	0.18	1.05	
Uniform Delay, d1	20.5	19.3	8.1	13.9	19.7		36.4	39.3	37.3	40.6	48.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	3.2	0.0	3.1	14.3		30.2	2.7	0.5	0.2	77.3	
Delay (s)	20.8	22.5	8.1	17.0	34.0		66.7	42.0	37.8	40.7	125.8	
Level of Service	C	C	A	B	C		E	D	D	D	F	
Approach Delay (s)		18.5			30.9			52.8			113.9	
Approach LOS		B			C			D			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			37.3			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.96									
Actuated Cycle Length (s)			109.3			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			93.9%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
 2: Oregon St & Tualatin-Sherwood Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↗			↑	↗	↖	↗	
Traffic Volume (vph)	7	777	130	461	1017	8	164	1	251	11	10	8
Future Volume (vph)	7	777	130	461	1017	8	164	1	251	11	10	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5			5.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00			1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1803	1830	1464	1770	1828			1738	1568	1805	1754	
Flt Permitted	0.95	1.00	1.00	0.10	1.00			0.20	1.00	0.65	1.00	
Satd. Flow (perm)	1803	1830	1464	191	1828			362	1568	1227	1754	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	8	835	140	496	1094	9	176	1	270	12	11	9
RTOR Reduction (vph)	0	0	41	0	0	0	0	0	71	0	8	0
Lane Group Flow (vph)	8	835	99	496	1103	0	0	177	199	12	12	0
Confl. Peds. (#/hr)	2					2	1					1
Confl. Bikes (#/hr)			1			3						
Heavy Vehicles (%)	0%	3%	8%	2%	3%	0%	4%	0%	3%	0%	0%	0%
Bus Blockages (#/hr)	0	2	0	0	2	0	0	0	0	0	0	0
Turn Type	Prot	NA	Perm	pm+pt	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases	5!	2!		1!	6!			8!	1		4!	
Permitted Phases			2	6!			8!		8	4!		
Actuated Green, G (s)	0.8	49.6	49.6	66.7	61.9			20.1	47.8	6.5	6.5	
Effective Green, g (s)	0.8	49.6	49.6	66.7	61.9			20.1	47.8	6.5	6.5	
Actuated g/C Ratio	0.01	0.51	0.51	0.69	0.64			0.21	0.49	0.07	0.07	
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5			5.0	4.0	4.0	4.0	
Vehicle Extension (s)	1.0	3.5	3.5	1.0	3.5			1.0	1.0	1.0	1.0	
Lane Grp Cap (vph)	14	932	746	580	1162			74	770	81	117	
v/s Ratio Prot	0.00	0.46		c0.24	c0.60				0.07		0.01	
v/s Ratio Perm			0.07	0.34				c0.49	0.05	0.01		
v/c Ratio	0.57	0.90	0.13	0.86	0.95			2.39	0.26	0.15	0.10	
Uniform Delay, d1	48.1	21.5	12.5	25.8	16.2			38.6	14.4	42.8	42.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	30.5	11.3	0.1	11.4	15.7			665.7	0.1	0.3	0.1	
Delay (s)	78.6	32.8	12.6	37.2	31.9			704.3	14.5	43.1	42.8	
Level of Service	E	C	B	D	C			F	B	D	D	
Approach Delay (s)		30.3			33.6			287.6			42.9	
Approach LOS		C			C			F			D	

Intersection Summary

HCM 2000 Control Delay	69.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.31		
Actuated Cycle Length (s)	97.3	Sum of lost time (s)	14.5
Intersection Capacity Utilization	94.3%	ICU Level of Service	F
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group



HCM Signalized Intersection Capacity Analysis  
 3: 124th Ave & Tualatin-Sherwood Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	924	130	29	961	119	118	118	8	196	186	225
Future Volume (vph)	88	924	130	29	961	119	118	118	8	196	186	225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	4.0	4.0	5.5	4.0	4.0	5.5		4.0	5.5	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1805	1812	1426	1805	1830	1552	1752	1845		1734	1827	1583
Flt Permitted	0.06	1.00	1.00	0.07	1.00	1.00	0.64	1.00		0.43	1.00	1.00
Satd. Flow (perm)	110	1812	1426	139	1830	1552	1173	1845		781	1827	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	92	962	135	30	1001	124	123	123	8	204	194	234
RTOR Reduction (vph)	0	0	47	0	0	41	0	3	0	0	0	75
Lane Group Flow (vph)	92	963	88	30	1001	83	123	128	0	204	194	159
Confl. Peds. (#/hr)	2		1	1		2			1	1		
Confl. Bikes (#/hr)			1			2						
Heavy Vehicles (%)	0%	4%	10%	0%	3%	2%	3%	2%	0%	4%	4%	2%
Bus Blockages (#/hr)	0	2	2	0	2	2	0	0	0	0	0	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8		7	4	5
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	75.3	68.8	75.2	68.9	65.6	79.9	21.0	14.6		32.9	22.5	29.0
Effective Green, g (s)	75.3	68.8	75.2	68.9	65.6	79.9	21.0	14.6		32.9	22.5	29.0
Actuated g/C Ratio	0.63	0.57	0.63	0.57	0.55	0.67	0.18	0.12		0.27	0.19	0.24
Clearance Time (s)	4.0	5.5	4.0	4.0	5.5	4.0	4.0	5.5		4.0	5.5	4.0
Vehicle Extension (s)	1.5	4.5	0.2	1.5	4.5	0.2	0.2	2.0		0.2	2.0	1.5
Lane Grp Cap (vph)	160	1038	893	125	1000	1033	236	224		327	342	382
v/s Ratio Prot	c0.03	0.53	0.01	0.01	c0.55	0.01	0.03	0.07		c0.07	0.11	0.02
v/s Ratio Perm	0.33		0.06	0.13		0.04	0.06			c0.10		0.08
v/c Ratio	0.57	0.93	0.10	0.24	1.00	0.08	0.52	0.57		0.62	0.57	0.42
Uniform Delay, d1	27.2	23.3	8.9	22.1	27.2	7.1	44.0	49.8		36.1	44.3	38.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.1	15.2	0.0	0.4	28.7	0.0	1.0	2.2		2.7	1.3	0.3
Delay (s)	30.2	38.5	8.9	22.5	55.9	7.1	44.9	52.0		38.7	45.6	38.6
Level of Service	C	D	A	C	E	A	D	D		D	D	D
Approach Delay (s)		34.5			49.8			48.5			40.8	
Approach LOS		C			D			D			D	

Intersection Summary		
HCM 2000 Control Delay	42.3	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.88	D
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	89.4%	19.0
Analysis Period (min)	15	ICU Level of Service
		E

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis  
 4: Tonquin Rd & Oregon St

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↘	↑	↖	↗
Traffic Volume (veh/h)	202	151	160	488	365	95
Future Volume (Veh/h)	202	151	160	488	365	95
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	220	164	174	530	397	103
<b>Pedestrians</b>						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL		TWLTL			
Median storage (veh)	2		2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			220		1098	220
vC1, stage 1 conf vol					220	
vC2, stage 2 conf vol					878	
vCu, unblocked vol			220		1098	220
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.3		3.5	3.3
p0 queue free %			87		0	87
cM capacity (veh/h)			1292		338	812
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	220	164	174	530	397	103
Volume Left	0	0	174	0	397	0
Volume Right	0	164	0	0	0	103
cSH	1700	1700	1292	1700	338	812
Volume to Capacity	0.13	0.10	0.13	0.31	1.17	0.13
Queue Length 95th (ft)	0	0	12	0	410	11
Control Delay (s)	0.0	0.0	8.2	0.0	139.3	10.1
Lane LOS			A		F	B
Approach Delay (s)	0.0		2.0		112.7	
Approach LOS					F	
<b>Intersection Summary</b>						
Average Delay			36.4			
Intersection Capacity Utilization			52.6%	ICU Level of Service	A	
Analysis Period (min)			15			

# MOVEMENT SUMMARY











 Site: 10 [SW Oregon St & Murdock Rd]

Year 2022 - Total PM Peak Hour Conditions  
 Site Category: (None)  
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Murdock Road												
3	L2	93	1.0	0.240	5.5	LOS A	1.2	29.9	0.40	0.27	0.40	32.2
18	R2	167	4.0	0.240	5.6	LOS A	1.2	29.9	0.40	0.27	0.40	30.5
Approach		260	2.9	0.240	5.6	LOS A	1.2	29.9	0.40	0.27	0.40	31.0
East: Oregon St												
1	L2	436	1.0	0.724	13.7	LOS B	8.5	214.5	0.61	0.34	0.61	28.9
6	T1	463	1.0	0.724	13.7	LOS B	8.5	214.5	0.61	0.34	0.61	28.4
Approach		899	1.0	0.724	13.7	LOS B	8.5	214.5	0.61	0.34	0.61	28.6
West: Oregon St.												
2	T1	204	2.0	0.339	8.0	LOS A	1.7	42.0	0.60	0.55	0.60	31.8
12	R2	88	2.0	0.339	8.0	LOS A	1.7	42.0	0.60	0.55	0.60	30.7
Approach		293	2.0	0.339	8.0	LOS A	1.7	42.0	0.60	0.55	0.60	31.5
All Vehicles		1452	1.5	0.724	11.1	LOS B	8.5	214.5	0.57	0.37	0.57	29.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Roundabout LOS Method: Same as Sign Control.  
 Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.  
 LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).  
 Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).  
 Roundabout Capacity Model: US HCM 6.  
 HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.  
 Gap-Acceptance Capacity: Traditional M1.  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

HCM Unsignalized Intersection Capacity Analysis  
 101: Oregon St & Site Access A

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	13	72	307	4	19	572
Future Volume (Veh/h)	13	72	307	4	19	572
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	78	334	4	21	622
<b>Pedestrians</b>						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage (veh)	2			2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1000	336			338	
vC1, stage 1 conf vol	336					
vC2, stage 2 conf vol	664					
vCu, unblocked vol	1000	336			338	
tC, single (s)	6.5	6.3			4.2	
tC, 2 stage (s)	5.5					
tF (s)	3.6	3.4			2.3	
p0 queue free %	97	89			98	
cM capacity (veh/h)	446	692			1188	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>	<b>SB 2</b>		
Volume Total	92	338	21	622		
Volume Left	14	0	21	0		
Volume Right	78	4	0	0		
cSH	639	1700	1188	1700		
Volume to Capacity	0.14	0.20	0.02	0.37		
Queue Length 95th (ft)	13	0	1	0		
Control Delay (s)	11.6	0.0	8.1	0.0		
Lane LOS	B		A			
Approach Delay (s)	11.6	0.0	0.3			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			1.2			
Intersection Capacity Utilization			41.9%	ICU Level of Service	A	
Analysis Period (min)			15			



HCM Unsignalized Intersection Capacity Analysis  
 102: Oregon St & Site Access B

























Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	39	24	287	10	6	579
Future Volume (Veh/h)	39	24	287	10	6	579
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	42	26	312	11	7	629
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage (veh)	2			2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	960	318			323	
vC1, stage 1 conf vol	318					
vC2, stage 2 conf vol	643					
vCu, unblocked vol	960	318			323	
tC, single (s)	6.5	6.3			4.2	
tC, 2 stage (s)	5.5					
tF (s)	3.6	3.4			2.3	
p0 queue free %	91	96			99	
cM capacity (veh/h)	463	709			1204	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	68	323	7	629		
Volume Left	42	0	7	0		
Volume Right	26	11	0	0		
cSH	534	1700	1204	1700		
Volume to Capacity	0.13	0.19	0.01	0.37		
Queue Length 95th (ft)	11	0	0	0		
Control Delay (s)	12.7	0.0	8.0	0.0		
Lane LOS	B		A			
Approach Delay (s)	12.7	0.0	0.1			
Approach LOS	B					
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			40.8%		ICU Level of Service	A
Analysis Period (min)			15			

Appendix G Total 2025 Traffic Operational  
Worksheets

Added northbound and southbound left turn lanes and used minimum splits on the north and southbound approaches. Changed the lane configurations. Applied to the AM and PM 2025 conditions.

HCM Signalized Intersection Capacity Analysis  
2: Oregon St & Tualatin-Sherwood Rd

Year 2025 Total Traffic AM Peak Hour Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	914	166	172	658	6	101	3	389	4	0	0
Future Volume (vph)	8	914	166	172	658	6	101	3	389	4	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5		4.0	5.0		4.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		1.00		
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	0.99		1.00		
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00		
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.85		1.00		
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95		
Satd. Flow (prot)	1805	3299	1447	1556	3126		1517	1521		1443		
Flt Permitted	0.95	1.00	1.00	0.23	1.00		0.95	1.00		0.95		
Satd. Flow (perm)	1805	3299	1447	370	3126		1517	1521		1443		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	8	962	175	181	693	6	106	3	409	4	0	0
RTOR Reduction (vph)	0	0	86	0	1	0	0	273	0	0	0	0
Lane Group Flow (vph)	8	962	89	181	698	0	106	139	0	4	0	0
Confl. Peds. (#/hr)			1	1					1	1		
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	0%	9%	9%	16%	15%	0%	19%	0%	5%	25%	0%	0%
Bus Blockages (#/hr)	0	2	0	0	2	0	0	0	0	0	0	0
Turn Type	Prot	NA	Perm	pm+pt	NA		Prot	NA		Prot		
Protected Phases	5!	2!		1!	6!		3!	8!		7!	4!	
Permitted Phases			2	6!								
Actuated Green, G (s)	0.7	28.3	28.3	28.5	23.8		12.8	21.7		0.7		
Effective Green, g (s)	0.7	28.3	28.3	28.5	23.8		12.8	21.7		0.7		
Actuated g/C Ratio	0.01	0.43	0.43	0.44	0.36		0.20	0.33		0.01		
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5		4.0	5.0		4.0		
Vehicle Extension (s)	1.0	3.5	3.5	1.0	3.5		1.0	1.0		1.0		
Lane Grp Cap (vph)	19	1427	626	357	1137		296	504		15		
v/s Ratio Prot	0.00	c0.29		c0.08	c0.22		c0.07	0.09		0.00		
v/s Ratio Perm			0.06	0.14								
v/c Ratio	0.42	0.67	0.14	0.51	0.61		0.36	0.28		0.27		
Uniform Delay, d1	32.1	14.9	11.2	13.3	17.0		22.7	16.1		32.1		
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00		
Incremental Delay, d2	5.4	1.3	0.1	0.4	1.0		0.3	0.1		3.5		
Delay (s)	37.5	16.2	11.3	13.7	18.1		23.0	16.2		35.6		
Level of Service	D	B	B	B	B		C	B		D		
Approach Delay (s)		15.6			17.2			17.6			35.6	
Approach LOS		B			B			B			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			16.6			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			65.4			Sum of lost time (s)			18.5			
Intersection Capacity Utilization			71.2%			ICU Level of Service			C			
Analysis Period (min)			15									
! Phase conflict between lane groups.												
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
3: 124th Ave & Tualatin-Sherwood Rd

Sherwood Commerce Center  
Year 2025 Total Traffic AM Peak Hour Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	81	1059	51	26	699	200	151	228	76	182	172	91	
Future Volume (vph)	81	1059	51	26	699	200	151	228	76	182	172	91	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5	5.5	4.0	5.5		4.0	5.5		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95		1.00	0.95		
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.95		
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00		
Satd. Flow (prot)	3242	3299	1252	2334	3127	1381	3155	3014		1612	2929		
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.27	1.00		
Satd. Flow (perm)	3242	3299	1252	2334	3127	1381	3155	3014		456	2929		
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Adj. Flow (vph)	87	1139	55	28	752	215	162	245	82	196	185	98	
RTOR Reduction (vph)	0	0	16	0	0	59	0	24	0	0	49	0	
Lane Group Flow (vph)	87	1139	39	28	752	156	162	303	0	196	234	0	
Confl. Bikes (#/hr)			3			1							
Heavy Vehicles (%)	8%	9%	28%	50%	15%	16%	11%	10%	31%	12%	12%	26%	
Bus Blockages (#/hr)	0	2	2	0	2	2	0	0	0	0	0	0	
Turn Type	Prot	NA	pt+ov	Prot	NA	pt+ov	Prot	NA		pm+pt	NA		
Protected Phases	5	2	2 3	1	6	6 7	3	8		7	4		
Permitted Phases										4			
Actuated Green, G (s)	7.9	90.0	105.9	4.0	86.1	108.8	10.4	19.8		41.0	26.6		
Effective Green, g (s)	7.9	90.0	105.9	4.0	86.1	108.8	10.4	19.8		41.0	26.6		
Actuated g/C Ratio	0.05	0.60	0.71	0.03	0.57	0.73	0.07	0.13		0.27	0.18		
Clearance Time (s)	4.0	5.5		4.0	5.5		4.0	5.5		4.0	5.5		
Vehicle Extension (s)	1.5	4.5		1.5	4.5		0.2	2.0		0.2	2.0		
Lane Grp Cap (vph)	170	1979	883	62	1794	1001	218	397		257	519		
v/s Ratio Prot	c0.03	c0.35	0.03	0.01	0.24	0.11	0.05	0.10		c0.09	0.08		
v/s Ratio Perm										c0.12			
v/c Ratio	0.51	0.58	0.04	0.45	0.42	0.16	0.74	0.76		0.76	0.45		
Uniform Delay, d1	69.2	18.3	6.7	71.9	17.9	6.4	68.5	62.8		45.7	55.2		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		
Incremental Delay, d2	1.1	1.2	0.0	1.9	0.7	0.0	11.3	7.6		11.4	0.2		
Delay (s)	70.3	19.6	6.7	73.8	18.6	6.4	79.8	70.4		57.1	55.4		
Level of Service	E	B	A	E	B	A	E	E		E	E		
Approach Delay (s)		22.4			17.6			73.5			56.1		
Approach LOS		C			B			E			E		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			33.6									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.65										
Actuated Cycle Length (s)			150.0									Sum of lost time (s)	19.0
Intersection Capacity Utilization			66.0%									ICU Level of Service	C
Analysis Period (min)			15										
c Critical Lane Group													



SimTraffic Simulation Summary  
 Year 2025 Total Traffic AM Peak Hour Conditions

04/12/2021

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	7:10	7:10	7:10	7:10	7:10	7:10
End Time	8:20	8:20	8:20	8:20	8:20	8:20
Total Time (min)	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4
Vehs Entered	4697	4781	4768	4592	4719	4713
Vehs Exited	4728	4822	4776	4617	4727	4734
Starting Vehs	234	259	224	225	228	231
Ending Vehs	203	218	216	200	220	212
Travel Distance (mi)	6106	6220	6205	5957	6133	6124
Travel Time (hr)	228.6	231.4	230.1	218.0	231.1	227.8
Total Delay (hr)	63.4	62.4	63.0	57.1	65.7	62.3
Total Stops	4701	4906	4839	4409	4716	4715
Fuel Used (gal)	209.8	213.3	212.0	201.4	211.2	209.5

Interval #0 Information Seeding

Start Time	7:10
End Time	7:20
Total Time (min)	10
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording1

Start Time	7:20
End Time	7:35
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	4	5	Avg
Vehs Entered	1149	1172	1136	1076	1097	1123
Vehs Exited	1183	1210	1152	1097	1119	1153
Starting Vehs	234	259	224	225	228	231
Ending Vehs	200	221	208	204	206	212
Travel Distance (mi)	1526	1587	1488	1432	1461	1499
Travel Time (hr)	57.3	58.4	54.8	52.4	54.0	55.4
Total Delay (hr)	15.8	15.6	14.8	13.5	14.6	14.9
Total Stops	1199	1268	1155	1057	1115	1157
Fuel Used (gal)	53.0	54.1	50.7	48.6	50.1	51.3

SimTraffic Simulation Summary  
 Year 2025 Total Traffic AM Peak Hour Conditions

04/12/2021

Interval #2 Information Recording2

Start Time	7:35
End Time	7:50
Total Time (min)	15
Volumes adjusted by PHF, Growth Factors.	

Run Number	1	2	3	4	5	Avg
Vehs Entered	1296	1312	1323	1300	1352	1315
Vehs Exited	1269	1298	1290	1249	1281	1278
Starting Vehs	200	221	208	204	206	212
Ending Vehs	227	235	241	255	277	246
Travel Distance (mi)	1620	1636	1667	1553	1652	1626
Travel Time (hr)	62.5	61.2	61.4	58.4	63.4	61.4
Total Delay (hr)	18.6	16.8	16.4	16.2	18.7	17.4
Total Stops	1328	1247	1252	1192	1302	1263
Fuel Used (gal)	56.3	55.9	56.6	53.0	57.1	55.8

Interval #3 Information Recording3

Start Time	7:50
End Time	8:05
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	4	5	Avg
Vehs Entered	1131	1131	1128	1091	1159	1128
Vehs Exited	1160	1175	1161	1160	1197	1170
Starting Vehs	227	235	241	255	277	246
Ending Vehs	198	191	208	186	239	204
Travel Distance (mi)	1510	1520	1504	1481	1564	1516
Travel Time (hr)	55.9	56.3	56.2	53.0	59.9	56.3
Total Delay (hr)	15.3	14.9	15.6	13.1	17.5	15.3
Total Stops	1123	1154	1249	1038	1228	1157
Fuel Used (gal)	51.2	51.9	51.6	49.8	54.0	51.7

Interval #4 Information Recording4

Start Time	8:05
End Time	8:20
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	4	5	Avg
Vehs Entered	1121	1166	1181	1125	1111	1140
Vehs Exited	1116	1139	1173	1111	1130	1133
Starting Vehs	198	191	208	186	239	204
Ending Vehs	203	218	216	200	220	212
Travel Distance (mi)	1449	1478	1546	1491	1455	1484
Travel Time (hr)	52.9	55.4	57.7	54.2	53.8	54.8
Total Delay (hr)	13.8	15.1	16.1	14.2	14.8	14.8
Total Stops	1051	1237	1183	1122	1071	1132
Fuel Used (gal)	49.4	51.3	53.1	50.1	50.0	50.8

Queuing and Blocking Report  
 Year 2025 Total Traffic AM Peak Hour Conditions

04/12/2021

Intersection: 1: Langer Farms Pkwy & Tualatin-Sherwood Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	R	L	TR
Maximum Queue (ft)	67	279	288	106	181	210	152	148	125	98	117
Average Queue (ft)	4	135	137	38	60	75	70	68	51	27	52
95th Queue (ft)	21	226	238	80	138	165	129	127	96	70	98
Link Distance (ft)		1478	1478		5033	5033		1246			602
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	175			200			375		300	140	
Storage Blk Time (%)		3			0					0	0
Queuing Penalty (veh)		0			0					0	0

Intersection: 2: Oregon St & Tualatin-Sherwood Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	R	L	T	TR	L	TR	L
Maximum Queue (ft)	37	318	321	192	213	269	278	181	277	44
Average Queue (ft)	6	115	113	45	90	105	122	75	134	6
95th Queue (ft)	25	239	239	122	164	214	225	141	233	31
Link Distance (ft)		5033	5033			2648	2648		3264	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	250			200	350			400		75
Storage Blk Time (%)		1	1	0		0				1
Queuing Penalty (veh)		0	2	0		0				0

Queuing and Blocking Report  
 Year 2025 Total Traffic AM Peak Hour Conditions

04/12/2021

Intersection: 3: 124th Ave & Tualatin-Sherwood Rd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	R	L	L	T	T	R	L	L
Maximum Queue (ft)	99	238	397	410	143	22	174	602	277	134	142	161
Average Queue (ft)	29	55	201	215	25	1	34	168	134	49	65	91
95th Queue (ft)	73	140	345	354	110	11	106	416	239	113	126	145
Link Distance (ft)			2648	2648				1801	1801			
Upstream Blk Time (%)								0				
Queuing Penalty (veh)								0				
Storage Bay Dist (ft)	250	250			375	375	375			375	300	300
Storage Blk Time (%)		0	3	0	0				0			
Queuing Penalty (veh)		0	3	0	0				0			

Intersection: 3: 124th Ave & Tualatin-Sherwood Rd

Movement	NB	NB	SB	SB	SB
Directions Served	T	TR	L	T	TR
Maximum Queue (ft)	248	274	313	373	319
Average Queue (ft)	120	130	195	123	107
95th Queue (ft)	203	232	333	287	232
Link Distance (ft)	2111	2111		1873	1873
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			300		
Storage Blk Time (%)			7	0	
Queuing Penalty (veh)			6	0	

Intersection: 4: Tonquin Rd & Oregon St

Movement	EB	EB	WB	NB	NB
Directions Served	T	R	L	L	R
Maximum Queue (ft)	72	170	104	163	109
Average Queue (ft)	3	22	37	65	50
95th Queue (ft)	43	112	79	127	95
Link Distance (ft)	372				552
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		240	190	210	
Storage Blk Time (%)	0	0		0	
Queuing Penalty (veh)	0	1		0	



Queuing and Blocking Report  
 Year 2025 Total Traffic AM Peak Hour Conditions

04/12/2021

Intersection: 5: Murdock Rd & Oregon St

Movement	EB	WB	NB	NB
Directions Served	TR	LT	L	R
Maximum Queue (ft)	100	66	52	158
Average Queue (ft)	33	12	18	57
95th Queue (ft)	85	44	46	114
Link Distance (ft)	1854	372	915	915
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 13

HCM Signalized Intersection Capacity Analysis  
2: Oregon St & Tualatin-Sherwood Rd

