

March 18, 2019

WORKSHOPS

Vancouver City Hall - 415 W 6th Street, Vancouver WA

Councilmember Stober arrived at 4:30 p.m.

4:00-4:30 p.m. Washington Legislature Mid-Session Update

Presenter: Brian Enslow, State Governmental Affairs Liaison

Summary

The City's state governmental affairs liaison provided Council with an update on the Washington State Legislative Session.

4:30-5:00 p.m. CDBG and HOME Program 2019-2023 Consolidated Plan & 2019 Action Plan

Presenters: Peggy Sheehan, Community Development Manager, 487-7952; Bryan Monroe, Associate Planner, 487-7958

Summary

Staff provided Council with an overview of the proposed 2019-2023 CDBG and HOME Program Consolidated Plan and the 2019 Action Plan, including proposed project grants.

5:00-6:00 p.m. Park Impact Fee Program Challenges & Potential Solutions

Presenters: Julie Hannon, Parks & Recreation Director, 487-8309; Monica Tubberville, Park Planner, 487-8353

Summary

Staff provided Council with an overview of current challenges to the City's Park Impact Fee program and potential policy changes that could address these challenges.

COUNCIL DINNER/ADMINISTRATIVE UPDATES (5:30 PM)**COUNCIL REGULAR MEETING****Pledge of Allegiance****Call to Order and Roll Call**

The regular meeting of the Vancouver City Council was called to order at 6:34 p.m. by Mayor McEnerny-Ogle in the Council Chambers of City Hall, 415 W. 6th Street, Vancouver, Washington.

Present: Councilmembers Paulsen, Lebowsky, Glover, Stober, Turlay, Hansen, Mayor McEnerny-Ogle

Absent: None

Approval of Minutes**Minutes - February 11, 2019 (amended)**

Motion by Councilmember Stober, seconded by Councilmember Turlay, and carried unanimously to approve the amended meeting minutes for February 11, 2019.

Minutes - February 25, 2019

Motion by Councilmember Stober, seconded by Councilmember Lebowsky, and carried unanimously to approve the meeting minutes for February 25, 2019.

Minutes - March 4, 2019

Motion by Councilmember Stober, seconded by Councilmember Lebowsky, and carried unanimously to approve the meeting minutes for March 4, 2019.

Citizen Communication (Items 1-5)

Mayor McEnerny-Ogle opened the Citizen Forum and, receiving no testimony, closed the Citizen Forum.

Consent Agenda (Items 1-5)

Mayor McEnerny-Ogle asked staff to clarify the apprenticeship hours achieved for Items 1 and 2.

Dan Swensen, Engineering & Construction Services Manager, provided staff comments.

Mr. Swensen explained that the water storage tower seismic improvements project was very materials intensive, which left very few available labor hours to meet the three percent labor apprenticeship goal. He explained that this company trains their employees in-house, which does not meet Labor and Industry qualifications. Rather than join a certified program for just this one job, the contractor chose to accept the City's penalty instead.

Mr. Swensen reported that since 2011, there have been 47 Public Works projects that have qualified for the apprenticeship goals, which required about 12,000 apprenticeship hours. These projects actually realized more than 20,000 hours. He noted that occasionally there will be a project where the apprenticeship program does not fit well with the type of project.

For Item 2, Mr. Swensen stated that the project had an eight percent apprenticeship goal, or about 4,900 hours. The contractor realized more than 6,200 apprenticeship hours for this project. He noted the type of work involved lent itself well to the program, as there were a number of different crafts involved.

Councilmember Stober asked what happens to the money when a contractor has to pay the penalty. Mr. Swensen explained it goes back into that project's budget. Councilmember Stober stated it would be good if the money could be put into efforts to support education about the construction trades, or something of that nature.

Councilmember Stober also asked for more information at a later briefing about whether the City has the option of making the ability or intent to utilize apprenticeship hours a requirement of being a responsive bidder.

Motion by Councilmember Glover, seconded by Councilmember Paulsen, and carried unanimously to approve the Consent Agenda.

1. Water Storage Tower Seismic Improvement Construction Acceptance

Staff Report 035-19

Summary

In 2014, OBEC Engineers was hired to evaluate how the City's elevated water towers at water stations 5, 6 and 7 would respond to a seismic event. Although the structures themselves responded well during simulated seismic events, the evaluation identified deficiencies that could be improved with an enhanced, modern anchoring system. The City Council

awarded a contract for the seismic retrofits to Lee Contractors of Battle Ground, Washington, on April 23, 2018.

The work was completed satisfactorily in accordance with the plans and specifications. These improvements significantly increased the ability of the towers to withstand seismic events. Water Station 5 is at 5401 Idaho Street, Water Station 6 is at 5800 NE 53rd Street and Water Station 7 is at 11595 NE 16th Street. Contract costs are summarized below.

TOTAL CONTRACT COSTS

<i>Labor, Equipment and Material</i>	<i>\$ 991,829.87</i>
<i>Sales Tax</i>	<i>\$ 83,313.71</i>
Total	\$ 1,075,143.58
<i>Retainage</i>	<i>\$ 49,591.49</i>

The original contract amount, including sales tax was \$1,073,160.00. The final project cost was \$1,983.58 higher than the original contracted amount, which equates to an overrun of less than two tenths of one percent.

The contract was very materials intensive, and as a result had a low number of labor hours compared to other projects of this size. Lee Contractors reported a total of only 2,803 labor hours expended for the project. At a required 3% apprenticeship utilization, Lee Contractors was required to deliver 84.1 apprentice hours, or pay \$10 per hour for apprentice hours not delivered.

Lee Contractors did not meet their required minimum apprenticeship utilization hours for the project. Lee Contractors paid the required \$10 per hour for required hours not delivered for a total of \$840.98.

Request: On March 18, 2019, accept the facilities as constructed by Lee Contractors of Battle Ground, WA and authorize release of the retainage in the amount of \$49,591.49, subject to receipt of all documentation required by law.

Tyler Clary, Engineering Program Manager, 487-7169

Motion approved the request.

2. Grant Street Pier, Construction Acceptance and Release of Retainage Bond

Staff Report 036-19

Summary

The original construction contract bid amount was \$12,318,980.49. Change

orders and quantity adjustments during construction increased the contract amount by 9.7% to \$13,516,625.42. The largest change was the addition of a concrete tremie seal at the bottom of the pier's foundation. This seal was not included in the project's design, but was needed to prevent the river from flooding the foundation excavation during the winter of 2016/2017. The seal allowed construction to proceed during several months when the river level was high and would have otherwise flooded the excavation.

Rotschy, Inc. of Vancouver, Washington, has satisfactorily completed the subject improvements in accordance with the plans and specifications. An apprenticeship goal of 8% (4,940 hours) was set for the project. The Contractor achieved an actual Apprenticeship Utilization of 10.1% (6,213 hours).

Request: On March 18, 2019, accept the Grant Street Pier as constructed by Rotschy, Inc. of Vancouver, Washington, and authorize release of the retainage bond, subject to receipt of all documentation required by law.

*Dan Swensen, Engineering & Construction Services
Manager, 487-7754*

Motion approved the request.

3. Bid Award for 2019 Resurfacing Curb Ramps

Staff Report 037-19

Summary

The City is issuing three separate curb ramp contracts this year as part of its 2019 pavement management program. A total of 151 ramps are to be constructed under those three contracts. These contracts include the "2019 Resurfacing Curb Ramps," which includes 42 curb ramps, the "2019 East Curb Ramps," which includes 70 curb ramps, and the "2019 West Curb Ramps," which includes 39 ramps. The purpose of splitting the work into multiple contracts is to reduce each contract to a manageable size, which helps expedite ramp construction. From a construction sequencing standpoint, it is far more efficient to construct the new curb ramps in advance of the on-street pavement management resurfacing work.

This staff report and recommended action is to award the contract for 2019 Resurfacing Curb Ramps only. The 2019 Resurfacing Curb Ramps and 2019 East Curb Ramps contracts are proposed to be awarded on March 18, and the 2019 West Curb Ramps contract is scheduled to be awarded on March 25.

On February 26, 2019, the City received nine bids for the 2019 Resurfacing Curb Ramps project. The bids ranged between \$529,620.00 to

\$873,415.00. The low bidder was responsive. The bids are as follows:

SUMMARY OF BIDS	
BIDDER	AMOUNT
<i>Halme Excavating Inc., Battle Ground, WA</i>	<i>\$529,620.00</i>
<i>Lee Contractors LLC, Battle Ground, WA</i>	<i>\$530,626.00</i>
<i>Clark and Sons Excavating, Inc., Battle Ground, WA</i>	<i>\$538,310.00</i>
<i>McDonald Excavating, Inc., Washougal, WA</i>	<i>\$584,765.00</i>
<i>Advanced Excavating Specialists (AES), LLC, Longview, WA</i>	<i>\$593,000.00</i>
<i>NW Construction GC Inc., Battle Ground, WA</i>	<i>\$649,930.00</i>
<i>MJ Hughes Construction, Vancouver, WA</i>	<i>\$658,143.00</i>
<i>Civil Works NW, Inc., Vancouver, WA</i>	<i>\$687,564.00</i>
<i>Brix Paving NW Inc., Tualatin, OR</i>	<i>\$873,415.00</i>
<i>Engineers' Estimate</i>	<i>\$600,000.00 to \$700,000.00</i>

There is a minimum apprenticeship goal of 3% of the utilized labor hours for this project. Halme Excavating Inc. of Battle Ground, Washington, has submitted an Apprenticeship Utilization Plan to meet or exceed this goal by using approximately 84 hours of apprentice time of the total 2,800 applicable labor hours for the project.

Request: On March 18, 2019, award a construction contract for the 2019 Resurfacing - Curb Ramps project to the lowest responsive and responsible bidder, and authorize the City Manager or his designee to sign a contract with Halme Excavating Inc. from Battle Ground, Washington, at their bid price of \$529,620.00, which includes Washington State sales tax.

Chris Sneider, Senior Civil Engineer, 487-8239

Motion approved the request.

4. Bid Award for 2019 East Curb Ramps

Staff Report 038-19

Summary

The City is issuing three separate curb ramp contracts this year as part of its 2019 pavement management program. A total of 151 ramps are to be constructed under those three contracts. These contracts include the "2019 Resurfacing Curb Ramps," which includes 42 curb ramps, the "2019 East

Curb Ramps,” which includes 70 curb ramps, and the “2019 West Curb Ramps,” which includes 39 ramps. The purpose of splitting the work into multiple contracts is to reduce each contract to a manageable size, which helps expedite ramp construction. From a construction sequencing standpoint, it is far more efficient to construct the new curb ramps in advance of the on-street pavement management resurfacing work.

This staff report and recommended action is to award the 2019 East Curb Ramps contract only. The 2019 Resurfacing Curb Ramps and 2019 East Curb Ramps contracts are proposed to be awarded on March 18, and the 2019 West Curb Ramps contract is scheduled to be awarded on March 25.

On March 5, 2019, the City received seven bids for the subject project. The bids ranged between \$686,000.00 to \$842,350.00. The low bidder was responsive. The bids are as follows:

SUMMARY OF BIDS	
BIDDER	AMOUNT
<i>Advanced Excavating Specialists (AES), LLC, Longview, WA</i>	<i>\$686,000.00</i>
<i>Clark and Sons Excavating, Inc., Battle Ground, WA</i>	<i>\$716,816.00</i>
<i>MJ Hughes Construction, Vancouver, WA</i>	<i>\$734,305.00</i>
<i>Lee Contractors LLC, Battle Ground, WA</i>	<i>\$736,021.00</i>
<i>NW Construction GC Inc., Battle Ground, WA</i>	<i>\$798,231.00</i>
<i>McDonald Excavating, Inc., Washougal, WA</i>	<i>\$834,165.00</i>
<i>Civil Works NW, Inc., Vancouver, WA</i>	<i>\$842,350.00</i>
<i>Engineers' Estimate</i>	<i>\$800,000.00 to \$950,000.00</i>

There is a minimum apprenticeship goal of 3% of the utilized labor hours for this project. Advanced Excavating Specialists of Longview, Washington, has submitted an Apprenticeship Utilization Plan to meet or exceed this goal by using approximately 90 hours of apprentice time of the total 3,000 applicable labor hours for the project.

Request: On March 18, 2019, award a construction contract for the 2019 East Curb Ramps project to the lowest responsive and responsible bidder, and authorize the City Manager or his designee to sign a contract with Advanced Excavating Specialists (AES), LLC from Longview, Washington, at their bid price of \$686,000.00, which includes Washington State sales tax.

Chris Sneider, Senior Civil Engineer, 487-8239

Motion approved the request.

5. Approval of Claim Vouchers

Request: Approve claim vouchers for March 18, 2019.

Copy available upon request.

Motion approved claim vouchers for March 18, 2019, in the amount of \$12,152,441.24.

Communications

A. From the Council

B. From the Mayor

C. From the City Manager

a. Vancouver Police Department Update

City Manager Eric Holmes stated the Vancouver Police Department (VPD) has experienced an unusually high number of officer-involved shootings so far this year. Mr. Holmes acknowledged that any loss of life in the community is tragic, regardless of the circumstances, and he offered condolences on behalf of the City to the families and friends of those who had lost their lives in these incidents.

Mr. Holmes stated he had invited Vancouver Police Chief James McElvain to come brief the Council generally on several issues related to officer-involved shootings. Mr. Holmes noted that each of the four incidents is currently under investigation, and as such Chief McElvain's briefing would be more general in nature and stick to known and available facts.

Chief briefed the City Council on the investigation process that follows any such incident and the role of the Regional Major Crimes Team; what occurs with the individual officers involved in such incidents while an investigation is ongoing; the status of and VPD's approach to continually monitoring department policies and updating for best practices; the training of officers and VPD's daily use of de-escalation tactics when they are working in the community; and information about body-worn cameras and what an investment in such technology would mean for the City.

Councilmember Stober expressed condolences to the friends and families of those individuals whose lives had been lost. He suggested this is an opportunity for the City to more pro-actively put together some listening sessions for the community. Mr. Holmes reported that he and the Chief are

discussing putting together some community forums for just that purpose.

Councilmember Paulsen also expressed his condolences to friends and families of those lost, and to the broader community. He noted that the community is safest when there is a strong relationship between the community and law enforcement, and that trust is undermined when these incidents occurs. He said it is good that VPD is continually monitoring its policies, and asked if the department also takes the results of investigations into these incidents and makes adjustments to policies when necessary. Chief McElvain confirmed the department does do that.

Councilmember Hansen also expressed condolences, and urged the Chief and VPD to continue to do the best work possible in the community and to remain committed to transparency.

Adjournment

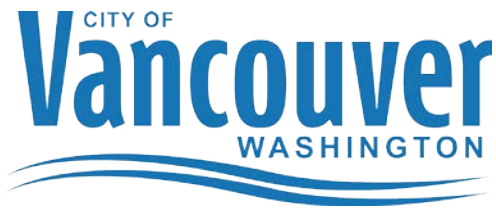
7:33 p.m.

Anne McEnery-Ogle, Mayor

Attest:

Natasha Ramras, City Clerk
By: Carrie Lewellen, Deputy City Clerk

Meetings of the Vancouver City Council are electronically recorded on audio and videotapes. The audio tapes are kept on file in the office of the City Clerk for a period of six years.



Memorandum

DATE: March 26, 2019

TO: Mayor and City Council

FROM: Danell Norby, Community Development Coordinator, Community and Economic Development Department
Bryan Snodgrass, Principal Planner, Community and Economic Development Department

RE: April 1 workshop review of potential zoning code text changes to expand housing choices

CC: Eric Holmes, City Manager

Background

The April 1 workshop is intended to provide an opportunity for Council to review and confirm general direction on initial staff work for development of the potential code changes to increase housing options. The changes follow 2016 Affordable Housing Task Report recommendations to encourage options by allowing alternatives such as cottage housing, corner-lot duplexes, micro and SRO housing, boarding houses, as well as reducing parking requirements to support these. The changes also build on the relative success so far of updates to city ADU standards in 2017 which have led to moderate increases in ADU construction citywide without significant changes to existing residential areas. The potential changes may also capitalize on secondary benefits including efficient development of housing in areas with full existing services, increased ability to age in place, and closer alignment of overall housing supplies with market and demographic trends.

These issues were previously discussed at an October 1, 2018 Council workshop, at which two types of potential code changes were introduced. One was creation of development standards for new single and multi-family zoning districts, which would then be mapped through future zone changes. A second was expansion of the types of housing allowed in existing residential zones. Since that time staff has researched existing and proposed standards in comparable jurisdictions and held an informational meeting with single and multi-family home developers. Public involvement, follow-up developer contacts and ongoing research remains. Staff envisions specific recommendations would be developed in two phases.

- Phase I: Draft standards for the new single and multi-family zoning districts, and new standards for cottage housing in existing residential areas, could be developed and brought forward to hearings in summer or fall 2019.
- Phase II: Potential expanded housing allowances in existing residential areas could be developed in 2020.

Pending Council discussion at the April 1 worksession, staff anticipates a follow-up worksession in summer or fall 2019 to present potential code changes for the Phase I tasks prior to Council hearings, and proposed workplan and scope for Phase II.

Staff contacts are Danell Norby and Bryan Snodgrass in the Department of Community and Economic Development, Danell.Norby@cityofvancouver.us (360) 487-7953, bryan.snodgrass@cityofvancouver.us, (360) 487-7946.

Phase I - New Zoning Districts, and Cottage Housing Standards to be developed in summer/fall 2019

New Single Family District

Currently the densest single family district in Vancouver is the R-9 zone, which allows single family lots averaging 5,000 square feet or more. Smaller individual lots can be created, but only under select circumstances- as part of a very small development under City infill standards, or as part of larger subdivision where large lots offset smaller ones so the minimum average is maintained, and through development of single family lots in multi-family zones. In this last example, single family projects must meet minimum multi-family zone densities, effectively precluding developments averaging larger than 3600 s.f. per lot.

A potential new zoning district allowing single family lots between 2,500 (or less) and 5,000 s.f. would fill this gap. Locations for the new zone are not currently known. Future mapping would occur through future Comprehensive Plan or zoning map designation changes initiated by property owners or by the City, and would require separate public hearings.

The new standards would likely allow a higher lot coverage (the percentage of the lot taken up by the building footprint) than the 50% maximum used in current single family zones. Additional staff work to be completed includes finalizing the lower end of the allowable lot size range; coordination with transportation standards, including use of alleys; relationship and implication of the new zone to the existing R-18 zoning district; and others. Initial developer panel feedback supported development of one or more denser districts, with more flexible requirements for lot widths, lot coverage, and parking.

New Multi-Family District

Vancouver's densest existing multi-family district is the R-35 zone, which allows housing between 30 and 35 units per acre. Denser apartments are allowed in the downtown CX zone, or in mixed use buildings in any of the multi-family and commercial districts provided a first floor non-residential component is included. Using these provisions, a market rate mixed use building at a 70 units per acre density was recently submitted for pre-application near the Fourth Plain corridor. Clark County has an R-43 district, mapped in the Salmon Creek area, which allows up to 43 units per acre.

A potential new zoning district allowing up 50 units per acre could provide an option for higher density development in areas outside of downtown where mixing of uses may not be feasible. Like the new single family zone, locations for the new multi-family zone are not known at this time and future mapping would be undertaken through owner or City-initiated zone changes. Some of this could occur through yearly Annual Review updates, the new Commercial Corridors project

anticipated to conclude in early 2020, or the next full Comprehensive Plan review slated to begin in 2022, all of which will involve public hearings.

Cottage housing standards

Cottage housing, not currently allowed in Vancouver, involves groupings of small homes typically around a small common open space. More units are allowed than by underlying zoning, but the structures are required to be smaller and shorter which typically limit impacts and lowers costs, all within in a layout encouraging communal interactions. Cottage developments are usually platted into individual lots for sale, but can also be located on a single property with units available for rent or condominium sale. Below is an example from Kirkland, Washington.



As noted in Attachment A at the end of this memorandum, cottage housing is allowed in single family zones in many comparable jurisdictions statewide, including locally by Clark County, and the cities of Battle Ground, Ridgefield, and Washougal under relatively similar sets of standards. La Center is in process of developing regulations. No local cottage housing developments have been built yet, but three proposals have recently been approved in Clark County and Ridgefield.

Staff has not drafted specific standards but envisions looking first to best practices of other jurisdictions, particularly local. The density allowances in Clark County and Ridgefield appear sufficient to attract development, while the height and size limitations ensure homes and associated impacts will be well below those of a typical new single family house, which nationally was slightly over 2400 square in size in 2017. If Vancouver standards were developed similar to neighboring jurisdictions, most or all single family zones would be eligible for cottage housing developments, but unlike ADUs, in practice existing development and parcel sizes effectively needed to accommodate the cluster would significantly limit likely applicability. Only approximately 2% of citywide lots zoned for single family development are over 10,000 s.f. in size and vacant.

Initial developer feedback was in support of allowing cottage housing, but with flexibility regarding parking, open space, and height limits, as well as allowance for more units to take

advantages of economies of scale. Platting lots for sale rather than renting or condominium sale was emphasized.

Further work includes the development of specific recommendations for standards for new cottages, common open space, and the amount and location of parking, and whether or how to allow incorporation of an existing home into a cottage development.

Part this work also includes developing a recommended review process for proposed cottage homes. Many other jurisdictions differ to existing processes, which in Vancouver's case would mean that a platted cottage development of 10 or more units on separate lots would require public hearing review and associated notice as a subdivision. A platted development of 9 or fewer lots, or rental or condominium cottages on a single property would be reviewed administratively without a public hearing as a short plat or site plan, but notice of proposals is required to adjacent properties, and decisions can be appealed. Enhanced hearing or notice requirements may be warranted.

Additional related Phase I tasks

Concurrent with the above, staff will also be exploring the following:

- An adjustment to the ADU standards to allow historical garages with non-conforming setbacks to be eligible for conversion to ADUs provided all building, zoning and ADU standards are met. This issue was raised by Council in 2018, and would make various properties in older western Vancouver neighborhoods eligible.
- Options for promoting "visitable" single family homes through educational efforts and/or to changes to City building codes to the extent feasible under state law. Visitability typically refers to homes with features to facilitate aging-in-place, including a zero-step entry, 36 inch wide door frames, and a first floor bathroom.
- Market demand for Single Room Occupancy (SRO) apartments in multi-family zones allowing small units with shared kitchen or bathroom facilities. City standards currently allow SROs, but only as group homes which require a live-in caretaker.

Community outreach to develop the standards for the new single and multi-family zones, cottage housing and other Phase I tasks is anticipated to include city newsletter updates, targeted notice to all neighborhood associations with follow-up presentations on request, web-based information, and a community open house prior to public hearings review.

Phase II – Expanded allowances for other housing types in existing single-family zones in 2020

Existing single family zones account for almost 10,000 acres in Vancouver, almost as much as the multi-family residential, commercial and industrial zones combined. Allowing modest levels of housing diversity in these areas could augment smaller multi-family districts in accommodating efficient long term growth, consistent with policy recommendations from the AHTF report and Comprehensive Plan. Clark County and the cities of Battle Ground, Ridgefield and Washougal currently allow duplexes in all or part of single family zones. Various Washington cities are considering similar or more extensive changes, as indicated in Attachment A. Vancouver's single family zones are more restrictive, although duplexes are allowed as part of small infill developments under VMC 20.920, and other non-traditional uses such as ADUs, attached single family homes, limited mobile homes, and residential care facilities are allowed under various

conditions. Through these allowances and pre-existing development, County Assessor data indicates approximately 3,100 built properties in Vancouver's single family zones have uses other than detached single family out of approximately 40,000 total lots.

A number of regulatory parameters could be considered to target the scope of any changes as desired, including which areas to allow additional flexibility, whether to establish particular size or design requirements, and what form of review process and notice to require. Staff anticipates returning to the Council for a 2020 worksession for discussion and direction on options.

Next steps

Pending Council direction on April 1, staff anticipates returning for a follow up workshop in summer or fall 2019 with recommended code language for the Phase I changes. A 2020 workshop will be scheduled for Council direction and discussion on whether and how to consider potential Phase II changes.