Sherwood Commerce Center  
Year 2025 Total Traffic PM Peak Hour Conditions

























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑		↘	↗		↘	↗	
Traffic Volume (vph)	7	845	136	422	1103	8	170	1	233	11	10	8
Future Volume (vph)	7	845	136	422	1103	8	170	1	233	11	10	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5		4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.85		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1803	3491	1464	1770	3487		1736	1569		1805	1761	
Flt Permitted	0.95	1.00	1.00	0.27	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1803	3491	1464	500	3487		1736	1569		1805	1761	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	8	909	146	454	1186	9	183	1	251	12	11	9
RTOR Reduction (vph)	0	0	99	0	1	0	0	152	0	0	9	0
Lane Group Flow (vph)	8	909	47	454	1194	0	183	100	0	12	11	0
Confl. Peds. (#/hr)	2					2	1					1
Confl. Bikes (#/hr)			1			3						
Heavy Vehicles (%)	0%	3%	8%	2%	3%	0%	4%	0%	3%	0%	0%	0%
Bus Blockages (#/hr)	0	2	0	0	2	0	0	0	0	0	0	0
Turn Type	Prot	NA	Perm	pm+pt	NA		Prot	NA		Prot	NA	
Protected Phases	5!	2!		1!	6!		3!	8!		7!	4!	
Permitted Phases			2	6!								
Actuated Green, G (s)	0.8	30.0	30.0	41.7	36.9		16.9	36.9		0.9	1.8	
Effective Green, g (s)	0.8	30.0	30.0	41.7	36.9		16.9	36.9		0.9	1.8	
Actuated g/C Ratio	0.01	0.32	0.32	0.44	0.39		0.18	0.39		0.01	0.02	
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	1.0	3.5	3.5	1.0	3.5		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	15	1114	467	583	1368		312	615		17	33	
v/s Ratio Prot	0.00	c0.26		c0.22	c0.34		c0.11	c0.06		0.01	0.01	
v/s Ratio Perm			0.03	0.12								
v/c Ratio	0.53	0.82	0.10	0.78	0.87		0.59	0.16		0.71	0.34	
Uniform Delay, d1	46.4	29.5	22.5	20.4	26.4		35.3	18.5		46.4	45.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	17.0	4.8	0.1	5.9	6.6		1.8	0.0		72.3	2.2	
Delay (s)	63.4	34.3	22.6	26.4	33.0		37.2	18.6		118.7	47.7	
Level of Service	E	C	C	C	C		D	B		F	D	
Approach Delay (s)		32.9			31.2			26.4			74.4	
Approach LOS		C			C			C			E	

Intersection Summary		
HCM 2000 Control Delay	31.5	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.77	
Actuated Cycle Length (s)	94.0	Sum of lost time (s) 18.5
Intersection Capacity Utilization	74.9%	ICU Level of Service D
Analysis Period (min)	15	

! Phase conflict between lane groups.  
c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
3: 124th Ave & Tualatin-Sherwood Rd

Sherwood Commerce Center  
Year 2025 Total Traffic PM Peak Hour Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	995	130	61	1003	127	129	137	12	207	218	230
Future Volume (vph)	85	995	130	61	1003	127	129	137	12	207	218	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5	5.5	4.0	5.5		4.0	5.5	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3502	3457	1456	3502	3491	1571	3400	3497		1735	3236	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.49	1.00	
Satd. Flow (perm)	3502	3457	1456	3502	3491	1571	3400	3497		891	3236	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	89	1036	135	64	1045	132	134	143	12	216	227	240
RTOR Reduction (vph)	0	0	52	0	0	44	0	4	0	0	101	0
Lane Group Flow (vph)	89	1036	83	64	1045	88	134	152	0	216	366	0
Confl. Peds. (#/hr)	2		1	1		2			1	1		
Confl. Bikes (#/hr)			1			2						
Heavy Vehicles (%)	0%	4%	10%	0%	3%	2%	3%	2%	0%	4%	4%	2%
Bus Blockages (#/hr)	0	2	2	0	2	2	0	0	0	0	0	0
Turn Type	Prot	NA	pt+ov	Prot	NA	pt+ov	Prot	NA		pm+pt	NA	
Protected Phases	5	2	2 3	1	6	6 7	3	8		7	4	
Permitted Phases										4		
Actuated Green, G (s)	7.2	47.5	60.6	5.1	45.4	65.9	7.6	11.8		30.8	19.2	
Effective Green, g (s)	7.2	47.5	60.6	5.1	45.4	65.9	7.6	11.8		30.8	19.2	
Actuated g/C Ratio	0.07	0.48	0.62	0.05	0.46	0.67	0.08	0.12		0.31	0.20	
Clearance Time (s)	4.0	5.5		4.0	5.5		4.0	5.5		4.0	5.5	
Vehicle Extension (s)	1.5	4.5		1.5	4.5		0.2	2.0		0.2	2.0	
Lane Grp Cap (vph)	256	1668	896	181	1610	1052	262	419		407	631	
v/s Ratio Prot	c0.03	c0.30	0.06	0.02	0.30	0.06	0.04	0.04		c0.08	c0.11	
v/s Ratio Perm										0.09		
v/c Ratio	0.35	0.62	0.09	0.35	0.65	0.08	0.51	0.36		0.53	0.58	
Uniform Delay, d1	43.4	18.8	7.7	45.1	20.4	5.7	43.6	39.8		26.6	35.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.9	0.1	0.4	1.1	0.1	0.7	0.2		0.7	0.9	
Delay (s)	43.7	19.7	7.8	45.5	21.5	5.7	44.3	40.0		27.3	36.8	
Level of Service	D	B	A	D	C	A	D	D		C	D	
Approach Delay (s)		20.1			21.1			42.0			33.8	
Approach LOS		C			C			D			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			25.0				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			98.4				Sum of lost time (s)			19.0		
Intersection Capacity Utilization			66.4%				ICU Level of Service			C		
Analysis Period (min)			15									

c Critical Lane Group

SimTraffic Simulation Summary  
 Year 2025 Total Traffic PM Peak Hour Conditions

04/12/2021

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	4:45	4:45	4:45	4:45	4:45	4:45
End Time	5:55	5:55	5:55	5:55	5:55	5:55
Total Time (min)	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4
Vehs Entered	5390	5432	5519	5343	5432	5427
Vehs Exited	5384	5429	5545	5353	5450	5432
Starting Vehs	276	272	304	307	286	289
Ending Vehs	282	275	278	297	268	281
Travel Distance (mi)	6904	6820	6941	6826	6900	6878
Travel Time (hr)	310.7	332.2	309.9	305.5	307.9	313.2
Total Delay (hr)	120.2	143.6	117.8	116.4	116.7	122.9
Total Stops	6035	6157	6265	6051	6270	6158
Fuel Used (gal)	247.7	250.6	247.2	243.3	247.1	247.2

Interval #0 Information Seeding

Start Time	4:45
End Time	4:55
Total Time (min)	10
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording1

Start Time	4:55
End Time	5:10
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	4	5	Avg
Vehs Entered	1299	1355	1384	1314	1350	1344
Vehs Exited	1339	1375	1363	1340	1321	1346
Starting Vehs	276	272	304	307	286	289
Ending Vehs	236	252	325	281	315	280
Travel Distance (mi)	1716	1703	1734	1703	1698	1711
Travel Time (hr)	68.8	70.8	72.5	71.3	70.1	70.7
Total Delay (hr)	21.3	23.5	24.9	24.1	23.1	23.4
Total Stops	1578	1578	1548	1556	1526	1556
Fuel Used (gal)	60.1	59.9	60.4	59.1	59.2	59.7



SimTraffic Simulation Summary  
 Year 2025 Total Traffic PM Peak Hour Conditions

04/12/2021

**Interval #2 Information Recording2**

Start Time	5:10
End Time	5:25
Total Time (min)	15
Volumes adjusted by PHF, Growth Factors.	

Run Number	1	2	3	4	5	Avg
Vehs Entered	1514	1419	1447	1399	1440	1444
Vehs Exited	1367	1367	1415	1305	1415	1374
Starting Vehs	236	252	325	281	315	280
Ending Vehs	383	304	357	375	340	349
Travel Distance (mi)	1829	1746	1796	1766	1801	1788
Travel Time (hr)	79.6	84.6	78.4	77.9	80.3	80.1
Total Delay (hr)	29.3	36.4	28.6	29.0	30.6	30.8
Total Stops	1776	1643	1768	1659	1631	1695
Fuel Used (gal)	64.9	63.7	63.4	62.5	64.4	63.8

**Interval #3 Information Recording3**

Start Time	5:25
End Time	5:40
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	4	5	Avg
Vehs Entered	1275	1335	1393	1296	1309	1322
Vehs Exited	1353	1349	1426	1382	1339	1370
Starting Vehs	383	304	357	375	340	349
Ending Vehs	305	290	324	289	310	304
Travel Distance (mi)	1723	1678	1767	1680	1688	1707
Travel Time (hr)	82.2	87.6	83.4	80.7	79.2	82.6
Total Delay (hr)	34.5	41.1	34.7	34.3	32.6	35.4
Total Stops	1343	1460	1592	1450	1488	1468
Fuel Used (gal)	62.6	63.0	64.8	61.9	61.7	62.8

**Interval #4 Information Recording4**

Start Time	5:40
End Time	5:55
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	4	5	Avg
Vehs Entered	1302	1323	1295	1334	1333	1318
Vehs Exited	1325	1338	1341	1326	1375	1340
Starting Vehs	305	290	324	289	310	304
Ending Vehs	282	275	278	297	268	281
Travel Distance (mi)	1635	1692	1644	1678	1714	1672
Travel Time (hr)	80.2	89.3	75.5	75.6	78.3	79.8
Total Delay (hr)	35.0	42.6	29.7	29.0	30.5	33.3
Total Stops	1338	1476	1357	1386	1625	1439
Fuel Used (gal)	60.0	64.0	58.6	59.9	61.8	60.9

Queuing and Blocking Report  
 Year 2025 Total Traffic PM Peak Hour Conditions

04/12/2021

Intersection: 1: Langer Farms Pkwy & Tualatin-Sherwood Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	R	L	TR
Maximum Queue (ft)	101	300	329	223	366	355	286	154	88	165	596
Average Queue (ft)	12	172	184	122	139	149	145	72	40	64	339
95th Queue (ft)	54	261	284	214	274	276	251	131	73	173	668
Link Distance (ft)		1478	1478		5042	5042		1246			602
Upstream Blk Time (%)											14
Queuing Penalty (veh)											0
Storage Bay Dist (ft)	175			200			375		300	140	
Storage Blk Time (%)		6		4	2		0			0	58
Queuing Penalty (veh)		1		19	3		0			0	20

Intersection: 2: Oregon St & Tualatin-Sherwood Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	86	368	398	225	337	376	347	301	149	47	55
Average Queue (ft)	10	142	148	66	169	130	135	139	68	11	17
95th Queue (ft)	53	284	300	173	305	313	303	274	121	37	45
Link Distance (ft)		5042	5042			2649	2649		3260		350
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	250			200	350			400		75	
Storage Blk Time (%)		2	4	0	1	0		0		0	0
Queuing Penalty (veh)		0	6	0	4	0		0		0	0

Queuing and Blocking Report  
 Year 2025 Total Traffic PM Peak Hour Conditions

04/12/2021

Intersection: 3: 124th Ave & Tualatin-Sherwood Rd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	R	L	L	T	T	R	L	L
Maximum Queue (ft)	67	129	315	322	126	29	114	305	273	103	114	144
Average Queue (ft)	18	40	153	168	38	7	37	185	160	32	33	72
95th Queue (ft)	47	90	281	296	96	25	83	279	255	79	85	130
Link Distance (ft)			2649	2649				1725	1725			
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	250	250			375	375	375			375	300	300
Storage Blk Time (%)			2	0								
Queuing Penalty (veh)			1	0								

Intersection: 3: 124th Ave & Tualatin-Sherwood Rd

Movement	NB	NB	SB	SB	SB
Directions Served	T	TR	L	T	TR
Maximum Queue (ft)	138	98	261	210	266
Average Queue (ft)	70	29	132	101	135
95th Queue (ft)	126	71	228	186	237
Link Distance (ft)	417	417		1872	1872
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			300		
Storage Blk Time (%)			0		
Queuing Penalty (veh)			0		

Intersection: 4: Tonquin Rd & Oregon St

Movement	WB	NB	NB
Directions Served	L	L	R
Maximum Queue (ft)	71	235	862
Average Queue (ft)	26	229	665
95th Queue (ft)	64	269	1078
Link Distance (ft)			808
Upstream Blk Time (%)			49
Queuing Penalty (veh)			0
Storage Bay Dist (ft)	190	210	
Storage Blk Time (%)		88	0
Queuing Penalty (veh)		81	1

Queuing and Blocking Report  
 Year 2025 Total Traffic PM Peak Hour Conditions

04/12/2021

Intersection: 5: Murdock Rd & Oregon St

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	130	216	80
Average Queue (ft)	47	68	24
95th Queue (ft)	92	170	61
Link Distance (ft)	1854	371	911
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 138



Appendix H Total 2022 Mitigated  
Worksheets

# MOVEMENT SUMMARY

 **Site: 9 [SW Oregon St & Tonquin Rd]**

Year 2022 - Total Traffic AM Peak Hour Conditions  
 Site Category: (None)  
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Tonquin Rd												
3a	L1	155	3.0	0.435	11.4	LOS B	2.2	62.1	0.68	0.77	0.91	30.5
18	R2	128	26.0	0.435	12.5	LOS B	2.2	62.1	0.68	0.77	0.91	28.4
Approach		283	13.4	0.435	11.9	LOS B	2.2	62.1	0.68	0.77	0.91	29.5
East: Oregon St												
1	L2	1	14.0	0.265	6.5	LOS A	1.2	32.6	0.44	0.33	0.44	34.5
16a	R1	261	8.0	0.265	6.3	LOS A	1.2	32.6	0.44	0.33	0.44	35.5
Approach		263	8.0	0.265	6.3	LOS A	1.2	32.6	0.44	0.33	0.44	35.5
West: Oregon St. EB												
5b	L3	89	3.0	0.621	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	36.9
2	T1	513	2.0	0.621	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	35.5
12	R2	499	1.0	0.621	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	34.2
Approach		1100	1.6	0.621	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	35.0
All Vehicles		1645	4.7	0.621	3.0	LOS A	2.2	62.1	0.19	0.18	0.23	34.0

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

Roundabout LOS Method: Same as Sign Control.

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

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

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

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

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

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Organisation: KITTELSON AND ASSOCIATES INC | Processed: Tuesday, April 6, 2021 7:13:24 PM

Project: H:\26\26314 - Sherwood Commerce Center\analysis\Sidra\26314\_Total MIT AM.sip8

# MOVEMENT SUMMARY

 Site: 9 [SW Oregon St & Tonquin Rd]

Year 2022 - Total Traffic PM Peak Hour Conditions  
 Site Category: (None)  
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Tonquin Rd												
3a	L1	397	1.0	0.514	10.1	LOS B	3.8	97.4	0.64	0.61	0.76	31.2
18	R2	103	5.0	0.514	10.2	LOS B	3.8	97.4	0.64	0.61	0.76	29.1
Approach		500	1.8	0.514	10.1	LOS B	3.8	97.4	0.64	0.61	0.76	30.7
East: Oregon St												
1	L2	1	12.0	0.903	36.0	LOS E	20.6	539.5	1.00	1.75	2.97	23.8
16a	R1	704	6.0	0.903	35.7	LOS E	20.6	539.5	1.00	1.75	2.97	24.3
Approach		705	6.0	0.903	35.7	LOS E	20.6	539.5	1.00	1.75	2.97	24.3
West: Oregon St. EB												
5b	L3	96	4.0	0.383	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	36.8
2	T1	220	3.0	0.383	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	35.5
12	R2	338	3.0	0.383	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	34.1
Approach		653	3.1	0.383	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	35.0
All Vehicles		1859	3.9	0.903	16.3	LOS C	20.6	539.5	0.55	0.83	1.33	29.1

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

Roundabout LOS Method: Same as Sign Control.

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

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

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

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

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

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Appendix I Total 2022 SimTraffic Queuing  
Worksheets



SimTraffic Simulation Summary  
 Year 2022 Total AM Peak Hour Conditions

04/05/2021

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	7:10	7:10	7:10	7:10	7:10	7:10
Total Time (min)	13	13	13	13	13	13
Time Recorded (min)	10	10	10	10	10	10
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	781	790	763	799	734	773
Vehs Exited	688	725	673	696	635	683
Starting Vehs	179	188	147	165	149	166
Ending Vehs	272	253	237	268	248	253
Travel Distance (mi)	940	930	860	898	840	894
Travel Time (hr)	41.0	42.8	34.7	38.2	34.6	38.2
Total Delay (hr)	14.7	17.0	10.9	13.6	11.4	13.5
Total Stops	1018	1093	785	823	772	897
Fuel Used (gal)	32.7	32.7	29.4	31.0	28.6	30.9

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	7:00
End Time	7:10
Total Time (min)	10
Volumes adjusted by Growth Factors.	

Run Number	1	2	3	4	5	Avg
Vehs Entered	781	790	763	799	734	773
Vehs Exited	688	725	673	696	635	683
Starting Vehs	179	188	147	165	149	166
Ending Vehs	272	253	237	268	248	253
Travel Distance (mi)	940	930	860	898	840	894
Travel Time (hr)	41.0	42.8	34.7	38.2	34.6	38.2
Total Delay (hr)	14.7	17.0	10.9	13.6	11.4	13.5
Total Stops	1018	1093	785	823	772	897
Fuel Used (gal)	32.7	32.7	29.4	31.0	28.6	30.9

Queuing and Blocking Report  
 Year 2022 Total AM Peak Hour Conditions

04/05/2021

Intersection: 1: Langer Farms Pkwy & Tualatin-Sherwood Rd

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	L	T	R	L	TR
Maximum Queue (ft)	56	478	141	94	338	119	129	107	74	106
Average Queue (ft)	11	297	57	39	170	74	86	61	39	53
95th Queue (ft)	76	544	160	110	346	130	158	117	92	116
Link Distance (ft)		1478			5023		1246			614
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	175		145	200		375		300	140	
Storage Blk Time (%)		16	0		4					1
Queuing Penalty (veh)		33	1		3					0

Intersection: 2: Oregon St & Tualatin-Sherwood Rd

Movement	EB	EB	EB	WB	WB	NB	NB	SB
Directions Served	L	T	R	L	TR	LT	R	L
Maximum Queue (ft)	16	386	133	291	591	134	374	21
Average Queue (ft)	3	231	59	149	332	109	207	8
95th Queue (ft)	18	415	161	325	764	205	417	31
Link Distance (ft)		5023			2666		1544	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	250		150	350		150		75
Storage Blk Time (%)		14	0		9	2	19	
Queuing Penalty (veh)		24	1		17	9	19	

Intersection: 3: 124th Ave & Tualatin-Sherwood Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	102	855	268	68	444	206	242	336	219	326	101
Average Queue (ft)	50	516	81	22	314	82	148	237	162	199	59
95th Queue (ft)	115	1054	314	73	529	282	263	359	314	494	131
Link Distance (ft)		2666			1735			453		1891	1891
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	100		375	375		375	400		300		
Storage Blk Time (%)	2	31	0		4	0		1	12		
Queuing Penalty (veh)	17	49	1		8	1		1	19		

Queuing and Blocking Report  
 Year 2022 Total AM Peak Hour Conditions

04/05/2021

Intersection: 4: Tonquin Rd & Oregon St

Movement	EB	WB	NB	NB
Directions Served	R	L	L	R
Maximum Queue (ft)	69	60	98	72
Average Queue (ft)	43	29	65	43
95th Queue (ft)	95	70	143	80
Link Distance (ft)				698
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	240	190	210	
Storage Blk Time (%)			0	
Queuing Penalty (veh)			0	

Intersection: 5: Murdock Rd & Oregon St

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	103	19	113
Average Queue (ft)	47	6	72
95th Queue (ft)	152	27	152
Link Distance (ft)	1854	309	911
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 101: Oregon St & Site Access A

Movement	WB	NB	SB
Directions Served	LR	TR	L
Maximum Queue (ft)	37	4	54
Average Queue (ft)	22	1	24
95th Queue (ft)	49	8	60
Link Distance (ft)	276	406	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			100
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queuing and Blocking Report  
 Year 2022 Total AM Peak Hour Conditions

04/05/2021

Intersection: 102: Oregon St & Site Access B

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	34	22
Average Queue (ft)	12	9
95th Queue (ft)	38	35
Link Distance (ft)	445	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	100	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 203



SimTraffic Simulation Summary  
 Year 2022 Total PM Peak Hour Conditions

04/05/2021

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	4:45	4:45	4:45	4:45	4:45	4:45
End Time	5:55	5:55	5:55	5:55	5:55	5:55
Total Time (min)	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4
Vehs Entered	5269	5065	5260	5211	5218	5204
Vehs Exited	5140	5023	5193	5144	5087	5116
Starting Vehs	302	296	269	303	320	300
Ending Vehs	431	338	336	370	451	389
Travel Distance (mi)	6517	6334	6460	6510	6536	6471
Travel Time (hr)	439.6	342.8	360.6	443.3	424.8	402.2
Total Delay (hr)	258.9	166.7	181.0	261.9	243.4	222.4
Total Stops	9599	6724	7549	9281	10448	8721
Fuel Used (gal)	260.5	234.7	241.0	262.8	257.6	251.3

Interval #0 Information Seeding

Start Time	4:45
End Time	4:55
Total Time (min)	10
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording1

Start Time	4:55
End Time	5:10
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	4	5	Avg
Vehs Entered	1258	1280	1301	1341	1256	1286
Vehs Exited	1233	1285	1244	1244	1233	1247
Starting Vehs	302	296	269	303	320	300
Ending Vehs	327	291	326	400	343	336
Travel Distance (mi)	1576	1598	1527	1574	1585	1572
Travel Time (hr)	81.4	74.9	74.3	87.2	81.7	79.9
Total Delay (hr)	37.9	30.6	31.4	43.2	37.5	36.1
Total Stops	1826	1677	1625	2196	2083	1882
Fuel Used (gal)	57.1	56.7	54.6	59.1	57.5	57.0

SimTraffic Simulation Summary  
 Year 2022 Total PM Peak Hour Conditions

04/05/2021

**Interval #2 Information Recording2**

Start Time	5:10
End Time	5:25
Total Time (min)	15
Volumes adjusted by PHF, Growth Factors.	