Attachment A: Sample housing options in single family zones in other jurisdictions

Jurisdiction	Duplexes	Tri- and Fourplexes	Cottage Housing
Local			
Clark County	On corner lots in R1-5 and R1-6 zones	Not in SFR zones	100% density bonus; units up to 1 600 s.f., 25' height. Sloped roofs, porches and other design required. Common area 400 s.f. per unit
Battle Ground	Corners in R5, R7 zones. CUP in R7 away from corners.	Not in SFR zones	50% density bonus; units up to 1 200 s.f., 25' height. Sloped roofs and porches required.. Common area 400 s.f. per unit
Camas	CUP in all SFR zones	Not in SFR zones	In commercial zones only
La Center	In all SFR zones	Not in SFR zones	Currently developing standards
Ridgefield	In all SFR zones	Not in SFR zones	100% density bonus; units up to 1 500 s.f., 25' height. Sloped roofs, porches and other design required. Common area 400 s.f. per unit
Washougal	R1-7.5 and R1-5 with side facing entrance, SFR-like roofs and eaves, and features such as dormers or porches	Not in SFR zones	100% density bonus; units up to 1 200 s.f., 25' height. Sloped roofs, porches and other design required. Common area 20% of site
Regional			
Everett	In one SFR zone, R2	Not allowed	In core residential areas only
Gresham	In Transit Low Density Residential. and on corner lots in Transition Residential districts	Not allowed	Not allowed
Kent	In SR-4.5, SR-6, SR-8, and MR-D	Not allowed	Not allowed
Olympia	Yes, except R-4-8	3, 4-plexes in all but environmentally sensitive zones. Townhouses in all residential zones.	20% density bonus; units up to 1 600 s.f., 25' height. Sloped roofs, porches and other design required. Common area 450 s.f. per unit
Portland (currently considering new standards)	Throughout R-2.5 zone, and in other SFR zones on corners and transitional lots	Not currently	Not currently
Spokane	In Residential Two-Family (RTF) and multi-	Attached houses in	20%-40% density bonus; units up to 1 200 s.f., 20 ' height. Porches, pitched roofs and other

	family zones	SFR zones, but not 3- or 4-plexes	design features required.
Tacoma	Not in SFR zones	3-plex allowed in R-2SRD and HMR-SRD with CUP, and in R-3 two-family zone. Multifamily (including 4plex) with CUP under Residential Infill Pilot Program.	50% density bonus; units up to 1200 s.f., 25' height. Sloped roofs, porches and other design required. Common area 300 s.f. per unit

Potential zoning code changes to increase housing options



April 1, 2019

Vancouver City Council Workshop

Danell Norby, Community Development Coordinator
Bryan Snodgrass, Principal Planner

Presentation overview

- Current housing market snapshot
- Background on housing options work
- Project scope and phasing:
 - Phase I - New residential zoning districts, cottage housing standards, and potential additional items related to ADUs, visitability and SROs
 - Phase II - Flexibility in single-family zones
- Next steps and discussion

Purpose

Following up on October 1, 2018 Council workshop, confirm direction on potential zoning code changes to increase housing options, including:

- Phasing of project components
- Emerging recommendations for standards for new residential zones and cottage housing

Related City housing initiatives

Other Affordable Housing Task Force recommendations adopted by Council:

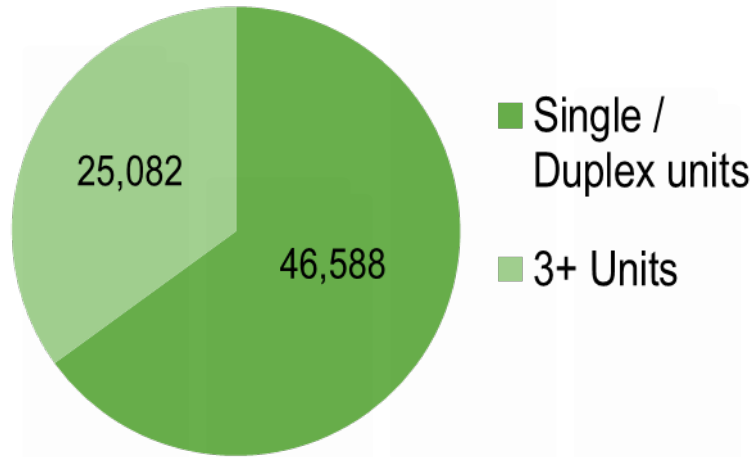
- Creation of Affordable Housing Fund
- Strengthening of Multifamily Tax Exemption program
- Strengthening of Impact Fee Waiver program
- Increased flexibility for ADUs
- Allowances for affordable housing on ground floor in commercial zones

Current market – Vacancy rate

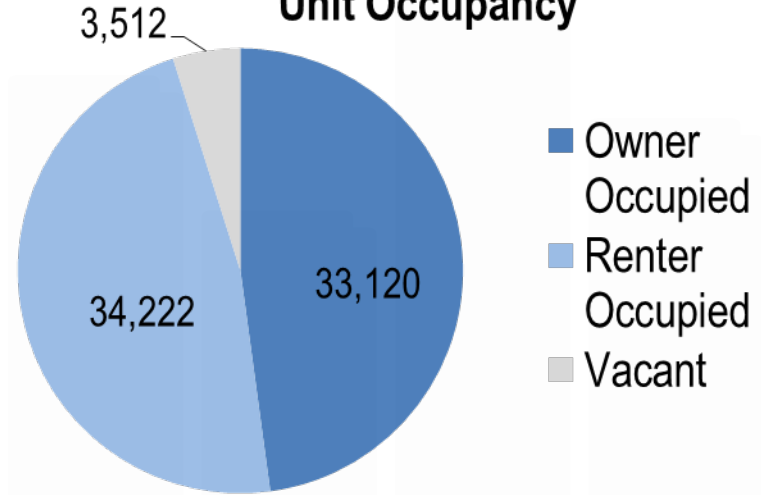
County	Multifamily Vacancy Rate
Clark	4.2%
Washington	5.5%
Clackamas	5.9%
Multnomah	5.9%

Current market – Housing units

Housing Units: 71,670

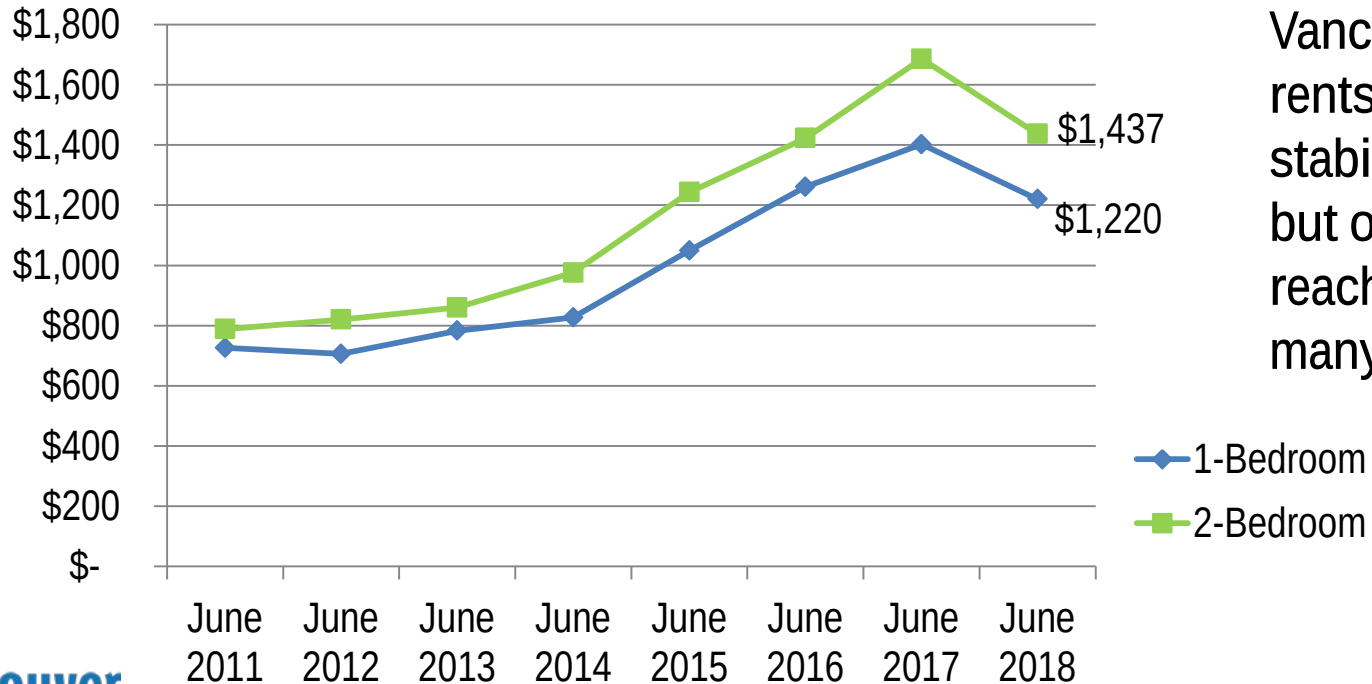


Unit Occupancy



- Approximately equal number of renters and owners
- More single-family units than multifamily units
- Many renters are living in single-family units

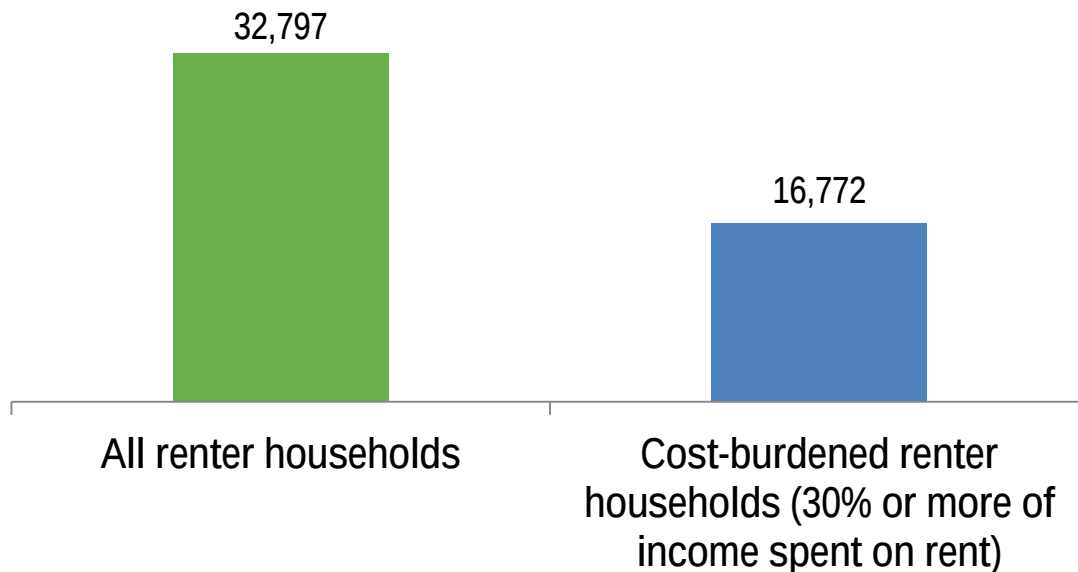
Current market – Median rent



Vancouver rents stabilizing, but out of reach for many

Current market – Housing cost burden

More than half of Vancouver's renter households are cost-burdened



Background on housing options project

- In 2016, Affordable Housing Task Force recommended zone changes to increase housing supply and affordability, including allowing cottage housing, corner-lot duplexes, SRO and boarding homes, and reducing parking requirements
- At October 1, 2018 Council workshop, discussed potential for:
 - Adding higher density single-family and multifamily residential zoning districts, to be mapped through later zone changes
 - Increasing housing options in existing residential zones

Rationale for potential zoning changes

Housing a growing and aging population:

- Vancouver's population grew by more than 23,000 people between 2010 and 2018 (14% increase, average of 8 new residents daily)
- Significant rise in Clark County senior population, with 158% growth in people age 60 and older projected between 2005 and 2030
- Ongoing housing crisis with challenges related to housing availability, affordability and choice
- Meeting housing needs will require accommodating growth within limited land supply

Housing options project – Scope and phasing

Phase I:
2019

New residential zoning
districts

Cottage housing

Explore additional smaller code changes
related to ADUs, visitability, SROs



Phase II:
Starting in 2020

Flexibility in single-
family zones

Process to date

- November 2018 to present
- Internal work group consisting of long range planning, development review and housing staff
- Research on best practices and comparable jurisdictions
- Development of recommended approach for new zoning districts and cottage housing, and general range of potential options for flexibility in single-family zones
- Outreach to developers for feedback on preliminary recommendations on new districts and cottage housing

Benefits of potential zoning changes

- Opportunity to improve housing availability, affordability and choice, and follow AHTF and Comprehensive Plan policy recommendations
- Better alignment of housing stock with changing demographics (smaller households)
- Efficient use of land – incremental growth in areas with existing services
- Opportunities for social interaction and aging in place



Efforts in other jurisdictions

- In comparable jurisdictions as well as smaller Clark County cities, longstanding allowances for:
 - Slightly wider range of housing density options
 - Greater flexibility in single-family residential zones
- Recent efforts to address housing choice in jurisdictions ranging in size from Olympia to Portland and Seattle



City of Olympia adopted code changes through its Missing Middle Housing initiative to address housing choice and affordability

Potential zoning changes – Phase I

New residential zoning districts

New single and multi-family districts allowing housing at higher densities than allowed in current baseline zones



Potential new SFR zone – Vancouver context

- 47% of citywide land zoned for development is for single-family residential (SFR)
- Densest current baseline SFR zone (R-9) allows lots from 5,000 to 7,400 s.f.



Potential new SFR zone – Comparable jurisdictions

Minimum lot size
required in jurisdiction's
densest baseline single-
family zone

Jurisdiction	Minimum lot size
Portland	1,600 s.f.
Olympia	2,000 s.f.
Kent	4,000 s.f.
Spokane	4,350 s.f.
Tacoma	4,500 s.f.
Bellevue	4,700 s.f.
Clark County	5,000 s.f.
Everett	5,000 s.f.
Vancouver	5,000 s.f.

Potential new SFR zone – District standards

- **Current standard:** Densest Vancouver baseline SFR zone allows lots no smaller than 5,000 s.f. (R-9); detached single-family homes also allowed in MFR zones (R-18 and R-22)

	Single-family R-9	Multifamily R-18	Multifamily R-22
Lot size	5,000-7,400 s.f.	1,800 s.f. minimum	1,500 s.f. minimum
Density	5.9-8.7 units/acre	12-18 units/acre	18.1-22 units/acre

- **Emerging recommendation:** Add new SFR zoning district(s) providing for development on lots ranging in size from 5,000 s.f. to 2,500 s.f. (or less)

Potential new SFR zone – Examples

- New SFR zoning district(s) could provide for development on lots ranging in size from 5,000 s.f. to 2,500 s.f. (or less)
- Below: examples of detached single-family homes on lots ranging from approximately 2,000 to 3,300 sq. ft. (built in R-18 MFR zone)



Potential new SFR zone – Other considerations

- Initial developer feedback
 - Support for creation of new zone to help meet demand for smaller, more affordable homes
 - Desire for smaller, narrower lots (min. lot size less than 2,500 s.f.)
 - Consider allowing additional lot coverage when home provides benefits such as affordability, accessibility or design features
- Additional considerations
 - Relationship to multifamily zones, where detached single-family housing of this density is already being developed
 - Design and parking standards

Potential new MFR zone – Vancouver context

- 13% of citywide land zoned for development is for multifamily residential (MFR)
- Densest current MFR baseline zone (R-35) allows 30 to 35 units per acre



Potential new MFR zone – Comparable jurisdictions

Maximum units/acre in
jurisdiction's densest
baseline multifamily zone

Jurisdiction	Max. density (units/acre)
Portland	100
Everett	58
Tacoma	58
Clark County	43
Kent	40
Vancouver	35
Bellevue	30
Olympia	30
Spokane	30

Potential new MFR zone – District standards

- Current standard: Densest Vancouver baseline MFR zone allows up to 35 units per acre (R-35)
- Emerging recommendation: Add new MFR district allowing up to 50 units per acre (R-50)

Note: Multifamily development denser than 35 units/acre already allowed in mixed use zones (with commercial component) and downtown

Potential new MFR zone – Other considerations

- Initial developer feedback
 - Support for creation of new zone
 - Higher cost of construction at this scale (elevator, commercial building code, state prevailing wage, materials, structured parking)
 - Parking reduction needed to make projects feasible
- Suggested parking approach
 - Require 1 space/unit (rather than 1.5 spaces/unit as in other MFR zones)
 - Consider further parking reductions for specific populations (e.g. housing for seniors or people who are homeless)

New zoning districts – Public process

- Public outreach to develop new zoning district standards
 - Neighborhoods – newsletter, mailings, present at meetings on request
 - Open houses
 - Web-based
- Public hearings to adopt new standards
- Zones would be mapped through future processes (Commercial Corridors Strategy, future Comp Plan Update); additional public outreach required
- In the meantime, developers could propose new zone through existing zone change process

Potential zoning changes – Phase I

Cottage housing

Allow clusters of smaller single-family dwellings around a common area at higher density than otherwise allowed in underlying zone



Cottage housing – Comparable jurisdictions

- Not currently allowed in Vancouver
- Allowed in some or all SFR zones in several jurisdictions statewide and locally

	Units allowed	Max. unit size
Clark County	100% bonus up to 12 units	1,600 s.f.
Battle Ground	50% density bonus, 12 units maximum	1,200 s.f.
Ridgefield	100% bonus up to 12/24	1,500 s.f.
Washougal	100% bonus up to 12/24	1,200 s.f.
Kirkland	100% bonus up to 12 per cluster, 24 per development	1,500 s.f.
Olympia	20% bonus	1,600 s.f.
Spokane	20-40% bonus up to 12/24	1,200 s.f.
Tacoma	50% bonus up to 12/24	1,200 s.f.

Cottage housing – Best practices

- Staff to develop recommended standards based on best practices from other jurisdictions and community and stakeholder input
 - Allowed density / cluster size
 - Size and height limitations
 - Parking and open space requirements
 - Land use review process
- Initial developer feedback – Request flexibility regarding configuration of parking, open space, size and number of homes

Cottage housing – Public process

- Public outreach to develop cottage housing standards (in conjunction with process for new zones)
 - Neighborhoods – newsletter, mailings, present at meetings on request
 - Open houses
 - Web-based
- Public hearings to adopt new standards
- Under current standards, public hearing would be required for subdivisions of 10 or more lots, administrative short plat review for less. Additional public process or enhanced development standards may be warranted.

Additional Phase I components

Explore smaller related code changes to address:

- Single room occupancy (SRO) housing with shared kitchen/bath – currently allowed only as group home with caretaker
- ADU update to make non-conforming garages eligible if they meet building and ADU codes
- Visitability/accessibility standards for single-family homes



Potential zoning changes – Phase II

Flexibility in single-family zones

Consider allowing additional
housing types under certain
conditions



Flexibility in single-family zones – Public process

Significant public outreach anticipated to develop and map potential changes

- Neighborhood and stakeholder engagement – in person, web-based, newsletter updates, targeted mailings, present at meetings on request, open houses
- Community advisory committee recommended if scope includes broader range of housing types and options; to include neighborhood associations, developers, affordable housing providers, low-income residents, seniors and other stakeholders
- Public hearings to adopt standards

Overall next steps

- Summer/Fall 2019 – Council workshop with specific recommendations for Phase I:
 - New zoning standards
 - Cottage housing
 - Any SRO/ADU/visitability updates
- Fall 2019 – Public hearings on Phase I
- 2020 – Council workshop to discuss potential Phase II scope

Questions and Discussion

Danell Norby, Community Development Coordinator
danell.norby@cityofvancouver.us, 360-487-7953

Bryan Snodgrass, Principal Planner
bryan.snodgrass@cityofvancouver.us, 360-487-7946





MEMORANDUM

DATE: April 1, 2019

TO: Mayor and City Councilmembers

FROM: Council Committee I (Glover, Hansen and Paulsen)

RE: **RECOMMENDATIONS FOR MID-TERM APPOINTMENT TO THE PARKING ADVISORY COMMITTEE**

CC: Eric J. Holmes, City Manager
Michelle Bartley, Boards & Commissions

The Parking Advisory Committee advises City Council on policy issues related to all city-owned on-street and off-street parking facilities, and makes recommendations on facilities and parking regulations.

Committee 1 recently interviewed six (6) candidates for one vacant mid-term position and recommends appointing Kurt Stonex to a mid-term appointment beginning immediately and expiring January 1, 2022.

If there are no objections, I would like to make this appointment at the **Monday, April 1 2019**, Council meeting.

Attachments:
Applications
Current Roster

VOUCHER APPROVAL

We, the undersigned council members of the City of Vancouver, Clark County, Washington, do hereby certify that the merchandise or services hereinafter specified have been received and that the vouchers listed below are approved for payment in the amount of:

\$ **7,456,145.50** this 1st day of April 2019.

MAYOR

COUNCILMEMBER



AUDITING OFFICER

COUNCILMEMBER

DATE	INCLUSIVE CHECK NUMBERS	CHECK TOTAL
March 19 - March 25	Accounts Payable Checks (see attached)	\$ 4,570,049.40
March 19 - March 25	Visa Refunds (see attached)	\$ 3,129.95
March 19 - March 25	Payroll Checks (see attached)	\$ 2,882,966.15
TOTAL		\$ 7,456,145.50

INVOICE PAYMENTS REPORT

Check Number	Check Date	Amount	Vendor Name	Description
120401	21-Mar-2019	234.00	STATE OF WASHINGTON	***WIRE*** 19MAR - WA STATE CPL FEE - 13 APPLICANTS - VPD
120402	22-Mar-2019	9,897.68	ACTIVE NETWORK INC	***WIRE*** ACTIVENET FEES - 3/1/19-3/17/19 - TREASURY
120403	22-Mar-2019	619,936.34	PNC BANK NATIONAL ASSOCIATION	***WIRE*** PNC PAYMENT TO COVER 03/20/19 STATMENT
120404	22-Mar-2019	33,583.49	PNC BANK NATIONAL ASSOCIATION	***WIRE*** PNC PAYMENT TO COVER 03/20/19 STATMENT
120405	22-Mar-2019	48,146.29	GALLAGHER BASSETT SERVICES INC	***WIRE*** WC TPA GALLAGHER BASSETT SDR FUNDING NOTICE - MESSAGE ID 45378698
120406	25-Mar-2019	187,562.11	BLUE CROSS BLUE SHIELD OF OR	***WIRE*** BLUE CROSS WEEKLY CLAIMS, WEEK 3 OF MARCH
120407	25-Mar-2019	14,317.38	WASHINGTON DENTAL SERVICE	***WIRE*** WDS WEEKLY CLAIMS INVOICE, WEEK 3 OF MARCH
120408	25-Mar-2019	5,781.58	WASHINGTON SDU	***WIRE*** PAYROLL
120409	25-Mar-2019	149,058.03	ICMA CORP	***WIRE*** PAYROLL
120410	25-Mar-2019	11,096.02	ALLEGIANCE BENEFIT PLAN MANAGEMENT	***WIRE*** PAYROLL
120411	25-Mar-2019	13,451.72	WESTERN STATES HEALTH &	***WIRE*** PAYROLL
120412	25-Mar-2019	1,462.30	VANCOUVER FIRE COMMAND OFFICERS	***WIRE*** PAYROLL
120413	25-Mar-2019	6,607.13	ICMA 401A	***WIRE*** PAYROLL
120414	25-Mar-2019	75.00	HRA VEBA PLAN	***WIRE*** PAYROLL
120415	25-Mar-2019	23,691.57	ING	***WIRE*** PAYROLL
120416	25-Mar-2019	61,058.79	STATE OF WASHINGTON 457	***WIRE*** PAYROLL
120417	25-Mar-2019	21,275.00	WASHINGTON STATE FIREFIGHTERS	***WIRE*** PAYROLL
120418	25-Mar-2019	25,011.12	VANCOUVER FIREFIGHTERS UNION HEALTH	***WIRE*** PAYROLL
600862	19-Mar-2019	1,001.98	A-CHECK AMERICA INC	CUST 00178340-0000 - 19FEB - EMPLOYMENT SCREENING SERVICES - HR
600862	19-Mar-2019	1,305.50	A-CHECK AMERICA INC	CUST 00178340-0000 - 19JAN - EMPLOYMENT SCREENING SERVICES - HR
600863	19-Mar-2019	900.78	A LINE ASPHALT MAINTENANCE INC	SUMMARY: 19FEB - MAINTENANCE RATED SWEEP
600864	19-Mar-2019	8,450.00	ACS FIRM DBA AVIATION CAREER SERVICES	AIRPORT MANAGER EXECUTIVE SEARCH - INSTALLMENT 3 - PEARSON AIRPORT - CMO
600865	19-Mar-2019	544.60	ACTION TECHNOLOGY SYSTEMS	ACCT 810076 - TICKET #44826 - SVC CALL TO CK VAULT TAMPERS & REPAIR - 02/12/19 - FIRE STATION 6 - OP CENTER - RECEIPT 140840 BY P NEWTON
600865	19-Mar-2019	289.32	ACTION TECHNOLOGY SYSTEMS	ACCT 810076 - TICKET #44900 - INSTALLED ALARM CODES - 02/12/19 - VANCOUVER NAVIGATION CENTER - 2018 GRAND BLVD - OP CENTER - RECEIPT 140839 BY P NEWTON
600865	19-Mar-2019	374.41	ACTION TECHNOLOGY SYSTEMS	ACCT 810093 - TRAINING OF STAFF ON CORRECT OPERATION OF PANIC BUTTONS - THRU 03/06/19 - FIRSTENBURG COMM CTR - 700 NE 136TH AVE - OP CENTER
600865	19-Mar-2019	2,157.91	ACTION TECHNOLOGY SYSTEMS	ACCT 810805 - INSTALL NEW SILENT KNIGHT POWER SUPPLY/SURGE SUPPRESSOR - 02/19/19 - TOWN PLAZA - 5411 E MILL PLAIN - OP CENTER - RECEIPT 140549 BY P NEWTON PER E-MAIL
600865	19-Mar-2019	289.32	ACTION TECHNOLOGY SYSTEMS	ACCT 810806 - PROGRAMMING SERVICES - THRU 03/06/19 - CLARK COUNTY HISTORICAL MUSEUM - 1511 MAIN ST - OP CENTER
600866	19-Mar-2019	27.33	AIRGAS NOR PAC INC	PAYER 2363679 - SHIP TO 2335879 - COMPRESSED GAS - 02/20/19 - FIRE STATION 5
600866	19-Mar-2019	2.98	AIRGAS NOR PAC INC	PAYER 2363679 - SHIP TO 2335879 - COMPRESSED GAS - 02/28/19 - FIRE STATION 5
600866	19-Mar-2019	71.68	AIRGAS NOR PAC INC	PAYER 2363679 - SHIP TO 2335879 - COMPRESSED GAS - 03/05/19 - FIRE STATION 5
600867	19-Mar-2019	14,415.25	ALLEGIANCE BENEFIT PLAN MANAGEMENT	RETIRED LEOFF 1 POLICE MEDICAL CLAIMS
600868	19-Mar-2019	29.00	Allison, Adam William	CONV CTR PARKING REIMBURSEMENT
600869	19-Mar-2019	283.50	ALTA PLANNING & DESIGN	PROJ 00-2018-216 - VEHICULAR WAYFINDING - THRU 02/28/19 - CDD - RECEIPT 141071 BY K HULL PER E-MAIL
600870	19-Mar-2019	100.00	AMERICAN MEDICAL RESPONSE NORTHWEST INC	TRIP 5672158 - MEDICAL SERVICE/BLOOD DRAW - 19FEB - VPD

INVOICE PAYMENTS REPORT

Check Number	Check Date	Amount	Vendor Name	Description
600871	19-Mar-2019	475.00	AMEX PRODUCTS INC	19FEB - MEDICAL TESTING SERVICES - HR
600872	19-Mar-2019	1,774.03	AMICA MUTUAL INSURANCE CO	60003241579 LIABILITY CLAIM SETTLEMENT PAYMENT TO THIRD PARTY INSURER FOR PROJECT 922889
600873	19-Mar-2019	43.20	Andersen, Peik	STATION MOVES
600874	19-Mar-2019	1,032.80	ARAMARK UNIFORM SERVICES INC	SUMMARY: MAT/TOWEL/COVERALL CLEANING - MULTIPLE LOCATIONS
600875	19-Mar-2019	563.68	ARBORSCAPE LTD INC	02/28/19 - REMOVE HANGERS IN MEDIAN TREE - E MILL PLAIN @ BRANDT RD - OPS
600875	19-Mar-2019	222.22	ARBORSCAPE LTD INC	03/04/19 - REMOVE SMALL TREE GROWING HORIZONTAL - WATER WORKS PARK - OPS
600875	19-Mar-2019	555.55	ARBORSCAPE LTD INC	03/05/19 - REMOVE CHERRY TREES - 2 EA - SE GRAND @ SE 20TH - OP CENTER
600875	19-Mar-2019	10,677.40	ARBORSCAPE LTD INC	03/05/19 - REMOVE DEAD TREES/PRUNING - HAAGEN PARK - OP CENTER
600875	19-Mar-2019	7,382.04	ARBORSCAPE LTD INC	03/05/19 - REMOVE TREE OF HEAVEN/TRIMMING SERVICES - WINTLER PARK - OPS
600875	19-Mar-2019	1,409.20	ARBORSCAPE LTD INC	03/07/19 - TRIM OVERHANGING TREES/REMOVE CHERRY TREE - 5400 NE 22ND AVE - URBAN FORESTRY
600876	19-Mar-2019	151.66	ARCHAEOLOGICAL SERVICES OF CLARK COUNTY LLC	PROJ 19786-CHRISTENSEN RES - COV PRED REPORT REVIEW - 02/05/19-03/08/19 - PREDETERMINATION REVIEW/REPORT - DRS - RECEIPT 141036 BY M RYAN PER E-MAIL
600876	19-Mar-2019	130.16	ARCHAEOLOGICAL SERVICES OF CLARK COUNTY LLC	PROJ 19794-WALNUT GROVE ELEM - COV PRED REPORT REVIEW - 02/27/19-03/08/19 - PREDETERMINATION REVIEW/REPORT - DRS - RECEIPT 141037 BY M RYAN PER E-MAIL
600877	19-Mar-2019	159.25	ASHLEY WEBB DBA AWTRANSCRIBES	SUMMARY: TRANSCRIPTION SERVICES
600878	19-Mar-2019	86.46	AT&T MOBILITY II LLC	ACCT 287238238360 - 1/17/19-2/16/19 - WIRELESS - IT
600879	19-Mar-2019	10,458.48	AT&T MOBILITY II LLC	ACCT #287256310986 - 02/5/19-3/4/19 - CELL PHONE WIRELESS CHARGES - OPS CENTER
600880	19-Mar-2019	27.60	AUTO WHEEL SERVICE INC	ACCR18 - CUST 02554 - REF 922373 - PARTS FOR VEHICLE REPAIRS - EQUIP SERVICES
600881	19-Mar-2019	611.34	Bachleder, Louis J	FLAMMABLE LIQUID EMERGENCIES TRANSPORTED BY RAIL - PUEBLO CO
600882	19-Mar-2019	2,028.00	BERGER ABAM INC	PROJ A18.0064.00 - 6TH STREET GATEWAY - THRU 02/22/19 - ECON DEV - RECEIPT 140937 BY M RYAN PER E-MAIL
600883	19-Mar-2019	10,000.00	BICKMORE & ASSOCIATES INC	ACCR18 - ACTUARIAL CONSULTING SERVICES - THRU 12/31/18 - RISK
600884	19-Mar-2019	37.94	BIKE CLARK COUNTY	ACCT 197 - BICYCLE PARTS/REPAIRS - THRU 02/28/19 - VPD
600885	19-Mar-2019	1,023.33	BOUND TREE MEDICAL LLC	SUMMARY: ACCT 109894 - MEDICAL SUPPLIES - FIRE
600886	19-Mar-2019	39.32	BRIDGE CHIROPRACTIC 4 LLC	LIABILITY CLAIM MEDICAL RECORDS FEE FOR PROJECT 922867 - K MONETTE - DOL: 11/03/18 - RISK
600887	19-Mar-2019	380.00	BRIDGEPORT RETAIL CENTER LLC	REFUND ON PERMIT CMI-258015
600888	19-Mar-2019	1,409.20	BRIGHTVIEW HOLDINGS INC	CUST 19006592 - JOB 474300023 - GRAFFITI REMOVAL - 19JAN - WATERFRONT PARK & GRANT ST PIER - PARKS ADMIN
600888	19-Mar-2019	7,273.64	BRIGHTVIEW HOLDINGS INC	CUST 19006592 - JOB 474300023 - MONTHLY JANITORIAL SERVICES - WATERFRONT PARK & GRANT ST PIER - PARKS ADMIN
600889	19-Mar-2019	9,224.05	BROADWAY INVESTORS LLC	APR 19 DOMESTIC VIOLENCE LEASE
600890	19-Mar-2019	2,682.00	BSK ASSOCIATES	SUMMARY: WO MULTIPLE - SAMPLE TESTING SERVICES
600891	19-Mar-2019	19,608.42	C&J CONTRACTING LLC	INV 1051 - PEDESTRIAN WAYFINDING PH II - EST 2 - THRU 03/15/19
600891	19-Mar-2019	16,260.00	C&J CONTRACTING LLC	SYNTHETIC TURF BATTER BOXES - THRU 03/14/19 - PARKS
600892	19-Mar-2019	5,042.18	CASCADE CENTERS INC	PROJ EAP AB - MONTHLY EMPLOYEE ASSISTANCE PROGRAM - 19MAR - HR - RECEIPT 141077 BY A BAFUS PER E-MAIL
600893	19-Mar-2019	7,573.04	CECO INC	SUMMARY: FUEL PURCHASES - OPS/FIRE
600894	19-Mar-2019	8,447.28	CENTENNIAL CONTRACTORS ENTERPRISES, INC.	2018 CURB RAMPS FOR RESURFACING - EST 2 - THRU 02/20/19
600894	19-Mar-2019	2,445.67	CENTENNIAL CONTRACTORS ENTERPRISES, INC.	CITY HALL HYDRONIC PUMPS - EST 2 - THRU 02/20/19
600894	19-Mar-2019	40,562.64	CENTENNIAL CONTRACTORS ENTERPRISES, INC.	FIRE STATION 4 KITCHEN REMODEL - EST 1 - THRU 02/20/19
600894	19-Mar-2019	78,728.46	CENTENNIAL CONTRACTORS ENTERPRISES, INC.	MILL PLAIN BLVD-104TH TO CHKLOV DR - EST 2 - THRU 02/20/19

INVOICE PAYMENTS REPORT

Check Number	Check Date	Amount	Vendor Name	Description
600894	19-Mar-2019	19,131.53	CENTENNIAL CONTRACTORS ENTERPRISES, INC.	ORCHARDS PUMP STATION EMERGENCY SHOWER - INV 1 - THRU 02/20/19
600894	19-Mar-2019	6,569.28	CENTENNIAL CONTRACTORS ENTERPRISES, INC.	PORT OF VANCOUVER LIFT STATION - INV 1 - THRU 02/20/19
600894	19-Mar-2019	1,991.57	CENTENNIAL CONTRACTORS ENTERPRISES, INC.	VANCOUVER BOATHOUSE RENOVATIONS - EST 6 - THRU 02/20/19
600894	19-Mar-2019	1,538.44	CENTENNIAL CONTRACTORS ENTERPRISES, INC.	WATER STATION 7 FENCE REPAIR - EST 1 - THRU 02/20/19
600894	19-Mar-2019	3,184.08	CENTENNIAL CONTRACTORS ENTERPRISES, INC.	WATER STATION ROOFING PROJECT - EST 4 - THRU 02/20/19
600895	19-Mar-2019	12,039.50	CENTURY WEST ENGINEERING CORP	PROJ 41004.011.01 - 2018 PEARSON AIRPORT IMPROV - THRU 02/22/19 - CONSTRUCTION
600896	19-Mar-2019	7,109.00	CFM STRATEGIC COMMUNICATIONS INC	PROFESSIONAL SVCS - THRU 02/28/19 - CMO - RECEIPT 140825 BY K PECK PER E-MAIL
600896	19-Mar-2019	2,500.00	CFM STRATEGIC COMMUNICATIONS INC	PROFESSIONAL SVCS - THRU 02/28/19 - CMO - RECEIPT 140826 BY K PECK PER E-MAIL
600896	19-Mar-2019	4,000.00	CFM STRATEGIC COMMUNICATIONS INC	VANCOUVER STRONG - STRATEGIC PUBLIC AFFAIRS/COMMUNICATIONS - THRU 02/28/19 - CMO - RECEIPT 140831 BY K PECK PER E-MAIL
600897	19-Mar-2019	5,165.65	CH2M HILL INC	CUST 003143 - PROJ 694155 - DESIGN THE SCADA IMPROVEMENTS FOR STATION 9 - THRU 02/22/19 - MP ENG - RECEIPT 140841 BY MP ENG
600898	19-Mar-2019	507.74	Chambers, Robert Charles	FLAMMABLE LIQUID EMERGENCY TRANSPORTED BY RAIL - PUEBLO CO
600899	19-Mar-2019	150.00	CHARLES PARDUE II	03/08/19 - MUSICAL ENTERTAINMENT - 50 AND BETTER DANCE - PARKS ADMIN
600900	19-Mar-2019	391.85	CIOX HEALTH LLC	LIABILITY CLAIM MEDICAL RECORDS REQUEST - COPY FEES - CUST 2184720 - J SANDERS - 02/26/19 - RISK
600901	19-Mar-2019	11.69	CITY OF PORTLAND	ACCT 504443 - TELECOMM SERVICES - 19FEB - VPD
600902	19-Mar-2019	1,212.75	CITY OF VANCOUVER POLICE TRAVEL FUND	TO REIMB. CHECKS WRITTEN AGAINST POLICE TRAVEL ADVANCE FUNDS.
600903	19-Mar-2019	61.53	CLACKAMAS ELECTRIC INC	REFUND PERMIT MPE-249473
600904	19-Mar-2019	130.00	CLARK CO UTILITIES COORDINATING COUNCIL	2019 CCUCC MEMBERSHIP - OPS CENTER
600905	19-Mar-2019	7,688.07	CLARK COUNTY PAVING INC	EXCAVATION/ROOT REMOVAL UNDER ASPHALT/GRADING - THRU 01/24/19 - HERITAGE PARK - PARKS ADMIN
600906	19-Mar-2019	328,398.50	CLARK PUBLIC UTILITIES	SUMMARY: ELECTRICITY AND WATER - MULTIPLE LOCATIONS
600917	19-Mar-2019			
600918	19-Mar-2019	352.92	CLARK REGIONAL EMERGENCY SERVICES AGENCY	GRANT 620095 - STATEWIDE DUI - 01/20/19 - C DEERING - VPD - RECEIPT 140943 BY A CARMAN PER E-MAIL
600919	19-Mar-2019	3,693.50	COLUMBIA CLAIMS SERVICE INC	FILE V119-1011 - CLAIMS ADJUSTER SERVICES - THRU 02/22/19 - RISK
600919	19-Mar-2019	2,880.50	COLUMBIA CLAIMS SERVICE INC	FILE V119-1012 - CLAIMS ADJUSTER SERVICES - THRU 03/11/19 - RISK
600920	19-Mar-2019	6,095.85	COLUMBIA RESOURCE COMPANY	ACCT 130625 - 19FEB - DISPOSAL FEE - OPS CENTER
600920	19-Mar-2019	1,174.79	COLUMBIA RESOURCE COMPANY	ACCT 130635 - 19FEB - CODE COMPLIANCE DISPOSAL FEE - SHAREHOUSE TALKIN TRASH - SOLID WASTE
600921	19-Mar-2019	1,147.30	COMCAST CABLE COMMUNICATIONS	SUMMARY: COMCAST SERVICE - MULTIPLE LOCATIONS
600922	19-Mar-2019	14,517.17	COMCAST CABLE COMMUNICATIONS	INTERNET CHARGES AT MULTIPLE LOCATIONS - IT
600923	19-Mar-2019	21,646.11	COMPASS MINERALS AMERICA INC	SUMMARY: CUST 537542 - PROD 2285396 - 166.24 TONS - OPS CENTER
600924	19-Mar-2019	9,116.45	CORE & MAIN LP	SUMMARY: ACCT 110866 - PARTS - OPS CENTER
600925	19-Mar-2019	472.10	CORPORATE TRANSLATION SVCS INC	SUMMARY: INTERPRETER SERVICES - 19JAN, FEB, MAR - VPD
600926	19-Mar-2019	572.00	COURIER NORTHWEST INC	SUMMARY: 19JAN, FEB - MONTHLY COURIER SERVICES - MAILROOM
600927	19-Mar-2019	120.00	CRAIG MENDENHALL DBA AMERICAN SANI-CAN	SUMMARY: JAN/FEB - WEEKLY PUMPING SERVICES - OP CENTER
600928	19-Mar-2019	336.04	CUES INC	SO 000683937 NW182 TRUCK REPAIR - STORMWATER VAN
600929	19-Mar-2019	21,341.15	CUMMINS NORTHWEST INC	CUST 2595056 - PROJ 24858 - CUMMINS GENERATOR - SER A190489446 - 1 EA - MP ENG

INVOICE PAYMENTS REPORT

Check Number	Check Date	Amount	Vendor Name	Description
600929	19-Mar-2019	1,958.53	CUMMINS NORTHWEST INC	CUST 2595056 - PROJ 24858 - CUMMINS TRANSFER SWITCH - SER A19M486198 - 1 EA
600930	19-Mar-2019	2,750.95	CYBERSOURCE CORPORATION	19FEB - CREDIT CARD SERVICES - TREASURY - RECEIPT 141052 BY C ALLEMANG PER E-MAIL
600930	19-Mar-2019	2,804.23	CYBERSOURCE CORPORATION	19JAN - CREDIT CARD SERVICES - TREASURY - RECEIPT 141050 BY C ALLEMANG PER E-MAIL
600931	19-Mar-2019	950.00	DANIEL HANES	RE-FELT POOL TABLES (2 EA)/REPAIR AIR HOCKEY TABLE - THRU 03/11/19 - FIRSTENBURG COMM CTR - RECEIPT 140941 BY A THOMPSON PER E-MAIL
600932	19-Mar-2019	1,205.00	DAVID COREY PHD PC	PRE-OFFER ASSESSMENTS (7 EA)/POST-OFFER EVALUATIONS (2 EA) - THRU 02/20/19 - VPD - RECEIPT 140579 BY A CARMAN PER E-MAIL
600933	19-Mar-2019	361.06	DEL SOL INC	19FEB - EXTRA JANITORIAL SERVICES - MULTIPLE CITY LOCATIONS - OP CENTER
600933	19-Mar-2019	81,471.51	DEL SOL INC	19FEB CONTR 9-666 JANITORIAL SERVICES - MULTIPLE LOCATIONS - RECEIPT 140778
600934	19-Mar-2019	52,610.56	DELL MARKETING LP	CUST 4451931 - ORDER 446386996 - POWEREDGE R740 SERVER - 3 EA - 01/15/19 - IT
600935	19-Mar-2019	23.30	DEPT OF LABOR AND INDUSTRIES	ACCR18 - 2018-2020 BOILER CERTIFICATION FEE - SLOCUM HOUSE - 605 ESTHER ST - 1 VESSEL - INSPECTION DATE 11/13/18 - OP CENTER - RECEIPT 140949 BY P NEWTON PER E-MAIL
600936	19-Mar-2019	14,541.86	DKS ASSOCIATES	PROJ 19017-000 - VANCOUVER MILL PLAIN COMPLETE STREETS ANALYSIS - THRU 02/28/19 - CED - RECEIPT 140942 BY M RYAN PER E-MAIL
600937	19-Mar-2019	11,700.00	DONNA L SKOGSTAD	PARCEL 164958000 - REAL PROPERTY VOUCHER - NE 112TH AVE SIDEWALK - 321 NE 112TH AVE - EASEMENTS/IMPROVEMENTS - 19MAR - CONSTRUCTION
600938	19-Mar-2019	898.67	Doria, Merce D	INTERNATIONAL EROSION CONTROL ASSOCIATION - POST TRAVEL
600939	19-Mar-2019	372.64	Dorszynski, Dale W (Weston)	LSAW ANNUAL CONFERENCE - POST TRAVEL
600940	19-Mar-2019	749.39	Dybdahl, Emily L	WORKDAY TRAINING
600941	19-Mar-2019	7,155.39	EAGLE WEB PRESS	SUMMARY: MESSENGER POSTAGE- MESSENGER INSERTS/MAIL PROCESSING - 19MAR - MEDIA SERVICES
600942	19-Mar-2019	13,194.00	EARTH CONTACT PRODUCTS	CUST 000637 - LIGHT POLE FND - 40 TOTAL - OPS CENTER
600943	19-Mar-2019	583.70	ELISA MARIA TIMMS	SPRING 2019 - BROADWAY KIDS - THE JUNGLE BOOK - PARKS
600944	19-Mar-2019	50.00	EMERALD SERVICES INC	ACCT C136684 - DISPOSAL OF SPENT FLUIDS FOR 2019 - EQUIP SERVICES
600945	19-Mar-2019	264.00	EMERGENCY ROOMS PS	SUMMARY: MEDICAL TESTING SERVICES - LAB - HR
600946	19-Mar-2019	955.04	ENVIROISSUES INC	PROJ 158-002-0C7 - VANCOUVER 2019 CHARTER REVIEW COMMITTEE - THRU 02/28/19 - CMO
600947	19-Mar-2019	3,034.59	EPIC LAND SOLUTIONS INC	PROJ 0811 - ON-CALL RIGHT-OF-WAY SERVICES - EVERGREEN TRAIL - THRU 02/10/19 - TRANSPORTATION
600947	19-Mar-2019	3,004.81	EPIC LAND SOLUTIONS INC	PROJ 0827 - ON-CALL RIGHT-OF-WAY SERVICES - NE 137TH AVE CORRIDOR COMPLETION PROJECT - THRU 02/10/19 - TRANSPORTATION
600948	19-Mar-2019	8,236.87	ESTHER SHORT COMMONS LLP	APR 19 ESTHER SHORT RETAIL SPACE
600949	19-Mar-2019	850.00	EXAMWORKS INC	CUST 1-BMWHT - MANDATORY INSURER REPORTING - 19FEB - RISK
600949	19-Mar-2019	850.00	EXAMWORKS INC	CUST 1-BMWHT - MANDATORY INSURER REPORTING - 19MAR - RISK
600950	19-Mar-2019	2,382.75	FERGUSON ENTERPRISES INC	CUST 51216 ORDER 91841 - OPERATING SUPPLIES - OPS CENTER
600951	19-Mar-2019	53.13	Fields, James B	GAS REIMBURSEMENT
600952	19-Mar-2019	1,410.00	FLOWING SOLUTIONS LLC	VANCOUVER GROIN - THRU 03/04/19 - PARKS
600953	19-Mar-2019	54,635.40	FRIENDS OF TREES	02/09/19-02/23/19 - FORESTRY SERVICES - RIGHT-OF-WAY & PRIVATE PLANTING/PRUNING SERVICES - URBAN FORESTRY
600954	19-Mar-2019	40.69	FRONTIER COMMUNICATIONS	ACCT 253-007-9377-072604-5 - 03/10/19-04/09/19 - FISHERS GROVE LIFT STATION
600955	19-Mar-2019	7,015.00	GALLAGHER BASSETT SERVICES INC	CONTR 00423500108 - CLIENT C004235000 - MONTHLY CLAIMS ADMINISTRATION SERVICE FEES - 03/31/19-04/29/19 - RISK - RECEIPT 140933 BY S LIGGIONS PER E-MAIL
600955	19-Mar-2019	1,919.77	GALLAGHER BASSETT SERVICES INC	CONTR 00423500206 - CLIENT C004235000 - BILL ON ACTUAL PER CLAIM - 02/01/19-02/28/19 - RISK
600955	19-Mar-2019	50.83	GALLAGHER BASSETT SERVICES INC	CONTR 00423500206 - CLIENT C004235000 - BILL ON ACTUAL PER CLAIM - RISK
600956	19-Mar-2019	2,003.86	GALLS LLC	SUMMARY: FIRE UNIFORM - FIRE