Run Number	1	2	3	4	5	Avg
Vehs Entered	1408	1282	1352	1307	1384	1347
Vehs Exited	1300	1240	1316	1318	1307	1295
Starting Vehs	327	291	326	400	343	336
Ending Vehs	435	333	362	389	420	386
Travel Distance (mi)	1654	1567	1687	1661	1659	1646
Travel Time (hr)	107.8	86.8	90.0	113.5	106.1	100.8
Total Delay (hr)	61.8	43.3	43.3	67.1	59.7	55.0
Total Stops	2577	1834	1863	2162	2778	2242
Fuel Used (gal)	64.6	58.7	61.8	67.1	65.5	63.5

**Interval #3 Information Recording3**

Start Time	5:25
End Time	5:40
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	4	5	Avg
Vehs Entered	1263	1220	1264	1293	1259	1261
Vehs Exited	1280	1239	1331	1268	1268	1278
Starting Vehs	435	333	362	389	420	386
Ending Vehs	418	314	295	414	411	368
Travel Distance (mi)	1623	1567	1622	1655	1654	1624
Travel Time (hr)	127.6	86.5	98.3	121.6	118.6	110.5
Total Delay (hr)	82.7	43.0	53.3	75.8	73.1	65.6
Total Stops	2694	1465	1991	2345	2877	2274
Fuel Used (gal)	69.5	58.0	62.7	68.9	67.4	65.3

**Interval #4 Information Recording4**

Start Time	5:40
End Time	5:55
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	4	5	Avg
Vehs Entered	1340	1283	1343	1270	1319	1308
Vehs Exited	1327	1259	1302	1314	1279	1295
Starting Vehs	418	314	295	414	411	368
Ending Vehs	431	338	336	370	451	389
Travel Distance (mi)	1663	1603	1623	1620	1638	1629
Travel Time (hr)	122.8	94.5	98.1	120.9	118.3	110.9
Total Delay (hr)	76.5	49.9	53.0	75.8	73.1	65.7
Total Stops	2502	1748	2070	2578	2710	2321
Fuel Used (gal)	69.3	61.2	62.0	67.8	67.2	65.5

Queuing and Blocking Report  
 Year 2022 Total PM Peak Hour Conditions

04/05/2021

Intersection: 1: Langer Farms Pkwy & Tualatin-Sherwood Rd

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	L	T	R	L	TR
Maximum Queue (ft)	75	638	170	225	950	273	162	129	165	663
Average Queue (ft)	13	317	112	168	426	136	68	47	71	572
95th Queue (ft)	49	563	220	273	810	242	136	98	193	751
Link Distance (ft)		1478			5038		1246			614
Upstream Blk Time (%)										63
Queuing Penalty (veh)										0
Storage Bay Dist (ft)	175		145	200		375		300	140	
Storage Blk Time (%)		22	0	1	18				0	93
Queuing Penalty (veh)		61	1	13	40				0	31

Intersection: 2: Oregon St & Tualatin-Sherwood Rd

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	LT	R	L	TR
Maximum Queue (ft)	81	696	175	375	1665	225	551	40	55
Average Queue (ft)	10	316	67	303	641	162	206	7	15
95th Queue (ft)	52	593	179	446	1473	261	482	28	41
Link Distance (ft)		5038			2661		1562		369
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	250		150	350		200		75	
Storage Blk Time (%)		21	0	7	10	24	2		0
Queuing Penalty (veh)		29	1	69	46	59	3		0

Intersection: 3: 124th Ave & Tualatin-Sherwood Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	125	1436	400	397	1360	400	226	227	276	241	230
Average Queue (ft)	70	762	161	51	1003	160	97	95	140	121	107
95th Queue (ft)	129	1483	456	228	1962	463	185	176	239	208	190
Link Distance (ft)		2661			1657			438		1891	1891
Upstream Blk Time (%)					20						
Queuing Penalty (veh)					0						
Storage Bay Dist (ft)	100		375	375		375	400		300		
Storage Blk Time (%)	2	33	0		29	0			1		
Queuing Penalty (veh)	22	73	1		43	1			2		

Queuing and Blocking Report  
 Year 2022 Total PM Peak Hour Conditions

04/05/2021

Intersection: 4: Tonquin Rd & Oregon St

Movement	EB	WB	NB	NB
Directions Served	R	L	L	R
Maximum Queue (ft)	86	82	235	752
Average Queue (ft)	13	28	220	450
95th Queue (ft)	58	65	281	886
Link Distance (ft)				710
Upstream Blk Time (%)				25
Queuing Penalty (veh)				0
Storage Bay Dist (ft)	240	190	210	
Storage Blk Time (%)			75	0
Queuing Penalty (veh)			71	1

Intersection: 5: Murdock Rd & Oregon St

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	108	204	67
Average Queue (ft)	45	65	22
95th Queue (ft)	87	162	58
Link Distance (ft)	1854	358	911
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 101: Oregon St & Site Access A

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	98	45
Average Queue (ft)	37	7
95th Queue (ft)	72	31
Link Distance (ft)	215	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		100
Storage Blk Time (%)		
Queuing Penalty (veh)		



Queuing and Blocking Report  
 Year 2022 Total PM Peak Hour Conditions

04/05/2021

Intersection: 102: Oregon St & Site Access B

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	93	24
Average Queue (ft)	36	1
95th Queue (ft)	68	11
Link Distance (ft)	298	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		100
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 566

## Appendix J Sight Distance Triangles

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Sight Distance Triangles - Sherwood Commerce Access A  
Washington County, Oregon

Figure  
J1





Sight Distance Triangles - Sherwood Commerce Access B  
Washington County, Oregon

Figure  
J2

H:\2620314 - Sherwood Commerce Center\analysis\Sight Distance\sight distance.dwg Aug 05, 2021 - 8:35am - Izend Layout Tab: Access B Triangles





Figure J1. North Access Looking Right, Car



Figure J2. North Access Looking Right, Truck





Figure J3. North Access Looking Left, Car



Figure J4. North Access Looking Left, Truck





Figure J5. South Access Looking Right, Car



Figure J6. South Access Looking Right, Truck

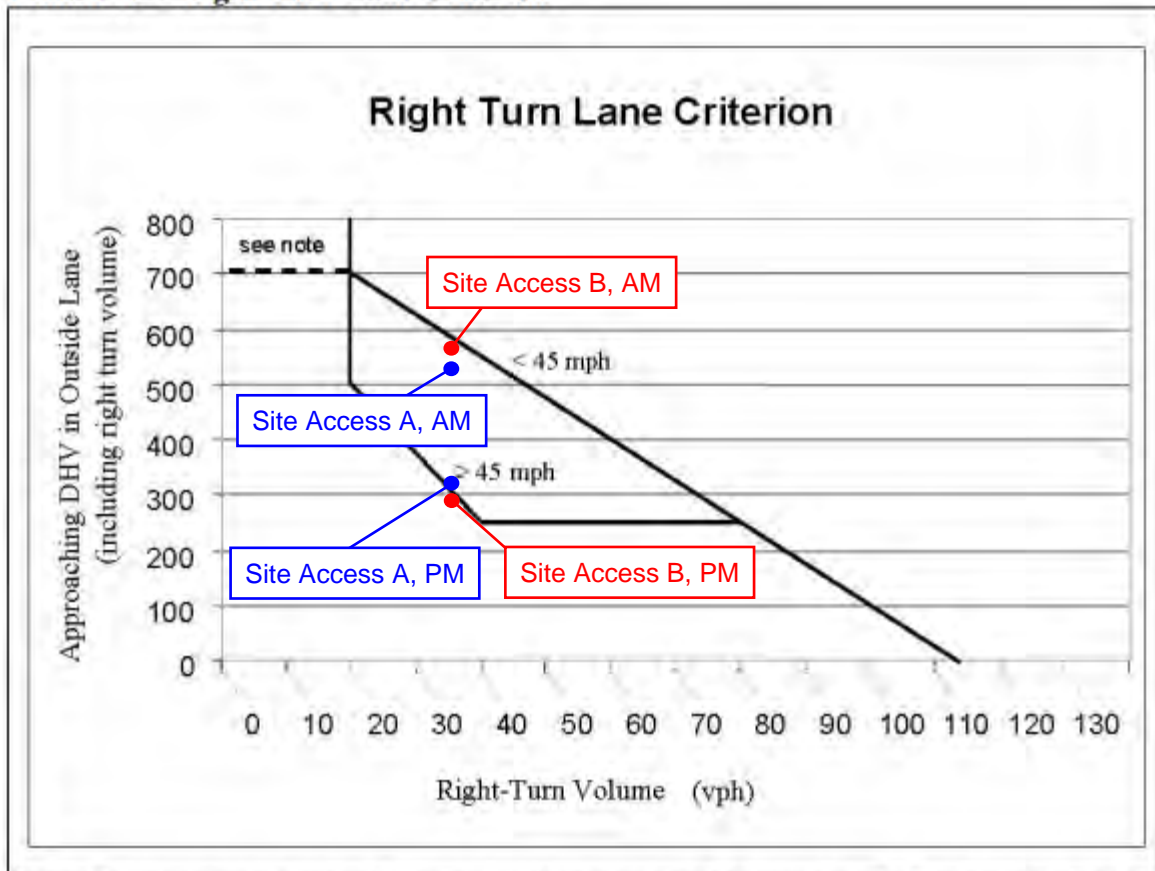


Figure J7. South Access Looking Left



Appendix K Right-Turn Lane Warrant  
Worksheet

Exhibit 12-2 Right Turn Lane Criterion



Note: If there is no right turn lane, a shoulder needs to be provided. If this intersection is in a rural area and is a connection to a public street, a right turn lane is needed.

Appendix L Sherwood Oregon Street AMP



## TECHNICAL MEMORANDUM

DATE: June 25, 2021  
 TO: Bob Galati | City of Sherwood  
 FROM: Garth Appanaitis | DKS  
 SUBJECT: Sherwood Oregon Street Access Management Plan (AMP)



Project #16197-037

This memorandum summarizes the findings of the transportation study to address Washington County’s Access Management Plan (AMP) process (CDC 501-8.5C) to analyze the potential for future roadway connections to Oregon Street between Tonquin Road and Tualatin-Sherwood Road. Oregon Street has the functional classification of arterial and Washington County CDC 501.8.5.B(4) states that arterials only have direct access from collector or other arterial roads and with a minimum access spacing of 600 feet.

The AMP process provides the framework for analyzing the traffic safety and operations of potential exceptions to the access standard, as well as the performance of future public street connections that comply with the standard. The AMP was conducted to explore the feasibility of future street connections to the south/east side of Oregon Street between Tonquin Road and the planned future extension of an east-west collector that bisects the Tonquin Employment Area (TEA). Prior planning efforts have identified the future collector connection to Oregon Street, but have not reviewed access to individual properties within the TEA.

### OVERVIEW

Three access alternatives (phases) were analyzed to determine the traffic operations and safety associated with increasing levels of development and transportation improvements. These *chronological* configurations (illustrations attached) would be implemented in phases to provide access to TEA and are assumed to include:

1. Alternative 1 – Initial, direct access to Oregon Street for the two fronting properties Taxlots 2S128C000500 and 2S128C000600 (TL 500 and TL 600). The purpose of this configuration is to provide access prior to the construction of additional public street system. Development of additional parcels within the TEA is not included in this initial configuration.



This temporary alternative would not meet Washington County access spacing requirements due to direct lot access to the Oregon Street arterial.

2. Alternative 2 – Intermediate, shared access to Oregon Street for properties via a public street connection, Tonquin Court. This alternative assumes development of remaining TEA properties, with shared access to Tonquin Court. This new street also would include additional partial direct access for TL 500 and TL 600. This temporary alternative would not meet Washington County access spacing requirements due to direct lot access, as well as a local street<sup>1</sup> (Tonquin Court) connection, to the Oregon Street arterial.
3. Alternative 3 – Ultimate access configuration that meets Washington County access management standards. The key element of this ultimate configuration would be the construction of the new east-west collector between Oregon Street and a point to the east (likely connecting to 124<sup>th</sup> Avenue). The extension of the new collector would provide connectivity to the east, as well as a connection for Tonquin Court to provide secondary ingress/egress for properties within the TEA.

## KEY FINDINGS AND RECOMMENDATIONS

The follow describes the key findings and recommended actions and triggers related to each access configuration. The three access alternatives provide an evolving approach to providing access to properties within the TEA with progressing levels of development and access needs.

1. The initial Alternative 1 (direct access for two stop-controlled driveways) would not alter traffic flow on Oregon Street and would meet City and County mobility standards. The driveways should align with existing driveways or shift existing driveways to align, but traffic queuing at driveways along Oregon Street would be minimal.

Recommendations:

- o Provide direct full access (stop-controlled) for TL 500, locating the access on Oregon Street at the future (Alternative 2) connection for Tonquin Court. The future location of Tonquin Court (and potential alignment to address the skew with Oregon Street) will dictate the location of this interim access and will require future study.<sup>2</sup>
- o The existing driveway for TL 501 on the north side of Oregon Street may need to be relocated to be placed opposite of the TL 500 driveway. This driveway is not

---

<sup>1</sup> Local street functional classification is assumed since the stub roadway would serve local access only and would not be a through street to provide circulation for other trips. Future extension of the street to connect eastward to the east-west collector could change the function of the street (as in Alternative 3) and could affect consideration of functional class designation.

<sup>2</sup> The specific location and design of the Tonquin Court intersection will depend on several factors including sight distance on Oregon Street, placement of the roadway near property edges, approach angle and skew of the roadway approaching Oregon Street, and other topographical considerations.

currently active<sup>3</sup> and relocation may be deferred to the construction of Tonquin Court.

- o Dedicate right of way for the future extension of Tonquin Court.
  - o Dedicate right of way along Oregon Street for frontage improvements including the planned shared use path and potential northbound right turn lanes at each driveway.
  - o Provide direct full access (stop-controlled) for TL 600 to Oregon Street. This driveway should be located opposite of the existing driveway for TL 201 to create a 4-legged intersection. Note that this driveway may be placed in the future location of the east-west collector (location to be determined).
  - o Provide direct full access (stop-controlled) for TL 700 to Oregon Street. This driveway should be located opposite of an existing driveway and may be the future alignment of the east-west collector (location to be determined). Future ROW for the east-west collector should be dedicated and TL 600 would take access from this location (and close initial TL 600 driveway)
  - o Proceed to Alternative 2 access configuration as additional lots within the TEA begin to develop and require access and/or add additional traffic that requires a traffic signal on Oregon Street at Tonquin Court.
2. The Alternative 2 intermediate access configuration would install a traffic signal at Tonquin Court as a shared access location. The back-to-back vehicle queues would dictate storage needs. However, the vehicle queues should be accommodated within available storage (center turn lane on Oregon Street). Turn restrictions (converting to right-in-right-out) at the north (TL 600) driveway would increase storage distance for this movement.

Recommendations:

- o Extend the initial TL 500 driveway as Tonquin Court to provide access to parcels to the south, including additional access for TL 600.
- o Reconfigure access to TL 500 to connect to Tonquin Court.
- o Reconfigure access for TL 600 to modify initial Oregon Street driveway to right-in-right-out condition and add full access driveway to Tonquin Court. Modification of the Oregon Street TL 600 driveway to right-in-right-out would also impact the existing driveway for TL 201, converting it to right-in-right-out.
- o Convert traffic control at Tonquin Court / Oregon Street to a traffic signal (when warranted).

---

<sup>3</sup> Driveway is gated and is additionally blocked with parked machinery on site.

- o Proceed to Alternative 3 access configuration upon completion of the east-west collector.
3. The ultimate access configuration (Alternative 3) would meet Washington County access spacing requirements and would be dependent on the completion of the new east-west collector. The specific placement of the east-west collector may vary, but would not impact the analysis findings, as long as opposite side driveways were aligned to reduce conflicts.

Recommendations:

- o Connect the east-west collector to Oregon Street as a signalized intersection. The collector should intersect Oregon Street as a four-legged intersection opposite a driveway serving properties north of Oregon Street. The location of this intersection may require relocation of an existing driveway(s) north of Oregon Street.
- o Extend the east-west collector to the east to connect it to the existing transportation network (assumed connection to 124<sup>th</sup> Avenue).
- o Include a northbound right turn lane on Oregon Street at the east-west collector intersection.
- o Extend Tonquin Court to connect it to the east-west collector, creating a through connection that would provide local access to the east or west.
- o Remove the traffic signal at the Tonquin Court / Oregon Street intersection and restrict the intersection to right-in-right-out movements.
- o Close Oregon Street access for TL 700 and relocate access to the east-west collector (located 300 feet or more from Oregon Street). Access should be placed opposite access to TL 600.
- o Add TL 600 driveway access to the east-west collector (located 300 feet or more from Oregon Street). Access should be placed opposite access to TL 700.

## ADDITIONAL CONTEXT

- Current Use and Access – Properties along both sides of Oregon Street currently have direct access to the arterial. Industrial properties on the north side of Oregon Street are generally developed, while properties on the south side have limited existing development. The existing driveways along Oregon Street generally do not meet the access spacing standard of 600 feet, and do not comply with the standard due to access type (driveway).
- Future Transportation Improvements – Several future transportation improvements have been identified in the area in **Sherwood's Transportation System Plan (TSP)**. These projects do not have identified funding unless noted:

- Tualatin-Sherwood Road widening to five lanes (identified funding through Washington County MSTIP) [TSP project D1]
  - New east-west collector through the TEA connecting Oregon Street to 124<sup>th</sup> Avenue [TSP project D20]
  - Traffic control (roundabout) upgrade at the intersections of Tonquin Road and Murdock Road [TSP project D3]
  - Shared use paths segments that are part of the Ice Age Tonquin Trail system [TSP projects P11, P16, P38]
- Potential TEA Land Use – The exact future land use details for each parcel are not known. However, TEA is identified as an employment/industrial area that will likely serve a range of uses. Some preliminary potential site information that has been shared with the City (type of use and estimated building area) was used to approximate overall traffic trip potential for the weekday morning and evening peak hour. While ultimately the proposed land uses and trip patterns may vary, this estimate provides an approximation of the overall level of traffic that would be served by site access configurations.
  - Trip generation estimates - Trip generation for the TEA was estimated using national rates published in Institute of Transportation Engineers (ITE). Trip generation was assumed to be general light industrial (ITE 110) for sites providing equipment storage, and industrial park (ITE 130) for the remaining general speculative industrial uses. The approximate trip generation for each alternative is:
    - Alternative 1 – Approximately 300 trips during the morning and evening peak hours.
    - Alternative 2 – Approximately 500 trips during the morning and evening peak hours.
    - Alternative 3 – Approximately 500 trips during the morning and evening peak hours. However, about 300 trips would load directly to Oregon Street with the remaining traffic (approximately 40 percent) traveling to/from the east via the new east-west collector.
  - Alternative 1 – Direct access driveways
    - Network Assumptions – No changes on Oregon Street. Both driveways would operate as full-access with two-way stop-control (TWSC) controlling the driveway traffic. The center turn lanes on Oregon Street would provide left turn access into the sites. TL 600 access should be located opposite of the existing Allied Systems driveway to reduce turning conflicts. TL 500 access may be located approximately 500 feet to the south (opposite secondary Allied Systems driveway) or both driveways may need to shift to accommodate the ultimate location for Tonquin Court.
    - Operations – The two driveways would meet the existing City of Sherwood and Washington County mobility standards operating at level of service (LOS) D or better.



- Potential Options – Consider the benefit of a secondary turn lane from TL 600 to reduce delay but may not have long-term utility depending on placement of east-west collector.
- Note: For properties not fronting on Oregon Street, interim access may be available via Tonquin Road. However, that has not been analyzed in this report. Coordination with Washington County will be required to establish whether and where interim access locations on Tonquin Road will be permitted.
- Alternative 2 – Intermediate shared access
  - Network Assumptions – Tonquin Court would replace the southern driveway (TL 500) and would provide shared access for all lots via a traffic signal. The northern driveway for TL 600 and Allied Systems may need to convert to a right-in-right-out only with left turns prohibited. This configuration would require modification of the existing access but would provide additional vehicle queue storage for the southbound left turn movement at Tonquin Court.
  - Trigger – A conversion to the Alternative 2 configuration would be needed as additional properties without frontage along Oregon Street develop and would require access to Tonquin Court.
  - Operations – The two driveways would meet the existing City of Sherwood and Washington County mobility standards. While the southbound left turn volume during the morning would be high for Tonquin Court, it could be served by the traffic signal and the 95<sup>th</sup> percentile queue (175 feet) would not approach the northern driveway. The southbound left turn for Coast Paving may conflict with the northbound left turn for Pride Disposal, but both driveways have low traffic volumes, operating at LOS D or better.
  - Potential Options – Consider the potential access restriction for north driveway to right-in-right-out. This would provide additional southbound left turn storage for the Tonquin Court traffic signal but would shift additional traffic to this movement. In addition, this would require modification to an existing site driveway and use.
- Alternative 3 - Ultimate Configuration
  - Network Assumptions – The completion of a new east-west collector through the TEA would provide secondary access for TEA properties to/from the east. Tonquin Court would also connect to the east-west collector. Primary access to/from Oregon Street would shift from the Alternative 2 configuration (Tonquin Court) to the east-west collector.

- The traffic signal at Tonquin Court would be removed<sup>4</sup> and replaced with a traffic signal at the east-west collector. The specific location of the east-west collector alignment is unknown, but it should be configured so that it is not offset with a driveway on the north side of Oregon Street.
  - A northbound right turn lane should be added on Oregon Street approaching the east-west collector.
- Trigger – A conversion to the ultimate access configuration should be pursued based on the completion of both A) Connection of the east-west collector from Oregon Street to 124<sup>th</sup> Avenue, and B) Connection of Tonquin Court to the east-west collector.
  - Operations (morning peak) – The high traffic flows during the morning peak would be the northbound traffic on Oregon Street and the northbound right turn at the east-west collector. The southbound left turn that was present in Alternative 2 would **primarily shift to the “back door”** via 124<sup>th</sup> Avenue and would not access via Oregon Street to avoid delay at the Oregon Street/Tualatin-Sherwood Road intersection. The traffic signal at the east-west collector would operate at LOS B, while Tonquin Court would operate at LOS D, but would be a low volume approach (due to improved TEA street connections).
  - Operations (evening peak) – In the evening, the high traffic flow would be southbound along Oregon Street and from the westbound left turn from the east-west collector. The westbound left turn would have a 95<sup>th</sup> percentile queue of approximately 225 feet, so access to the collector would require adequate spacing from Oregon Street.<sup>5</sup> The intersection LOS would be similar to the morning peak, with LOS B for the east-west collector and LOS D for Tonquin Court.

## ATTACHMENTS

The following attachments are included:

1. Access Diagrams for Alternative 1, 2, 3
2. Traffic Operations and Vehicle Queuing

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<sup>4</sup> Removal of the traffic signal would be needed to address two mobility strategies along the corridor: 1) reduce opportunity for traffic stopped at Tonquin Court to spill back to the future roundabout at Tonquin Road, and 2) maintain southbound traffic flow on Oregon Street for a single southbound lane approach.

<sup>5</sup> Preliminary site plans indicate the nearest driveway would be located approximately 400 feet from Oregon Street, which would exceed the estimated queue storage needs.

ACCESS DIAGRAMS

# Alternative 1: Direct Access for TL 500 and TL 600

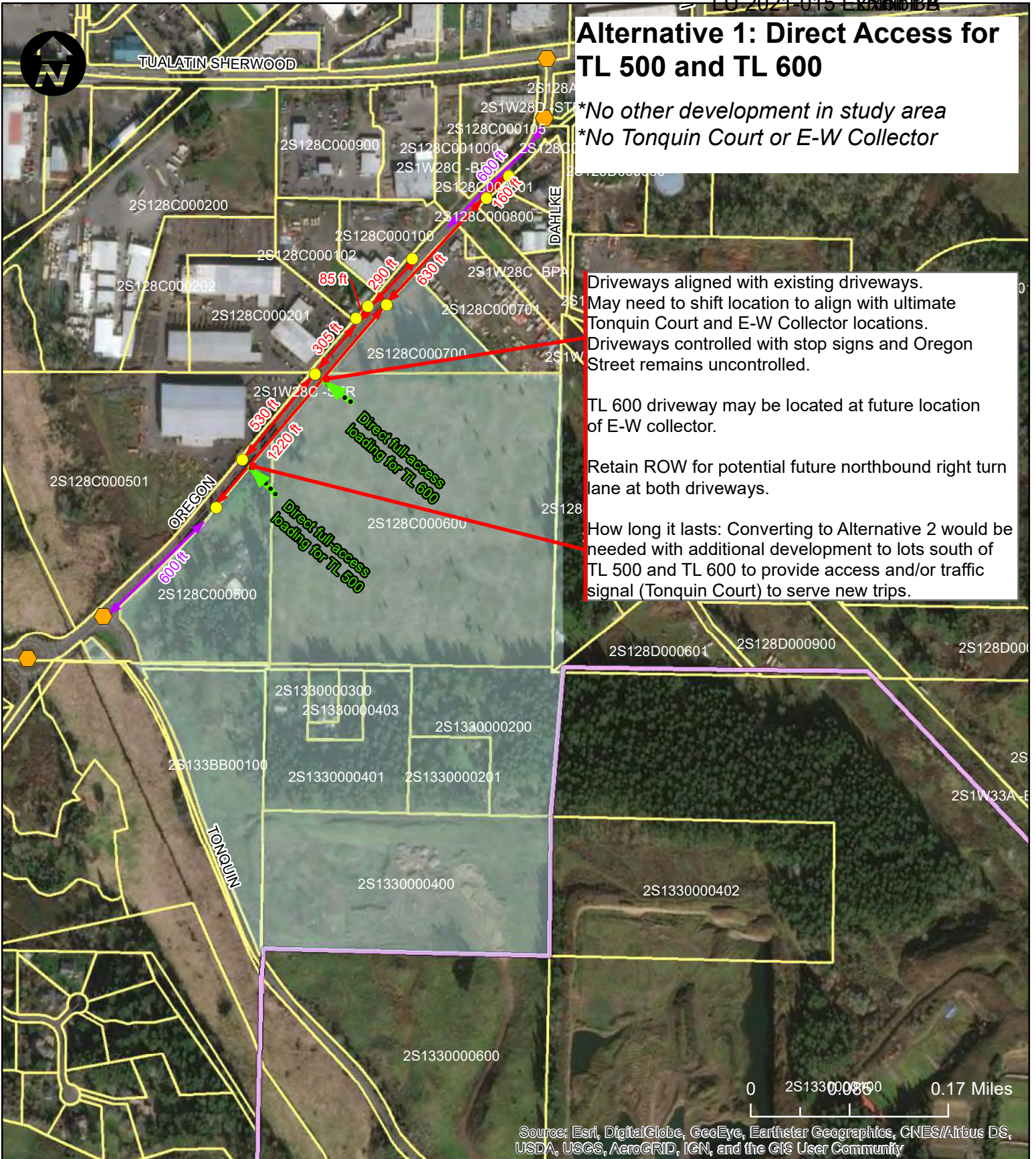
*\*No other development in study area  
\*No Tonquin Court or E-W Collector*

Driveways aligned with existing driveways.  
May need to shift location to align with ultimate Tonquin Court and E-W Collector locations.  
Driveways controlled with stop signs and Oregon Street remains uncontrolled.

TL 600 driveway may be located at future location of E-W collector.

Retain ROW for potential future northbound right turn lane at both driveways.

How long it lasts: Converting to Alternative 2 would be needed with additional development to lots south of TL 500 and TL 600 to provide access and/or traffic signal (Tonquin Court) to serve new trips.



## Legend

- ↔ Study Area Measurements
- ↔ Access Spacing Standard
- ↔ Access
- ◆ Public Access
- ◆ Private Access
- Taxlots
- Urban Growth Boundary
- Potential Parcels Connected to Proposed Tonquin Court Alignment





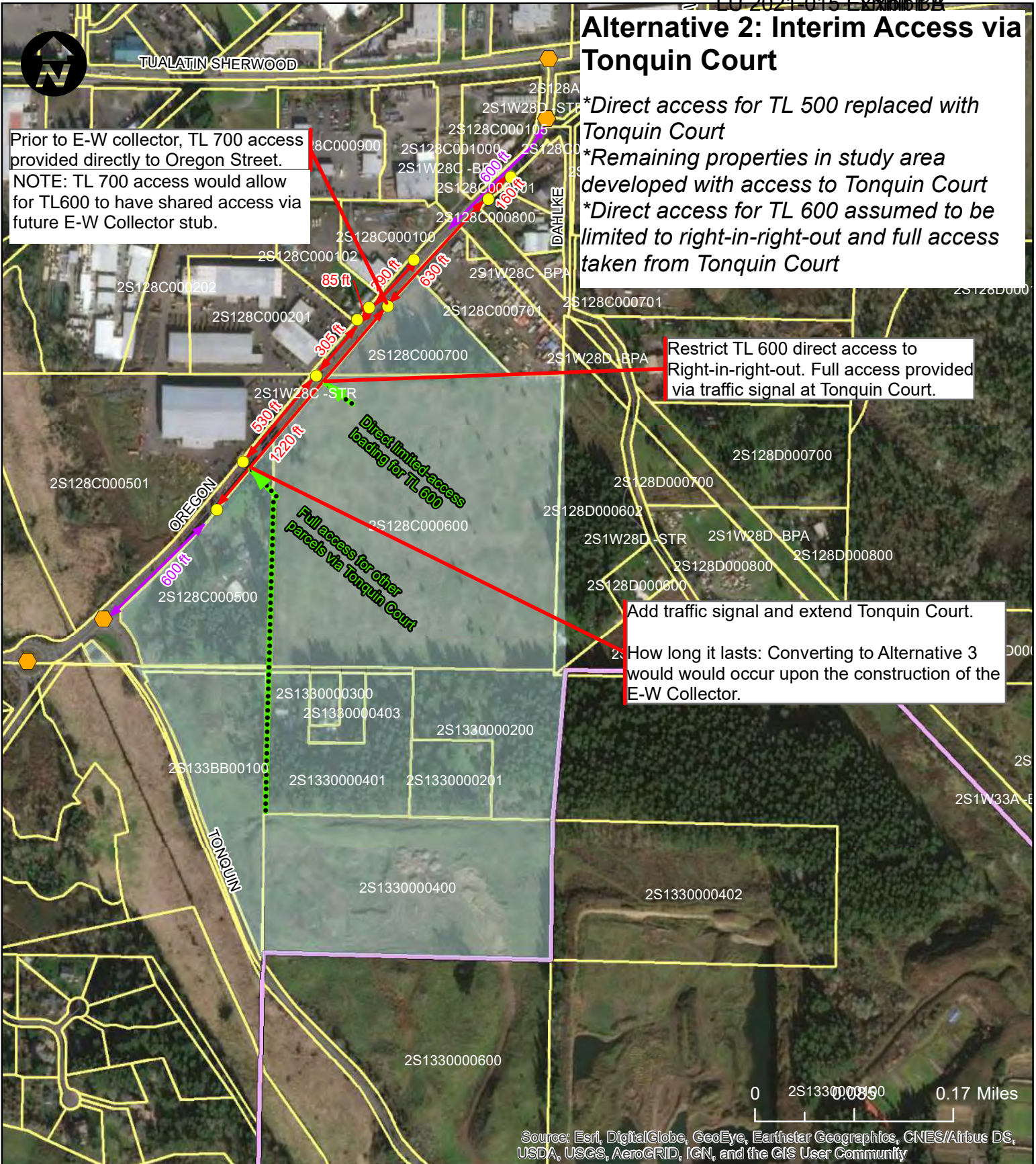
# Alternative 2: Interim Access via Tonquin Court

Prior to E-W collector, TL 700 access provided directly to Oregon Street.  
 NOTE: TL 700 access would allow for TL600 to have shared access via future E-W Collector stub.

\*Direct access for TL 500 replaced with Tonquin Court  
 \*Remaining properties in study area developed with access to Tonquin Court  
 \*Direct access for TL 600 assumed to be limited to right-in-right-out and full access taken from Tonquin Court

Restrict TL 600 direct access to Right-in-right-out. Full access provided via traffic signal at Tonquin Court.

Add traffic signal and extend Tonquin Court.  
 How long it lasts: Converting to Alternative 3 would occur upon the construction of the E-W Collector.



- Legend**
- ↔ Study Area Measurements
  - ↔ Access Spacing Standard
  - Access
  - Public Access
  - Private Access
  - Taxlots
  - Urban Growth Boundary
  - Potential Parcels Connected to Proposed Tonquin Court Alignment



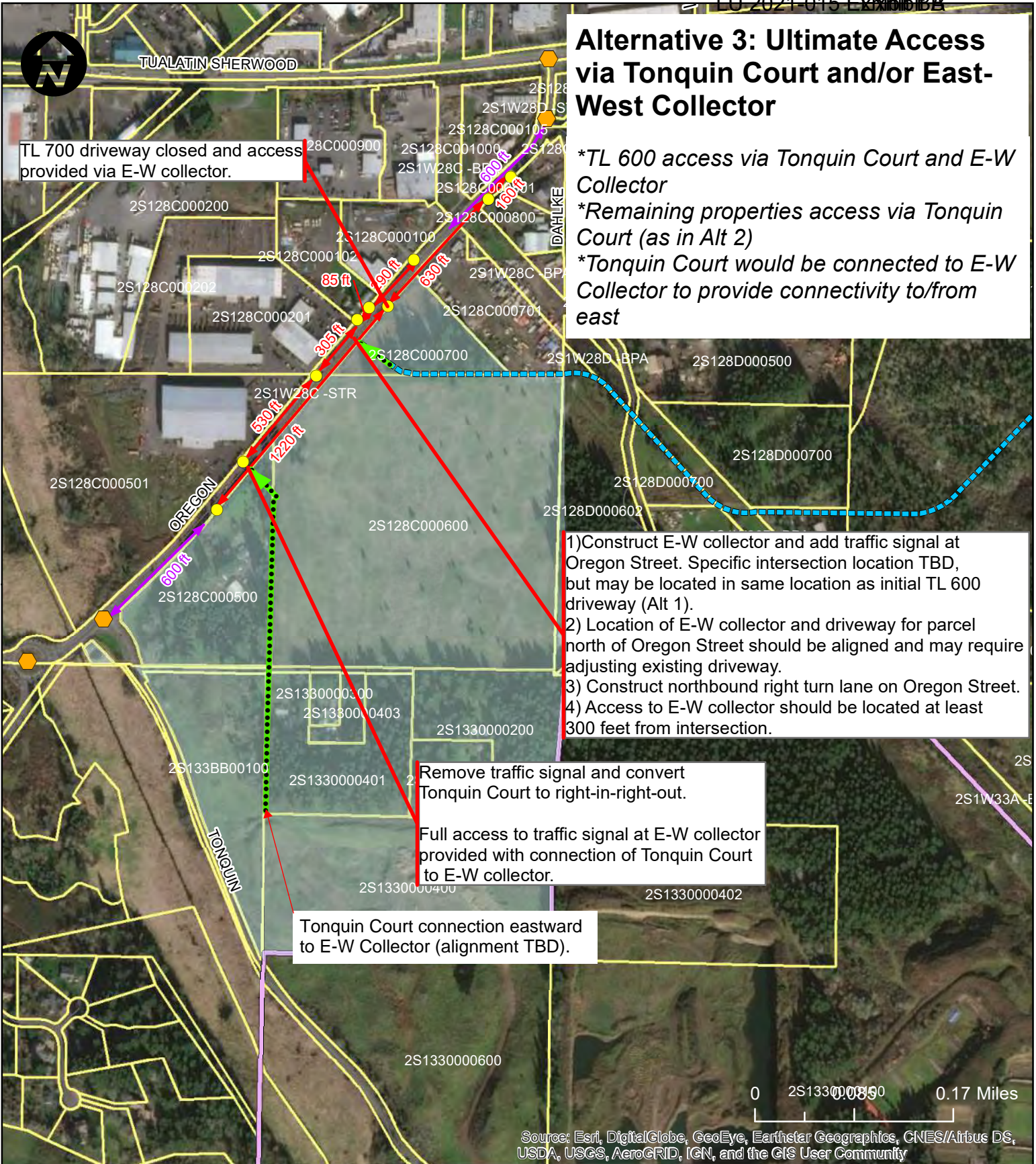




# Alternative 3: Ultimate Access via Tonquin Court and/or East-West Collector

TL 700 driveway closed and access provided via E-W collector.

- \*TL 600 access via Tonquin Court and E-W Collector
- \*Remaining properties access via Tonquin Court (as in Alt 2)
- \*Tonquin Court would be connected to E-W Collector to provide connectivity to/from east



- 1) Construct E-W collector and add traffic signal at Oregon Street. Specific intersection location TBD, but may be located in same location as initial TL 600 driveway (Alt 1).
- 2) Location of E-W collector and driveway for parcel north of Oregon Street should be aligned and may require adjusting existing driveway.
- 3) Construct northbound right turn lane on Oregon Street.
- 4) Access to E-W collector should be located at least 300 feet from intersection.

Remove traffic signal and convert Tonquin Court to right-in-right-out.  
Full access to traffic signal at E-W collector provided with connection of Tonquin Court to E-W collector.

Tonquin Court connection eastward to E-W Collector (alignment TBD).



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

### Legend

- Study Area
- Access Spacing Standard
- Access
- Potential TEA East/West Collector Alignment
- Public
- Private
- Taxlots
- Urban Growth Boundary
- Potential Parcels Connected to Proposed Tonquin Court Alignment



**TRAFFIC OPERATIONS**

The following tables summarize the traffic analysis conducted for each alternative.

TABLE 1: EXISTING TRAFFIC OPERATIONS – 2018 PEAK HOUR

NAME	AM Peak			PM Peak		
	Delay (s)	LOS	V/C	Delay (s)	LOS	V/C
SW Oregon St \ Heintz Excavation	8.3	A\A	0.00	0	A\A	0.00
SW Oregon St \ Pride Disposal	10.9	A\B	0.03	12.5	A\B	0.02
SW Oregon St \ Allied Systems	11.8	A\B	0.01	13.1	A\B	0.08
SW Oregon St \ Blast Cleaning	9.7	A\A	0.00	0	A\A	0.00
SW Oregon St \ Tonquin Rd	21.8	A\C	0.38	>100	A\F	>1.0

TABLE 2: ALTERNATIVE 1 TRAFFIC OPERATIONS – 2023 PEAK HOUR

NAME	AM Peak			PM Peak		
	Delay (s)	LOS	V/C	Delay (s)	LOS	V/C
SW Oregon St \ Heintz Excavation	8.7	A\A	0.00	0	A\A	0.00
SW Oregon St \ Pride Disposal	12.9	A\B	0.04	14.2	A\B	0.02
SW Oregon St \ Allied \ Lot 600	29.9	A\D	0.20	34.6	A\D	0.66
SW Oregon St \ Lot 500	15.1	A\C	0.04	15.3	A\C	0.13
SW Oregon St \ Tonquin Rd	36.2	B\E	0.55	>100	A\F	>1.0

TABLE 3: ALTERNATIVE 2 TRAFFIC OPERATIONS – 2025 PEAK HOUR

NAME	AM Peak			PM Peak		
	Delay (s)	LOS	V/C	Delay (s)	LOS	V/C
SW Oregon St \ Heintz Excavation	8.8	A\A	0.00	0	A\A	0.00
SW Oregon St \ Pride Disposal	14.4	A\B	0.04	15.3	A\C	0.02
SW Oregon St \ Allied \ Lot 600	29.1	A\D	0.07	33.5	A\D	0.25
SW Oregon St \ Lot 500 [TRAFFIC SIGNAL]	16.1	B	0.85*	8.7	A	0.69*
SW Oregon St \ Tonquin Rd	54.0	B\F	0.69	>100	A\F	>1.0

Note: \* V/C listed as worst movement

TABLE 5: ALTERNATIVE 3 TRAFFIC OPERATIONS – 2035 PEAK HOUR

NAME	AM Peak			PM Peak		
	Delay (s)	LOS	V/C	Delay (s)	LOS	V/C
SW Oregon St \ Heintz Excavation	8.6	A\A	0.00	0	A\A	0.00
SW Oregon St \ Pride Disposal	12.5	A\B	0.03	14.6	A\B	0.02
SW Oregon St \ Allied \ E-W Collector [TRAFFIC SIGNAL]	11.2	B	0.72*	16.3	B	0.86*
SW Oregon St \ Lot 500	36.4	B/E	0.10	60.9	A\F	0.45
SW Oregon St \ Tonquin Rd	>100	C\F	>1.0	>100	A\F	>1.0










Note: \* V/C listed as worst movement



Appendix M Supplemental Analysis of  
Opening Day Operations with a  
Single Access











HCM Unsignalized Intersection Capacity Analysis  
101: Oregon St & Site Access

11/01/2021

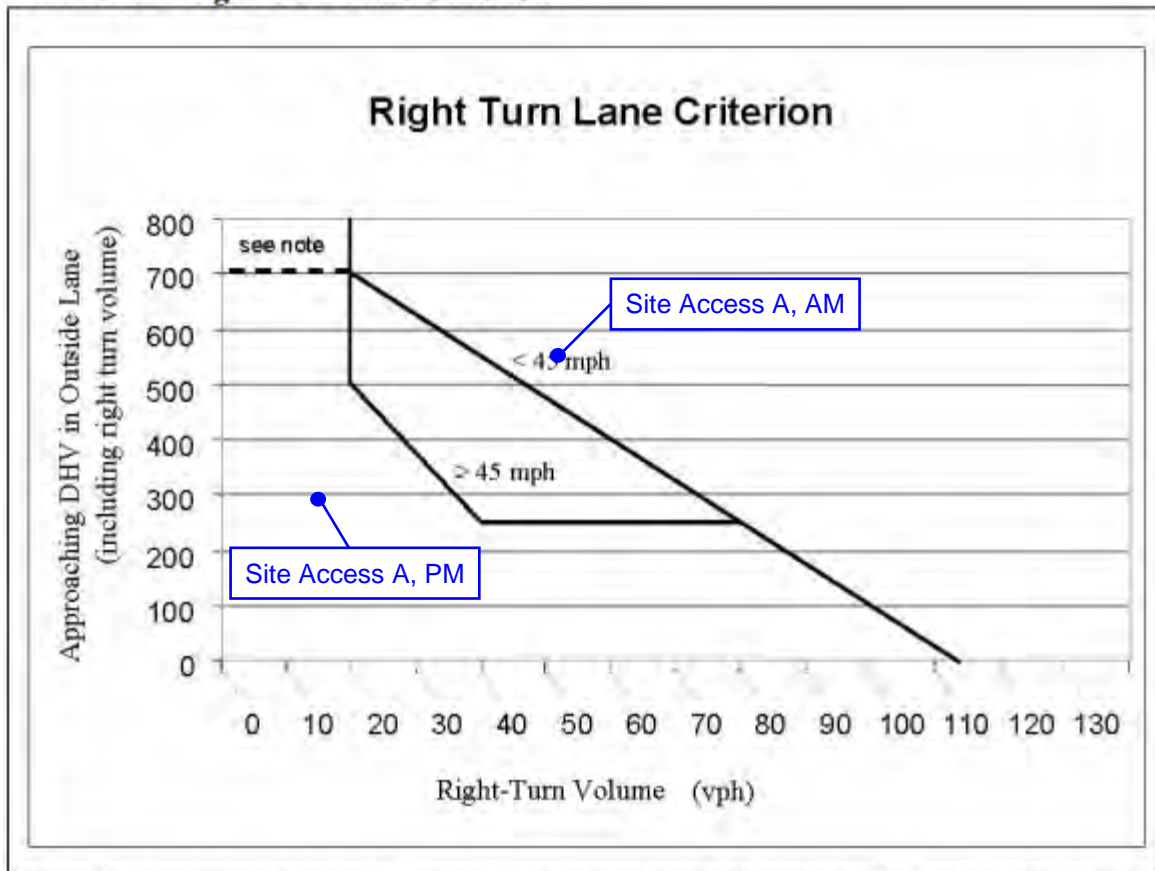
						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	13	23	511	53	98	245
Future Volume (Veh/h)	13	23	511	53	98	245
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	15	26	581	60	111	278
<b>Pedestrians</b>						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1111	611			641	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1111	611			641	
tC, single (s)	6.5	6.3			4.2	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.3	
p0 queue free %	92	95			88	
cM capacity (veh/h)	193	474			893	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	41	641	389			
Volume Left	15	0	111			
Volume Right	26	60	0			
cSH	309	1700	893			
Volume to Capacity	0.13	0.38	0.12			
Queue Length 95th (ft)	11	0	11			
Control Delay (s)	18.4	0.0	3.8			
Lane LOS	C		A			
Approach Delay (s)	18.4	0.0	3.8			
Approach LOS	C					
<b>Intersection Summary</b>						
Average Delay			2.1			
Intersection Capacity Utilization			61.8%		ICU Level of Service	B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
101: Oregon St & Site Access A

10/29/2021

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	52	96	283	14	25	566
Future Volume (Veh/h)	52	96	283	14	25	566
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	57	104	308	15	27	615
<b>Pedestrians</b>						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	984	316			323	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	984	316			323	
tC, single (s)	6.5	6.3			4.2	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.3	
p0 queue free %	78	85			98	
cM capacity (veh/h)	262	711			1204	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>	<b>SB 2</b>		
Volume Total	161	323	27	615		
Volume Left	57	0	27	0		
Volume Right	104	15	0	0		
cSH	443	1700	1204	1700		
Volume to Capacity	0.36	0.19	0.02	0.36		
Queue Length 95th (ft)	41	0	2	0		
Control Delay (s)	17.7	0.0	8.1	0.0		
Lane LOS	C		A			
Approach Delay (s)	17.7	0.0	0.3			
Approach LOS	C					
<b>Intersection Summary</b>						
Average Delay			2.7			
Intersection Capacity Utilization			45.2%	ICU Level of Service	A	
Analysis Period (min)			15			

**Exhibit 12-2 Right Turn Lane Criterion**



Note: If there is no right turn lane, a shoulder needs to be provided. If this intersection is in a rural area and is a connection to a public street, a right turn lane is needed.





Home of the Tualatin River National Wildlife Refuge

## MEMORANDUM

City of Sherwood  
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**To:** City of Sherwood Planning Commission

**From:** Eric Rutledge, Associate Planner

**RE:** LU 2021-012 SP Oregon St. Business Park – Alternative Tonquin Ct.

**Date:** February 1, 2022

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### Background

On January 25, 2022 the Planning Commission held the initial evidentiary hearing for LU 2021-015 SP Oregon St. Business Park. Prior to the hearing, the applicant submitted a revised proposal for access to the development site. The applicant's original submittal proposed a permanent driveway access to SW Oregon St. along the northern boundary of the site. Under the revised proposal, access is proposed at the southeast corner of the site from a new local street known as SW Tonquin Ct.

The hearing was continued to February 8, 2022 in order to allow staff and the applicant time to discuss the proposal and to identify actions needed to vet the proposal. The Planning Commission requested that staff and agency partners provide input on the feasibility of the southern access for the site and Alternative Tonquin Ct. alignment.

### Feasibility of Alternative Tonquin Ct. Alignment

In order to gauge feasibility of the Alternative Tonquin Ct. alignment, staff has provided discussion on the following considerations:

- A. *Compliance with Long-Range Planning Policy*
- B. *Compliance with On-Site Community Design Standards*
- C. *Compliance with Public Street Design Standards*
- D. *Compliance with Off-Site Transportation Impacts*
- E. *TEA Lot Configuration, Phasing, and Access*
- F. *TEA Grade and Slopes*
- G. *Public and Private Utilities*
- H. *Fire Department Access and Standards*
- I. *Washington County Access and Standards*
- J. *Impact to LU 2021-015 Sherwood Commerce Center Application*

Staff analysis is provided at a high level and to the extent feasible, with information in the record or otherwise readily available. Robust analysis and conclusions on the feasibility of the Alternative Tonquin Ct. alignment and compliance with local standards cannot be provided without additional information including revised transportation studies, grading plans, utility plans, architectural drawings, etc.

If Planning Commission determines the Alternative Tonquin Ct. alignment is a viable option, the following additional information will be needed for the City to draft complete approval findings and Conditions of Approval:

- Provide revised plans and narrative for staff and Planning Commission review which demonstrates compliance with the on-site design standards
- Provide revised plans and narrative demonstrating compliance with the public street design standards
- Submit a Type II Transportation Facility Modification pursuant to SZCDC § 16.106.020(E) for the cul-de-sac length to be reviewed as part of the land use approval. (note, this is an additional application and will require additional notice)
- Provide a revised TIA identifying traffic impacts and required mitigation measures for the alternative Tonquin Ct. alignment
- Provide revised grading plans and a street profile for the Alternative Tonquin Ct. alignment to ensure properties can be served by the proposed roadway
- Provide revised utility plans to be reviewed and approved by the City of Sherwood Engineering Department and Public Works Department
- Obtain County approval of interim access location to Oregon Street

Discussion on the issues and rational for this additional information is provided below.

#### ***A. Compliance with Long-Range Planning Policy***

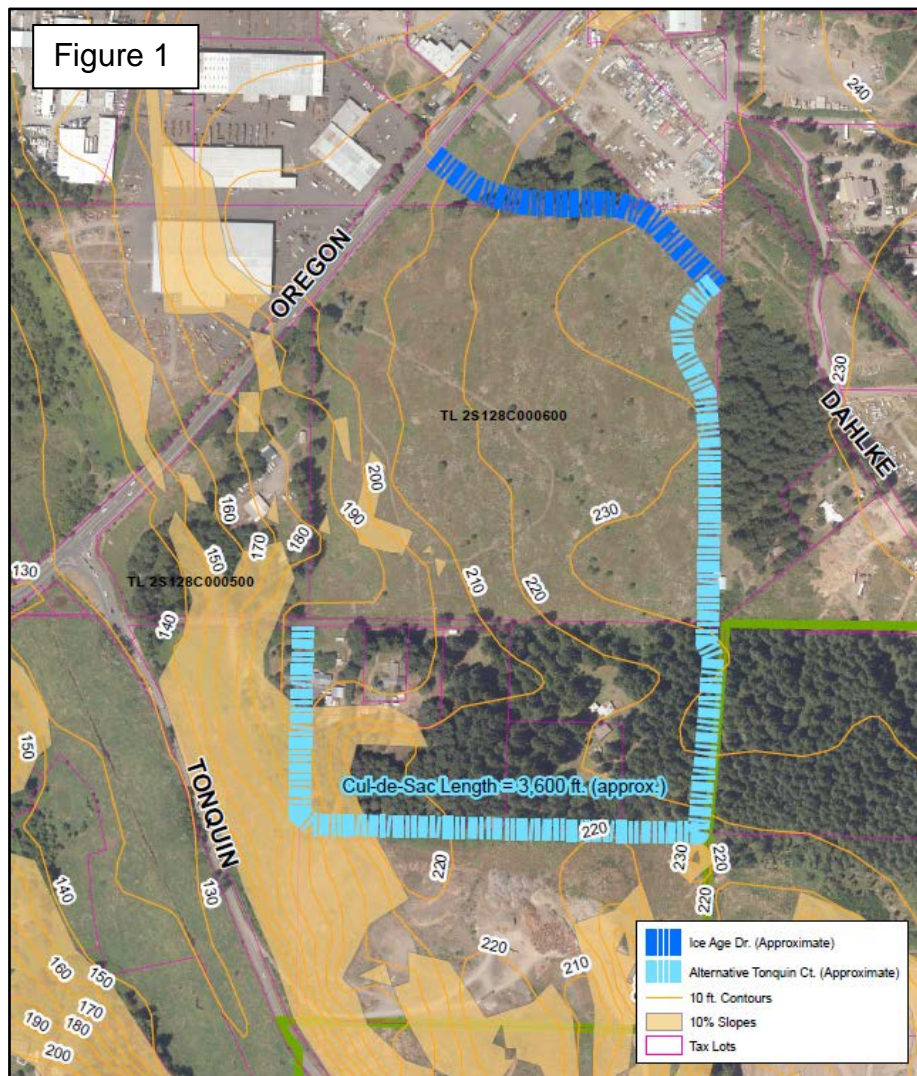
##### **A1. Tonquin Employment Area Preferred Concept Plan**

The Tonquin Employment Area Preferred Concept Plan (Concept Plan) was adopted by City Council via Ordinance in October 2010. Page 9 of the Concept Plan states:

*“A distinguishing characteristic of the Preferred Concept Plan is that it shows a proposed alignment for a future east-west collector street that minimizes the bisection of developable land. In particular, the proposed location of this future collector preserves over fifty of the most developable acres of the largest parcel of land in the northeast corner of the site, as well as keeps whole the second largest (~30 acre) parcel.”*

The 30-acre parcel referred to in the Concept Plan is Tax Lot 600 (aka Sherwood Commerce Center), which abuts the subject site to the east. The applicant’s original transportation analysis proposed the east-west collector through the middle of Tax Lot 600, breaking up the parcel into three or four separate lots. In the applicant’s Alternative

Tonquin Ct. proposal, the east-west collector would follow the alignment in the Concept Plan, but a new local street would be required along the east property line of Tax Lot 600. The Alternative Tonquin Ct. alignment would need to intersect Ice Age Dr. at a 90° angle (see figure 1). In addition to right-of-way dedication along the east property line of the Sherwood Commerce Center, a new intersection at the northeast corner of the site would be required. The Alternative Tonquin Ct. alignment does not appear to be in compliance with the Concept Plan which is intended to preserve large properties when determining roadway alignments.



Regarding the design of SW Oregon St., the Concept Plan identifies three potential new street intersections with SW Oregon St. between SW Tonquin Rd. and SW Tualatin-Sherwood Rd. The potential intersections include two local streets intersections, restricted to right-in / -out, and one collector street intersection with full turn movements. The applicant’s Alternative Tonquin Ct. alignment would remove one of the local street

intersections with SW Oregon St. Because the Concept Plan does not require three or more intersections along Oregon St., removal of one of the intersections is not in conflict with the plan. However, the properties that would have been served by the local street off Oregon St. should be served by an alternative route in compliance with the Concept Plan. As described above, the alternative alignment does not appear to be in compliance with the Concept Plan due to its impact to Tax Lot 600.