INVOICE PAYMENTS REPORT

Check Number	Check Date	Amount	Vendor Name	Description
600957	19-Mar-2019	8,503.44	GB MANCHESTER INC	WO 5171 - QUOTE 23 - INSTALL NEW WIRELESS ACCESS POINTS AT CITY LOCATIONS - IT
600958	19-Mar-2019	1,403.78	GENERAL PACIFIC	CUST 101952 ORD 1188081 WATER DIVISION
600959	19-Mar-2019	139.20	GENUINE PARTS COMPANY	CUST 7970 - 19FEB - PARTS FOR VEHICLE AND EQUIPMENT REPAIRS - EQUIP SERVICES
600959	19-Mar-2019	326.86	GENUINE PARTS COMPANY	CUST 7970 - CR19FEB - PARTS FOR VEHICLE AND EQUIPMENT REPAIRS - EQUIP SERVICES
600960	19-Mar-2019	2,523.28	GEORGE ELEVATOR SERVICE LLC	19MAR - MONTHLY ELEVATOR MAINTENANCE - MULTIPLE CITY LOCATIONS - OP CENTER - RECEIPT 140759 BY P NEWTON PER E-MAIL
600961	19-Mar-2019	35,871.58	GGLO LLC	PROJ 2018013.01 - CREATE HEIGHTS SUBAREA PLAN - THRU 01/31/19 - LRP - RECEIPT 141098 BY M RYAN PER E-MAIL
600962	19-Mar-2019	34.00	GILBARCO INC	CUST 111450 - SO SG0843270 - MONTHLY INSPECTION OF FUEL TANK AT PEARSON AIRPORT - 19JAN - CMO
600962	19-Mar-2019	36.86	GILBARCO INC	CUST 111450 - SO SG0875644 - MONTHLY INSPECTION OF FUEL TANK AT PEARSON AIRPORT - 19FEB - CMO
600963	19-Mar-2019	258.75	GINA L ARMSTRONG	02/19/19 - TRANSCRIPTION SERVICES - COV V MOON - CASE 8Z0760784 - INDIGENT SERVICES - CMO
600963	19-Mar-2019	164.25	GINA L ARMSTRONG	02/27/19 - TRANSCRIPTION SERVICES - COV V MOON - CASE 8Z0760784 - INDIGENT SERVICES - CMO
600964	19-Mar-2019	403.20	GLOBAL TRANSPORTATION ENGINEERING CORP	PROJ P18-173 - ON-CALL TRAFFIC ENG SERVICES - 19FEB - MP ENG
600965	19-Mar-2019	1,281.31	GORDIAN GROUP	ACCR18 - PROJ 4583 - DAY CENTER (DFW) GENERAL REPAIR PROJECT SUPPL- JOB ORDER CONTRACTING PROGRAM CONSULTANT - NTP 12/11/18 - PROCUREMENT
600965	19-Mar-2019	252.92	GORDIAN GROUP	ACCR18 - PROJ 4583 - FIRE STATION 5 DUCT CLEANING SUPPL - JOB ORDER CONTRACTING PROGRAM CONSULTANT - NTP 05/31/18 - PROCUREMENT
600965	19-Mar-2019	214.81	GORDIAN GROUP	ACCR18 - PROJ 4583 - FIRE STATION 7 SEPTIC TANK SERVICE - JOB ORDER CONTRACTING PROGRAM CONSULTANT - NTP 09/12/18 - PROCUREMENT
600965	19-Mar-2019	391.74	GORDIAN GROUP	ACCR18 - PROJ 4583 - FIRE STATION 8 HVAC REPLACEMENT/ROOF ACCESS DOOR SUPPL - JOB ORDER CONTRACTING PROGRAM CONSULTANT - NTP 03/01/17 - PROCUREMENT
600965	19-Mar-2019	2,573.43	GORDIAN GROUP	ACCR18 - PROJ 4583 - SHARED ENCLOSURES IN DOWNTOWN AREA SUPPL - JOB ORDER CONTRACTING PROGRAM CONSULTANT - NTP 07/10/18 - PROCUREMENT
600965	19-Mar-2019	73.28	GORDIAN GROUP	ACCR18 - PROJ 4583 - STATION 7 FENCE REPAIR - JOB ORDER CONTRACTING PROGRAM CONSULTANT - NTP 12/26/18 - PROCUREMENT
600965	19-Mar-2019	6,716.70	GORDIAN GROUP	ACCR18 - PROJ 4583 - TOWN PLAZA MAINTENANCE/ABATEMENT SUPPL - JOB ORDER CONTRACTING PROGRAM CONSULTANT - NTP 12/21/18 - PROCUREMENT
600965	19-Mar-2019	1,536.31	GORDIAN GROUP	ACCR18 - PROJ 4583 - WREC RESTROOM REMODEL SUPPL CARPET REPLACEMENT - JOB ORDER CONTRACTING PROGRAM CONSULTANT - NTP 11/05/18 - PROCUREMENT
600965	19-Mar-2019	1,838.24	GORDIAN GROUP	PROJ 4583 - 2019 CITY LANDSCAPING SERVICES PROJECT - JOB ORDER CONTRACTING PROGRAM CONSULTANT - NTP 02/26/19 - PROCUREMENT
600965	19-Mar-2019	1,727.72	GORDIAN GROUP	PROJ 4583 - 28TH ST BURTON ROAD FIBER REPAIR - JOB ORDER CONTRACTING PROGRAM CONSULTANT - NTP 01/29/19 - PROCUREMENT
600965	19-Mar-2019	675.36	GORDIAN GROUP	PROJ 4583 - FIRSTENBURG FLOOR HEAT RETURN SUPPL ADDL PIPING - JOB ORDER CONTRACTING PROGRAM CONSULTANT - NTP 03/05/19 - PROCUREMENT
600965	19-Mar-2019	979.48	GORDIAN GROUP	PROJ 4583 - HVAC FILTER CHANGING BLAIRCO INVOICING - JOB ORDER CONTRACTING PROGRAM CONSULTANT - NTP 02/21/19 - PROCUREMENT
600965	19-Mar-2019	2,006.66	GORDIAN GROUP	PROJ 4583 - LUEPKE/MARSHALL GENERATOR PROJ SUPPL FUEL POLISHER - JOB ORDER CONTRACTING PROGRAM CONSULTANT - NTP 02/25/19 - PROCUREMENT
600965	19-Mar-2019	14,213.27	GORDIAN GROUP	PROJ 4583 - MARSHALL GENERATOR PROJECT - JOB ORDER CONTRACTING PROGRAM CONSULTANT - NTP 02/15/19 - PROCUREMENT

INVOICE PAYMENTS REPORT

Check Number	Check Date	Amount	Vendor Name	Description
600965	19-Mar-2019	855.54	GORDIAN GROUP	PROJ 4583 - MARSHALL WINDOW PROJ SUPPL ENGINEERING/COLUMN REPAIR AT WINDOWS - JOB ORDER CONTRACTING PROGRAM CONSULTANT - NTP 02/12/19 - PROCUREMENT
600965	19-Mar-2019	641.85	GORDIAN GROUP	PROJ 4583 - PEARSON AIRPORT SKYLIGHT/ROOF REPAIR - JOB ORDER CONTRACTING PROGRAM CONSULTANT - NTP 01/30/19 - PROCUREMENT
600965	19-Mar-2019	759.20	GORDIAN GROUP	PROJ 4583 - SEWER ENGINEERING BREAKROOM CONVERSION - JOB ORDER CONTRACTING PROGRAM CONSULTANT - NTP 01/29/19 - PROCUREMENT
600965	19-Mar-2019	875.83	GORDIAN GROUP	PROJ 4583 - SEWER ENGINEERING REMODEL - JOB ORDER CONTRACTING PROGRAM CONSULTANT - NTP 01/30/19 - PROCUREMENT
600966	19-Mar-2019	62,781.96	GRIDSMART TECHNOLOGIES INC	GRIDSMART TRADITIONAL CAMERA ADVANCED SOLUTION/RELATED EQUIPMENT - 2 EA - OP CENTER
600967	19-Mar-2019	7,123.56	GVP VENTURES INC	EXECUTIVE SEARCH SERVICES - CLERICAL SUPPORT - THRU 02/18/19 - HR - RECEIPT 140953 BY A BAFUS PER E-MAIL
600968	19-Mar-2019	44.00	H&H WOOD RECYCLERS INC	ACCT 10-0000006 - THRU 02/15/19 - TREE RECYCLING - GROUNDS - OPS CENTER
600969	19-Mar-2019	13,183.34	HALBERT CONSTRUCTION LLC	INV 835-91431-1 - EVERGREEN ESTATES CURB REPLACEMENT - EST 1 - THRU 02/28/19
600969	19-Mar-2019	36,268.86	HALBERT CONSTRUCTION LLC	INV 836-91335-1 - BURTON ROAD FIBER REPAIR - EST 1 - THRU 02/28/19
600969	19-Mar-2019	21,426.27	HALBERT CONSTRUCTION LLC	INV 838-89272-1 - MARSHALL SOUTH POOL WINDOW REPLACEMENT PROJECT - EST 1 - THRU 02/28/19
600969	19-Mar-2019	156,803.86	HALBERT CONSTRUCTION LLC	INV 812-90980-2 - LUEPKE/MARSHALL GENERATOR PROJECT - EST 2 - THRU 01/16/19
600969	19-Mar-2019	1,121.15	HALBERT CONSTRUCTION LLC	INV 813-91494-1 - METER REPLACEMENT PROJECT PHASE 2 - EST 1 - THRU 02/28/19
600969	19-Mar-2019	20,703.92	HALBERT CONSTRUCTION LLC	INV 814-89881-2 - FIRSTENBURG GYM FLOOR HEAT RETURN - EST 2 - THRU 02/28/19
600969	19-Mar-2019	5,243.72	HALBERT CONSTRUCTION LLC	INV 815-91535-1 - DISTINCTIVE LANDSCAPE - EST 1 - THRU 02/25/19
600969	19-Mar-2019	15,011.95	HALBERT CONSTRUCTION LLC	INV 816-91536-1 - BLAIRCO FILTER PROJECT - EST 1 - THRU 02/21/19
600969	19-Mar-2019	15,937.41	HALBERT CONSTRUCTION LLC	INV 819-91659-1 - MARINE PARK ENGINEERING REMODEL - EST 1 - THRU 01/30/19
600970	19-Mar-2019	90,158.99	HALME EXCAVATING INC	COUNTRY CLUB VILLAGE STORM WATER RETROFIT PHASE I - EST 2 - THRU 02/28/19
600971	19-Mar-2019	2,910.60	HARPER HOUF PETERSON RIGHELLIS INC	PROJ VAN-64-E - WATER TOWER SEISMIC IMPROVEMENTS - THRU 01/18/19 - CONSTRUCTION - RECEIPT 140655 BY L PETERSEN PER E-MAIL
600971	19-Mar-2019	375.00	HARPER HOUF PETERSON RIGHELLIS INC	PROJ VAN-67 - NORTH IMAGE PARK - THRU 01/18/19 - PARKS
600971	19-Mar-2019	2,728.25	HARPER HOUF PETERSON RIGHELLIS INC	PROJ VAN-71 - MCLOUGHLIN BLVD COMPLETE STREETS PILOT PROJECT - THRU 02/15/19 - CED - RECEIPT 140993 BY M RYAN PER E-MAIL
600972	19-Mar-2019	344.71	HARRYS KEY SERVICE INC	ACCT C1037 - SERVICE CALL - REKEY & MASTER - COV HOUSE - THRU 02/25/19 - RECEIPT#140853 PER PATSY NEWTON
600972	19-Mar-2019	134.42	HARRYS KEY SERVICE INC	ACCT C1037 - SERVICE CALL - REPLACE CASH DRAWER CAM LOCK - CITY HALL - THRU 02/20/19 - RECEIPT#140852 PER PATSY NEWTON
600972	19-Mar-2019	3,579.37	HARRYS KEY SERVICE INC	SERVICE CALL - REPAIR/REPLACE STOREFRONT DOORS - 5107 FOURTH PLAIN BLVD - THRU 02/25/19 - OP CENTER
600973	19-Mar-2019	420.00	HART CROWSER INC	ACCR18 - PROJ 1594406 - GEOTECHNICAL ENGINEERING SERVICES - BLOCK 4/KIRKLAND - THRU 10/26/18 - CED - RECEIPT 141028 BY M RYAN PER E-MAIL
600974	19-Mar-2019	7,876.27	HD FOWLER CO	ORDER 06195247 - OPERATING SUPPLIES - OPS CENTER
600974	19-Mar-2019	212.58	HD FOWLER CO	ORDER 06200425 - OPERATING SUPPLIES - OPS CENTER
600975	19-Mar-2019	31,483.54	HDR ENGINEERING INC	PROJ 10080977 - PROFESSIONAL SERVICESS - EVERGREEN HWY & 102ND CRT CULVERT REPLACEMENT - THRU 02/02/19 - MP ENG - RECEIPT 140783 BY L JONES PER E-MAIL
600975	19-Mar-2019	2,150.95	HDR ENGINEERING INC	TRANSPORTATION SYSTEM SAFETY ANALYSIS - THRU 03/02/19 - CDD - RECEIPT 140965 BY M RYAN PER E-MAIL
600976	19-Mar-2019	8,238.47	HERRERA ENVIRONMENTAL CONSULTANTS	PROJ 14-05818-004 - BURNT BRIDGE CREEK 2018 WATER QUALITY MONITORING - THRU 03/01/19 - MP ENG - RECEIPT 141023 BY L JONES
600976	19-Mar-2019	3,825.75	HERRERA ENVIRONMENTAL CONSULTANTS	PROJ 15-06206-002 - LID MAINTENANCE TOOLKIT - THRU 01/25/19 - MP ENG

INVOICE PAYMENTS REPORT

Check Number	Check Date	Amount	Vendor Name	Description
600977	19-Mar-2019	4,583.33	HISPANIC METROPOLITAN CHAMBER	PROJ 414841 - SMALL BUSINESS ASSISTANCE PROGRAM - 19FEB - CDBG FUNDING
600978	19-Mar-2019	4,000.00	HOUSTON ENGINEERING INC	PROJ R010005-0001 - IDDE CUSTOMIZATION - THRU 02/23/19 - INFO TECH
600979	19-Mar-2019	577.61	INDUSTRIAL SCIENTIFIC CORP	CUST 106747 - ORDER US000111666 - INET GAS MONITORING SUBSCRIPTION - 01/23/19-02/22/19 - OP CENTER - RECEIPT 140753 BY P NEWTON PER E-MAIL
600980	19-Mar-2019	13,008.00	INFOR PUBLIC SECTOR INC	CUST 372822 - INFOR PUBLIC SECTOR SUITE CASHIERING/MAINTENANCE - 3 EA - 02/19/19-02/18/20 - INFO TECH
600981	19-Mar-2019	4,909.22	INTERNATIONAL BUSINESS MACHINES	CUST 9469326-00 - SO 0061790223 - CONTR 0000205478 - QTY 2 EA - USER LICENSE/SUBSCRIPTION - IBM I2 IBASE/ANALYSTS NOTEBOOK - 07/01/18-06/30/19 - IT - RECEIPT 140873 PER J SCHOESSLER
600982	19-Mar-2019	20.00	INVESTIGATIVE SOLUTIONS LLC	INVESTIGATIVE SERVICES - S LAKHUN #22333V - 02/17/19 - CMO
600983	19-Mar-2019	1,570.00	INVINTUS MEDIA INC	SYSTEM MAINTENANCE AGREEMENT/PERSISTENT STREAMING/HOSTING OF CVTV WEBSITE - THRU 02/28/19 - MEDIA SERVICES
600984	19-Mar-2019	341.38	IRON MOUNTAIN INTELLECTUAL PROPERTY MANAGEMENT INC	CUST 24WNH - RECORDS STORAGE/RETRIEVAL - 01/30/19-02/26/19 - FINANCE
600985	19-Mar-2019	454.35	IRON MOUNTAIN SECURE SHREDDING	CUST 7121Y - ON-SITE DOCUMENT DESTRUCTION - 19FEB - VPD - RECEIPT 141004 BY A CARMEN PER E-MAIL
600986	19-Mar-2019	200.55	J2 BLUEPRINT SUPPLY CO	ACCT CO19 - CONTRACT CN10150-04 - CANON IPF765 COPIER/PLOTTER - SER AAGW4033 - 03/01/19-03/31/19 - PERMITS - INVOICE APPROVED BY M RYAN
600986	19-Mar-2019	294.74	J2 BLUEPRINT SUPPLY CO	ACCT CO19 - CONTRACT CN10233-01 - HP DESIGNJET T3500PS PLOTTER - SER CN84PCH00M - 02/01/19-02/28/19 - SOLID WASTE - RECEIPT 140787 BY A POWERS PER E-MAIL
600987	19-Mar-2019	5,416.68	JANUS YOUTH PROGRAMS	PROJ 2018-CDBG-414835 - OAK CASE MANAGEMENT - 19FEB - CDBG FUNDING
600987	19-Mar-2019	5,035.27	JANUS YOUTH PROGRAMS	PROJ 414842 - THE NEST HOUSING SERVICES - 19FEB - CDBG FUNDING
600987	19-Mar-2019	7,663.79	JANUS YOUTH PROGRAMS	PROJ 601802 - THE NEST RENT ASSISTANCE - 19FEB - CDBG FUNDING
600988	19-Mar-2019	3,950.00	JCI JONES CHEMICALS INC	ORDER 577745 - CHLORINE 150 LB CYLINDERS 13 EA & 4 TESTED CYLS - OP CENTER
600989	19-Mar-2019	84,091.00	JEFFREY BARRAR PS AKA VANCOUVER DEFENDERS	19APR PUBLIC DEFEND PRIMARY AND INVESTIGATOR - CMO
600990	19-Mar-2019	380.00	JENSEN HUGHES INC	PROJ 1CWC16004.002 - VANCOUVER FD PLAN REVIEW - THRU 02/22/19 - FIRE
600991	19-Mar-2019	1,000.00	JERRY HERRERA	03/12/19 - BANQUET EVENT ORDER - POLICE ANNUAL AWARDS - 200 ATTENDEES - VPD
600992	19-Mar-2019	84.00	JUDITH L BUFFORD	19FEB - WREC HABITAT/WATER MONITORING PROGRAM/CONGRESS - CITY - WREC
600992	19-Mar-2019	1,848.00	JUDITH L BUFFORD	19FEB - WREC HABITAT/WATER MONITORING PROGRAM/CONGRESS - COUNTY - WREC
600993	19-Mar-2019	264.00	KAISER PERMANENTE	ACCR18 - ACCT 11000334 - MEDICAL SERVICES - 4 EA - 11/20/18-12/14/18 - VACCINES - OP CENTER
600993	19-Mar-2019	410.00	KAISER PERMANENTE	ACCT 11000334 - MEDICAL SERVICES - 7 EA - 01/08/19-02/22/19 - VACCINES - OP CENTER
600994	19-Mar-2019	225.00	KATHY MILLER DBA BODYWELL MASSAGE	02/07/19-02/21/19 - MASSAGE SERVICES - FIRSTENBURG COMM CTR
600994	19-Mar-2019	69.00	KATHY MILLER DBA BODYWELL MASSAGE	03/05/19-03/06/19 - MASSAGE SERVICES - FIRSTENBURG COMM CTR
600995	19-Mar-2019	24,237.60	KEATING BUCKLIN & MCCORMACK INC PS	CLIENT MATTER 1109-00002 - LEGAL SERVICES - COV ADV QUINN - 01/05/19-02/28/19 - INVOKE VMC 3.05.200(2) - RISK - PROJ 922732
600996	19-Mar-2019	1,588.00	KELLY SERVICES INC	MELVIN, DJ - ORDER A2615 - W/E 03/10/19 - INFO TECH - RECEIPT 141073 BY J SCHOESSLER PER E-MAIL
600997	19-Mar-2019	465.00	KINETICORP LLC	JOB LLOYD.3593-0918 - 02/15/19 - JOB MATTER CORRESPONDENCE/ANALYSIS & DOC REVIEW - GLUR V COV - RISK
600998	19-Mar-2019	150.22	KITTELSON & ASSOC INC	PROJ 198940 - VANCOUVER TRAFFIC ON CALL - THRU 01/31/19 - FACILITIES - RECEIPT 140608 BY A POWERS PER E-MAIL
600999	19-Mar-2019	14.66	KRONOS INCORPORATED	CONTR 1208122 - WORKFORCE TELESTAFF IVR SERVICE - 19JAN - FIRE/INFO TECH - RECEIPT 140638 BY J SCHOESSLER PER E-MAIL

INVOICE PAYMENTS REPORT

Check Number	Check Date	Amount	Vendor Name	Description
601000	19-Mar-2019	1,205.52	LAKESIDE INDUSTRIES	JOB 1 - ASPHALT - ORCHARDS EZ STREET ASPHALT SALES - 10.11 TON - THRU 02/23/19 - OPS CENTER
601001	19-Mar-2019	554.45	LAW LYMAN DANIEL KAMERRER & BOGDANOVICH	ACCR18 - CLIENT VANCOUV-002 - LEGAL SERVICES - WSAMA V WCOG - 18NOV-18DEC - LAW
601001	19-Mar-2019	2,197.60	LAW LYMAN DANIEL KAMERRER & BOGDANOVICH	CLIENT VANCOUV-002 - LEGAL SERVICES - WSAMA V WCOG - 19FEB - LAW
601001	19-Mar-2019	91.56	LAW LYMAN DANIEL KAMERRER & BOGDANOVICH	CLIENT VANCOUV-002 - LEGAL SERVICES - WSAMA V WCOG - 19JAN - LAW
601002	19-Mar-2019	200.00	LEE NICHOLAS	02/24/19 - SUNDAY DANCE - MUSICAL ENTERTAINMENT - PARKS - RECEIPT 140674 BY A THOMPSON PER E-MAIL
601003	19-Mar-2019	156.00	LEGACY LABORATORY SERVICES LLC	ACCR18 - ACCT 700005039 - MEDICAL TESTING SERVICES - THRU 11/25/18 - HR
601003	19-Mar-2019	364.00	LEGACY LABORATORY SERVICES LLC	ACCR18 - ACCT 700005039 - MEDICAL TESTING SERVICES - THRU 12/23/18 - HR
601003	19-Mar-2019	24.15	LEGACY LABORATORY SERVICES LLC	ACCR18 - ACCT 700005040 - MEDICAL TESTING SERVICES - THRU 12/23/18 - HR
601004	19-Mar-2019	58.05	LIN R ROGERS ELECTRICAL INC	REFUND PORTION OF MPE-255238
601005	19-Mar-2019	1,320.70	LINGUAVA INC	SUMMARY: INTERPRETING SERVICES - JAN/FEB - VPD
601006	19-Mar-2019	934.88	LN CURTIS & SONS	CUST C32902 - ORDER 456970 - FIRE
601007	19-Mar-2019	3,297.98	LOOMIS ARMORED US LLC	ACCT 10038010/1700 - 19FEB - ARMORED CAR SERVICES - MULTIPLE CITY LOCATIONS - FINANCE - RECEIPT 141070 BY C ALLEMANG PER E-MAIL
601007	19-Mar-2019	3,385.98	LOOMIS ARMORED US LLC	ACCT 10038010/1700 - 19JAN - ARMORED CAR SERVICES - MULTIPLE CITY LOCATIONS - FINANCE - RECEIPT 141062 BY C ALLEMANG PER E-MAIL
601008	19-Mar-2019	4,000.00	LSW ARCHITECTS PC	PROJ 2019-0006 - FVRL FACILITY ASSESSMENT PHASE II - THRU 02/28/19 - CMO - RECEIPT 141032 BY K PECK PER E-MAIL
601009	19-Mar-2019	14,719.24	MALLORY SAFETY & SUPPLY LLC	CUST 16345 - ORDER 2394388 - OPERATING SUPPLIES - OPS CENTER
601010	19-Mar-2019	178.86	MANS BEST FRIEND INC	40# BAG - DOG FOOD (3 EA) - CANINE OFFICERS - VPD
601011	19-Mar-2019	151.76	MARK IV ENTERPRISES DBA FOLIAGE SERVICES	CITY HALL - MONTHLY PLANT MAINTENANCE - 19MAR - RECEIPT 140817 BY A POWERS PER E-MAIL
601011	19-Mar-2019	135.50	MARK IV ENTERPRISES DBA FOLIAGE SERVICES	CUST VANCO - LOCATION 4500 SE COLUMBIA - PLANT SERVICE - 19MAR - MP ENG - RECEIPT 140798 BY A POWERS PER E-MAIL
601012	19-Mar-2019	1,000.00	MATT POMERINKE PUBLIC SPEAKING	03/11/19 - SAFETY PRESENTATION - OP CENTER
601013	19-Mar-2019	1,000.00	MESSAGE GEARS LLC	19MAR - USAGE FEE - INFO TECH
601014	19-Mar-2019	19,950.10	METEREADERS LLC	19FEB - MONTHLY METER READING SERVICES - UTILITIES - RECEIPT 140621 BY J JONES PER E-MAIL
601015	19-Mar-2019	162.50	MFR LAW GROUP PLLC	19FEB - LEGAL SERVICES - POLICE DEPT INVESTIGATION 2 - VPD - RECEIPT 140860/861 BY A CARMAN
601015	19-Mar-2019	325.00	MFR LAW GROUP PLLC	19FEB - LITIGATION SERVICES - INVOKE VMC 3.05.200(2) - RISK/LAW
601016	19-Mar-2019	88.57	MINE SAFETY APPLIANCES COMPANY	CUST 632329 - ORDER 401469130 - MSA PARTS AND SUPPLIES - FIRE
601017	19-Mar-2019	5,954.64	MISCELLANEOUS	SUMMARY: MISCELLANEOUS REFUNDS
I				
601033				
601034	19-Mar-2019	413.66	MOBES BUSINESS FORMS INC	1,000 SPECIAL LICENSE PAPER - A/R
601034	19-Mar-2019	545.56	MOBES BUSINESS FORMS INC	4,000 SELF CHECK STOCK A/P - FINANCE
601035	19-Mar-2019	1,355.00	MOSS ADAMS LLP	ACCR18 - CLIENT 628026 - CLAIMS AUDIT OF HEALTHSMART - THRU 12/15/17 - HR - PO 92086/RECEIPT 141095 BY A BAFUS PER E-MAIL
601036	19-Mar-2019	3,371.02	MOTOROLA SOLUTIONS INC	CUST 1000838550 0002 - SO 0955710090090 QTY 30 RADIO BATTERIES - FIRE
601037	19-Mar-2019	905.63	MOTUS RECRUITING & STAFFING INTL	NOTO KELLY - W/E 02/24/19 - PAYROLL WORK DAY PROJ
601037	19-Mar-2019	1,250.63	MOTUS RECRUITING & STAFFING INTL	NOTO KELLY - W/E 03/03/19 - PAYROLL WORK DAY PROJ
601037	19-Mar-2019	267.38	MOTUS RECRUITING & STAFFING INTL	NOTO KELLY - W/E 03/10/19 - PAYROLL WORK DAY PROJ
601037	19-Mar-2019	1,380.00	MOTUS RECRUITING & STAFFING INTL	NOTO KELLY - W/E 03/17/19 - PAYROLL WORK DAY PROJ

INVOICE PAYMENTS REPORT

Check Number	Check Date	Amount	Vendor Name	Description
601038	19-Mar-2019	4,475.60	MUNICIPAL EMERGENCY SERVICES INC	SUMMARY: POINT BLANK AXIIA AND ACCESSORIES - VPD
601039	19-Mar-2019	3,071.50	MURRAYSMITH INC	PROJ 17-2134 - 63RD STREET PUMP STATION REPLACEMENT - THRU 01/31/19 - MP ENG - RECEIPT 140741 BY A POWERS PER E-MAIL
601039	19-Mar-2019	11,246.24	MURRAYSMITH INC	PROJ 18-2286 - 2019 CURB RAMP DESIGN - THRU 01/31/19 - OP CENTER - RECEIPT 140664 BY P NEWTON PER E-MAIL
601039	19-Mar-2019	4,131.00	MURRAYSMITH INC	PROJ 18-2357 - CTC PUMP STATION ASSESSMENT - THRU 01/31/19 - MP ENG - RECEIPT 140701 BY A POWERS PER E-MAIL
601040	19-Mar-2019	500.00	NAGRA & ATWAL CORPORATION	APR 19 OPS PARKING LEASE
601041	19-Mar-2019	4,178.05	NATIONAL PARK SERVICE	APR 19 PEARSON AIR PARK LEASE 19 PEARSON AIR PARK LEASE
601042	19-Mar-2019	82.50	NELSON\NYGAARD CONSULTING ASSOCIATES INC	ACCR18 - PROJ 928984.001 - VANCOUVER WA MILL PLAIN BRT SUPPORT - THRU 12/31/18 - CED - RECEIPTED BY M RYAN PER ORACLE
601043	19-Mar-2019	1,938.25	NET TRANSCRIPTS	CUST 20-VANCOUVERPD - TRANSCRIPTION SERVICES - 02/13/19-02/28/19 - VPD - RECEIPT 141056 BY A CARMAN PER E-MAIL
601044	19-Mar-2019	425.00	NEW DAY MAINTENANCE LLC	02/15/19 - SONIC TOMOGRAPHY SERVICES - DOUGLAS FIR TREE - FIRE STATION 6 - URBAN FORESTRY
601045	19-Mar-2019	120.00	NORTH IMAGE NEIGHBORHOOD ASSN	2019 PARTICIPATION IN THE RECYCLEU GRANT - SOLID WASTE
601046	19-Mar-2019	7,264.64	NORTHEND TRUCK EQUIPMENT	CL 18999 - BOSS PLOW SN#401424264 / 404706213 ON UNIT#2358
601046	19-Mar-2019	102,639.10	NORTHEND TRUCK EQUIPMENT	WO PAL7-1218 PALIFT T-29M VIN HKT7342 - EQUIP SVCS
601046	19-Mar-2019	102,639.10	NORTHEND TRUCK EQUIPMENT	WO PAL7-1218 PALIFT T-29M VIN HKT7343 - EQUIP SVCS
601047	19-Mar-2019	248.00	NORTHWEST CASCADE INC DBA HONEY BUCKET	SUMMARY: PORTALET RENTALS - OPS CENTER
601048	19-Mar-2019	13,474.82	NORTHWEST STAFFING RESOURCES	3/3/2019 - CITY WIDE TEMPORARY SERVICES
601048	19-Mar-2019	14,461.06	NORTHWEST STAFFING RESOURCES	CITY WIDE TEMPORARY SERVICES - W/E 03/10/19
601048	19-Mar-2019	12,992.42	NORTHWEST STAFFING RESOURCES	W/E 2/24/2019 - CITY WIDE TEMPORARY SERVICES
601049	19-Mar-2019	2,146.07	NW NATURAL	SUMMARY: MULTIPLE LOCATIONS - GAS USAGE 2/7/18-3/11/19
601050	19-Mar-2019	22,974.25	OLDCASTLE INFRASTRUCTURE	SUMMARY: CUST 020001137 OPERATING SUPPLIES - OPS
601051	19-Mar-2019	1,051.81	ONE CALL CONCEPTS INC	ACCT 19-0000085 - DIST VAN01 - EXCAVATION NOTIFICATIONS - 19FEB - OP CENTER - RECEIPT 140735 BY P TANDY PER E-MAIL
601051	19-Mar-2019	236.47	ONE CALL CONCEPTS INC	ACCT 19-0000085 - DIST VAN04 - EXCAVATION NOTIFICATIONS - 19FEB - OP CENTER/TRAFFIC - RECEIPT 140734 BY P TANDY PER E-MAIL
601052	19-Mar-2019	410,924.35	OPERATIONS MANAGEMENT INTERNATIONAL INC	ACCR18 - 2018 - PROJ 664927.IC.00.00.00 - CUST 003143 - REF VANC - CAM012 2018 INCINERATOR SHUTDOWN - MP ENG
601053	19-Mar-2019	271.00	ORCHARDS TOWING	02/27/18 - TOWING - ELDORADO MOTORHOME - LIC HD15689 - FROM 16100 NE 11TH ST TO LOT 1 @ 2511 NE 65TH AVE #B - CASE 89901-BADGE 1431 HAM - VPD
601054	19-Mar-2019	16,603.00	OTAK INC	PROJ 018727.000 - WESTSIDE BICYCLE MOBILITY IMPROVEMENT - THRU 02/22/19 - CDD - RECEIPT 140792 OK TO PAY PER A DEARMAN
601055	19-Mar-2019	1,036.79	OTIS ELEVATOR	SUMMARY: 19JAN,FEB,MAR - MONTHLY ELEVATOR SVC - TOWER MALL BLDG - OP CENTER
601056	19-Mar-2019	24,344.98	OWEN EQUIPMENT CO DBA BENKOMATIC	ACCT 38631 - ORDER 109885 - NEW F FANAFOAM VAPOROOTER II - OP CENTER
601057	19-Mar-2019	7,290.00	PARKEON	CUST 0030328P - SO P76346 - PARKFOLIO LEVEL 3 FEES - 162 TOTAL - 19FEB - PARKING
601057	19-Mar-2019	650.00	PARKEON	CUST 0030328P - SO P76782 - PARKFOLIO LEVEL 3 FEES/VALIDATION CODES - 13 EA - 19FEB - PARKING
601057	19-Mar-2019	45.00	PARKEON	CUST 0030784P - SO P76781 - PARKFOLIO LEVEL 3 FEES - 19FEB - PARKS
601058	19-Mar-2019	200.00	PATRICK HILDRETH DBA PDH CREATIVE	WEB CARE/HOSTING - MARKETING OUTREACH - CDD

INVOICE PAYMENTS REPORT

Check Number	Check Date	Amount	Vendor Name	Description
601059	19-Mar-2019	1,142.50	PAUL LEWIS	MULTI-FAMILY PROPERTY TAX EXEMPTION PROGRAM SUPPORT - 01/08/19-02/23/19 - CED
601060	19-Mar-2019	22,325.79	PC SPECIALISTS INC	CUST 29019 - VARIOUS CISCO PRODUCTS - SHIPPED 01/18/19 - INFO TECH - RECEIPT 141074 BY J SCHOESSLER PER E-MAIL
601061	19-Mar-2019	8.00	PETTY CASH CUSTODIAN	CAR WASH
601061	19-Mar-2019	16.75	PETTY CASH CUSTODIAN	CRAFT SUPPLIES - RECYCLING 101
601061	19-Mar-2019	6.47	PETTY CASH CUSTODIAN	OUTLET BOX- MARINE PARK ENG PROJECT
601061	19-Mar-2019	13.00	PETTY CASH CUSTODIAN	PARKING - TRAINING
601061	19-Mar-2019	13.00	PETTY CASH CUSTODIAN	PARKING - UERC
601061	19-Mar-2019	23.93	PETTY CASH CUSTODIAN	RECORDED EASEMENT
601061	19-Mar-2019	20.00	PETTY CASH CUSTODIAN	REETA
601061	19-Mar-2019	21.25	PETTY CASH CUSTODIAN	REETAS / PARKING
601062	19-Mar-2019	681.84	PHYSIO CONTROL INC	ACCT 07176401 - SO S3956584-00 - 1 PK RAINBOW R20, PED DISP 10/BX - SHIPPED 02/25/19 - FIRE
601063	19-Mar-2019	2,612.25	PORTER W YETT CO	CUST 20408 - CRUSHED ASPHALT 1" - 0" - 259.02 UNITS & 1 ASPHALT DUMP - 02/19/19-02/20/19 - OP CENTER
601064	19-Mar-2019	2,304.00	PORTLAND ADVENTIST MEDICAL CENTER	19FEB - MEDICAL TESTING SERVICES - HR/VPD
601065	19-Mar-2019	199.15	POTTER WEBSTER CO	CUST 8108500 - ORDER 297688 - PARTS FOR VEHICLE REPAIR AND EQUIPMENT - EQUIP SERVICES
601066	19-Mar-2019	25,476.92	PPC SOLUTIONS INC	CUST 2409 - SECURITY SERVICES - MULTIPLE LOCATIONS
601067	19-Mar-2019	618.13	PRAXAIR DISTRIBUTION INC	SUMMARY: CO2 LIQUID BULK TANK & TELEMETRY - PARKS & REC
601068	19-Mar-2019	130.00	PUBLIC SAFETY TESTING INC	19FEB - AGENCY APPLICANT ADD-ON CHARGES - 13 EA - VPD
601069	19-Mar-2019	550.68	Ramras, Natalya Y. (Natasha)	NEW TRUSTEES INSTITUTE - LEVELS 1 AND 2
601070	19-Mar-2019	592.00	RB RECYCLING	RECYCLING PASSENGER TIRES - 2.96 TIRES - THRU 2/28/19 - EQUIP SERVICES
601070	19-Mar-2019	602.00	RB RECYCLING	RECYCLING PASSENGER TIRES - 3.01 TIRES - THRU 2/28/19 - EQUIP SERVICES
601071	19-Mar-2019	15,177.66	REBECCA DEAN PLLC	MATTER 00004 - PROVIDE INVESTIGATION AND RELATED SERVICES - 02/04/19-02/28/19 - CMO - RECEIPT 140970 BY K PECK PER E-MAIL
601072	19-Mar-2019	752.84	RENTOKIL NORTH AMERICA INC	SUMMARY: MONTHLY PEST CONTROL MAINTENANCE
601073	19-Mar-2019	4,555.91	RETAIL LOCKBOX INC	EPAY AND SUSPENSE - TRANSACTION FEES - THRU 02/28/19 - TREASURY
601074	19-Mar-2019	247.25	RICHARD HEPPER	19MAR - SENIOR MESSENGER DELIVERY - MEDIA SERVICES
601075	19-Mar-2019	3,451.83	RIGHT OF WAY ASSOC INC	REF 15001-010-000 TO 15001-010-077 - SE 1ST ST-NE 164TH AVE TO NE 192ND AVE - RIGHT OF WAY SERVICES - 01/01/19-02/28/19 - TRANSPORTATION - RECEIPT 140842 BY L PETERSEN PER E-MAIL
601076	19-Mar-2019	92.14	RIVERSIDE CONTAINERS LLC	JOB 49628 - RENTAL - 20' STEEL CONTAINER - 19MAR - CONSTRUCTION - RECEIPT 140790 BY L PETERSEN PER E-MAIL
601077	19-Mar-2019	1,994.88	ROBERT HALF INTERNATIONAL	CUST 03660-000152000 - RUTLEDGE JANET - W/E 01/25/19 - HR
601077	19-Mar-2019	2,592.64	ROBERT HALF INTERNATIONAL	CUST 03660-000152000 - RUTLEDGE JANET - W/E 02/01/19 - HR
601077	19-Mar-2019	2,680.00	ROBERT HALF INTERNATIONAL	CUST 03660-000152000 - RUTLEDGE JANET - W/E 02/08/19 - HR
601077	19-Mar-2019	2,549.76	ROBERT HALF INTERNATIONAL	CUST 03660-000152000 - RUTLEDGE JANET - W/E 02/15/19 - HR
601077	19-Mar-2019	2,496.00	ROBERT HALF INTERNATIONAL	CUST 03660-000152000 - RUTLEDGE JANET - W/E 02/22/19 - HR
601078	19-Mar-2019	200.00	RONALDO EXCONDE	02/10/19 - SUNDAY DANCE - MUSICAL ENTERTAINMENT - PARKS
601079	19-Mar-2019	4,174.36	S&B INC	ORDER 24901 - FISHER GROVE LIFT STATION UPGRADES - 7% SYSTEM INTEGRATION - MP ENG - RECEIPT 140669 BY A POWERS PER E-MAIL
601080	19-Mar-2019	129.79	SEALS UNLIMITED INC	CUST 395300 - ORDER 125038 - OPS
601081	19-Mar-2019	3,390.24	SECOND STEP HOUSING	PROJ 414844 - HOUSING SERVICES - 19FEB - 2018 CDBG FUNDING
601081	19-Mar-2019	4,135.00	SECOND STEP HOUSING	PROJ 601806 - RENT ASSISTANCE - 19FEB - 2018 HOME FUNDING
601082	19-Mar-2019	36,438.66	SELECTRON TECHNOLOGIES INC	05/01/19-04/30/20 - VOICEPERMITS & WEBPERMITS - PREMIERPRO SERVICE FOR IVR SYSTEM - SUPPORT & MAINTENANCE - CED

INVOICE PAYMENTS REPORT

Check Number	Check Date	Amount	Vendor Name	Description
601083	19-Mar-2019	21,302.95	SEQUENCE GRAPHICS LLC	ADVERTISING SALES COMMISSION FOR SR MESSENGER - 19MAR - MEDIA SERVICES - RECEIPT 140255 BY T RAMIREZ
601084	19-Mar-2019	13,232.00	SHARE INC	19JAN - SHARE HOUSE - SOLID WASTE SERVICE/SUPPLIES - SOLID WASTE
601084	19-Mar-2019	13,323.00	SHARE INC	ACCR18 - 18DEC - SHARE HOUSE - SOLID WASTE SERVICE/SUPPLIES - SOLID WASTE
601085	19-Mar-2019	61,854.41	SIERRA-CEDAR INC	CUST 109266 - PROJ CITYVNCW_IMP_01 - WORKDAY IMPLEMENTATION SERVICES - THRU 02/28/19 - INFO TECH - RECEIPT 140915 BY S COOLEY PER E-MAIL
601085	19-Mar-2019	60.00	SIERRA-CEDAR INC	CUST 109266 - PROJ CITYVNCW_IMP_01 - WORKDAY IMPLEMENTATION SERVICES/EXPENSE REIMBURSEMENT - THRU 02/16/19 - INFO TECH - RECEIPT 140916 BY S COOLEY PER E-MAIL
601086	19-Mar-2019	660.00	SISTERS OF ST MARY OF OREGON	50+ PROGRAM - 22 TEA TICKETS - PARKS
601087	19-Mar-2019	314.29	SOFTWARE HOUSE INTERNATIONAL SHI	CUST 1072078 - SO S49179486 - ACROBAT PROFESSIONAL V2017 NEW LICENSE - 1 EA - AGREEMENT 4600026430 - INFO TECH
601088	19-Mar-2019	5,535.00	SONIA LOPEZ DBA ACTION ONSITE INC	19FEB - INJURY ASSESSMENT TRAINING - OP CENTER - RECEIPT 140919 BY P NEWTON PER E-MAIL
601089	19-Mar-2019	2,190.00	SOUTHWEST OFFICIALS SVCS INC	01/01/19-02/25/19 - ADULT BASKETBALL OFFICIATING FEES - PARKS
601089	19-Mar-2019	1,674.00	SOUTHWEST OFFICIALS SVCS INC	02/22/19-03/12/19 - YOUTH BASKETBALL OFFICIATING FEES - PARKS
601089	19-Mar-2019	876.00	SOUTHWEST OFFICIALS SVCS INC	03/01/19-03/12/19 - ADULT BASKETBALL OFFICIATING FEES - PARKS
601090	19-Mar-2019	5,959.07	SP PLUS CORPORATION	19FEB - PARKING SERVICES
601091	19-Mar-2019	3,000.00	SPECIAL SERVICES GROUP LLC	2019-2020 RENEWAL OF COVERT TRACK SERVICE W/ 5 SECOND UPDATES - 05/16/19-05/15/20 - 5 DEVICES - VPD - PO 92006
601092	19-Mar-2019	4,132.00	SSD INTERNATIONAL INC	CUST 149 - 200 HORNADY 308 155 GR A-MAX - VPD
601093	19-Mar-2019	19,652.30	STANTEC CONSULTING SERVICES	PROJ 2002005591 - CUST 93668 - AIR GAP/WATER PROTECTION PROJECT - THRU 03/01/19 - MP ENG - RECEIPT 141086 BY L JONES PER E-MAIL
601094	19-Mar-2019	3.00	STATE OF WASHINGTON	ACCR18 - ACCT 195167 - FILING FEES - 18DEC - PARKING
601094	19-Mar-2019	2.20	STATE OF WASHINGTON	ACCT 195167 - FILING FEES - 19FEB - PARKING
601094	19-Mar-2019	3.96	STATE OF WASHINGTON	ACCT 195167 - FILING FEES - 19JAN - PARKING
601095	19-Mar-2019	5,791.99	STATE OF WASHINGTON	PROJ JM0203L - CUST 916001288 5 - MATERIAL LAB CHARGES - 19JAN - CONSTRUCTION
601096	19-Mar-2019	63.03	STERICYCLE INC	CUST 6029888 - 19FEB - MEDICAL WASTE REMOVAL - VPD
601097	19-Mar-2019	225.00	STEVEN J ZERFING DBA MASSAGE DOJO	CHAIR/TABLE MASSAGES - 8 TOTAL - THRU 03/14/19 - FIRSTENBURG/MARSHALL CENTERS - PARKS
601098	19-Mar-2019	675.00	SUZANNE BEST	2/11,13,19 - POST-INCIDENT DEBRIEFING SERVICES - VPD - RECEIPT 140809 BY A CARMAN
601099	19-Mar-2019	209.00	Loski, Melissa Lynne	ICC I PMO CERTIFICATE REIMB
601100	19-Mar-2019	3,855.51	T2 SYSTEMS INC	CUST 1359 - FLEXPORT MAINTENANCE - 1/2/19 THRU 11/2/19 - CED
601100	19-Mar-2019	2,926.95	T2 SYSTEMS INC	CUST 1359 - ROVR SERVICE - 19FEB - 1501 UNITS - PARKING
601101	19-Mar-2019	4,838.00	TARGETSOLUTIONS LEARNING LLC	CUST 410000014ARKAA2 - TARGETSOLUTIONS PREMIER MEMBERSHIP PLATFORM/MAINTENANCE FEE - THRU 03/31/19 - FIRE
601101	19-Mar-2019	3,224.62	TARGETSOLUTIONS LEARNING LLC	CUST 410000014ARKAA2 - TARGETSOLUTIONS PREMIER MEMBERSHIP PLATFORM/MAINTENANCE FEE - THRU 12/30/18 - FIRE
601102	19-Mar-2019	1,890.00	TEKSYSTEMS	BENSON ROBERT - W/E 03/02/19 - INFO TECH - RECEIPT 140870 BY J SCHOESSLER PER E-MAIL
601102	19-Mar-2019	3,105.00	TEKSYSTEMS	BENSON ROBERT - W/E 03/09/19 - INFO TECH - RECEIPT 141044 BY J SCHOESSLER PER E-MAIL
601102	19-Mar-2019	2,900.00	TEKSYSTEMS	LAWSON COREY - W/E 03/02/19 - INFO TECH - RECEIPT 140871 BY J SCHOESSLER PER E-MAIL
601102	19-Mar-2019	4,000.00	TEKSYSTEMS	LAWSON COREY - W/E 03/09/19 - INFO TECH - RECEIPT 141045 BY J SCHOESSLER PER E-MAIL
601103	19-Mar-2019	942.91	THE SALVATION ARMY	PROJ 414847 - MOVING FORWARD TOGETHER - 19FEB - CDBG FUNDING
601103	19-Mar-2019	5,941.82	THE SALVATION ARMY	PROJ 601808 - MOVING FORWARD TOGETHER - 19FEB - HOME FUNDING