The Concept Plan also addresses properties south of the TEA which are currently in the Urban Reserve. The plan states that urban uses are planned on properties in the Urban Reserve and the Concept Plan was designed to not preclude growth into the area. The City received public testimony stating concern about a new roadway (SW Tonquin Ct.) being planned through the Urban Reserve and a timeframe for construction of the roadway. While timing is a consideration, the Concept Plan acknowledges the Urban Reserve properties and indicates development in the TEA should not preclude growth into the area. Both the Oregon St. Access Management Plan (AMP) and the applicant's Alternative Tonquin Ct. alignment propose Tonquin Ct. through the Urban Reserve.

#### A2. Tonquin Employment Area Implementation Plan

The Tonquin Employment Area Implementation Plan (Implementation Plan) was adopted by City Council via Resolution in June 2015. While the 2015 Implementation Plan was not adopted as an ordinance, the plan was reviewed and approved by the Sherwood City Council as a resolution, indicating clear intent and support for the refined public street system in the TEA. The Implementation Plan shows SW Tonquin Ct. creating a new intersection with SW Oregon St. near the shared property line between the subject site and Tax Lot 600 (Sherwood Commerce Center). The Implementation Plan does not assume a new road would be required or constructed along or near the east property line of Tax Lot 600.

#### ***B. Compliance with Land Use and Community Design Standards (On-Site Design)***

Divisions II and V of the Sherwood Zoning and Community Development Code (SZCDC) address on-site development standards including building height and setbacks, landscaping, parking, loading, vehicle circulation, pedestrian circulation, and outdoor storage. The Alternative Tonquin Ct. alignment will change the access point on the development site to the opposite side of the property. The on-site pedestrian and vehicle circulation patterns, parking layout, building setbacks, and other on-site design elements will change as a result of the change in access.

While minor changes to a site plan can be implemented through a Type I staff review (Final Site Plan), the amount of changes required in this situation and the potential impact to surrounding properties warrants an opportunity for public review and comment. The City, public, and adjacent property owners have not received or reviewed plans or a narrative that demonstrate compliance with the on-site design standards under the Alternative Tonquin Ct. proposal. The applicant will need to provide revised plans and narrative for staff



and Planning Commission review which demonstrates compliance with the on-site design standards prior to approval of a revised access point and Alternative Tonquin Ct. alignment.

***C. Compliance with Public Street Design Standards***

SZCDC § 16.106 addresses public streets and provides standards for their location and design. SZCDC § 16.106.040(E) limits the maximum cul-de-sac length to 200 ft. Under the Alternative Tonquin Ct. alignment, a new cul-de-sac approximately 3,600 ft. in length will be created between the new Ice Age Dr. / Tonquin Ct. intersection and the end of the street terminating at the development site. This proposed cul-de-sac length is approximately 18x longer than what the code permits and would be the longest cul-de-sac in the City. It should be noted that Tonquin Court, as shown in the Commerce Center plans and the implementation plan, is not "terminated" and may extend further in the future and connect to Ice Age drive which is why the issues and constraints outlined in this section do not apply to that alignment.

At final build-out of the Alternative Tonquin Ct. alignment, a new intersection would be created at the northeast corner of Tax Lot 400 (Kerr property) as Tonquin Ct. splits and heads to the south to connect to SW Tonquin Rd. The resulting cul-de-sac terminating at the development site would be reduced from 3,600 ft. to 1,800 ft. in length, or 9x longer than what the code permits. In order for the City to grant an exception to a transportation standard such as cu-de-sac length, a Type II Transportation Facility Modification pursuant to SZCDC § 16.106.020(E) is required as part of the land use approval. The Type II application requires public notice in accordance with SZCDC § 16.72. The City has not received or reviewed a modification request from the applicant.

The development code limits cul-de-sac length in order for developments to provide safe and convenient vehicle access through an area. Inadequate vehicle circulation and access can impact business viability as drivers are required to travel out of the way along the public street system to reach their destination. In addition, extremely long cul-de-sacs encourage speeding as no intersections or cross-traffic is anticipated.

The proposed 1,800 – 3,600 ft. long cul-de-sac will also impact pedestrian and bike connectivity between Oregon St. and the Tonquin Employment Area. In order to reach properties in Subarea B2 of the Concept Plan, employees that are walking or biking from the south on Oregon St. would be required to travel up the hill along SW Oregon St. to Ice Age Dr., before heading back south along the Alternative Tonquin Ct. alignment. Under the Oregon St. AMP, SW Tonquin Ct. would provide vehicle, pedestrian, and bicycle access directly from SW Oregon St. to the southern portion of the Tonquin Employment Area.

To address the pedestrian circulation concerns under the revised proposal, a public pedestrian and bicycle easement through the development site can be provided. The minimum recommended width for a public accessway is 15 ft. including a paved path, landscaping, and lighting. The unnamed road stemming from SW Tonquin Rd. that runs

along the south end of the development site may be suitable for a pedestrian and bicycle easement, however, improvements such as grading, new asphalt / concrete, lighting, and landscaping would likely be required. The road is currently hilly with blind spots, has no sidewalks or lighting, and is used by vehicles for accessing residential properties.

The City, public, and adjacent property owners have not received or reviewed a Design Modification for the proposed cul-de-sac length or plans / narrative demonstrating compliance with the other public street design standards for the Alternative Tonquin Ct. proposal. The applicant will need to provide revised plans and narrative demonstrating compliance with the public street design standards prior to approval the Alternative Tonquin Ct. alignment. A Type II Transportation Facility Modification is also required.

#### ***D. Off-Site Transportation Impacts***

Off-site transportation impacts, such as intersection delay, are determined through the applicant's Transportation Impact Analysis (TIA). The requirements for the applicant's TIA are addressed in SZCDC § 16.106.080. The applicant's current TIA assumes all trips will be to and from a private driveway along SW Oregon St. and the Alternative Tonquin Ct. proposal is a significant change as it relates to traffic impacts on the surrounding street system. Specifically, the intersections of SW Tonquin Ct. and SW Ice Age Dr., SW Ice Age Dr. and SW Oregon St., and SW Ice Age Dr. and SW 124<sup>th</sup> Ave will be directly impacted by the revised street plan and traffic pattern. Additional streets and intersections may also be impacted.

An updated TIA is required for the City comply with the State Transportation Planning Rule, which requires the City apply conditions to land use proposals in order to minimize impacts on and protect transportation facilities.

The City, public, and adjacent property owners have not received or reviewed a revised transportation impact study for the new street plan and traffic impacts. In addition, the City's transportation consultant (DKS & Associates) and Washington County have identified a number of issues with the applicant's existing transportation study and an updated study has not been submitted. The applicant will need to provide a revised TIA identifying traffic impacts and required mitigation measures for the alternative Tonquin Ct. alignment.

#### ***E. TEA Lot Configuration, Phasing and Access***

The Alternative Tonquin Ct. alignment would provide access to properties in Subarea B1 and B2 of the TEA Concept Plan via a new intersection with SW Ice Age Dr. on Tax Lot 600 (Sherwood Commerce Center). SW Ice Age Dr. cannot be constructed as part of the Oregon St. Business Park or Sherwood Commerce Center developments because the SW Ice Age Dr. and SW Oregon St. intersection is located on a property outside City limits. As a result, access from the Alternative Tonquin Ct. alignment would not be available to properties on each side of the roadway until such time as Tax Lot 2S128C000700 is annexed to the City

and SW Ice Age Dr. is constructed. The City has not received an annexation application for Tax Lot 700 and a development timeline for the property is unknown.

Under the proposed alignment of SW Tonquin Ct. in the TEA Implementation Plan and Oregon St. AMP, and as provided in the Sherwood Commerce Center application, Tonquin Ct. would be on the shared property line of two properties currently in City limits (the subject site and Sherwood Commerce Center). Both properties where the road is located have also submitted applications for new industrial business parks. If the subject application (Oregon St. Business Park) were revised to provide right-of-way for SW Tonquin Ct., the properties known as the “Kerr” properties to the south / southeast of the development site would also be provided access without the need for annexation of Tax Lot 700 and construction of SW Ice Age Dr.

#### ***F. Grade and Slopes***

Figure 1 shows the proposed alignment of Ice Age Dr. and Alternative Tonquin Ct. relative to existing grades and slopes. The east property line of Tax Lot 600 is relatively flat and can likely accommodate a new local street in the area. Where the Alternative Tonquin Ct. abuts Tax Lot 100 (Kerr property), slopes of greater than 10% are present. The road is planned in this location under all alternatives, and it is anticipated that cut / fill will be required for on- and off-site improvements.

The City and adjacent property owners have not received or reviewed grading plans for the new street plan and profile. The applicant will need provide revised grading plans and a street profile for the Alternative Tonquin Ct. alignment to ensure properties can be served by the proposed roadway.

#### ***G. Public and Private Utilities***

The Alternative Tonquin Ct. alignment will require changes to on and off-site grading that will impact the location and design of public and private utilities. The subject site and surrounding area generally slope down from east to west, towards SW Tonquin Rd. Storm water and sanitary sewer are required to function under a gravity system and it is assumed that public and private utilities would be directed from north to south and east to west. Water is provided from a pressure system and would likely be provided from an existing public line in SW Oregon St.

The City, public, and adjacent property owners have not received or reviewed grading and utility plans for the new public and private utilities. The applicant (Oregon St. Business Park) will need to provide revised utility plans to be reviewed and approved by the City of Sherwood Engineering Department and Public Works Department.

#### ***H. Fire Department Access and Standards***

Tualatin Valley Fire & Rescue has provided comment on the Alternative Tonquin Ct. alignment (Attachment 1). The comments state the Fire District is open to either alternative,

however, if an alternative alignment impacts the existing Fire Department approved site plans, the applicant is required to have a new access and water supply review completed.

***I. Washington County Access and Standards***

SW Oregon St. is an arterial roadway under the jurisdiction of Washington County. New public street intersections and private driveway intersections require review and approval from the County. The County is aware of the Alternative Tonquin Ct. proposal but has not provided comment as of the date of this memo.

***J. Impact to LU 2021-015 Sherwood Commerce Center Application***

In addition to the subject land use application, the City is processing a land use application for the property to the east, known as Sherwood Commerce Center (LU 2021-012). The Sherwood Commerce Center application proposes a new multi-building industrial development including dedication of a new public street system abutting the west side of the site (east side of the Oregon St Business Park site). The staff report for LU 2021-012 recommends approval of the application, with findings that the applicant has provided a local and regional transportation system for the Tonquin Employment Area consistent with the 2010 TEA Concept Plan and 2015 TEA Implementation Plan.

The applicant for Oregon St. Business Park (subject application) is proposing a new street layout for the Tonquin Employment Area whereby SW Tonquin Ct. is relocated to stem off SW Ice Age Dr. instead of SW Oregon St. A new street intersection would be created at the northeast corner of Sherwood Commerce Center site. SW Tonquin Ct. would then run along the east property line of the Commerce Center site to provide access to the Kerr properties to the south. While the proposed Alternative Tonquin Ct. alignment has been submitted as part of the record for the Sherwood Commerce Center application, the applicant is not proposing the change and their application materials have not been updated to reflect the change.

If the Planning Commission determines that the Alternative Tonquin Ct. is approvable and the preferred alignment, the Commerce Center application would need to be conditioned to provide the roadway along its eastern boundary. The information required to condition the Commerce Center application for an alternative Tonquin Ct. alignment is similar to the information needed to review and approve the change as part of the subject application (Oregon St. Business Park). If the Sherwood Commerce Center applicant is not able or unwilling to provide the information, staff does not believe adequate information is provided in the Commerce Center record that would allow the City to condition the Alternative Tonquin Ct. alignment. Such a decision would require the City to condition the applicant to revise their entire Site Plan and public improvement plans as part of the Type I Final Site Plan Review. The public and adjacent property owners do not have the opportunity to weigh in on the revised application and staff decisions. In effect, the City would be taking a Type IV Site Plan Review and processing it as a Type I Final Site Plan Review.





*February 7, 2022*

City of Sherwood  
Planning Commission  
22560 SW Pine Street  
Sherwood, Oregon 97140  
[planningcommission@sherwoodoregon.gov](mailto:planningcommission@sherwoodoregon.gov)

Attention:

Jean Simson, Chair  
Justin Kai, Vice Chair  
Daniel Bantz, Member  
Taylor Giles, Member  
Rick Woidyla, Member  
Doug Scott, Council Representative  
Erika Palmer, Staff Representative, Planning Manager

*Sent via email*

Re: Testimony Regarding Proposed Development located generally at 21720 SW Oregon Street (Tax Lot 2S128C000500) - LU 2021-015 SP (Oregon Street Business Park)

Dear Planning Commission:

In advance of the February 8, 2022 meeting of the City of Sherwood (the “City”) Planning Commission, please accept this correspondence as written testimony with respect to LU 2021-015 SP, which is comprised of a proposed 9.3 acre industrial development generally located at 21720 SW Oregon Street (Tax Lot 2S128C000500) (referred to herein as the “Proposed Project”). Representatives of Schnitzer Properties, LLC (fka Harsch Investment Properties, LLC) and John Niemeyer will also be providing verbal testimony with respect to the Proposed Project at the Planning Commission meeting on February 8, 2022.

As you are aware, the development team (comprised of John Niemeyer and representatives of Schnitzer Properties, LLC) for Sherwood Commerce Center (LU 2021-012 SP/CUP/VAR) has spent countless hours attempting to reach a compromise with respect to the Proposed Project and the Sherwood Commerce Center. Those efforts commenced in 2018 and have continued through a conference call with the applicant team for the Proposed Project as recently as 8:00 am on Monday, February 7, 2022.





These attempted compromises have included, but have not been limited to: (i) the Schnitzer/Niemeyer team assuming a large, disproportionate share of road and utility cost; (ii) realignment of Tonquin Court to the Sherwood Commerce Center side (which we have done with our application as well by lowering it to further help the applicant); (iii) giving land owned by Tim Kerr to the applicant to compensate for land lost due to Tonquin Court; (iv) bringing in fill and excavation to make the Proposed Project more buildable; (v) sharing of the Proposed Project's detention area and (vi) offering to purchase the Proposed Project at a price far in excess of the price paid (per square foot) for the Sherwood Commerce Center land.

Furthermore, while it is not a requirement for the approval of the Sherwood Commerce Center application (which has received the full support of City Staff and has been found to be in compliance with the City's Development Code and Planning Documentation) on February 22, 2022, we have engaged our development team with evaluating an alternative transportation plan that was offered by the applicant at the last minute. These efforts were undertaken upon the suggestion of City of Sherwood staff. As you will see in the attached memoranda from VLMK Engineering and Design ([Exhibit A](#)) and Kittleson and Associates, Inc. ([Exhibit B](#)), the alternative transportation plan is riddled with issues, is entirely unworkable, and is inconsistent with current City planning documents.

As is abundantly clear, the well-intentioned attempts at compromise have proven to be unsuccessful, despite the best efforts of all parties. However, these attempts at compromise, nor anything that the applicant has offered into the record with respect to its Proposed Project or the Sherwood Commerce Center, are of any dispositive nature of the tasks placed before the Planning Commission. Rather, they are solely entered into the record as a showing of good faith efforts on behalf of all parties.

At the end of the day, the Planning Commission should not be distracted by the proposed alternative plan (which is not feasible based on the reasons set forth herein), and should instead focus on the fact that the Proposed Project materially fails to comply with many sections of the Sherwood Development Code and the City's planning documentation. Therefore, we strongly urge the Planning Commission to follow the recommendations made in the Staff Report dated January 12, 2022, and all attachments thereto (collectively, the "Staff Report") and deny the application (as currently proposed) for the Proposed Project.

Very truly yours,

Schnitzer Properties, LLC  
John Niemeyer





## MEMORANDUM

To: Jean Simson, *City of Sherwood, Planning Commission Chairperson*  
 Justin Kai, *Vice Chair*  
 Daniel Bantz, *Member*  
 Taylor Giles, *Member*  
 Rick Woidyla, *Member*  
 Doug Scott, *Council Representative*  
 Erika Palmer, *Staff Representative, Planning Manager*

Date: February 7, 2022

From: Colby Anderson, P.E.

Subject: Testimony on Application LU 2012-015 SP – 'Oregon Street Business Park'

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Dear Chair Simson and Planning Commissioners,

This letter is intended as testimony towards the above referenced land use application (LU 2012-015). As you know, the first evidentiary hearing for this application was held on January 25<sup>th</sup>, 2022. At this hearing, and within approximately 24 hours prior, new documentation was submitted towards this application's record indicating a request to consider an alternative transportation system plan that deviates from the City of Sherwood's existing planning documentation. The basis of the request was rooted in a disagreement regarding the necessity of Tonquin Court in its currently illustrated location per the City of Sherwood's Access Management Plan (AMP) and the Tonquin Employment Area (TEA) Concept Plans, and a suggested disproportionality imposed by the roadway and its impact on the applicant's development.

### **CURRENT AMP AND TEA PLAN BENEFITS**

The items listed below reinforce our support for Planning Commission to proceed with the current AMP and TEA Concept Plans, and outline why this is the more beneficial path forward for the City of Sherwood and its residents and businesses:

1. **Analysis and Input.** The City of Sherwood and the community have spent many years and significant taxpayer dollars to develop the existing planning documents through the efforts of consultants, input from the community, land owners, City staff, and County staff. These plans are designed to provide the optimal long-term and large-scale public systems within the subject area. *It is highly unusual for jurisdictions to deviate from these documents at the request of or to reduce the impact on a single property owner or development.*
2. **Circulation and Connectivity.** Below are several ways in which the traffic circulation and connectivity of the City's current AMP and TEA Concept



Plans are advantageous. For additional information on these items, please reference Kittelson & Associate's memo attached hereto.

- a. The documents are supported by full traffic analysis, which supports the technical viability of the existing plans.
- b. These documents meet both City and County development codes.
- c. These documents are designed to serve the entire area over the long term, rather than just one or two properties in the short term.
- d. These documents address many interim situations and alternatives, allowing for several paths towards completion depending on the order in which properties are developed.
- e. At the final stage, these plans minimize traffic impacts on SW Oregon Street, which has been a clear community concern. Tonquin Ct. will ultimately be a right-in/right-out access, which will reduce the burden on the future intersection at Ice Age Drive (see Kittelson's letter for more information).
- f. The cul-de-sac at Tonquin Court is temporary, and will ultimately be connected as a through-street to 124<sup>th</sup> Avenue as contemplated and supported by the TEA Concept Plans. See figures 1 and 2 below:

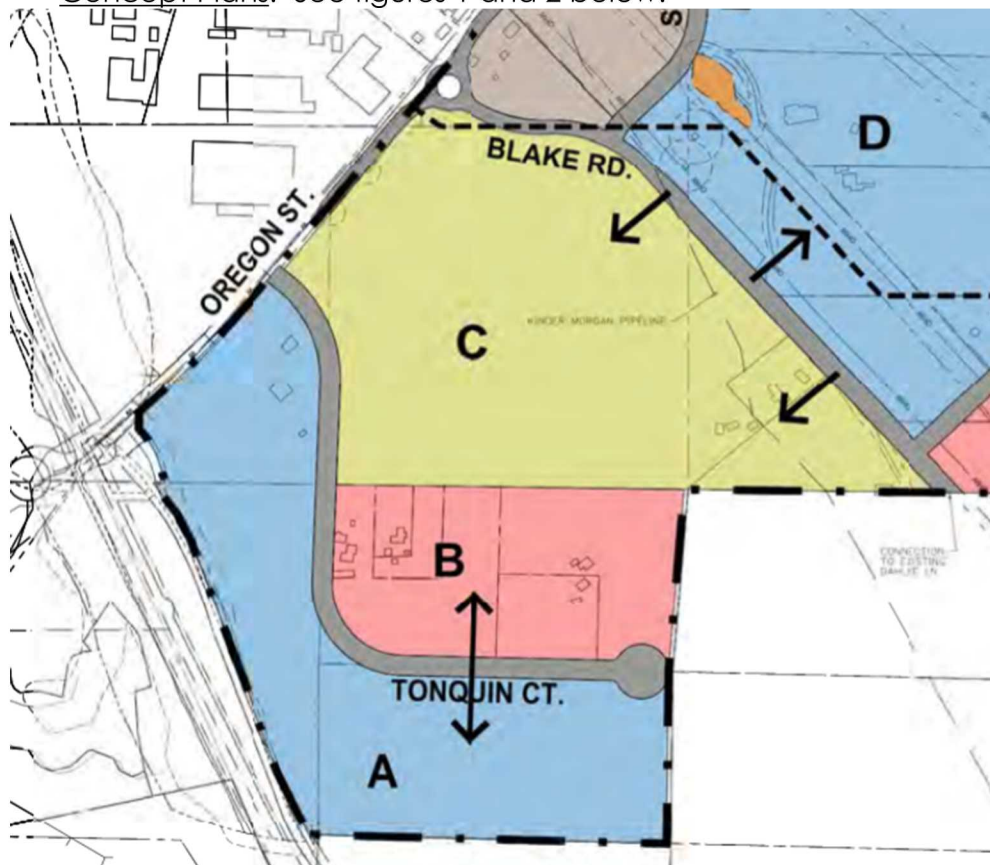


Figure 1 – TEA Implementation Plan Diagram (Showing Intermediate Stage)



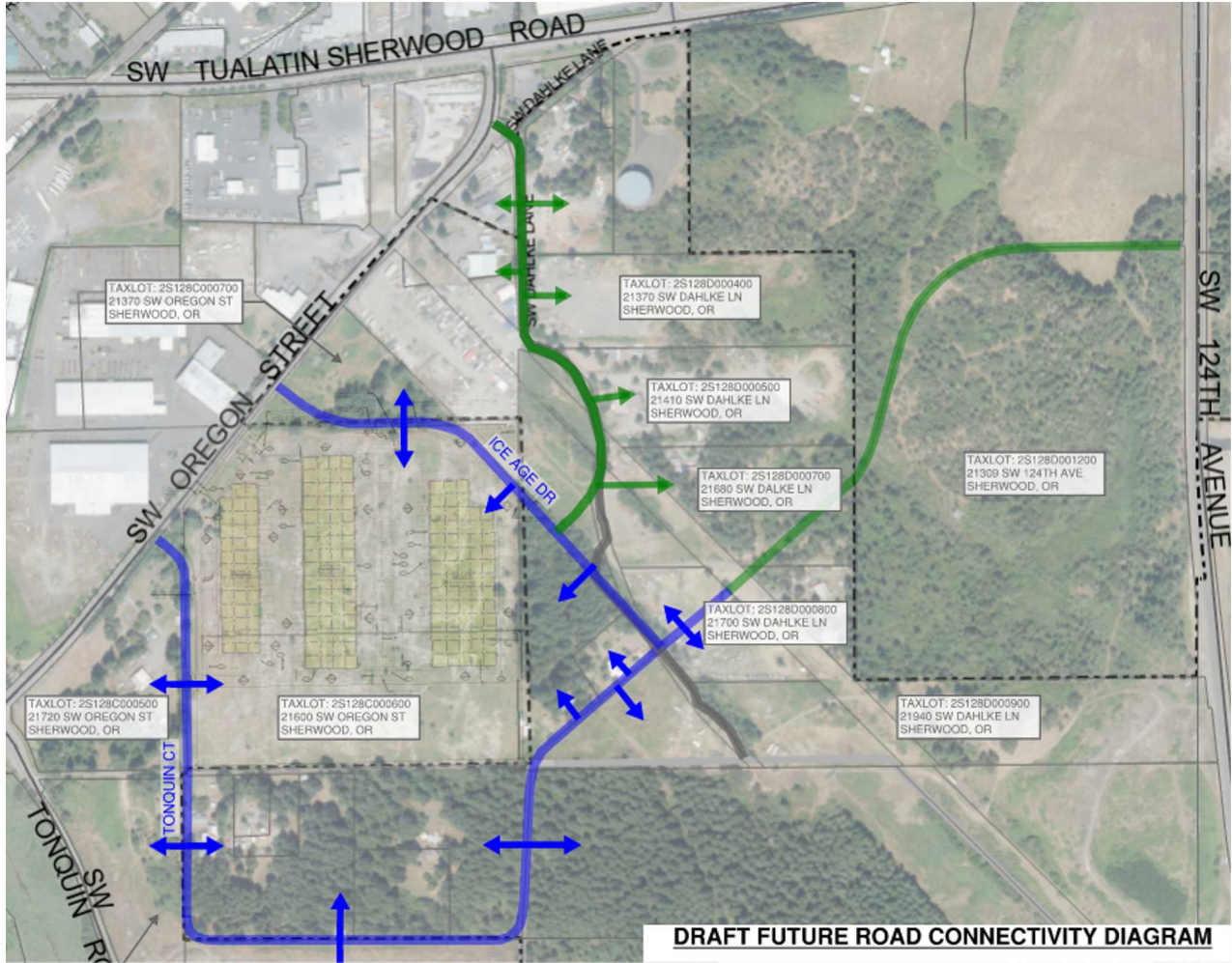


Figure 2 – Potential Future Connectivity Diagram (Preliminary)

## ALTERNATIVE ALIGNMENT DEFICIENCIES

The items listed below summarize the deficiencies presented by the alternative alignment, which deviates significantly from the existing AMP and TEA Concept Plans:

3. **Insufficient Technical Analysis.** The applicant has not yet provided the technical information (roadway alignments, full grading exhibits, etc) to demonstrate the technical feasibility of the proposed alternative roadway alignments. As noted in the City of Sherwood's memorandum toward this project dated February 1<sup>st</sup>, 2022, the following information would need to be provided (at a minimum) to fully evaluate this alternative, which would take significant time for the applicant to prepare and for the city to review:
  - a. A revised application, including site plans and narrative, demonstrating how the applicant satisfies on-site City development code standards.
  - b. Roadway design information including vertical alignment, grading, utility plans, pedestrian traffic continuity, and a design exception request for the proposed 1,800ft+ long cul-de-sac which exceeds the city code standard of 200ft maximum.
  - c. A revised Traffic Impact Analysis demonstrating the adequacy of the proposed roadway alignments, as well as a TEA phasing and access plan.
  