INVOICE PAYMENTS REPORT

Check Number	Check Date	Amount	Vendor Name	Description
601104	19-Mar-2019	271.11	TMG SERVICES INC	CUST 2203000 - 2018 ANNUAL CHLORINATOR SERVICE WORK - STATION 3 - 4201 WA ST LOC 3506 - THRU 02/22/19 - OP CENTER
601105	19-Mar-2019	108.40	TOWING & RECOVERY SERVICES INC	TOWING - '04 PONTIAC GRAND AM - FROM 3318 "M" ST TO VPD WEST
601106	19-Mar-2019	460.70	TOWING & RECOVERY SERVICES INC	SUMMARY: TOWING SERVICE - MULTIPLE VEHICLES - VPD
601107	19-Mar-2019	515.22	TRANSUNION RISK & ALTERNATIVE DATA SOLUTIONS INC	ACCT 230397 - DATABASE SEARCH FEES - 19FEB - VPD
601108	19-Mar-2019	930.00	TRIANGLE RESOURCES INC	19FEB - YARD DEBRIS - OPS CENTER
601109	19-Mar-2019	758.80	TRIPLE J ENTERPRISES	SUMMARY: FEB/MAR TOWING - VPD
601110	19-Mar-2019	1,343.45	TYREE OIL, INC	CUST 0048324 - ORDER 0691133 - OPERATING SUPPLIES - EQUIP SERVICES
601111	19-Mar-2019	144.73	UNITED PARCEL SERVICE	19MAR - SHIPPER 856018 - SERVICE CHARGE - OPS CENTER
601112	19-Mar-2019	294.11	UNITED PARCEL SERVICE	POSTAGE 3/2/19
601113	19-Mar-2019	13,782.89	UNITED STATES POSTAL SERVICE	SUMMER 2019 PARKS CATALOG POSTAGE
601114	19-Mar-2019	4,758.00	UNIVAR USA INC	CUST 107817 - ORDER 220031 - CAUSTIC SODA - OPS CENTER
601115	19-Mar-2019	6,652.65	UNIVERSAL FIELD SERVICES INC	JOB 1483 - CUST 159BF - SE MILL PLAIN BLVD-104TH AVE TO CHKLOV DR PROJECT - 19FEB - TRANSPORTATION/CONSTRUCTION
601115	19-Mar-2019	1,847.78	UNIVERSAL FIELD SERVICES INC	JOB 1927 - CUST 159BF - RIGHT OF WAY SERVICES-NE 112TH AVE PROJECT - 19FEB - TRANSPORTATION/CONSTRUCTION
601116	19-Mar-2019	1,144.49	URBAN NW HOMES LLC	REFUND PERMIT RES-233677
601116	19-Mar-2019	1,183.91	URBAN NW HOMES LLC	REFUND PERMIT RES-233720
601116	19-Mar-2019	4,607.00	URBAN NW HOMES LLC	REFUND RE: RES-233701
601117	19-Mar-2019	325.20	US WATER SERVICES INC	CUST MH00356 - ORDER CTRTBS2106 - 19MAR - MONTHLY CHILLER/BOILER CHEM TESTING - MARSHALL CTR - OP CTR - RECEIPT 140930 BY P NEWTON PER E-MAIL
601117	19-Mar-2019	216.80	US WATER SERVICES INC	CUST MH00448 - ORDER CTRTBS2052 - 19MAR - MONTHLY CHILLER/BOILER CHEM TESTING - 415 BLDG - OP CTR - RECEIPT 140930 BY P NEWTON PER E-MAIL
601117	19-Mar-2019	216.80	US WATER SERVICES INC	CUST MH00523 - ORDER CTRTBS2072 - 19MAR - MONTHLY CHILLER/BOILER CHEM TESTING - FIRE 5 - OP CTR - RECEIPT 140931 BY P NEWTON PER E-MAIL
601118	19-Mar-2019	412.50	VANCOUVER AIRE LLC DBA FRESH AIRE AIR FRESHENERS	SUMMARY: DEODORIZING SERVICE - THRU 3/5/19 MULTIPLE LOCATIONS
601119	19-Mar-2019	23,158.00	VANCOUVER HOUSING AUTHORITY	PROJ 2017-AHF-221301 - AHF RENTAL ASSISTANCE - 19FEB - CDBG
601119	19-Mar-2019	14,000.00	VANCOUVER HOUSING AUTHORITY	PROJECT 414547 - SHELTER IMPROVMENT - RETAINAGE - CDBG FUNDING
601120	19-Mar-2019	400.10	VERIZON WIRELESS	ACCT 670557900-00018 - CURRENT CHARGES - 1/24/19-2/23/19 - VPD
601121	19-Mar-2019	40.01	VERIZON WIRELESS SERVICES LLC	ACCT 972233911-00002 - MOBILE BROADBAND MONTHLY CHARGES 01/24/19-02/23/19 - J SEARS - FACILITIES
601122	19-Mar-2019	300.00	W TODD PASCOE PLLC	03/06/19 - PUBLIC DEFENDER SERVICES - CASE 8Z0632127 - U HERNANDEZ - CMO
601122	19-Mar-2019	3,363.00	W TODD PASCOE PLLC	2019 CONTRACTURAL SERVICES - 19FEB - CMO
601122	19-Mar-2019	3,363.00	W TODD PASCOE PLLC	2019 CONTRACTURAL SERVICES - 19MAR - CMO
601123	19-Mar-2019	973.25	WA STATE PATROL	ACCT VAN313 - CPL PROGRAM - MONTHLY BACKGROUND CHECKS - 41 EA - 19FEB - VPD
601124	19-Mar-2019	23,030.20	WALTER E NELSON CO	SUMMARY: CUST 21069/21070 - JANITORIAL SUPPLIES - FIRE & OPS
601125	19-Mar-2019	55,594.61	WASTE CONNECTIONS INC	SUMMARY: 19FEB - MULTIPLE LOCATIONS - SOLID WASTE & DISPOSAL
601127	19-Mar-2019	475.61	WATERSHED GARDEN WORKS	2/6/2019 MISC PLANTS - VOLUNTEER EVENT - WREC
601128	19-Mar-2019	473.52	WHITE BEAR WEST INC	2019 SERVICE MANUAL FOR GO-4 SCOOTERS (2017 & NEWER)
601129	19-Mar-2019	5,042.26	WILCOX & FLEGEL	FUEL FOR ENGLISH PIT
601129	19-Mar-2019	3,400.99	WILCOX & FLEGEL	FUEL FOR FIRE STATION 5
601130	19-Mar-2019	23,244.80	WILLIAMS KASTNER & GIBBS PLLC	CLIENT 32569 - MATTER 0101 - LEGAL SERVICES - 19JAN - INVOKE VMC 3.05.200(2) - RISK - PROJ 922732
601131	19-Mar-2019	4,230.50	WINTERBAUER & DIAMOND PLLC	ACCT 1987-01M - LEGAL SERVICES - THRU 01/31/19 - HR
601132	19-Mar-2019	309.99	XPO ENTERPRISE SERVICES INC	SUMMARY: WEEKLY POSTAGE - THRU 03/09/19 - FINANCE/MAILROOM
601133	19-Mar-2019	2,240.03	ZAYO GROUP, LLC	19MAR - SERVICE AGR - INTERNET SVC TELECOMMUNICATIONS - IT
601134	19-Mar-2019	11,687.33	ZUMAR INDUSTRIES INC	CUST 000721 - JOB 209558 - OPERATING SUPPLIES - OPS CENTER

INVOICE PAYMENTS REPORT

Check Number	Check Date	Amount	Vendor Name	Description
601134	19-Mar-2019	61.57	ZUMAR INDUSTRIES INC	CUST 000721 - JOB 209951 - OPERATING SUPPLIES - OPS CENTER
601134	19-Mar-2019	62,855.24	ZUMAR INDUSTRIES INC	CUST 000721 - JOB 209951 - SIGNS - OP CENTER
601135	21-Mar-2019	550.00	MFS SERVICE CENTER INC	PAYROLL
601136	21-Mar-2019	1,373.28	UNITED WAY OF THE COLUMBIA WILLAMETTE	PAYROLL
601137	21-Mar-2019	3,612.00	CHAPTER 13 - TRUSTEE	PAYROLL
601138	21-Mar-2019	8,223.64	LIFE INSURANCE CO OF NORTH AMERICA	PAYROLL
601139	21-Mar-2019	9,056.10	AMERICAN FAMILY LIFE ASSURANCE	PAYROLL
601140	21-Mar-2019	795.24	IAM LOCAL #1374	PAYROLL
601141	21-Mar-2019	19,165.01	IAFF LOCAL #452	PAYROLL
601142	21-Mar-2019	12,775.74	VANCOUVER POLICE OFFICER GUILD	PAYROLL
601143	21-Mar-2019	5,552.54	AFSCME LOCAL #307	PAYROLL
601144	21-Mar-2019	990.66	WESTERN METAL IND PENSION FUND	PAYROLL
601145	21-Mar-2019	5,561.59	OPEIU LOCAL #11	PAYROLL
601146	21-Mar-2019	2,236.20	WESTERN CONFERENCE OF TEAMSTERS	PAYROLL
601147	21-Mar-2019	608.00	TEAMSTERS LOCAL #58	PAYROLL
601148	21-Mar-2019	332.50	UA LOCAL #290	PAYROLL
601149	21-Mar-2019	72.36	LEGAL SHIELD	PAYROLL
601150	22-Mar-2019	971.35	Lynch, Jeff S	TRAINING POST TRAVEL
	SUB TOTAL	4,570,049.40		
VISA	26-Mar-19	953.00	MISCELLANEOUS	PARKS CLASS REFUNDS - FCC 3-19-19 thru 3-25-19
VISA	26-Mar-19	1,281.25	MISCELLANEOUS	PARKS CLASS REFUNDS - MCC 3-19-19 thru 3-25-19
VISA	26-Mar-19	-	MISCELLANEOUS	PARKS CLASS REFUNDS - SPEC EVENTS 3-19-19 thru 3-25-19
VISA	26-Mar-19	895.70	MISCELLANEOUS	PARKS CLASS REFUNDS - WREC 3-19-19 thru 3-25-19
VISA	SUBTOTAL	3,129.95		
	TOTAL	4,573,179.35		
EXCEPTIONS: No exceptions on this report				

**City of Vancouver
Payroll Council Report
March 19, 2019 - March 25, 2019**

[illegible]

\$ 2,882,966.15



Item #3.

Staff Report 041-19

TO: Mayor and City Council

FROM: Eric Holmes, City Manager

DATE: 4/1/2019

SUBJECT Four Seasons South Planned Unit Development

Key Points

- Approval of a planned development ordinance and approval of a preliminary plat to allow for the development of Four Seasons South Subdivision.

Strategic Plan Alignment

N/A

Present Situation

The applicant requests approval of a proposed planned development for a 70-lot single family subdivision totaling 8.47 acres in R-9 Low Density Residential & R-22 Higher Density Residential zoning. The proposal also includes a boundary line adjustment.

On February 19, 2019, a public hearing was conducted before the Hearings Examiner. On March 5, 2019, the Hearings Examiner issued findings, conclusions and recommendations. Her findings recommend that the planned development, boundary line adjustment and subdivision ordinance be approved by City Council.

Advantage(s)

1. Approval will allow for additional housing units to be constructed.
2. Approval will allow for flexible design with the emphasis on senior housing.
3. Approval will allow for the development in an area currently served by public utilities.

Disadvantage(s)

There will be additional traffic. However, this has been reviewed and the City has determined there is adequate capacity.

Budget Impact

None

Prior Council Review

Council has not previously reviewed this development.

Action Requested

On April 1, 2019, subject to second reading and public hearing, approve ordinance.

Kristian Corbin, Associate Planner, 487-7818

ATTACHMENTS:

- ▣ Ordinance
- ▣ Staff Report 2/19/2019 Hearing
- ▣ Staff Report Exhibits 2/19/2019 Hearing
- ▣ Exhibit 9 2/19/2019 Hearing
- ▣ Exhibit 16 2/19/2019 Hearing
- ▣ Exhibit 17 2/19/2019 Hearing
- ▣ Hearings Examiner Recommendation

03/25/19

04/01/19

ORDINANCE NO. M- 4265

AN ORDINANCE approving the concept development plan for the Four Seasons South Planned Unit Development; and providing for severability and an effective date.

WHEREAS, on February 19, 2019, a hearing was held before the Vancouver Hearings Examiner regarding the approval of the concept development plan for the Four Seasons South Planned Unit Development.

WHEREAS, on March 5, 2019, the Vancouver Hearing Examiner recommended approval of the concept development plan for the Four Seasons South Planned Unit Development under File PRJ-156552, LUP-70974; and

WHEREAS, the concept development plan is consistent with the Comprehensive Plan and the underlying zoning of the property.

NOW, THEREFORE,

BE IT ORDAINED BY THE CITY OF VANCOUVER:

Section 1. Findings.

A. The Vancouver Hearing Examiner has found that all of the following criteria have been met, with conditions, as required by VMC 20.260.050:

1. Content. The concept plan contains all of the components required in Section 20.260.070. Compliance with all applicable standards. The proposed development and uses comply with all applicable standards of the Title, except where adjustments are

- being approved as part of the concept plan application, pursuant to Section 20.260.030(D)(2).
2. Architectural and site design. The proposed development demonstrates the use of innovative, aesthetic, energy-efficient and environmentally-friendly design and materials.
 3. Transportation system capacity. There is either sufficient capacity in the transportation system to safely support the development proposed in all future phases or there will be adequate capacity by the time each phase of development is completed.
 4. Availability of public services. There is either sufficient capacity within public services such as water supply, police and fire services, and sanitary waste and storm water disposal, to adequately serve the development proposed in all future phases, or there will be adequate capacity available by the time each phase of development is completed.
 5. Protection of designated resources. City-designated resources such as historic landmarks, significant trees and sensitive natural resources are protected in compliance with the standards in this and other Titles of the VMC.
 6. Compatibility with adjacent uses. The concept plan contains design, landscaping, parking, traffic management and multi-modal transportation elements that limit conflicts between the planned development and adjacent uses. If zoning districts are shifted per Section 20.260.020(C) VMC, there shall be a demonstration that the reconfiguration of uses is compatible with surrounding uses by means of appropriate setbacks, design features or other techniques.

7. Mitigation of off-site impacts. All potential off-site impacts including litter, noise, shading, glare and traffic, will be identified and mitigated to the extent practicable.

B. The information for the concept development plan has been submitted and approved, as required by VMC 20.260.070.

C. The concept development plan of the Four Seasons South Planned Unit Development is consistent with the Comprehensive Plan and the underlying zoning.

D. City Council hereby adopts the foregoing findings and the findings of the Vancouver Hearings Examiner contained in the Findings, Conclusions, and Recommendation, which are hereby incorporated by reference, as its own.

Section 2. Legal Description. The legal description of the lands referred to in this ordinance is as follows:

Lot 3 of Northwestern Home Lots, according to the Plat thereof, recorded in Volume “C” of Plats, Page 41, and Records of Clack County, Washington, located in a portion of the Northwest quarter of Section 27, Township 2 North, Range 2 East, Willamette Meridian, and Clark County, Washington.

Section 3. Approval Granted. Based upon the foregoing findings, as well as the findings contained in Staff Report No. PRJ-143892/LUP-34824, which are hereby incorporated by reference, approval of the concept development plan for the Four Seasons South Planned Unit Development is hereby granted, with the conditions outlined in the Hearing Examiner’s Findings, Conclusions, and Recommendation, incorporated above by reference.

Section 4. Severability. If any provision of this ordinance or its application to any person or circumstance is held invalid, the remainder or the application of the provision to other persons or circumstances is not addicted.

Section 5. Effective Date. This ordinance shall take effect fifteen (15) days after passage and publication.

Read first time: March 25, 2019

Ayes: Councilmembers Lebowsky, Stober, Turlay, Hansen, Mayor McEnerny-Ogle

Nays: None

Absent: Councilmembers Glover, Paulsen

Read second time: April 1, 2019

PASSED by the following vote: 4-0

Ayes: Councilmembers Lebowsky, Glover, Stober, Hansen

Nays: None

Absent: Councilmembers Paulsen, Turlay, Mayor McEnerny-Ogle

SIGNED this 1st day of April, 2019.

DocuSigned by:

58CB15C0632F403...
Anne McEnerny-Ogle, Mayor

Attest:

DocuSigned by:

Carrie Lewellen

661359AB277E439...

Natasha Ramras, City Clerk

By: Carrie Lewellen, Deputy City Clerk

Approved as to form:

DocuSigned by:

E. Bronson Potter

AAC4768B6D2D446...

E. Bronson Potter, City Attorney

SUMMARY

ORDINANCE NO. M-4265

AN ORDINANCE approving the concept development plan for the Four Seasons South Planned Unit Development; and providing for severability and an effective date.

The full text of this ordinance will be mailed upon request. Contact Raelyn McJilton, Records Officer at 487-8711, or via www.cityofvancouver.us (Go to City Government and Public Records).



Staff Report 041-19

TO: Mayor and City Council

FROM: Eric Holmes, City Manager

DATE: 4/1/2019

SUBJECT Four Seasons South Planned Unit Development

Key Points

- Approval of a planned development ordinance and approval of a preliminary plat to allow for the development of Four Seasons South Subdivision.

Strategic Plan Alignment

N/A

Present Situation

The applicant requests approval of a proposed planned development for a 70-lot single family subdivision totaling 8.47 acres in R-9 Low Density Residential & R-22 Higher Density Residential zoning. The proposal also includes a boundary line adjustment.

On February 19, 2019, a public hearing was conducted before the Hearings Examiner. On March 5, 2019, the Hearings Examiner issued findings, conclusions and recommendations. Her findings recommend that the planned development, boundary line adjustment and subdivision ordinance be approved by City Council.

Advantage(s)

1. Approval will allow for additional housing units to be constructed.
2. Approval will allow for flexible design with the emphasis on senior housing.
3. Approval will allow for the development in an area currently served by public utilities.

Disadvantage(s)

There will be additional traffic. However, this has been reviewed and the City has determined there is adequate capacity.

Budget Impact

None

Prior Council Review

Council has not previously reviewed this development.

Action Requested

On April 1, 2019, subject to second reading and public hearing, approve ordinance.

Kristian Corbin, Associate Planner, 487-7818

ATTACHMENTS:

- ▣ Ordinance
- ▣ Staff Report 2/19/2019 Hearing
- ▣ Staff Report Exhibits 2/19/2019 Hearing
- ▣ Exhibit 9 2/19/2019 Hearing
- ▣ Exhibit 16 2/19/2019 Hearing
- ▣ Exhibit 17 2/19/2019 Hearing
- ▣ Hearings Examiner Recommendation

03/25/19
04/01/19

ORDINANCE NO. M-_____

AN ORDINANCE approving the concept development plan for the Four Seasons South Planned Unit Development; and providing for severability and an effective date.

WHEREAS, on February 19, 2019, a hearing was held before the Vancouver Hearings Examiner regarding the approval of the concept development plan for the Four Seasons South Planned Unit Development.

WHEREAS, on March 5, 2019, the Vancouver Hearing Examiner recommended approval of the concept development plan for the Four Seasons South Planned Unit Development under File PRJ-156552, LUP-70974; and

WHEREAS, the concept development plan is consistent with the Comprehensive Plan and the underlying zoning of the property.

NOW, THEREFORE,

BE IT ORDAINED BY THE CITY OF VANCOUVER:

Section 1. Findings.

A. The Vancouver Hearing Examiner has found that all of the following criteria have been met, with conditions, as required by VMC 20.260.050:

1. Content. The concept plan contains all of the components required in Section 20.260.070. Compliance with all applicable standards. The proposed development and uses comply with all applicable standards of the Title, except where adjustments are

being approved as part of the concept plan application, pursuant to Section 20.260.030(D)(2).

2. Architectural and site design. The proposed development demonstrates the use of innovative, aesthetic, energy-efficient and environmentally-friendly design and materials.
3. Transportation system capacity. There is either sufficient capacity in the transportation system to safely support the development proposed in all future phases or there will be adequate capacity by the time each phase of development is completed.
4. Availability of public services. There is either sufficient capacity within public services such as water supply, police and fire services, and sanitary waste and storm water disposal, to adequately serve the development proposed in all future phases, or there will be adequate capacity available by the time each phase of development is completed.
5. Protection of designated resources. City-designated resources such as historic landmarks, significant trees and sensitive natural resources are protected in compliance with the standards in this and other Titles of the VMC.
6. Compatibility with adjacent uses. The concept plan contains design, landscaping, parking, traffic management and multi-modal transportation elements that limit conflicts between the planned development and adjacent uses. If zoning districts are shifted per Section 20.260.020(C) VMC, there shall be a demonstration that the reconfiguration of uses is compatible with surrounding uses by means of appropriate setbacks, design features or other techniques.

7. Mitigation of off-site impacts. All potential off-site impacts including litter, noise, shading, glare and traffic, will be identified and mitigated to the extent practicable.

B. The information for the concept development plan has been submitted and approved, as required by VMC 20.260.070.

C. The concept development plan of the Four Seasons South Planned Unit Development is consistent with the Comprehensive Plan and the underlying zoning.

D. City Council hereby adopts the foregoing findings and the findings of the Vancouver Hearings Examiner contained in the Findings, Conclusions, and Recommendation, which are hereby incorporated by reference, as its own.

Section 2. Legal Description. The legal description of the lands referred to in this ordinance is as follows:

Lot 3 of Northwestern Home Lots, according to the Plat thereof, recorded in Volume “C” of Plats, Page 41, and Records of Clack County, Washington, located in a portion of the Northwest quarter of Section 27, Township 2 North, Range 2 East, Willamette Meridian, and Clark County, Washington.

Section 3. Approval Granted. Based upon the foregoing findings, as well as the findings contained in Staff Report No. PRJ-143892/LUP-34824, which are hereby incorporated by reference, approval of the concept development plan for the Four Seasons South Planned Unit Development is hereby granted, with the conditions outlined in the Hearing Examiner’s Findings, Conclusions, and Recommendation, incorporated above by reference.

Section 4. Severability. If any provision of this ordinance or its application to any person or circumstance is held invalid, the remainder or the application of the provision to other persons or circumstances is not addicted.

Section 5. Effective Date. This ordinance shall take effect thirty15 days after passage and publication.

Read first time: March 25, 2019

Ayes: Councilmembers Lebowsky, Stober, Turlay, Hansen, Mayor McEnerny-Ogle

Nays: None

Absent: Councilmembers Glover, Paulsen

Read second time: April 1, 2019

PASSED by the following vote:

Ayes: Councilmembers

Nays: Councilmembers

Absent: Councilmembers

SIGNED this 1st day of April, 2019.

Anne McEnerny-Ogle, Mayor

Attest:

Natasha Ramras, City Clerk
By: Carrie Lewellen, Deputy City Clerk

Approved as to form:

E. Bronson Potter, City Attorney

SUMMARY

ORDINANCE NO. _____

AN ORDINANCE approving the concept development plan for the Four Seasons South Planned Unit Development; and providing for severability and an effective date.

The full text of this ordinance will be mailed upon request. Contact Raelyn McJilton, Records Officer at 487-8711, or via www.cityofvancouver.us (Go to City Government and Public Records) .



City of Vancouver • P.O. Box 1995 • Vancouver, WA 98668-1995
www.cityofvancouver.us

Staff Report and Recommendation to the Hearing Examiner
Four Seasons South PUD
PRJ-156552/LUP-70974

Report Date	February 5, 2019
Hearing Date	February 19, 2019
Proposal	A proposed Planned Development for a 70-lot single family subdivision totaling 8.47 acres in R-9 Low Density Residential & R-22 Higher Density Residential zoning. The proposal also includes a boundary line adjustment.
Location	Parcels 110250000, 110251000, 110252000 and 110235000 are located on the northeast corner of the intersection of NE 112th Avenue and NE 16th Street. The site is located in the NW Quarter of Section 27, Township 2N, Range 2E of the WM.
Applicant/Contact	Lisa Harker Four Seasons Subdivision LLC 7223 NE Hazel Dell Avenue Vancouver WA 98665
Property Owners	Kilada Walnut Village LLC PO Box 61982 Vancouver, Washington 98666 Joseph and Gayle Beaudoin 701 NE 112th Avenue Vancouver, Washington 98684
Staff	Kristian Corbin, Associate Planner Jen Patrick, Transportation Steve Ulibarri, Fire Giff Hancock, Water Eric Torgerson, Sewer Fereidoon Safdari, Stormwater Sue McNutt-Koning, Building

SEPA**Determination**

Final Determination of Non-significance

Approval**Criteria**

Planned Developments - VMC20.260.050

Boundary Line Adjustments - VMC20.310.050

Subdivision - VMC20.320.040

Staff**Recommendation**

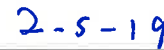
Planned Development, Preliminary Plat and Boundary Line Adjustment approval with conditions. Project conditions and/or required revisions are identified in the conclusion of this report.