4. **TEA Development Phasing Issues.** The proposed roadway alignment creates a potentially significant phasing challenge for the remainder of the Tonquin Employment Area to the South of the developments currently in question. Due to the reliance of this connection on the Capitol Improvement Project for Ice Age Drive, the Southern properties could likely be without access for several years until this roadway can be constructed.
  - a. Under the City's current planning documentation (AMP & TEA Concept plans), connections to these properties could happen much faster if the applicant was willing to accommodate the infrastructure required by City staff, the development code, and relevant planning documentation. *We believe this represents a significant community benefit and one that would enable more expedient development within the City of Sherwood.*
  
5. **Applicant's Site Plan.** The Applicant has repeatedly cited 'loss of building square footage' as the primary burden imposed by Tonquin Court being installed in locations illustrated in City planning documentation.
  - a. A more appropriate metric to use when evaluating the impact of roadway dedications would be to evaluate the *developable area* of a site after the right of way dedications. *Rather than the suggested loss of ~35% of building area, a more appropriate measure would be the reduction of developable area of around 6.7%.*
  - b. It is very common for on-site design (including building layout, configuration, etc) to be iterated throughout the process of fitting a site development with the public improvements required by the jurisdiction.
  - c. *To date, we are not aware of any attempt by the applicant to adjust their site plan to allow for this roadway that has been submitted towards their application for city review. We would ask that Planning Commission request an alternative plan from the applicant to demonstrate the true loss of usability imposed by this site, and what a viable alternative might look like.*



- d. Per the exhibit below, it appears there is some flexibility in the site plan that, with some compromise, would allow for a site plan that is significantly less burdened by the alignment of Tonquin Ct. (particularly as it relates to loss of building square footage). While the retaining wall requirements may be increased for this layout, the neighboring property owners have offered to help lighten the burden imposed by this adjustment. See Figure 3 below:

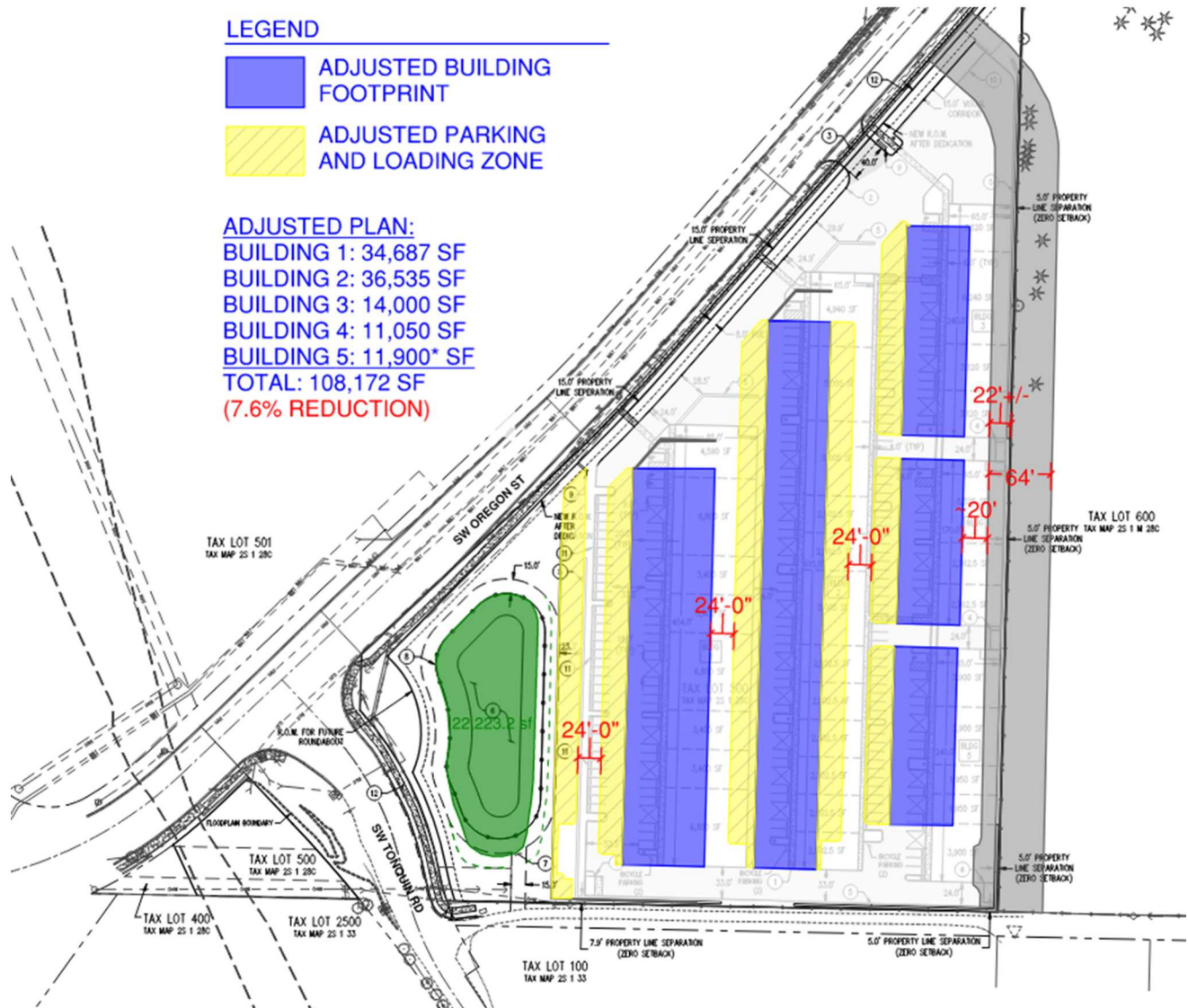


Figure 3 – Potential Alternative Site Plan (For Reference Only)

- 6. **Shifting Burden to Other Properties.** The request to relocate Tonquin Court from its current location to the proposed 'East Alignment' represents a reduction in dedication area of around 60% for the applicant, while increasing the burden on other property owners:
  - a. Dedication requirements for the Sherwood Commerce Center project could increase by as much as 45% over the current requirements for the project. This could represent an additional loss in developable area of as high as 50,000 square feet, and a potentially significant loss of building square

footage.

- b. Shifting this alignment places additional burden on properties to the East, such as the one highlighted in red below, which already have other significant encumbrances to development. This alternative could generate additional concerns from this property and others to the East. The proposed site is already served by Ice Age Drive, so this proposed relocation of Tonquin Court represents more of a burden than an advantage:

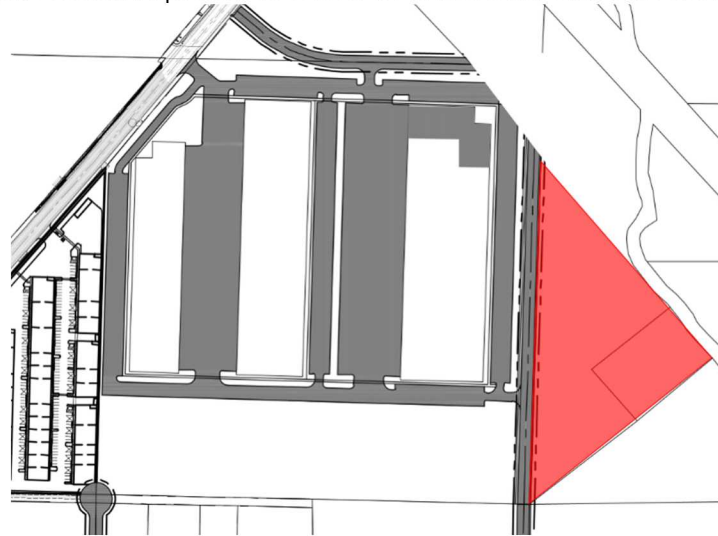


Figure 4 - Conflicts with Properties to the East

- 7. **Additional Kinder Morgan Pipeline Conflicts.** The proposed road alignment presents additional potential points of conflict with the existing Kinder Morgan petroleum line, which runs under the proposed intersection of Tonquin Court (East) and Ice Age Drive, as shown below in Figure 5.

- a. Due to limitations related to grading or construction around this easement, it is possible that the roadway would be additionally constrained as it relates to vertical alignment and utility continuity.

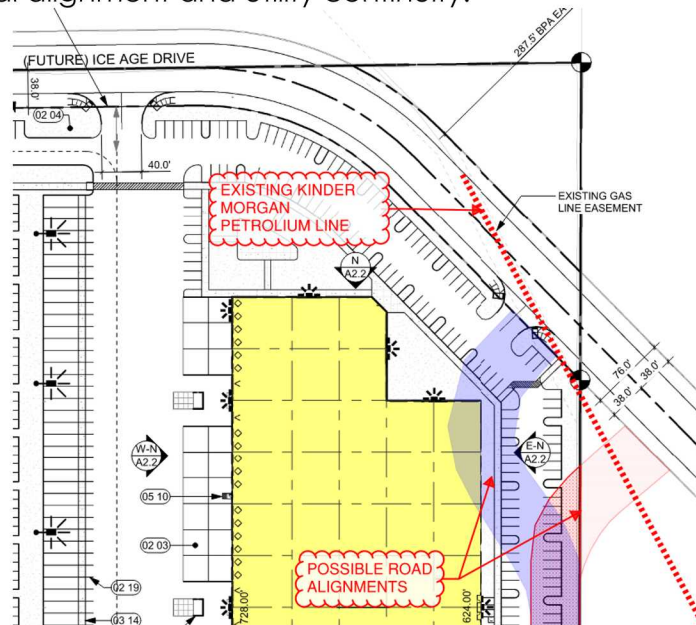


Figure 5 - Kinder Morgan Conflicts



8. **Sacrifices by Other Property Owners.** Other nearby developments, including Sherwood Commerce Center, have spent significant time and money designing their projects to be in compliance with these documents. A last-minute change to these planning documents represents a significant burden placed on other properties to accommodate the needs of one property owner.

a. The Sherwood Commerce Center project has already made significant concessions to allow for proper implementation of the City's planning Documents, including the loss of over 43,000 Sq. Ft. of building area and over 1 acre of development area, see Figure 6 below:

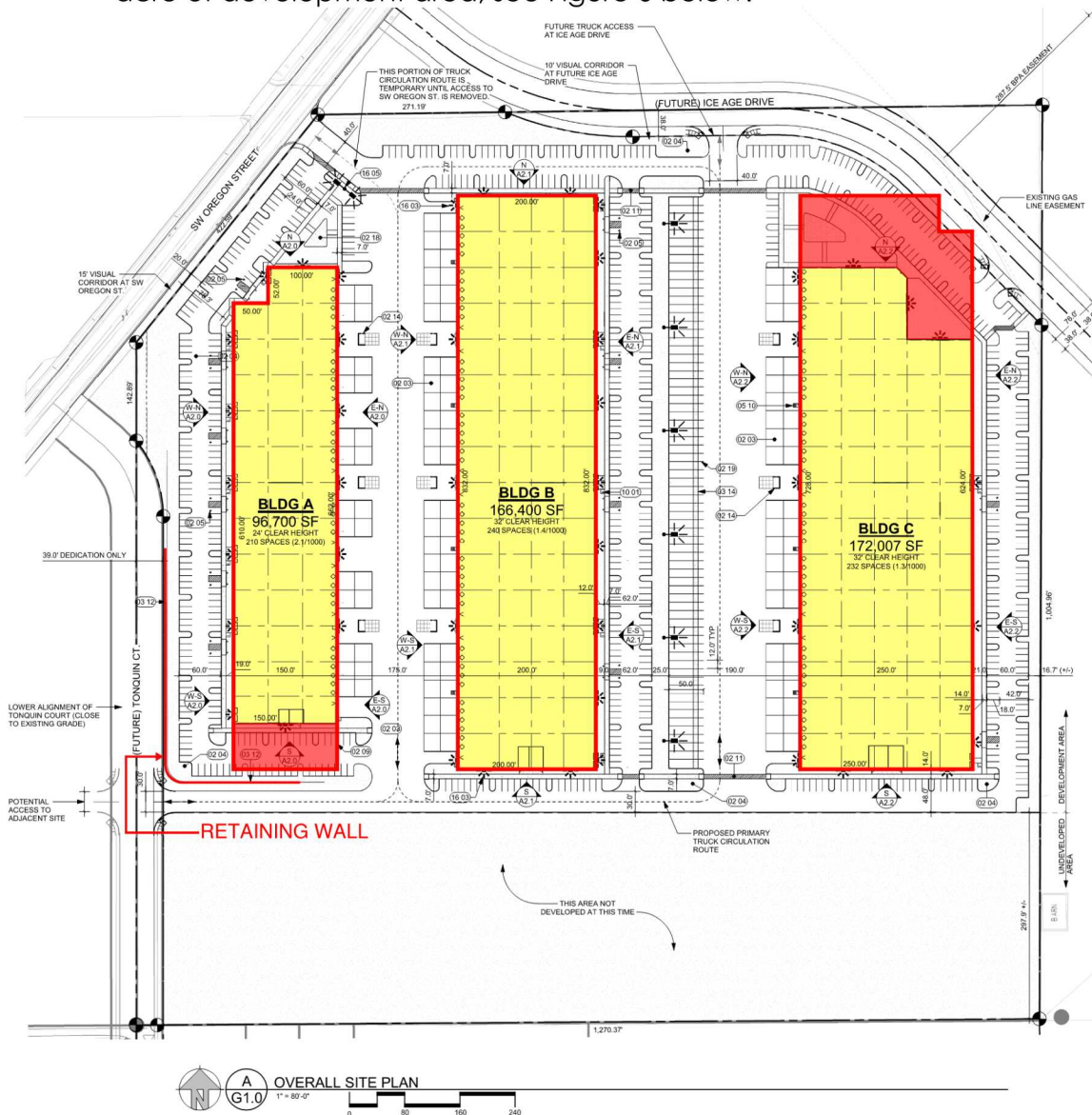


Figure 6 - Concessions Made by SCC for Public Improvements

9. **Pedestrian Connection Missing.** Per the City of Sherwood's memorandum dated February 1<sup>st</sup>, 2022, the proposed eastside alignment of Tonquin Ct. is a concern for pedestrian circulation, so a new pedestrian path would be required through the applicant's property. This would require an adjustment to the site plan to allow for

an easement or dedication, and which will also result in a loss of building square footage.

10. **Length of Travel.** The re-routing of traffic around the proposed Eastside Tonquin Court creates a circuitous route to the southern properties within the TEA. The applicant's property, for example, would require approximately 5,500 feet (~1 mile) of travel from SW Oregon Street, whereas the current AMP alignments would only require ~800ft of travel.
11. **Proposed Cul-de-sac Access.** The grading exhibit provided by the applicant towards the Sherwood Commerce Center application, which was intended to demonstrate the feasibility of the proposed Eastside Tonquin Court Alignment, does not provide equitable access for the adjoining properties. The proposed vertical alignment of the cul-de-sac is unrealistic, sitting as much as 7' below existing adjacent grade.

- a. Per the exhibit below, the only property that gains access from this cul-de-sac is the applicant's, while the road is too low for access from the other (3) adjoining properties. This is another example of an undue burden being requested of adjacent property owners. See Figure 7 below:

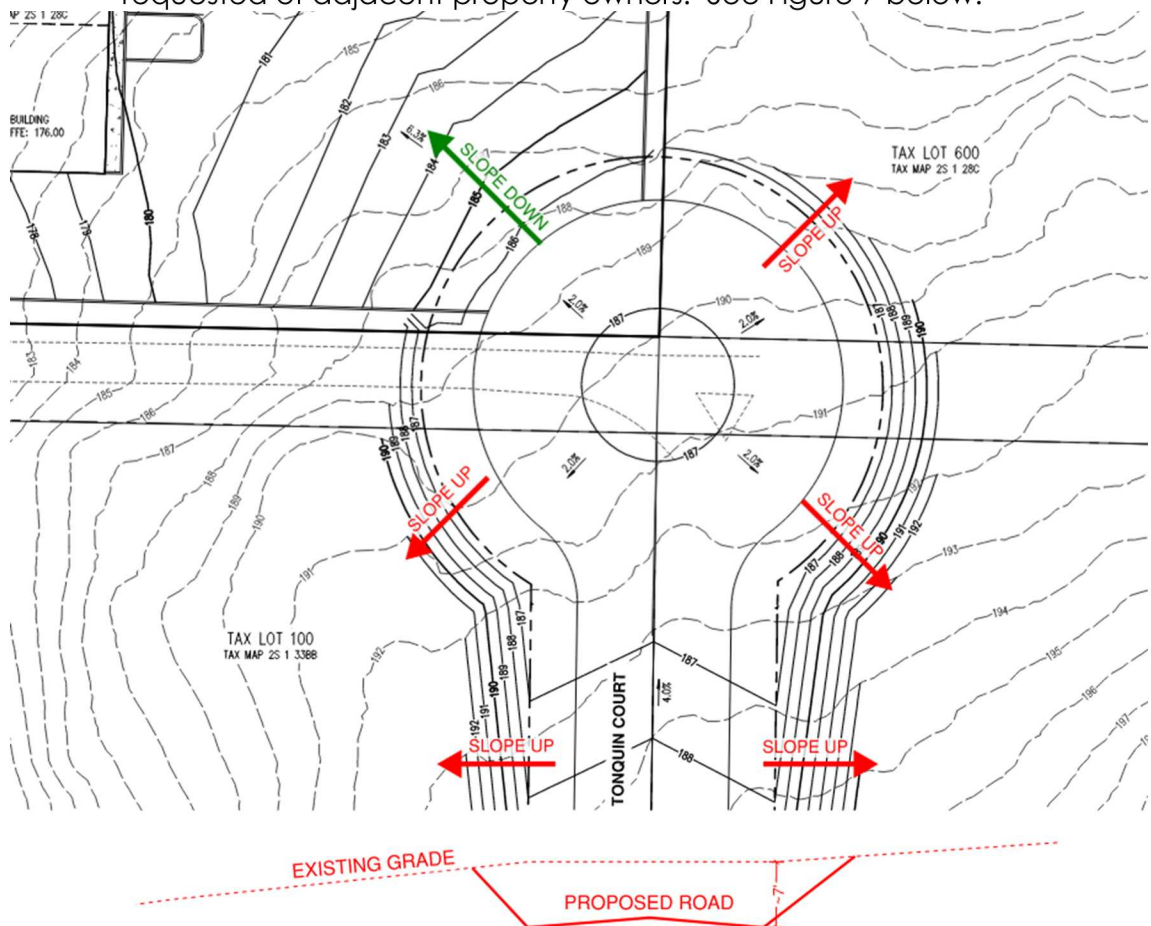


Figure 7 - Grading Exhibit Concerns for Tonquin Ct. East

## Technical Memorandum

Date: February 7, 2022

Project #: 26314

To: City of Sherwood Planning Commission

Cc: Erika Palmer – City of Sherwood Planning Manager

From: Kristine Connolly, PE

Subject: Testimony on Application LU 2012-015:  
Oregon Street Business Park



EXPIRES: 12/31/2023

Kittelton & Associates, Inc., prepared this memorandum on behalf of Schnitzer Properties, LLC, as public testimony for land use application LU 2012-015 for Oregon Street Business Park to highlight systemic benefits of the current approved Sherwood Oregon Street Access Management Plan (current AMP) compared to the Applicant's proposed alternative access management plan (alternative AMP). Based on our review, we recommend that the Planning Commission retain and support the implementation of the current AMP as developed and recommended by City staff.

Four aspects of the current AMP are summarized below for your consideration.

1. **Analysis and Input.** The current AMP is the product of several years of thoughtful consideration and technical analysis, and is consistent with the Tonquin Employment Area (TEA) Implementation Plan that was adopted by resolution in 2015. The Plan depicted a future street connection at a location consistent with the current AMP:



Although the current AMP was not finalized until June of 2021, the proposed location of Tonquin Court was known at the time that the subject site was annexed into the City of Sherwood in October of 2020, based on the TEA Implementation Plan and ongoing City preparation of the current AMP at the time of annexation.



2. **Compliance with Standards.** The current AMP complies with City of Sherwood and Washington County standards in the long-term.
  - a. In the near-term, Tonquin Court would terminate in an interim cul-de-sac with a length exceeding the 200-foot maximum per City of Sherwood Code Section 16.106.040(E). However, the long-term extension of Tonquin Court to Ice Age Drive (and removal of the interim cul-de-sac) resolves this condition and is compliant with City code.
  - b. The location of the Ice Age Drive and Tonquin Court connections were selected to comply with Washington County's access spacing standard of 600'.
  
3. **Circulation and Connectivity.** The current AMP was designed to wholistically provide access and connectivity for present and future development of the entire Tonquin Employment Area (TEA), not just one or two properties. For example:
  - a. Provision of a right-in/right-out public street connection of Tonquin Court to SW Oregon Street per the current AMP reduces traffic volumes (and thus reduces queuing and delay) traveling through the future Oregon Street/Ice Age Drive traffic signal. For instance, by providing an alternative entrance for the 35-45%<sup>1</sup> of site traffic arriving from the south on Oregon Street, those right-turning vehicles no longer need to stop for a potential red indication at the Ice Age Drive signal.
  - b. The location of the Ice Age Drive and Tonquin Court locations were specifically selected to preserve large parcels within the region by running the roads along property lines.
  
4. **Phased Implementation.** The current AMP comprehensively addresses many potential timing scenarios with interim solutions.
  - a. Tonquin Court, as proposed in the current AMP, can provide access to the Kerr property without requiring right-of-way dedication from properties outside of the current Urban Growth Boundary (UGB). The City does not have a mechanism to obtain right-of-way on parcels outside of the UGB and not yet annexed into the City.
  - b. At the first evidentiary hearing held for the Oregon Street Business Park application on January 25<sup>th</sup>, 2022, potential issues were identified regarding a possible temporary traffic signal at the intersection of SW Oregon Street and Tonquin Court under the current AMP. We evaluated the *2009 Manual on Uniform Traffic Control Devices (MUTCD)* eight-hour and four-hour traffic signal warrants at the intersection of SW Oregon Street and future Tonquin Court to assess the likelihood of justifying signalization. A preliminary signal warrant analysis was performed assuming development of the current Oregon Street Business Park and Sherwood Commerce Center Phase 1 applications, as well as with the addition of trips anticipated with a future Sherwood Commerce Center Phase 2 development. The results of the signal warrant analysis are provided in Table 1<sup>2</sup>. See Appendix A for details of the signal warrant analysis.

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<sup>1</sup> As estimated in the TIAs for the Oregon Street Business Park and Sherwood Commerce Center developments.

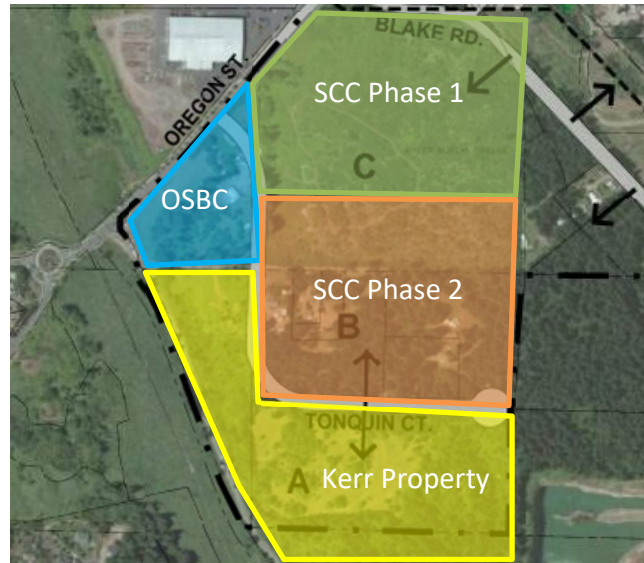
<sup>2</sup> Weekday daily 24-hour volumes were estimated based on the peak hour and typical volume profiles along similar roadway facilities. The analysis assumes a 50% right-turn on red reduction, though Oregon Department of Transportation (ODOT) traffic signal warrant procedures would support a higher reduction based on the unsignalized capacity analysis of the intersection. Excluding right-turns on red further reduces the traffic volumes that count towards the traffic signal warrant, meaning a traffic signal would be even less likely to be warranted if more right-turns on red are excluded.



**Table 1. Oregon Street/Tonquin Court – Preliminary Signal Warrant Analysis Summary**

Scenario	Signal Warrant Met? (Yes/No)
Year 2023 with Oregon Street Business Park and Sherwood Commerce Center Phase 1	No
Year 2023 with Oregon Street Business Park and Sherwood Commerce Center Phases 1 and 2	No

As shown in Table 1, projected traffic volumes at the intersection of Tonquin Court and Oregon Street with development of the Oregon Street Business Park and Sherwood Commerce Center Phases 1 and 2 would not warrant signalization.



As such, we anticipate some level of near-term development of the Kerr property can occur before the Oregon Street/Tonquin Court intersection will reach sufficient levels to justify (warrant) installation of a temporary traffic signal based on the traffic volume criteria. In the long-term when Ice Age Drive is constructed, Tonquin Court is planned to be converted to an unsignalized, right-in/right-out connection.

For comparison purposes, we reviewed the Applicant’s proposed alternative AMP through the perspective of the same four considerations as described below.