RECOMMENDATION

This report to the hearing examiner is a recommendation from Community & Economic Development Department. The examiner may adopt, modify or reject this recommendation. The hearing examiner recommendation will be forwarded to City Council for a final decision.



Report Prepared By
Kristian Corbin, Associate Planner/Case Manager



Date



Greg Turner, Manager
Land Use Team



Date

BACKGROUND

Project Summary

The subject site consists of four parcels and a boundary line adjustment is proposed to divide the lot into two parcels, one .99 acres in size and the remaining three parcels consisting of a total of approximately 8.47 acres. The proposal also includes a Planned Development containing a 70-lot single-family subdivision on the 8.47 acre tract of land. The eastern rear portion of the site is zoned R-9 Lower Density Residential and western portion of the site is zoned R-22 Higher Density Residential. The applicant is proposing both attached and detached single-family dwellings units.

The original design concept of the project was to create a 70-lot single-family development for senior oriented living. However, a new off-site connection to the existing signal on NE 18th Street in association with this project will be required. In response to the required change, the applicant has altered their original design concept to allow for sale of units to all potential buyers rather than to just 55 and older. The change will result in some two story dwellings as opposed to all single-story dwellings as originally proposed. This was due to the anticipated impact of flow-through traffic along the newly proposed 115th Avenue, to mitigate the cost of developing an additional 300 linear feet of roadway and the potential loss of desirability to the 55 and older demographic due to increased traffic through the site. The applicant has provided a supplemental narrative to address amendments to the original narrative addressing the new requirements.

Access to the 70 lots will be directly to NE 16th Street which runs east and west along the southern property lines of the subject site. The site is relatively flat and contains no mapped critical areas as listed in VMC 20.740 Critical Areas Protection.

General Site Information

Zoning District	R-22, R-9 High Density Residential
Adjacent Zoning Designation	North, South, West: R-22 High Density Residential East: R-9 Low Density Residential
Comprehensive Plan Designation	UL Urban Low Density
Parcel Size	8.47 Acres
Adjacent Land Uses	North, South: Vacant East, West: Single-Family Residential
Access Roads	NE 16th Street to the south
Existing Vegetation	Trees and Grasses
Existing Structures	Sheds
Topography	Flat
Geologic Hazards	No mapping indicators
Seismic Hazard	No mapping indicators
Flood Plains	No mapping indicators
Wetlands	No mapping indicators
Archaeology	Level B – Lower Probability above 5 acres
Drainage Basin	Burnt Bridge Creek
Soils	Non-Hydric / WrB, Non-Hydric / WrF
Park Impact Fee District	District C
School Impact Fee District	Evergreen

Impacted Schools	Fircrest Elementary, Cascade Middle School, Evergreen High School
Traffic Impact Fee District	Cascade
Transportation Analysis Zone	None
Sewer District	Vancouver
Water District	Vancouver
Fire Service	Vancouver
Neighborhood Association	Fircrest

Procedural History

Activity	Case #	Date
Annexation history, Ordinance M-3299	M-3131	01-01-1995
Pre-application conference	PIR-62754 PIR-64574 PIR-69948	07-06-2017 10-12-2017 08-23-2018
Application submitted		09-28-2018
Application determined fully complete		11-16-2018
Notice of application and notice of public hearing		11-30-2018
Final DNS		01-03-2019
Hearing Date		02-19-2019

APPLICABLE REGULATIONS

Vancouver Municipal Code

VMC Chapters 11.80 Street Standards; 11.90 Transportation; 11.95 Transportation Concurrency; 14.04 Water and Sewer Use Regulations; 14.16 Water and Sewer Service Connections; 14.24 Erosion Control; 14.25 Stormwater Control; 16.04.160 Water Supply and Fire Hydrants; 16.04.150 Fire Apparatus Access; 16.04.170 through 16.04.210 Fire Protection Systems; 16.04.010 Premises Identification; 20.210 Decision Making Procedures; 20.260 Planned Development; 20.320 Subdivisions; 20.915 Impact Fees; 20.770 Tree Conservation; 20.410 Lower Density Residential Districts; 20.925 Landscaping and Open Storage; 20.945 Parking and Loading; and 20.790 State Environmental Policy Act Regulations.

Public Works Publications

General Requirements & Details for Water Main Construction

General Requirements & Details for Sewer Main Construction

Other

RCW 58.17

Manual on Uniform Traffic Control Devices

ANALYSIS

Major Issues

Staff reviewed the proposal for compliance with applicable regulations, code criteria and standards in order to determine whether all potential impacts will be mitigated by the requirements of the code. Staff's recommendation reflects review of agency and public comments received during the comment period and knowledge gained from a site visit.

Only the major issues, errors in the development proposal and/or justification for any conditions of approval are discussed below. Staff finds that all other aspects of this proposed development comply with the applicable code requirements and require no discussion in this report.

Building code review is not performed during pre-application or site plan review. Filing of building permit application with required fees and review materials is required for a building code review.

AGENCY AND PUBLIC COMMENT

Department of Ecology

A comment letter was received from the Department of Ecology dated Jan. 2, 2019 (Exhibit 10). The letter contains standards and requirements related to water quality and water resources.

Public Health

A comment was received from the State of Washington Environmental Public Health Division requesting the nearby wellhead protection area be evaluated under VMC 14.26.

Staff Response: The wellhead was reviewed by city engineering staff for water resource protection as required by VMC Chapter 14 Water Resource Protection.

FINDINGS

Land Use

20.210 Decision Making Procedures

Finding: Per VMC 20.210-1 Planned Developments 25 acres or less require a Type IV process and recommendation by the hearing examiner to the City Council for final approval. Per Table 20.210-1, preliminary subdivision (10 lots or more) require a Type III process and preliminary approval by the hearing examiner.

Per VMC 20.210.020.D, when more than one application is submitted for a given development and those applications are subject to different types of procedure, then all of the applications are subject to the highest type of procedure that applies to any of the applications.

Conclusion: The proposal was reviewed as a Type IV application which is the highest type of procedure. The proposal complies with the decision making procedures of VMC 20.210.

20.260 Planned Developments

Finding: Per VMC 20.260.030(1) Planned Developments, 25 acres or less require a Type IV process and a recommendation by the hearing examiner to the City Council for final approval.

20.260.010 Purpose

A. Flexibility. Provide a means for creating planned environments in any base zoning district through the application of flexible standards, i.e., zero-lot lines, narrower streets, and other innovative planning practices that will result well-designed, efficient and functional urban environments.

B. Efficiency. Facilitate the efficient use of land.

C. Economic feasibility. Increase economic feasibility by fostering the efficient arrangement of land use, buildings, circulation systems, open space and utilities.

D. Resource preservation. Preserve to the greatest extent possible the existing landscape features and amenities through the use of a planning procedure that can tailor the type and design of a development to a particular site.

Applicant Response: This proposal seeks to create a cohesive planned community attractive to adults 55 and over that desire to live close to live in the Four Seasons activity center in the heart of east Vancouver. The community is planned to provide single-level housing, two-car garages, well designed and finished homes with on-site open space amenities and convenient proximity to groceries, retail opportunities and health care services. The homes may be purchased by any buyer and will not be exclusively for older buyers, but the Applicant believes that the homes will be particularly attractive to older buyers seeking to downsize and live closer to urban services and amenities.

Staff Response: The applicant is proposing a planned development to accommodate specific design elements to attract the 55 and older demographic. The design requires the applicant to request the following adjustments through the planned development to applicable codes requirements: maximum lot coverage up to 75 percent for single-story homes, up to 68 percent maximum lot coverage for the two-story homes and reduction of the R-9 minimum lot size to 2,450 square feet.

Additionally, the applicant is requesting to utilize adjustments to the development standards found in VMC 20.910 Exceptions & Interpretations and VMC 20.927 Narrow Lot adjustments. These adjustments include: zero lot line development and reduced setbacks for covered porches.

As the applicant mentioned above, the reason for this request is to create a cohesive planned community attractive to adults 55 and older that desire to live close to the Four Seasons activity center. Staff finds no issues or concerns with the reasoning behind the proposed PUD and the requested adjustments. The proposal meets the goals and policies of providing new housing units for a growing diverse population as listed in the Vancouver Comprehensive Plan 2011-2030 and the 112th Corridor Subarea Plan which are both applicable to this development.

20.260.020 Applicability

A. Applicable in all zones.

The planned development is a development vehicle that may be used in all base zoning districts except in the Park, Greenway and Natural Area districts.

Applicant Response: The applicant is proposing a planned development on land with both R-9 and R-22 zones. Planned developments may be allowed each of these zones. The changes proposed in this supplemental narrative, offered in response to the City's request for a new offsite roadway connection, do not affect the applicability of the Planned Development ordinance. This proposal still includes higher than average open space, smaller lots with primarily single level homes and proposed amenities that will appeal to a range of buyers. The Project, with various lot sizes and configurations (alley load, single level, two level, etc.) will include higher than average architectural variability. Front porches will aid in creating and maintaining community as owners take possession of homes and get to know their neighbors.

Staff Response: Staff concurs.

B. Permitted Uses.

Applicant Response: Planned development may be allowed on the subject site. Also, the applicant is allowed a 5% density bonus.

Per 20.260.020.B, single-family detached and single-family attached are permitted by right in both the R-9 and the R-22 zones.

Eighteen attached single-family residential units and 52 detached single-family units are proposed. Associated with the planned development, an adjustment is requested to the maximum lot coverage standards allowed in both the R-9 and R-22 zone.

Because the site is proposed for narrow lots and more than 50% of the lots will be provided alley access (discussed in more detail below), the base zone lot coverage is 55% on the R-9 portion and 65% on the R-22 portion of the site. This Planned Development proposal requests an adjustment to 75% lot coverage. The purpose of the lot coverage request is to accommodate the single level housing that will be attractive to buyers that are planned 55 and older community. This development will consist primarily (at least 80%) of single-level two-car-garage homes. The single level homes will include two-car garages and all living space on a single floor to provide accessibility for an aging population the requires more space on each lot. At the same time, some outside area is preserved on each lot for pleasant landscaping, without a heavy ongoing maintenance burden for the future owners.

Staff Response: Staff concurs with the applicant. The subject site is currently zoned both R-9 Lower Density Residential and R-22 Higher Density Residential. The applicant is proposing a series of 18 single-family attached units and 52 single-family detached units. In both the R-9 and R-22 residential districts, single-family detached and single-family attached (two or more) are permitted by right within planned developments per VMC 20.260.020(B)(1)(a) & VMC 20.206.020(B)(2)(a).

C. More than one base zone.

More than one base zone. When a site contains land that is in more than one zoning district, the allowed and conditional uses at the required minimum and maximum densities, if applicable, shall be proportionate to the land within the development site devoted to each zoning district. The zoning may be shifted around the site provided that the same proportion acreage of each zoning district is retained. The concept and detailed plans shall explicitly illustrate such physical re-configuration of the site and shall be used as the basis for all subsequent land use reviews.

Applicant Response: The proposal contains 4.79 acres zoned R-9 (although, as mentioned above, this parcel will be reduced to 3.79 acres via a boundary line adjustment prior to subdivision) and 4.68 acres zoned R-22. The gross site acreage after BLA will be 8.47. The minimum and maximum densities in the R-9 zone are 5.9 to 8.7. In the R-22 zone the allowed densities range from 18.1 – 22 units per acre. These are based on net density.

The proposed density related to the R-9 zoned area is 12.61 units per acre. The proposed density related to the R-22 zoned area is 13.27 units per acre.

The maximum net density allowed in the R-9 zone is 8.7 units per acres. The minimum net density allowed in the R-22 zone is 18.1 units per acre.

The minimum number of units allowed in the R-9 portion of the site is 14. The maximum number of units is 20.

In the R-22 zoned area the minimum number of units allowed is 56 and the maximum number of units allowed is 67.

For the entire proposal, the combined minimum number of units allowed is 70. The combined maximum number of units allowed is 87. The applicant proposes 70 units.

Staff Response: The applicant proposes to retain the proportionate land area for both the R-9 and R-22 zoning designations. Maximum and minimum density requirements will be discussed later in this report.

20.260.030 Approval Process

A. Elements of approval process. The two elements of the planned development approval process:

- 1. Approval of the planned development concept development plan which contains a substantial level of detail for the whole project; and*
- 2. Approval of the detailed site plan(s) to be constructed in one or more phases that provide all of the additional detail not contained in the concept plan.*

Applicant Response: Although the code indicates there two elements of the planned development approval process, 20.260.030.C, concurrent reviews, indicates an applicant may file two or more related requests concurrently. The applicant is filing for concept development plan, detailed site plan and subdivision approval.

Staff Response: The applicant has submitted a concept development plan and a detailed development plan as part of their planned development application. In addition, the applicant is requesting approval of a subdivision and boundary line adjustment. Per VMC 20.260.030(C), filing multiple applications is permitted and shall be reviewed by the procedure type of the highest level. The review for a new planned development concept plan requires a Type IV procedure which is the highest level in this application. Staff finds the proposed concurrent reviews adhere to VMC 20.260.030(C).

B. Decision-making process.

- 1. Initial approval. A new planned development concept plan shall be processed by means of a Type IV review, per 20.210 VMC, using approval criteria contained in 20.260.050 VMC. The Planning Commission shall be the initial review authority for planned developments greater than 25 acres in size and the Hearings Examiner shall be the initial review authority for planned development 25 acres or less in size. The initial reviewer shall issue a recommendation to the City Council. The City Council shall be the final authority for planned developments.*

Applicant Response: VMC 20.260.030.B describes the decisions-making process. The applicant is aware of the decision-making process. No further response is required.

Staff Response: As previously mentioned, a new development concept plan shall be processed by means of a Type IV review. Planned developments less than 25 acres in size shall be initially reviewed by the hearing examiners then subsequently the city council for final authority. The public hearing is set for Feb. 19, 2019, and City Council hearing is set for March 25, 2019.

C. Concurrent reviews. *An applicant may file two or more related requests concurrently. These concurrent reviews will be reviewed by the procedure type of the higher/highest level, that is, if one review is subject to a Type III process and the other a Type II process, both will be subject to a Type III review process.*

Applicant Response: As indicated above, the requested action in approval of a concept development plan, detail site plan and subdivision approval concurrently. The proposal includes a planned development, planned development require a Type IV review process. Therefore, the entire application is subject to the Type IV review standards.

Staff Response: As previously mentioned, staff finds the proposed concurrent reviews adhere to VMC 20.260.030(C).

D. Adjustments. *Adjustments to numerical development standards in the underlying zoning district shall meet the criteria contained in Section 20.260.050(B) VMC below in lieu of requirements for variances contained in Chapter 20.290 VMC. The exception to this is a request to exceed the maximum height permitted in the underlying zone, which will require a concurrent variance request per 20.290 VMC.*

Applicant Response: The applicant is requesting an adjustment to the maximum lot coverage standard. Under the narrow lot standards, the maximum allowed lot coverage is 55% in the R-9 zone and 65% in the R-22 zone. The applicant is requesting maximum lot coverage of 75% for the entire development. This is addressed fully in response to 20.260.050(B).

The applicant is also requesting an adjustment to the minimum required lot area in the R-9 portion of the proposal.

Staff Response: As previously mentioned, the applicant is requesting two adjustments under the planned development provisions. The first is an increase in maximum allowable lot coverage from 55 percent (R-9 narrow lot VMC 20.927.050(B)) and 65 percent (R-22 narrow lot VMC 20.927.050(B)) to 75 percent for single-story homes and 68 percent for two-story homes. The applicant is limiting the two-story homes to only 20 percent of the total lots to accommodate for marketing trends and architectural diversity.

Provide a note on the final plat indicating which lots will be dedicated for two-story dwelling units.

The second adjustment is a reduction in minimum allowable lot sizes in the R-9 zoning designation from 5,000 square feet to 2,400 square feet.

Staff has no issues with the requested adjustments. As previously mentioned, the purpose of these adjustments is to primarily attract the 55 and older demographic. The proposal is consistent

with the vision of the 112th Corridor Subarea Plan. The plan identifies goals for a diversity of housing types in more urban areas for a growing demographically diverse population.

Time Limits 20.260.040

A. Time limit on filing of detailed development plan. Within two years after the date that the conceptual development plan is approved, the applicant shall prepare and file with the planning official a detailed development plan to be reviewed pursuant to 20.260.030(B)(1) VMC. In the case of phased development, as governed by Subsection (C) below, this provision shall apply to the first phase of the development.

Applicant Response: The applicant is aware of the time limits associated with the planned development process. No comments from the Applicant are required at this time.

Staff Response: The applicant is not proposing phasing or extensions with the application.

20.260.050 Approval Criteria

A. Concept development plan approval criteria. To receive approval for a planned development, the applicant shall demonstrate compliance with all of the following criteria:

1. Content. The concept plan contains all of the components required in Section 20.260.070. The proposed development and uses comply with all applicable standards of the Title, except where adjustments are being approved as part of the concept plan application, pursuant to Section 20.260.030 (D)(2).

Applicant Response: Compliance with the provisions of 20.260.070 is addressed under the response to that subsection.

Staff Response: The applicant submitted a Concept Development Plan with the application. Elements of this plan were reviewed against VMC 20.260.070. Further analysis of this plan will be addressed throughout this report.

2. Architectural and site design. The proposed development demonstrates the use of innovative, aesthetic, energy-efficient and environmentally-friendly architectural and site design.

Applicant Response: Within the application materials at Section 10, the applicant has submitted detailed drawings addressing the architecture and site design.

Staff Response: The subject site is located in the 112th Avenue Corridor Subarea plan which contains design guidelines and standards. This will be discussed later in this report.

3. Transportation system capacity. There is either sufficient capacity in the transportation system to safely support the development proposed in all future phases or there will be adequate capacity by the time each phase of development is completed.

Applicant Response: The applicant has submitted a traffic study (Exhibit 17) prepared by Kittelson and Associate, Inc. addressing trip generation, trip distribution and traffic impacts prepared pursuant to City-required traffic study standards.

Staff Response: A traffic study dated Oct. 23, 2018, was submitted to the City of Vancouver Transportation Department for review. Comments on the traffic study are listed later in this report addressing this requirement.

4. Availability of public services. There is either sufficient capacity within public services such as water supply, police and fire services, and sanitary waste and storm water disposal, to adequately serve the development proposed in all future phases, or there will be adequate capacity available by the time each phase of development is completed.

Applicant Response: The pre-application conference report dated August. 23, 2018, indicated public utilities were available or could be extended to the site. Stormwater facilities will be required to meet the standards contained in VMC 14.25.

Staff Response: The proposal was reviewed by the engineering department for public services availability. Their comments are listed later in this report addressing this requirement.

5. Protection of designated resources. Protection of designated resources. City-designated resources such as historic landmarks, significant trees and sensitive natural resources are protected in compliance with the standards in this and other Titles of the VMC.

Applicant Response: The pre-application report indicated no resources designated for protection on the project site. However, although the site is not within an area of high probability of encountering artifact, an archaeological predetermination is required as the site contains more than 5 acres.

Staff Response: There were no mapped critical areas located on the subject site. However, per VMC 20.710.020(B)(2), an archaeological predetermination was required. Findings listed in this report were inconclusive. Additional information on this report is addressed later in this report under 20.710 Archaeological Resource Protection.

6. Compatibility with adjacent uses. The concept plan contains design, landscaping, parking/traffic management and multi-modal transportation elements that limit conflicts between the planned development and adjacent uses. If zoning districts are shifted per Section 20.260.020(C) VMC, there shall be a demonstration that the reconfiguration of uses is compatible with surrounding uses by means of appropriate setbacks, design features or other techniques.

Applicant Response: To the east, the land use is residential. One tier of the proposed residential development abuts the existing residential. To the south the land uses are single-family residential, the city of Vancouver water station and a vacant tract. To the west is NE 112th Avenue. This major arterial separates the proposal from the land to the west, to the north is the BPA right of way. This approximately 340-foot-wide right of way separates the proposed development from the higher density residential zoned to the north. The proposed use is single-family residential.

Staff Response: The subject site is surrounded by single-family detached uses to the east and south. Adjacent to the north is farmland located within a BPA easement and to the west is 112th

Avenue corridor separating the subject site from undeveloped land zoned residential. Based on the surrounding uses, zoning and comprehensive plan designation, the proposed development is compatible with the adjacent uses.

7. Mitigation of off-site impacts. All potential off-site impacts including litter, noise, shading, glare and traffic, will be identified and mitigated to the extent practicable.

Applicant Response: The proposal is for single-family residential development. Litter, noise, shading glare and traffic are not generally off-site impacts associated with single-family dwellings.

The proposal is required to meet concurrency standards, including demonstration of compliance with the City transportation concurrency and safety standards which is established in the Applicant's traffic study. Areas for solid waste disposal and recycling collection will be provided. Access for collection vehicle access will also be provided.

The proposed structures will be single level. Significant shading is not anticipated. Related to glare, lighting is anticipated to be typical of a residential neighborhood.

Staff Response: The development will be subject to applicable building codes, routine site inspections during construction and VMC 8.20 Nuisances.

B. Adjustment approval criteria. Adjustments to numerical development standards may be processed as part of the request for concept if the applicant can demonstrate compliance with all of the following approval criteria:

1. The adjustment(s) is warranted given site conditions and/or characteristics of the design.
2. The benefits accruing from the implementation of the adjustment outweigh any potential adverse impacts.
3. Any impacts resulting from the adjustment are mitigated to the extent practical.

Applicant Response: The applicant requests two adjustments. The first is to the maximum lot coverage standard. The second is to the minimum lot area requirement.

The requested adjustment would increase lot coverage from the base zone amount to 75% to provide for sufficient ground-floor building area for single-level dwellings and to provide additional amenities that will enhance the community. Specifically, a portion of the increased lot coverage will be allocated to inclusion of front porches which are allowed under City code in the front yard setback area where homes are alley loaded. This supplemental narrative includes an exhibit showing a typical plan view and how the porch will be incorporated into the building and community design.

There are two base zoning districts included in the proposed Planned Development, R-9 and R-22. Both zoning districts have a maximum lot coverage of 50% but both are also modified by VMC 20.927.050 to allow 60% lot coverage as of right where more than 50% of the proposed homes on narrow lots will be served by alleyways. More than 50% of the proposed lots will be accessed via alleys, so the applicable base lot coverage is 60%. The applicant is seeking 75% lot coverage to accommodate single-level primarily detached homes on narrow lots.

The site design is based on meeting the minimum allowable density (70 lots) on the combined site (R-9 & R-22) on smaller lots and targeting the underserved market segment for single-level homes for entry level buyers and/or homes for downsizing baby boomers. As can be seen on the proposed preliminary plat, lot sizes vary from 2450 square feet to 3400-3800 square feet. These lot sizes will accommodate a home for single level living with a two-car garage and three bedrooms, but only at 70% to 75% lot coverage. Conditioned living space for a three bedroom home will typically be about 1550-2260 square feet (average of around 1800) and a two-car garage (necessary, we believe, due to the location of the property) will be approximately 460 square feet. Thus, the combined ground floor area for a three bedroom, single level home is 2200 square feet. Because the lots vary between 2450 to around 3500, 75% lot coverage will allow for around 2000 square feet buildings, including garages, which allows for a reasonable home design. Finally, the Applicant also wants to include front porches on the alley load lots as an additional community amenity and to create character and livability and the front porches will count against allowable lot coverage.

Because the Applicant is seeking to both meeting minimum density and provide housing in an underserved market segment, the adjustment is warranted to accommodate the proposed community design.