1. **Analysis and Input.** The Applicant provided some traffic analysis of the alternative AMP on January 31<sup>st</sup>, 2022. The analysis showed that key intersections operate within mobility standards under the alternative AMP, but it did not provide a comparison to operations under the current AMP. The future traffic signal at Oregon Street/Ice Age Drive is shown to operate at LOS C with an average PM peak hour delay of 20.7 seconds under the Applicant’s analysis of the alternative AMP in year 2035. However, comparative analysis of the current AMP prepared by DKS Associates shows the intersection operating at LOS B with an average PM peak hour delay of 16.3 seconds. The increased delay under the alternative AMP can be attributed to added traffic demand on Ice Age Drive without local access via Tonquin Court, leading to increased queuing and stopping at the Ice Age Drive signal. On average, the comparative analysis suggests that each vehicle traveling through the signal under the Applicant’s alternative AMP experiences an added delay of 4.4 seconds, with some movements experiencing even greater added delay. Additional information

(vertical alignment, grading, utility plans, etc.) is also needed to demonstrate the technical feasibility of the proposed roadway alignments in the alternative AMP.

2. **Compliance with Standards.** The Applicant’s proposed alternative AMP does not comply with City and County standards in the long-term. The Applicant’s proposed access to Oregon Street would serve only the Oregon Street Business Park property, rather than providing a regional benefit to the surrounding properties. Two key issues Planning Commission should consider in its deliberations include:
  - a. The alternative AMP proposes a near-term cul-de-sac length of approximately 3,600 feet, significantly exceeding the 200-foot maximum per City of Sherwood code section 16.106.040(E). In the long-term, this length may be reduced to approximately 1,800 feet with future development to the south, which is still nine times longer than the maximum cul-de-sac length permitted by City code. There is no opportunity to resolve this condition without connection of Tonquin Court to Oregon Street as proposed in the current AMP.
  - b. The Applicant has proposed a permanent access to Oregon Street approximately 110 feet from the existing Allied Systems Company emergency access. The 110 foot spacing violates Washington County’s minimum access spacing standard of 600 feet.
  
3. **Circulation and Connectivity.** The Applicant’s proposed access to Oregon Street would serve only the Oregon Street Business Park property. In stark contrast, the current AMP provides both Oregon Street Business Park and surrounding properties property with access.
  - a. Without the right-in/right-out Tonquin Court access to Oregon Street as planned in the current AMP, the 35-45% of site traffic arriving from the south on Oregon Street would experience significant out-of-direction travel that directly increases vehicle miles traveled (VMT) and emissions in the City. Viewed from an individual property perspective, the out-of-direction travel from the south on Oregon Street would add:
    1. approximately *one mile* to access the Oregon Street Business Park (shown conceptually below),
    2. over 3,000 feet to access the Kerr Property, and
    3. approximately 1,000 feet to access the Sherwood Commerce Center.



- b. The 3,600 foot cul-de-sac in the alternative AMP presents challenges for pedestrians and bicyclists, requiring the same out-of-direction travel as noted above for vehicular traffic, with significant grade changes.
4. **Phased Implementation.** The alternative AMP has a significant barrier to implementation: it relies on construction of Ice Age Drive, the timing of which is unknown.
  - a. Tonquin Court, as proposed in the alternative AMP, requires right-of-way dedication from properties outside of the current Urban Growth Boundary (UGB) and/or not yet annexed into the City of Sherwood, which the City does not have a mechanism to ensure.
  - b. The alternative AMP proposed by the Applicant requires Ice Age Drive to be at least partially constructed in order to provide access to the Kerr property. In the meantime, the Kerr property is landlocked. It is more feasible to provide access to the Kerr property via a localized connection to Oregon Street (Tonquin Court, as identified in the current AMP) through properties with active land use applications than waiting for the design and construction of Ice Age Drive (a higher order collector).

## SUMMARY

Comparing the current AMP and the alternative AMP, the current AMP:

- Is the product of several years of thoughtful consideration and technical analysis and is consistent with the Tonquin Employment Area (TEA) Implementation Plan;
- Better complies with applicable City of Sherwood and Washington County standards in the long-term;
- Wholistically provides access and connectivity opportunities for present and future development of the entire Tonquin Employment Area (TEA) while minimizing out-of-direction travel during interim implementation periods; and
- Comprehensively addresses many potential timing scenarios with interim solutions.

For these reasons, we recommend the Planning Commission retain and support the implementation of the current AMP as developed and recommended by City staff.

## APPENDICES

- A. Traffic Signal Warrant Analysis

## Appendix A Traffic Signal Warrant Analysis





**KITTELSON & ASSOCIATES, INC.**  
 851 SW 6th Ave, Suite 600  
 Portland, Oregon 97204  
 (503) 228-5230

**Project #:** 26314  
**Project Name:** Sherwood Commerce Center  
**Analyst:** KMC  
**Date:** 2/6/2022  
**File:** H:\26\26314 - Sherwood Commerce Center\[\MUTCD Signal Warrant - Polley and Schnitzer Phase 1.xls]Data Input  
**Intersection:** Oregon Street/Tonquin Court  
**Scenario:** 2023 with Polley and Schnitzer Phase 1

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
4:00 PM	5:00 PM		370	644	0	99
2nd Highest Hour			346	602	0	79
3rd Highest Hour			341	594	0	74
4th Highest Hour			332	577	0	66
5th Highest Hour			303	527	0	61
6th Highest Hour			298	519	0	56
7th Highest Hour			279	485	0	56
8th Highest Hour			259	452	0	52
9th Highest Hour			259	452	0	52
10th Highest Hour			255	443	0	51
11th Highest Hour			240	418	0	45
12th Highest Hour			226	393	0	43
13th Highest Hour			221	385	0	35
14th Highest Hour			211	368	0	34
15th Highest Hour			168	293	0	32
16th Highest Hour			159	276	0	31
17th Highest Hour			144	251	0	19
18th Highest Hour			125	217	0	19
19th Highest Hour			101	176	0	7
20th Highest Hour			48	84	0	6
21st Highest Hour			43	75	0	4
22nd Highest Hour			29	50	0	1
23rd Highest Hour			24	42	0	1
24th Highest Hour			24	42	0	1

**Warrant Summary**

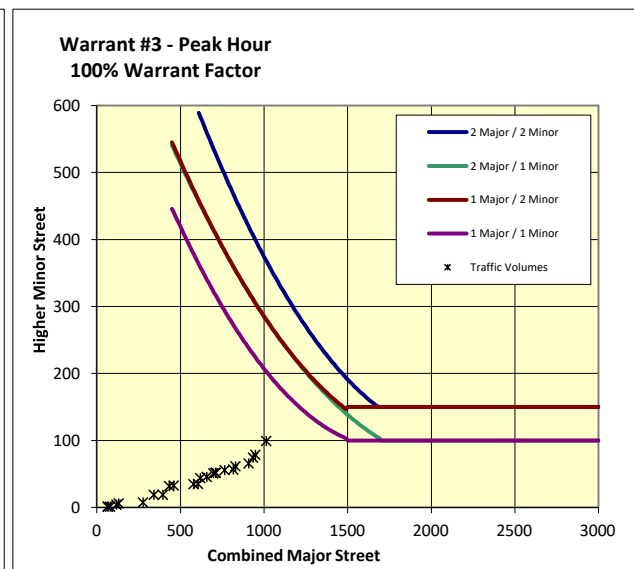
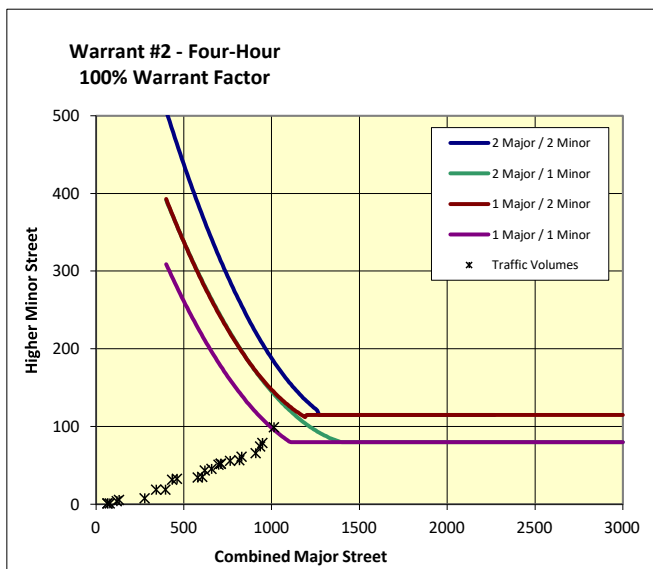
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	90%
Major Street: 8th-Highest Hour / Peak Hour	70%
Minor Street: 4th-Highest Hour / Peak Hour	66%
Minor Street: 8th-Highest Hour / Peak Hour	52%

**Warrant #1 - Eight Hour**

Warrant Factor	Condition	Major Street Requirement	Minor Street Requirement	Hours That Condition Is Met	Condition for Warrant Factor Met?	Signal Warrant Met?
100%	A	500	150	0	No	No
	B	750	75	3	No	No
80%	A	400	120	0	No	No
	B	600	60	5	No	No
70%	A	350	105	0	No	No
	B	525	53	7	No	No
56%	A	280	84	1	No	Yes
	B	420	42	12	Yes	Yes





**KITTELSON & ASSOCIATES, INC.**  
 851 SW 6th Ave, Suite 600  
 Portland, Oregon 97204  
 (503) 228-5230

**Project #:** 26314  
**Project Name:** Sherwood Commerce Center  
**Analyst:** KMC  
**Date:** 2/6/2022  
**File:** H:\26\26314 - Sherwood Commerce Center\[\MUTCD Signal Warrant - Polley and Schnitzer Phase 2.xls]Data Input  
**Intersection:** Oregon Street/Tonquin Court  
**Scenario:** 2023 with Polley and Schnitzer Phases 1 and :

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
4:00 PM	5:00 PM		384	665	0	153
2nd Highest Hour			359	622	0	122
3rd Highest Hour			354	613	0	114
4th Highest Hour			344	596	0	102
5th Highest Hour			314	544	0	94
6th Highest Hour			309	535	0	87
7th Highest Hour			289	501	0	86
8th Highest Hour			269	466	0	80
9th Highest Hour			269	466	0	80
10th Highest Hour			264	458	0	79
11th Highest Hour			249	432	0	70
12th Highest Hour			234	406	0	67
13th Highest Hour			229	397	0	54
14th Highest Hour			219	380	0	53
15th Highest Hour			175	302	0	50
16th Highest Hour			165	285	0	49
17th Highest Hour			150	259	0	29
18th Highest Hour			130	225	0	29
19th Highest Hour			105	181	0	11
20th Highest Hour			50	86	0	9
21st Highest Hour			45	78	0	6
22nd Highest Hour			30	52	0	1
23rd Highest Hour			25	43	0	1
24th Highest Hour			25	43	0	1

**Warrant Summary**

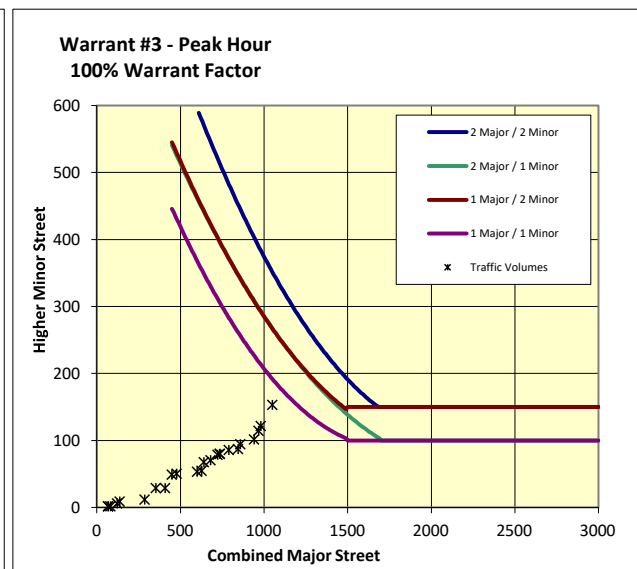
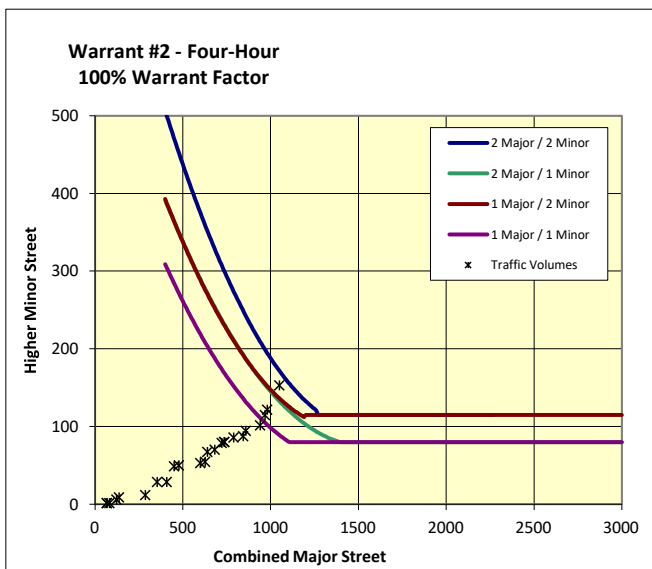
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#3	Peak Hour	Yes	No
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#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	90%
Major Street: 8th-Highest Hour / Peak Hour	70%
Minor Street: 4th-Highest Hour / Peak Hour	66%
Minor Street: 8th-Highest Hour / Peak Hour	52%

**Warrant #1 - Eight Hour**

Warrant Factor	Condition	Major Street Requirement	Minor Street Requirement	Hours That Condition Is Met	Condition for Warrant Factor Met?	Signal Warrant Met?
100%	A	500	150	1	No	No
	B	750	75	7	No	No
80%	A	400	120	2	No	Yes
	B	600	60	12	Yes	Yes
70%	A	350	105	3	No	Yes
	B	525	53	14	Yes	Yes
56%	A	280	84	7	No	Yes
	B	420	42	16	Yes	Yes



**From:** [Colleen Resch](#)  
**To:** [Eric Rutledge](#)  
**Subject:** Fwd: LU 2012-015 & LU 2012-012 - eliminate Tonquin Ct. & Signal on slope  
**Date:** Tuesday, February 8, 2022 8:14:00 AM  
**Attachments:** [image007.png](#)  
[image008.png](#)  
[image009.png](#)

Fyi

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**From:** Matt Langer <matt.langer04@gmail.com>  
**Sent:** Tuesday, February 8, 2022 7:21:37 AM  
**To:** Erika Palmer <PalmerE@SherwoodOregon.gov>; Colleen Resch <ReschC@SherwoodOregon.gov>; Colleen Resch <ReschC@SherwoodOregon.gov>  
**Subject:** Re: LU 2012-015 & LU 2012-012 - eliminate Tonquin Ct. & Signal on slope

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### **Planning Commission-**

I just wanted to bring to your attention a couple facts identified in the Harsch/Schnitzer/Kittleston written testimony provided 2/7/2022 that might not be that obvious without a close read as these are important matters to the citizens of Sherwood. It appears pretty clear that the original Tonquin Court alignment **dead-ends up against the UGB** and **will require a signal** as mentioned previously.

Just as I was originally concerned it all appears confirmed by Harsch/Schnitzer/Kittleston that Sherwood will end up with **two signals on Oregon Street** while one of them is on the slope up from Tonquin Road.

Please pay close attention here and find a feasible solution to consolidate to only a single signal at Ice Age Drive.

### **Kittleston & Associates Technical Memorandum February 7, 2022 – Page 2 item 2.a.**

Notice that the 'interim cul-de-sac' **dead-ends up against the UGB is not mentioned**. You must **look at the map** to see the UGB dead-end.

#### **From Kittleston Item 2.a.**

2. Compliance with Standards. The current AMP complies with City of Sherwood and Washington County standards in the long-term.

a. In the near-term, Tonquin Court would terminate in an interim cul-de-sac **(that dead-ends up against the UGB)** with a length

exceeding the 200-foot maximum per City of Sherwood Code Section 16.106.040(E).

However, the long-term extension of Tonquin Court to Ice Age Drive (and removal of the interim cul-de-sac) resolves this condition and is compliant with City code.

**Kittleson & Associates Technical Memorandum February 7, 2022 – Page 3 item 4.b. last paragraph**

Notice here nested in the last paragraph that a **signal will be necessary** once some portion of Kerr develops.

In this fast paced Light Industrial market I'd think it's highly likely Kerr will develop long before Metro expands the UGB here.

I could be wrong, but I'm not aware of a UGB expansion for this area being planned at this time and even if it was these UGB

expansions seem to be moving-goal-posts.

**From Kittleson Item 4.b. last paragraph**

As such, we anticipate some level of near-term development of the Kerr property can occur before the Oregon Street/Tonquin Court intersection **will reach sufficient levels to justify (warrant) installation of a temporary traffic** signal based on the traffic volume criteria.

A single signal on Oregon Street is right for Sherwood.

Matt Langer  
Langer's since 1879  
21650 SW Langer Farms Parkway  
Sherwood, OR 97140  
503-956-9220

On Sat, Jan 29, 2022 at 7:39 AM Matt Langer <[matt.langer04@gmail.com](mailto:matt.langer04@gmail.com)> wrote:

Erika-

Thanks Erika. That sounds fine. I made a few edits to this version just to clean it up as I was in a hurry walking out the door when I sent the original Please use the below for entering into the record.

Something just doesn't feel right here where we've got a big, out-of-Sherwood developer buying property in Sherwood next to a small family parcel, then the City starts talking about Condemning the family property if the smaller family project doesn't comply. This sure doesn't feel like the Sherwood I know and I hope our Planning Commission can find a solution here that is best for all of Sherwood with only one intersection/signal at Ice Age and both developers on Oregon Street.

**1) Proportionality** - Tonquin Court has nowhere near proportional impact to **Polley(50%)** and **Schnitzer(5%)**. The Polley impact is nearly **50%** of his building square footage while



the impact to Schnitzer is less than **5%**. Building square footage is what matters in the end as this is what creates value to the Developers and City which generates Leasing revenue and Property Taxes for Sherwood. For all involved we should be focused on maximizing building square footage. Building size proportionality is what matters, not raw land dedication.

**2) Cul-De-Sac Length** - The original Tonquin Court concept idea is a dead-end cul-de-sac up against the UGB and it's well over the maximum length permitted for a cul-de-sac so to say the newly suggested solution for a cul-de-sac is 'too long' simply does not make any sense. In both cases the cul-de-sac is longer than the maximum.

**3) UGB Expansion** - To think the intersection at Tonquin Court won't need a signal or will be somewhat '**temporary**' doesn't make any sense since the cul-de-sac dead-ends up against the UGB. We've all watched the snail-pace at which the UGB is expanded so it only makes sense that a cul-de-sac that dead-ends up against the UGB is going to be a dead-end for 10-20+ years if ever expanded in our lifetimes. Please pay close attention to this one as this seems very obvious, but somehow seems to have been 'brushed over' in the Planning Commission meeting Tuesday night as I heard very little concern about the intentionally planned dead-end cul-de-sac up against the UGB. This should be a **red flag** for Sherwood long-term planning.

Regardless of how we got here something just doesn't seem right and having an intersection with or without a signal on a slope just doesn't make any sense. Please find a feasible solution that is a win-win for all Polley, Schnitzer, Kerr, Sherwood and all the other impacted properties as the current solution only seems to benefit one or two property owners while **negatively impacting other neighbors and all of Sherwood** who could potentially have two signals on Oregon Street which simply is a **big-fail** and does not represent Sherwood well.

We need a real solution here for Sherwood.

Thanks for all your volunteer time.

Matt Langer  
Langer's since 1879  
21650 SW Langer Farms Parkway  
Sherwood, OR 97140  
503-956-9220

On Fri, Jan 28, 2022 at 9:59 AM Erika Palmer <[PalmerE@sherwoodoregon.gov](mailto:PalmerE@sherwoodoregon.gov)> wrote:

Hello Matt,

**From:** [Tim Kerr](#)  
**To:** [Eric Rutledge](#)  
**Subject:** Comments for the Record for Polly site and Harsh Site  
**Date:** Tuesday, February 8, 2022 2:51:04 PM

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Eric,

Just wanted to voice my support for both of the above site developments. While we may not have the alignment figured out yet from roadway articulation, we are a proponent for the industrial growth. As we have always said, our need is access both to Oregon Street thru Tonquin loop, and future access to Ice Age. We believe there can be a mutually beneficial access arrangement between the three parties. I would ask that Planning Commission considers this when making decision. "To and Thru" for roadway and utilities is essential to the promise the City made when we Annexed. That is our expectation, and needs to occur thru conditions of above two applications.

Thanks for your consideration.

Tim Kerr



**Time Extension Form**

I, Bruce Polley, pursuant to ORS 227.178(5), hereby request to extend the 120-day period set forth in ORS 227.178(1) and/or the 100-day period set forth in ORS 197.311, whichever may be applicable, for LU 2021-015 – SW Oregon Street Business Park. Any applicable statutory deadline(s) for final action on the above-referenced matter(s) is/are hereby extended to April 20, 2022.

Signed

A handwritten signature in black ink, appearing to read "Bruce Polley", is written over a horizontal line.

Date

A handwritten date "1-27-22" is written in black ink over a horizontal line.



**Time Extension Form**

I, Bruce Polley, pursuant to ORS 227.178(5), hereby request to extend the 120-day period set forth in ORS 227.178(1) and/or the 100-day period set forth in ORS 197.311, whichever may be applicable, for LU 2021-015 – SW Oregon Street Business Park. Any applicable statutory deadline(s) for final action on the above-referenced matter(s) is/are hereby extended to May 4, 2022.

Signed

A handwritten signature in black ink, appearing to read "B. Polley", is written over a solid horizontal line.

Date

A handwritten date "2-15-22" in black ink is written over a solid horizontal line.





February 21, 2022

Jean Simson, City of Sherwood Planning Commission Chairperson  
c/o: Erika Palmer – Planning Manager  
City of Sherwood  
22560 SW Pine Street  
Sherwood, OR 97140

**RE: LU 2021-15 Oregon Street Business Park Request for Continuance**

Dear Chair Simson and Planning Commissioners:

We greatly appreciate your efforts in reviewing the materials for our application. Through many efforts behind the scenes, we have made significant progress in working with surrounding property owners towards a mutually beneficial and equitable solution. As a result, the materials for the Oregon Street Business Park will need to be updated for site plan revisions.

We would like to request a continuance to our hearing in order to modify our application materials. To accommodate this, we will provide a four-month (120-day) extension to our 120-day timeline per ORS 227.178. Resulting in a new statutory deadline of September 1, 2022. At this continued hearing, we hope to come before the Planning Commission with modified application materials that will allow both approval by the City and the reasonable development of this and other properties within the Tonquin Employment Area.

Sincerely,

**AKS ENGINEERING & FORESTRY, LLC**

A handwritten signature in blue ink that reads 'Mimi Doukas'.

Mimi Doukas, AICP, RLA - Principal  
12965 SW Herman Road, Suite 100  
Tualatin, OR 97062  
503-563-6151 | [MimiD@aks-eng.com](mailto:MimiD@aks-eng.com)



**Time Extension Form**

I, Bruce Polley, pursuant to ORS 227.178(5), hereby request to extend the 120-day period set forth in

ORS 227.178(1) and/or the 100-day period set forth in ORS 197.311, whichever may be applicable, for

LU 2021-015 – SW Oregon Street Business Park. Any applicable statutory deadline(s) for final action on

the above-referenced matter(s) is/are hereby extended to September 5, 2022.

Signed

A handwritten signature in black ink is written over a solid horizontal line. The signature is cursive and appears to read "Bruce Polley".

Date

A handwritten date "2-22-22" is written in black ink over a solid horizontal line.



**Time Extension Form**

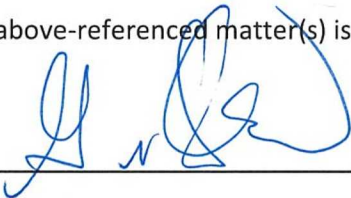
I, Glen Southerland, AICP – AKS Engineering & Forestry, LLC, representing the Applicant, Bruce Polley,

and pursuant to ORS 227.178(5), hereby request to extend the 120-day period set forth in ORS

227.178(1) and/or the 100-day period set forth in ORS 197.311, whichever may be applicable, for LU

2021-015 – SW Oregon Street Business Park. Any applicable statutory deadline(s) for final action on the

above-referenced matter(s) is/are hereby extended to September 21, 2022.

  
\_\_\_\_\_  
Signed

6/21/22  
\_\_\_\_\_  
Date

**From:** [Glen Southerland](#)  
**To:** [Eric Rutledge](#)  
**Cc:** [Mimi Doukas](#)  
**Subject:** RE: Question on driveway location  
**Date:** Tuesday, June 21, 2022 11:08:26 AM  
**Attachments:** [image001.png](#)  
[We sent you safe versions of your files.msg](#)  
[7971 20220621 Final 120-Day Extension.pdf](#)  
[Cooperative Development Agreement - Sherwood \(3.30.22\) - Final.pdf](#)

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Hi Eric,

Given the time constraint, Bruce has authorized us to extend the timeline to September 21<sup>st</sup> and request a hearing continuance to July 12<sup>th</sup> on his behalf.

Also attached is the private agreement between Schnitzer Properties, Kerr, and Polley for the construction of SW Laurelwood Way.

Please let me know if this works for you or if there is something else needed.

Thank you,

**Glen Southerland, AICP**

**AKS ENGINEERING & FORESTRY, LLC**

P: 503.563.6151 Ext. 166 | [www.aks-eng.com](http://www.aks-eng.com) | [southerlandg@aks-eng.com](mailto:southerlandg@aks-eng.com)

---

**From:** Eric Rutledge <[RutledgeE@SherwoodOregon.gov](mailto:RutledgeE@SherwoodOregon.gov)>  
**Sent:** Tuesday, June 21, 2022 10:42 AM  
**To:** Glen Southerland <[southerlandg@aks-eng.com](mailto:southerlandg@aks-eng.com)>  
**Cc:** Mimi Doukas <[MimiD@aks-eng.com](mailto:MimiD@aks-eng.com)>  
**Subject:** RE: Question on driveway location

**EXTERNAL EMAIL:** This email originated from outside AKS Engineering & Forestry.

Hi Glen,

Can we expect a continuance and 120-day extension today? If not we'll work to finalize the staff report and get out at the end of the day.

Thanks,

Eric Rutledge  
City of Sherwood



## COOPERATIVE DEVELOPMENT AGREEMENT

This Cooperative Development Agreement (the “Agreement”), dated as of March 30, 2022 (the “Effective Date”), by and among Sherwood Commerce Center, LLC, an Oregon limited liability company (“SCC”), Bruce Polley and Karen Polley, each an individual (collectively, the “Polleys”) and Tonquin Industrial Complex, LLC, an Oregon limited liability company (“TIC”), each a “Party”, and together with SCC and the Polleys, the “Parties”.

### Recitals

A. The Polleys own certain real property located in the City of Sherwood, Oregon (the “City”), Washington County Tax Lot No. 2S128C000500 (the “Polley Property”).

B. The Polleys have submitted a land use application (LU 2021-015 SP) (the “Polley Application”) to the City Planning Commission (the “PC”), which remains subject to approval by the PC, pursuant to which the Polleys have proposed an industrial development (the “OSBP”) on the Polley Property.

C. SCC owns certain real property located in the City, Washington County Tax Lot Nos. 2S128C000600, 2S1330000401, 2S1330000403, 2S1330000200, 2S1330000300, and 2S1330000201 (collectively, the “SCC Property”).

D. SCC has (i) submitted a land use application (LU 2021-012 SP / CUP / VAR) (the “SCC Phase 1 Application”) to the PC, which was approved by the PC on February 22, 2022, pursuant to which SCC will construct an industrial development (the “Sherwood Commerce Center Phase 1”) on SCC Property and (ii) intends to submit a land use application (the “SCC Phase 2 Application”, and together with SCC Phase 1 Application, the “SCC Application”) to the PC with respect to Phase 2 of the Sherwood Commerce Center (the “Sherwood Commerce Center Phase 2”, and together with the Sherwood Commerce Center Phase 1, the “Sherwood Commerce Center”), to be located on SCC Property.

E. TIC owns certain real property located in the City, Washington County Tax Lot No. 2S133BB00100, 2S1330000400, and 2S1330000600 (the “TIC Property”).

F. TIC intends to submit a land use application (the “TIC Application”) to the PC, which remains subject to approval by the PC, pursuant to which TIC has proposed an industrial development (the “Tonquin Industrial Complex” and together with the Sherwood Commerce Center and OSBP, each a “Project” and collectively the “Projects”) on the TIC Property.

G. The Parties desire to enter into this Agreement for the mutual development of the Projects and hereby acknowledge due consideration in exchange for the obligations, covenants, promises, and rights set forth herein.

### Cooperative Agreement

In consideration of the mutual recitals and covenants contained herein, the Parties agree as follows:

1. Tonquin Court and Related Improvements. The Parties agree that Tonquin Court shall be constructed as follows:

a. TIC and SCC agree to design and construct the road currently known as Tonquin Court (or any successor, referred to herein as “Tonquin Court”), as depicted on Exhibit A attached hereto and as further described in the City’s Tonquin Employment Area Concept Plan. All costs associated with the design, planning and construction of Tonquin Court shall be borne by TIC and SCC pursuant to a separate agreement. Construction of Tonquin Court shall be completed on or prior to September 1, 2023.

b. The costs of the design, planning and construction of any sanitary, sewer, storm sewer and water utilities, gas, electric, telecommunications, and similar costs, including any late-comer fees, credits, and similar amounts, associated with Tonquin Court or which serve the Parties (collectively, the “Utilities”) shall be borne on a pro rata basis (the “Proportional Share”) amongst the Parties based on each Party’s respective square footage of the constructed Sherwood Commerce Center, OSBP, and Tonquin Industrial Complex. By way of example, assuming (i) the Sherwood Commerce Center is comprised of 934,000 square feet, (ii) the Tonquin Industrial Complex is comprised of 355,000 square feet and (iii) the OSBP is comprised of 120,000 square feet, then SCC, TIC, and the Polleys shall be responsible, respectively, for 66.29%, 25.2%, and 8.51% of the Proportional Share. SCC shall construct or caused to be constructed the Utilities. A Party’s Proportional Share shall be adjusted based on the square footage of each Project as fully constructed. The location of the Utilities is depicted generally on Exhibit B. The Parties shall obtain up to three (3) bids for the Utilities and shall mutually agree upon which bid to utilize in construction of the Utilities.

c. The approximately 25-foot easement/right-of-way between OSBP and Tonquin Industrial Complex will be legally modified to allow their joint use (including, but not limited to, joint access from Tonquin Ct, site traffic flow, Utilities, and a utility easement for SCC).

d. In connection with and furtherance of the foregoing, the Polleys shall promptly, and no later than prior to the permit approval for Tonquin Court being issued, dedicate a portion of the Polley Property (generally as depicted on Exhibit C attached hereto) for the construction of Tonquin Court. The Polleys shall grant SCC and TIC any and all necessary Temporary Construction Easements, and any similar or related documents, in a form satisfactory to SCC and TIC in their discretion.

e. Any costs contemplated to be shared as set forth in this Section 1 shall be promptly paid by a Party when due and payable and within thirty (30) days of written demand by another Party. For the avoidance of doubt, each Party shall be responsible for the frontage (except the frontage at the intersection of Tonquin Court and Oregon Street) associated with their respective Project.

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2. Detention Pond. The Parties agree that a storm detention pond (the “Detention Pond”), shall be constructed as follows:

a. The Polleys shall design and construct the Detention Pond on the southwest corner of the Polley Property in a manner that will serve the capacity needs of the OSBP and Tonquin Court in its entirety. Construction of the Detention Pond shall be completed on or prior to September 1, 2023.

b. The construction costs directly related to the Detention Pond shall be borne by TIC and SCC in accordance with a separate agreement; provided, however, that the Polleys shall pay the aforementioned costs and shall be reimbursed by TIC and SCC within thirty (30) days’ written notice. For the avoidance of doubt, the costs contemplated in the first sentence of this section 2(b) do not include any retaining walls, related grading work, environmental impact, wetlands mitigation, or similar work or improvements specifically related to the OSBP. All other costs associated with the Detention Pond shall be borne solely by the Polleys. If there is excess capacity in the Detention Pond and either TIC or SCC elect to utilize such capacity upon written notice to the Polleys, TIC and/or SCC shall pay the costs associated with their respective use of the Detention Pond. All proportional use shall be based on the impervious square footage of OSBP and Tonquin Court that drain to the Detention Pond.

c. The design for the Detention Pond shall be subject to the written approval of all Parties. The Parties shall obtain up to three (3) bids for the Detention Pond and shall mutually agree upon which bid to utilize in construction of the Detention Pond.

d. The Parties shall use best efforts in collaborating with the Authorities Having Jurisdiction (“AHJ”) so that the Detention Pond is a public pond that is operated, maintained, and otherwise controlled by the AHJ.

e. The Polleys will promptly, and prior to the permits being issued for Tonquin Court, dedicate land or grant an easement to the City for maintenance of the Detention Pond. The Polleys will work collaboratively and expeditiously with the City to make the Detention Pond a regional facility that will be owned and maintained by the City. Except as expressly set forth in this Section 2, TIC and SCC shall have no liability with respect to the Detention Pond.

3. OSBP. The Polleys hereby agree to, within sixty (60) days of the Effective Date, amend the Polley Application and submit the same to the PC for approval, in a form substantially in compliance with the depiction attached hereto as Exhibit D. The Parties hereby agree that neither TIC nor SCC shall have any liability with respect to the Polley Application or the OSBP; nor shall TIC nor SCC make any guarantee as to (i) approval by the City of the OSBP or (ii) any square footage desired by the Polleys with respect to OSBP.

4. Cooperative Development of the Projects. With respect to the approval, design, and construction of the Projects, the Parties hereby agree as follows:

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a. The Parties shall promptly grant to the other Parties, as is reasonably necessary, any temporary construction easements or other access required for any work associated with grading or other development of a Project.

b. The Parties hereby approve the development and construction of the Sherwood Commerce Center and any conditions imposed thereon by the PC as of the Effective Date.

c. The Parties agree that any decision of the PC or other body with respect to a Project shall be final, binding and conclusive on the Parties and cannot be reviewed or appealed for any reason by any party.

d. The Parties agree that they shall not in any way, either directly or indirectly, oppose, threaten to oppose, disparage, or otherwise delay any planning, design, or construction efforts (including any permitting process), associated with any Project. Any appeals or opposition shall be rescinded prior to the date hereof.

e. The Parties agree that they shall not seek to amend, modify, supplement, or otherwise change any planning documentation, policy, ordinance, law, rule, regulation, or resolution of any AHJ that would adversely affect the development of any Project as described herein.

f. The Parties agree that they shall not encourage any third party to act in violation of this Section 4. The Parties further agree that this Section 4 shall be binding on any affiliate, consultant, successor or assign of any Party.

## 5. General.

a. Cooperative Nature. The Parties agree that they shall promptly execute and deliver any applications, permits, documents required by the City or the County of Washington, Oregon (the "County"), and any other reasonably requested document, certificate, application, or instrument (including any such requirement by a Party's lending institution) related to the terms described herein in furtherance of the rights and obligations to be performed hereunder. The Parties further agree to work collaboratively and diligently with the City and County in furtherance of the obligations required to be performed hereunder.

b. Effect of Agreement; Severability; Amendment; Assignment. The terms of this Agreement shall be effective immediately and shall supersede any previous agreements (whether verbal or in writing) amongst any Party. Any such previous agreement is hereby deemed null and void *ab initio*. Should any provision of this Agreement be determined to be void, invalid, unenforceable or illegal for whatever reason, or otherwise not approved by the City, the County, or any other applicable governing body, such provision(s) shall be null and void; provided, however, that the remaining provisions of this Agreement shall be unaffected thereby and shall continue to be valid and enforceable. This Agreement (including the Exhibits



attached hereto) constitutes the entire agreement amongst the Parties with respect to each Party's respective Project described herein. This Agreement may not be amended, modified, or supplemented unless expressly done so in a writing executed by all Parties. This Agreement may not be assigned, by operation of law or otherwise by any Party, without the written consent of the non-assigning Parties.

c. Indemnity. To the fullest extent permitted by law and except as limited hereunder, each Party releases and shall indemnify, defend and hold harmless the other Parties, their affiliates and lenders and each of their respective officers, agents, employees, representatives, consultants and contractors, from and against any and all claims, damages, losses and expenses, including, but not limited to, reasonable attorney's fees, which arise out of or result from any act or conduct of the given Party, its employees, agents, breach of this Agreement or any negligent, reckless or illegal act or omission of the given Party, any subcontractor or independent contractor engaged by a Party, anyone directly or indirectly employed by them or anyone for whose acts any of them may be liable.

d. Dispute Resolution. The Parties shall be permitted to, as set forth herein, pursue any remedy at law or equity upon a breach of this Agreement by any Party; provided, however, that no Party shall be entitled to seek or recover special, punitive, incidental, consequential damages, or any similar damages (including loss of rent or building square footage) except as explicitly set forth herein. In the event of a dispute between the Parties hereto as to a breach of this Agreement, the Parties agree to first attempt to mediate their dispute. Each party shall bear its own cost of counsel in the mediation effort, but they shall each bear the cost of the mediator and the mediation facilities equally. If the dispute cannot be resolved through mediation, any Party may initiate litigation. If mediation is not successful and any action, or other proceeding (other than mediation) is brought in connection with this Agreement, the substantially prevailing party, as determined by a final non-appealable judgment of a court of competent jurisdiction, shall be entitled to recover from the other party the reasonable costs, expenses and attorneys' fees incurred in such action.

e. Authority to Execute Agreement; Conflicts. Each Party acknowledges and confirms that it has full and lawful authority to execute this Agreement and perform as contemplated hereunder. Each Party further hereby represents and warrants that the execution and delivery of this Agreement, and performance of the terms hereunder, does not and will not result in a violation of any other agreement (either verbal or in writing), mortgage, administrative action, governmental approval, legal judgment, or similar action. Each Party hereby represents and warrants that there are no pending actions or claims related to each Party's respective project described herein.

f. Time of the Essence. The obligations contained in this Agreement are time sensitive and require the prompt attention, delivery, and efforts of all Parties and their consultants. Time is of the essence for this Agreement.

g. Counterparts. This Agreement may be signed on any number of counterparts with the same effect as if the signatures were on the same instrument when counterparts containing signatures from all of the Parties are obtained by SCC. A signed

counterpart transmitted by electronic means or facsimile shall be deemed sufficient to bind the transmitting party when sent, but any party submitting its signature in that fashion shall also be obligated to mail an originally signed counterpart to the other party promptly thereafter.

h. Confidentiality. The Parties and any affiliates, owners, members, agents, consultants, or other third parties shall keep confidential all matters concerning the terms of this Agreement and the negotiations which led to it and shall not disclose the fact or substance of the negotiations or the terms to anyone without the prior written consent of all Parties. Notwithstanding the foregoing, the provisions and preceding negotiations may (i) be revealed to a Party's consultants, attorneys and lenders so long as each such recipient is advised of the necessity for them to also maintain the confidentiality of the information and (ii) be disclosed to the City for the limited purposes of the City's involvement and approval as described herein.


i. Binding Effect. This Agreement shall be binding on the Parties and all affiliates, successors, and assigns, including any transferee of any Party's respective property as described herein. Except as set forth herein, this Agreement shall not create any rights or benefits to parties other than the Parties. Nothing contained in this Agreement shall be deemed to create a relationship of partnership, joint venture or any other relationship between the Parties except as explicitly set forth herein.

j. Miscellaneous. Preparation of this document by either Party or their agent and its submittal to the other party shall not be deemed to impose any obligation or legal liability from either party to the other. This Agreement is not intended to be binding until it is executed and delivered by all parties hereto.

[Signature Page to Immediately Follow.]

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Sherwood Commerce Center, LLC, an Oregon limited liability company

By:   
Name: Jeffrey F. Nudelman  
Title: Vice President, Secretary

Tonquin Industrial Complex, LLC, an Oregon limited liability company

By:   
Name: Tim Kerr  
Title: Member

  
Bruce Polley

  
Karen Polley

Exhibit A  
Tonquin Court

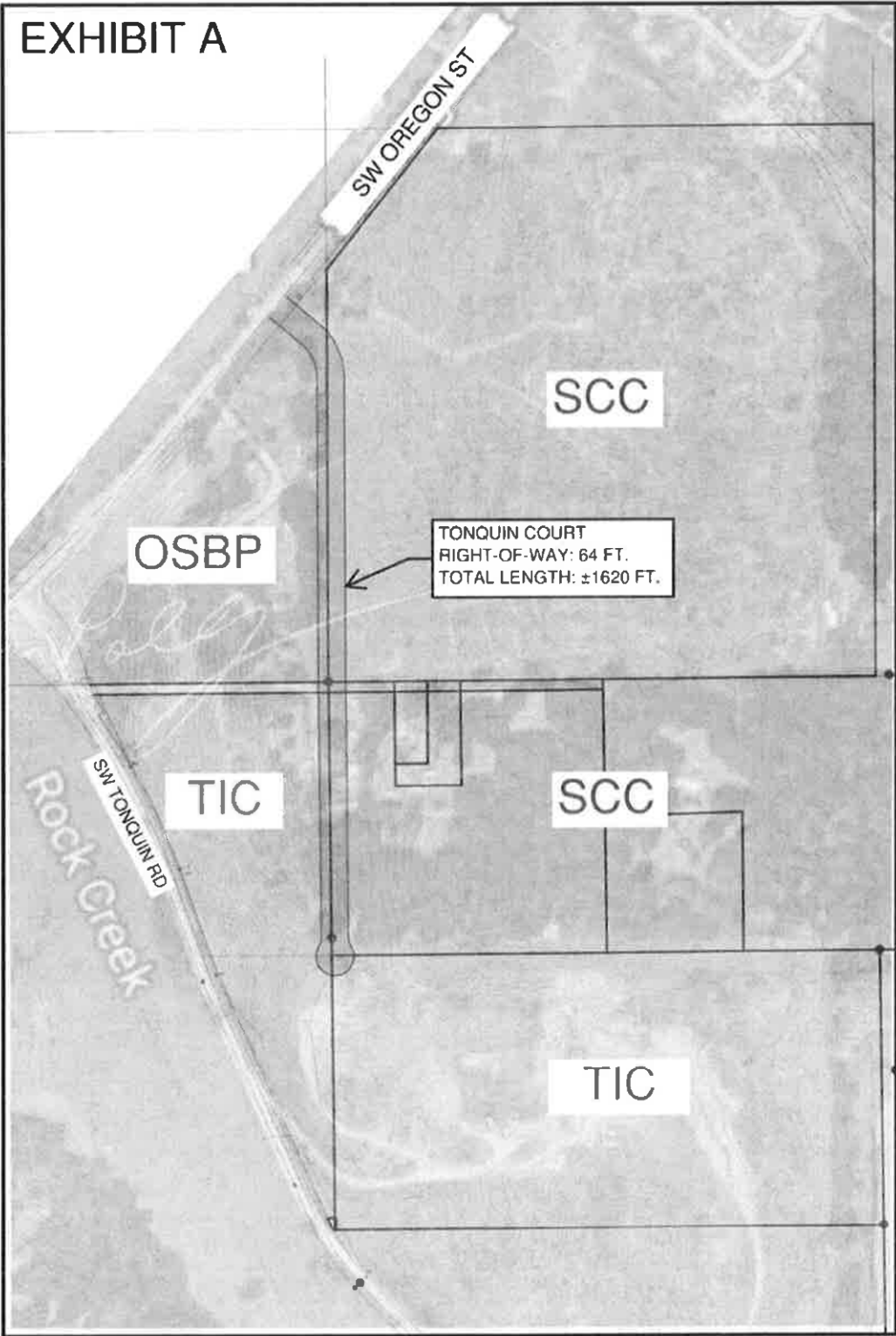
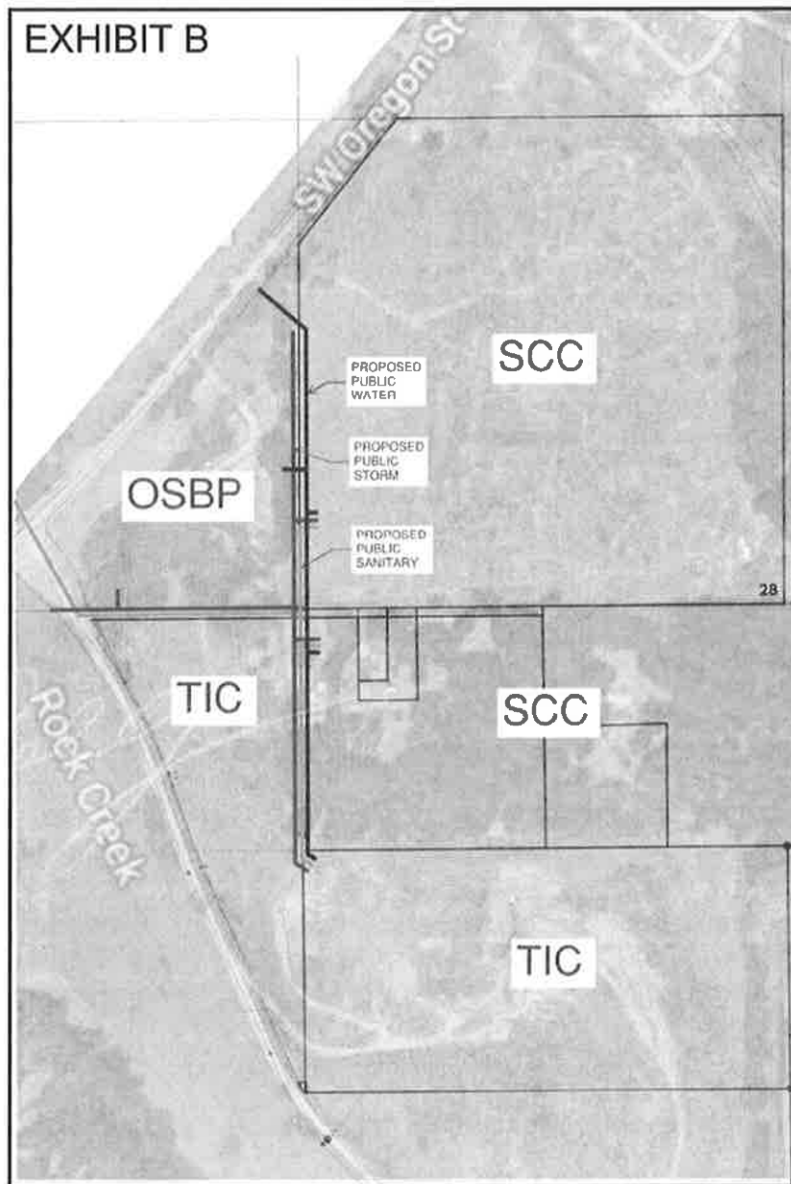




Exhibit B

Utilities<sup>1</sup>



<sup>1</sup> Utilities also include gas, electric, telecommunications, and similar costs.

Exhibit C

Dedication Area

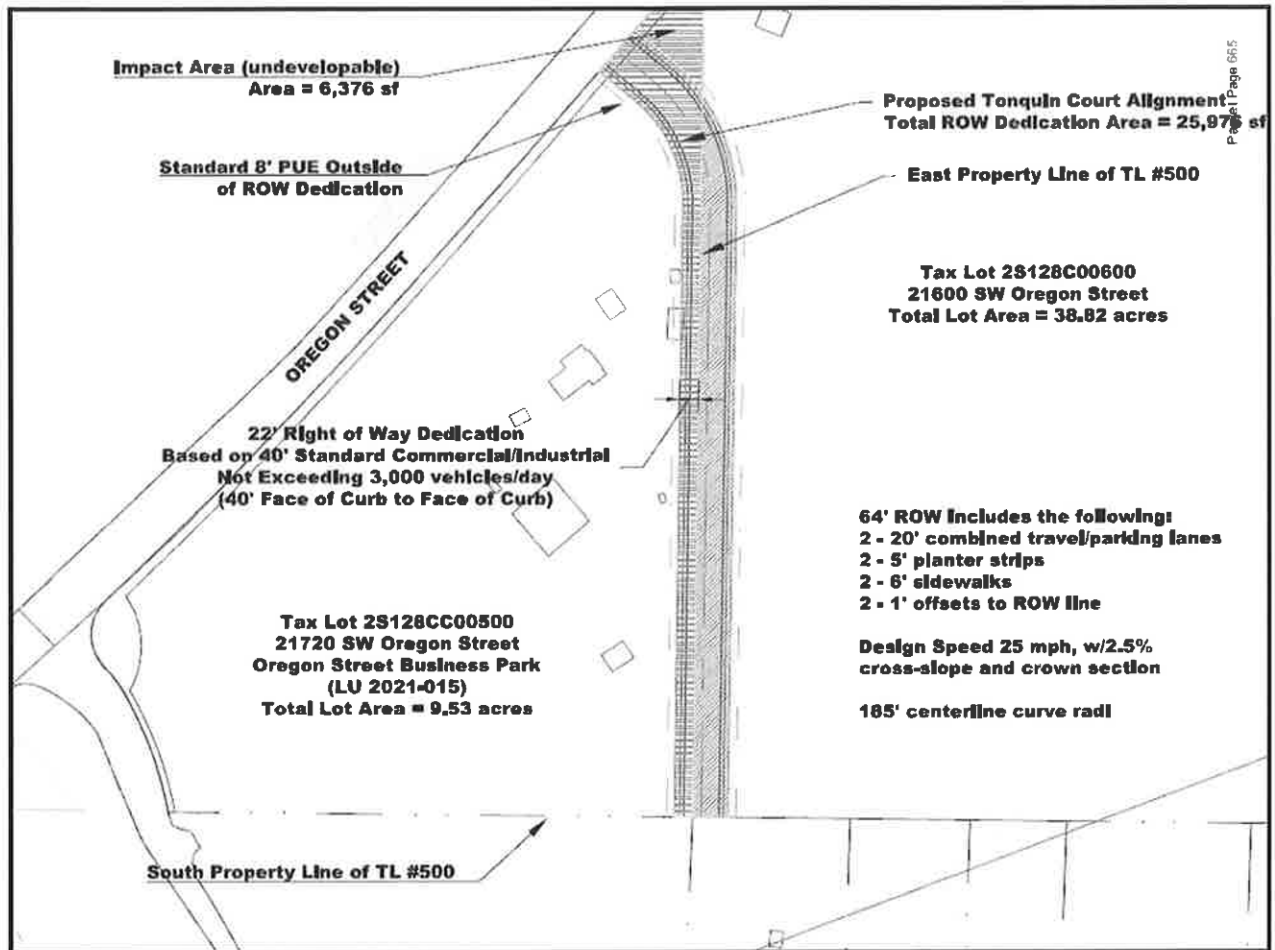


Exhibit D

Tonquin Ct. Preliminary Grading Exhibit