The use of maximum lot coverage percentages in the zoning code is interesting in light of minimum and maximum lot dimensions, densities and setbacks. It is an issue that is not addressed in the City's narrow lot code but probably should be. More affordable housing for both those entering the housing market for the first time and for those families downsizing from larger homes is lacking in Vancouver. In this case, higher lot coverage will allow for a lower price point in exchange for smaller individual yards.

Through the Planned Development ordinance, we are proposing to build homes with smaller yards but more community open space and off-site guest parking. The proposed development includes 10% open space on three separate tracts and a trail tract that provides access through the site to the BPA right of way on the north side of the development site. The project also proposes off-site guest parking in three separate areas and significant opportunities for on-street parking in front of homes because of the alley-load design.

The combination of community open space, off-site parking and homes with single-level living, smaller yards and 2-car garages outweighs the proposed increase in lot coverage from 60% to 75%. 75% would be a maximum. In most cases we believe that lot coverage will be between 68%-72%. All homes will still meet all required setbacks and heights will be limited due to the single level living design.

As noted above, the community design includes significant open space and parking and will meet all setback requirements under the code. The goal of increasing lot coverage is to build homes for single level living that includes a similar level of functionality to traditional two-level homes, and to do so on smaller, more urban lots. In this context, the impact of smaller yards is mitigated by including more community space and parking. The benefit is a housing product in very short supply in the City of Vancouver.

Minimum lot area standard adjustment request

The minimum lot area standard in the R-9 zone is 5,000 square feet. The minimum lot area standard in the R-22 zone is 1,500 square feet. The site contains 3.79 gross acres of R-9 zoned land and 4.68 gross acres of R-22 zoned land.

The proposed lots range from 2,450 square feet to 3,858 square feet. The average lot area is 2,881.34 square feet. The applicant is requesting the minimum lot area required be reduced to 2,400 square feet.

The adjustment is warranted as the average lot areas within the proposal exceed the blended average minimum lot area requirements to create a cohesive community design for a 55 and older community.

The proposal is not anticipated to have any adverse impacts. The total number of residential units will be less than the maximum number of units allowed by the current zoning districts.

The required setbacks of the underlying zones will be met. Storm drainage will be addressed. All required utilities and facilities will be provided. The residential density is within the allowed range. Parking and landscaping standards will be met.

The proposal allows for an innovative approach to single-family residential development.

Staff Response: Staff finds the approval criteria have been met. The requested adjustment is warranted given the characteristics of the design concept is to attract the 55 and older demographic. This aligns with the intent of the 112th Corridor Subarea design guidelines which emphasize a mixture of housing types that accommodate the area's demographic diversity.

The proposal does not appear to impact the general, health safety and welfare of the area and as previously mentioned, is consistent with the City of Vancouver Comprehensive plan.

C. Conditions of approval. The review authority shall impose any conditions of approval necessary to mitigate potentially adverse impacts on surrounding properties to the greatest extent practicable.

Applicant Response: The applicant recognizes the review authority can impose conditions necessary to address potentially adverse impacts. However, as indicated above, no adverse impacts are anticipated.

Staff Response: Staff recommends conditions of approval that are listed at the end of this report.

D. Detailed site plan approval criteria. During the site plan review process, the Planning Official shall approve the detailed development plan for one or more phases of the development upon finding that the final plan conforms to the approved conceptual development plan, including all conditions of approval, unless the modification of the concept plan is sought concurrently as described in 20.260.030 (C)(6) VMC.

Applicant Response: The applicant requests concept development plan approval, detailed site plan approval of the entire development and preliminary land division approval as allowed by 20.260.030.D.

Staff Response: The applicant is not proposing any phasing for this project.

20.260.060 Development Standards

A. Minimum development size. There shall be no minimum site size for any type of planned development.

Applicant Response: The total post BLA site area is 8.47 acres.

Staff Response: The applicant is proposing a planned development for a tract of land 8.47 acres in size.

B. Applicability of base zone development standards. The provisions of the base zone are applicable as follows. When the zoning districts within the planned development have been shifted as permitted in Section 20.260.020 (C) VMC, the applicable development standards for the underlying zones shall shift accordingly.

1. *Lot dimensional standards:* The minimum lot depth and lot width standards shall not apply.

Applicant Response: No response required.

Staff Response: Though not required, the applicant is proposing adherence to the Narrow Lot Development standards VMC 20.927 for this development.

2. *Lot coverage:* The site coverage provisions of the base zone shall apply.

Applicant Response: The proposal has two zoning designations. The western portion is zoned R-22 and the eastern portion R-9. In each zone, the maximum lot coverage allowed is 50% (Tables 20.410.050-1 and 20.420.050-1).

The proposal is also subject to the narrow lot standards. Section 20.927.050, incentives for providing alleys states any development subject to this chapter which provides alley access to at least 50% of the total number of lots shall qualify for the following modifications to development standards:

- In lower density residential districts, maximum lot coverage shall be 55%.
- In higher density residential districts, maximum lot coverage shall be 65%.

The proposal provides alley access to 48 of the proposed 70 lots. This exceeds the 50% criterion.

Staff Response: The base zoning allows for 50 percent lot coverage for both the R-9 and R-22 residential zoning districts. Through the narrow lot incentives for providing alleys (VMC 20.927.050(B)), maximum lot coverage can be increased to 55 percent for lower density residential districts and 65 percent for higher density residential. As previously mentioned, the applicant is requesting the following adjustment through the Planned Development to the lot coverage: 75 percent for single-story homes and 68 percent for two-story homes with a limitation on the two-story homes to only 20 percent of the total lots.

3. Setbacks:

- a. *Front and rear yard setbacks for structures at the perimeter of the project shall be the same as required by the base zone except when an adjustment is approved, per Section 20.260.030(D).*

Applicant Response: Per table 20.410.050-1, the minimum front yard setback in the R-9 zone is 10 feet, except for garages/carports which required 18 feet. The rear yard setback is 5 feet.

Per table 20.420.050-1, the minimum front yard setback in the R-22 zone is 10 feet, except for garages/carports which required 18 feet. The rear yard setback is 0 feet or 5 feet.

The site is also subject to narrow lot standards. Under incentives for alleys, at 20.927.050(F)(2) the code allows the minimum rear yard setback from edge of alley pavement to garage or carport may be either 4 feet or at least 18 feet. Lots with alley access will have 4-foot rear yard setbacks. Lots without alley access will have 5-foot rear yard setbacks.

Lots with the garage fronting public street will have the garages setback 18 feet from the right of way. The minimum front setback for house is 10 feet in the R-9 and R-22 zones. The Applicant anticipates using the setback exception provided for in VMC 20.927.050(F)(3), so that front porches can be integrated into the building and community design.

Staff Response: The applicant is proposing to utilize incentive based adjustments to the setback requirements as listed in VMC 20.927.050 Narrow Lot Developments and VMC 20.910.050 Zero Lot Line Development. More specifically the incentives sought are for porch allowance of a six-foot encroachment into the front yard setback (20.927.050(F)(3)), zero lot lines (20.910.050), and a four-foot rear yard setback from the edge of alleys (20.927.050(F)(2)). All other setback requirements will adhere to the development standards of the underlying zoning.

- b. *The side yard setback provisions shall not apply except that all detached structures shall meet the City's adopted building code requirements for type of construction.*

Applicant Response: The project incorporates the zero lot line provisions contained in 20.910.050. 20.910.050(A) states the minimum setback on the adjacent lot to the zero-setbacks side yard lot shall be either zero or 5 feet. The proposal will meet the requirement of that code section by recording the required easements and covenants and incorporating the required building design provisions.

Staff Response: As mentioned by the applicant, the setbacks will adhere to the VMC 20.910.050 Zero Lot Line requirements.

- c. *Front yard and rear yard setback requirements in the base zone setback shall not apply to structures on the interior of the project except that any garage facing a street shall be set back a minimum of 18 feet from the front or side street property line.*

Applicant Response: All buildings will meet the front and rear yard setback standards as modified by the narrow lots standards (including allowance of front-porch encroachment into the setback) and the zero lot line standards.

Staff Response: The applicant is permitted to utilize the narrow lot development setback requirements as listed in VMC 20.927.

- d. *All buildings will meet the front and rear yard setback standards as modified pursuant to this Chapter, except for maximum height for which a variance shall be sought, as governed by Chapter 20.290 VMC.*

Applicant Response: The minimum lot area standards apply unless modified by an adjustment. The minimum lot area requirement in the R-9 zone is 5,000 square feet. The minimum lot area standard in the R-22 zone is 1,500 square feet. The applicant requests an adjustment under the planned development process.

Staff Response: The applicant is not proposing any adjustments to the height requirements of the base zone therefore, no variance is required for the requested adjustments. As previously mentioned, the applicant is requesting adjustments to overall lot coverage and minimum lot size for the R-9 zoned portion of the site and to allow for 2,400-square-foot lots. Staff has no issues with the requests. The incentive for using alleys allows for greater lot coverage above what is permitted in the base zoning (VMC 20.927.050). Additionally, the subject site is located within the 112th Corridor Subarea Plan Design Guidelines. As part of the concept of the plan, there is an emphasis on a mixture of housing types that accommodate demographic diversity (*B 112th Corridor Concept pg. 6*) and the encouragement of street-oriented developments (*C Site Planning & Amenities [C.1 Building Location & Orientation] pg. 8*). The request meets the design concept, intent and vision of the 112th Corridor Subarea Plan. Buildings adjacent to the proposed alleys are oriented towards the street and lot design is proposed to attract a specific demographic. Staff does not foresee any conflicts with the adjustment requests that would jeopardize the general health, safety and welfare of the immediate area.

C. Common open space. In exchange for the approval of higher residential densities, smaller lots and relaxed development standards, the developer of a planned development is required to provide common open space for the active and passive recreational activities of residents, employees and visitors. Such space will be aggregated wherever feasible and shall consist of a combination of landscaped and paved (hard-scraped) areas. Such common open space shall include some combination of the following: plazas, arbors, sitting areas, picnic areas, playing fields and trails to accommodate a variety of active and passive activities and promote visual interest.

- In planned developments, the following requirements shall apply.
 - a. At least 10 percent of the gross area of the site must be devoted to such open space. Such space must be fully accessible to the residents, employees, visitors and/or other users of the site. Reduction of this standard in PDs of two acres or more is prohibited. A reduction of this standard in PDs of less than two acres is subject to an adjustment per Section 20.260.030(D) VMC using approval criteria in Section 20.260.050(B) VMC.

Applicant Response: The site has a gross area of 8.47 acres. Therefore, 0.847 acres must be open space.

Staff Response: The applicant is proposing three open space tracts that will be accessible to the residents of the proposed development. The applicant has dedicated a total land area of 50,506 square feet for the open space on an 8.47 acre project area. This totals 13.6 percent of the gross area devoted to open space meeting the requirement of this section.

- b. Fenced yards associated with buildings immediately adjacent to designated open space and landscaping in parking lots shall not count toward the total requirement.
- c. Environmentally-constrained land within the planned development, including wetlands, geologically hazardous areas, sensitive wildlife habitats, pursuant to Section 20.740 VMC or native vegetation and healthy soil preservation pursuant to 20.770 VMC or stormwater facilities pursuant to Chapter 14.25 VMC; may be used to meet up to 50 percent of the total requirement specified in Subsection (a) above, provided that these areas are not fenced and are either accessible to pedestrians to the extent practical or are visually accessible from adjacent and adjoining common open space.

Applicant Response: 0.849 acres of open space are incorporated into the design.

Staff Response: Based on information taken from county data, there are no mapped areas that contain environmental constraints within the subject site as listed in VMC 20.740 Critical Areas or 20.770 Tree, Vegetation, and Soil conservation. A slope easement was granted by the City of Vancouver on the west side of the site adjacent to 112th Avenue (Exhibit 12). The land area of this easement is approximately 6,206 square feet. The area of this easement is permitted to be removed from the density calculations per VMC 20.150.

- The common open space designated to meet this requirement shall be permanently maintained by and conveyed to one of the following:
 - a. A homeowners' or property owners' association as regulated by State law.
 - b. A public agency that agrees to maintain the common open space and any buildings, structures or improvements placed within it.

Applicant Response: The open space, trail tract and front yards of each home will be maintained by the homeowners' association.

Staff Response: A condition of approval has been added requiring the following note to be placed on the final plat "**Home Owner Association is responsible for maintenance of all open space tracts listed on this plat.**"

- The applicant may not seek a variance or adjustment to reduce the minimum open space requirement specified in Subsection (2)(a) above.

Applicant Response: The applicant is not seeking a variance or adjustment to reduce the minimum open space requirements.

Staff Response: The applicant did not request application variance or adjustment to the minimum open space requirement.

- The open space created under this provision is not subject to the Park Impact Fee (PIF) credit unless so authorized by the Vancouver-Clark Parks Department.

Applicant Response: The applicant is aware of this provision and has not requested the City of Vancouver Parks and Recreation Department to authorize Park Impact Fee Credits.

Staff Response: The applicant will be required to pay impacts fees at issuance of building permits.

20.310 Boundary Adjustment

Finding: In addition to the Planned Development and Subdivision, the applicant has submitted for boundary line adjustment approval. This was review for compliance with the terms and requirements of VMC 20.310 as listed below.

20.310.030 Approval Process

- A. Decision-making process. Boundary adjustments shall be reviewed by means of a Type I procedure.
- B. Time limit for recording. A legal description of the newly-configured lots approved by the planning official shall be recorded with the Clark County Auditor within 90 days of the date of the written decision, unless a longer time period is specified in the decision.
- C. Extension. By means of a Type I procedure the applicant may request an extension of the recording date for a period not to exceed one-year provided that no changes are made from the original approval.

20.310.050 Approval Criteria

The planning official shall approve, approve with conditions or deny a request for a boundary adjustment in writing based on findings addressing all of the following criteria:

1. No additional parcel(s) shall be created by the boundary adjustment;

Finding: The request is to adjust the existing property lines between PID 110252000 and PID 110235000. The proposal will not create any additional parcels.

2. The lot and location of any structure(s) on the lots shall comply with the minimum density, dimensional and area requirements of the zoning district, unless a variance is sought in conjunction with the request per the requirements of Chapter 20.290. Per VMC 20.410.040(C)(1)(a), lots developed or approved before March 11, 2004, are exempt from the requirement for minimum density/maximum lot size. However, if a site is completely redeveloped the new development must comply with the minimum density requirements contained in Table 20.410.010-1.

Finding: The subject parcels were legally created prior to 1969 when the State Subdivision Law (RCW 58) went into effect.

The adjusted parcels are zoned R-9 (Low Density Residential) and R-22 (Higher Density Residential). The R-9 zoning district requires a minimum lot size of 5,000 square feet, maximum lot size of 7,400 square feet, a minimum lot width of 45 feet and a minimum lot depth of 65 feet.

The R-22 zoning district requires a minimum lot size of 1,500 square feet, no maximum lot size, a minimum lot width of 20 feet and minimum lot depth of 50 feet.

Since the lots were created before March 11, 2004, they are exempt from the maximum lot size requirement.

3. Legal access shall be provided to each of the lots.

Finding: Lot 11025200 and Lot 110235000 currently have access from NE 16th Street.

20.320 Subdivision

Finding: Per VMC 20.320.020.A.2, the hearing examiner shall approve, approve with conditions or deny an application for subdivision preliminary plat by means of a Type III procedure using approval criteria contained in VMC 20.320.040.

Phasing VMC 20.320.020.C. The developer may develop the subdivision in phases. Any phasing proposal shall be submitted with application materials for the preliminary plat and approved by the review authority, except that the planning official may approve a phasing plan for an approved short subdivision or subdivision by means of a Type I procedure, governed by 20.210.040 VMC Type I Application upon finding that:

- The phasing plan includes all land identified within the legal notice of the approval hearing;
- The sequence of phased development is identified by map;
- Each phase shall constitute an independent project meeting all of the requirements for density, open space, public and private infrastructure, landscaping, pedestrian and vehicle circulation etc.; and
- The Director of Public Works and Transportation Manager have approved the necessary documents to determine that all streets, sanitary and storm sewers, water and other public improvements, including but not limited to drainage improvements, and erosion control measure are assured.

Staff is agreeable to look at future phasing subject to the above approval criteria if requested. At this time, no such request has been made by the applicant.

Approval Criteria Per 20.320.040 VMC, to receive approval of a preliminary subdivision, the applicant must demonstrate compliance with the following criteria:

Public Facilities Provision

Approved provisions to the extent necessary to mitigate an impact of the development have been made for transportation, water, storm drainage, erosion control and sanitary sewage disposal methods that are consistent with the city's current ordinances, standards and plans, where applicable.

Finding: All utilities required for development are available to the site and will be extended as required for connection.

Proposed Improvements

Appropriate provisions have been made for proposed streets, alley and public ways, utilities and other improvements that are consistent with the city's current ordinances, standards and plans, and Department of Health and/or Washington State Department of Transportation standards and plans, where applicable.

Finding: The frontage along 112th Avenue and NE 16th Street will be improved with detached sidewalks, planter strips and street trees. The new internal streets will be constructed to City of Vancouver standards. Utilities and stormwater management provisions will be extended through the site. Existing sewer and water systems have sufficient capacity to serve this development and stormwater will be managed in accordance with adopted codes and regulations.

Open Space Dedications

Appropriate provisions to the extent necessary to mitigate an impact of the development have been made for open space, parks, schools, dedications, easements and reservations.

Finding: Provisions for the acquisition and maintenance of parks, open space, and schools will be provided with the payment of school and parking impact fees, paid upon at the issuance of building permits. The proposed dedications for right of way and utility easements are indicated on the plans. The applicant is proposing three open space tracts and a trail system that connects NE 16th Street to the site. The applicant will be required to provide any necessary easements for sidewalks, streetlights and utility extensions prior to final plat approval.

Physical Characteristics

The design of the proposed short subdivision or subdivision-site has taken into consideration the physical features of the site including but not limited to topography, soil conditions, susceptibility to flooding, inundation or swamp conditions, steep slopes or unique natural features such as wildlife habitat or wetlands.

Finding: The project will be developed on native soils. The area is relatively flat with no mapped environmental critical areas as listed in VMC 20.740 Critical Areas Protection.

Re-platting of existing subdivisions

When re-platting an existing subdivision, the short subdivision shall comply with all of the terms and conditions of the existing subdivision's conditions of approval.

Finding: There was no prior subdivision associated with the subject site.

Compliance with all requirements of this title

The proposed short subdivision or subdivision complies with all applicable requirements of this title unless modified through the approval.

Finding: The provisions of this title have been met or will be met with proposed mitigation and with conditions of approval imposed on the approval of this request.

Compliance with state requirements

The proposed short subdivision or subdivision complies with the requirements of RCW 58.17.110.

Finding: The comprehensive plan identifies goals and policies that guide development in the City of Vancouver for the benefit of the public health, safety and general welfare. The proposed plat complies with these goals and policies by providing new housing units to a large segment of the population at anticipated densities; by providing the necessary infrastructure to serve the development, including the payment of impact fees for schools, parks and transportation; and by demonstrating all applicable laws can be complied with as conditioned.

The proposed plat will assist in the expansion of the city's housing supply; it will facilitate development in an area that is developed and has urban services; it will implement city goals promoting development while limiting urban sprawl.

This project complies with RCW 58.17.110.

Evergreen School District

The Evergreen School District received notification of the proposed development to assist in the forecasting growth within each school from the SEPA application dated Sept. 28, 2018.

Evergreen School District provides bus service to the area. School bus services are provided at the following locations as provided by Evergreen School District website:

Fircrest Elementary School – 11906 NE 16th Street – Bus #202

Cascade Middle School – 11900 NE 18th Street – Bus #121

Evergreen High School – 11022 NE 18th Street – Bus #128

Street improvement standards. *All proposed street and street improvements shall comply with the provisions of Title 11 and approved transportation standards details on file with Transportation Services.*

As stated in the Transportation section of this report, proposed street improvements will comply with the provisions of Title 11, subject to the conditions of approval.

Blocks. *The length, width and shape of blocks shall be designed with due regard to providing adequate building sites for the use contemplated; consideration of the needs for convenient access, circulation, control, safety of motor vehicular, bicycle and pedestrian traffic and recognition of limitations and opportunities of topography.*

The proposed blocks comply with these limits.

Blocks – sizes. *Blocks shall not exceed 1,300 feet in length between street lines, except blocks adjacent to arterial streets or unless a previous adjacent layout or topographical condition justifies variation. The recommended minimum distance between intersections of arterial streets in 1,800 feet. Minimum length of a block shall not be less than 180 feet.*

The proposed blocks comply with these limits.

Easements – utility lines. *Easements for sewers, drainage, water lines, electric lines or other public use utilities shall be provided. The size and location of the easement shall be reviewed and approved by the appropriate utility provider.*

All water, storm and sanitary sewer lines constructed within the public right of way do not require easements. However, if these lines, hydrants, water meters or other utilities are constructed outside the public right of way, dedication or easements will be required prior to final plat approval.

Watercourse. *If a subdivision is traversed by watercourse, such as a drainage way, channel or stream, there shall be provided a stormwater easement for the widths of the watercourse plus 15 feet on each side of the watercourse. Street or parkways parallel to a major watercourse may be required.*

No watercourses traverse the property.

Pedestrian/bicycle way in and through residential subdivisions. *In blocks over 800 feet in length, a pedestrian/bicycle way with a minimum width of 16 feet shall be required through the middle of the block when required by the Transportation Manager for public convenience and safety; 12 feet of the 16-foot corridor shall be paved in a durable material. If unusual conditions require blocks longer than 1,200 feet in length, two pedestrian/bicycle ways shall be required. When required by the Transportation Manager for public convenience and safety, pedestrian ways.*

There are no proposed blocks that exceed over 800 feet in length.

Flag lots. *Flag lots may be permitted, provided that the minimum width of the flag stem is 15 feet for a single lot and 20 feet for a shared flag access. No more than four lots may be accessed from a single flag stem.*

The applicant is not proposing any flag lots.

Lots side lines. *Sides lines, as far as practical, shall run at a right angles to the street on which the lot faces.*

Side lot lines run at right angles to adjacent existing streets and proposed.

Lot frontage. *With the exception of flag lots, all lots shall abut on a public or private street with a minimum frontage of not less than 20 feet.*

All lots have at least 20 feet of frontage.

Lot depth and setbacks. *Lots fronting or accessing on primary or secondary arterials shall be avoided when possible. If lots front on arterials, the lots shall have an average minimum depth of 100 feet.*

The subject site fronts NE 16th Street, which is a local access. None of the proposed lots have frontage along arterials.

Parks and playgrounds. *The review authority shall see that appropriate provision is made for parks and playground to serve the proposed subdivision.*

Park impact fees, assessed for each new residence at the time of building permits, are to be used for the acquisition of new parklands and improvements to existing parks.

Existing trees. *All subdivision developments shall comply with the tree and vegetation management provisions contained in Chapter 20.770 VMC Tree Conservation.*

The proposal complies with the tree ordinance as conditioned in this report.

Public Improvements. *Public improvements, which are installed by the developer either as a requirement of this approval or at his own option, shall conform to the requirements, improvement standards, specifications, inspections and procedures of Title 20.*

The applicant has submitted preliminary utility plans for public improvements. These have been reviewed and noted with necessary corrections. Civil plans will be required to be submitted for review, approval and construction prior to recording the final plat.

20.410 Lower Density Residential

Finding: Per table 20.410.030-1, detached single-family dwellings and attached single-family dwellings are permitted within R-9 zoning districts in Planned Developments. The base zoning minimum lot size is 5,000 square feet; the maximum is 7,400. The applicant is requesting an adjustment to the minimum lot size which is permitted under VMC 20.260.050(B) so long as compliance to the approval criteria is demonstrated. As previously mentioned in this report, the applicant is requesting the minimum lot area required be reduced to 2,400 square feet to create a design to attract a 55 and older population.

Staff has no issues with the request to reduce the minimum lot size to 2,400 square feet. As previously mentioned, the proposal meets elements of the 112th Corridor Subarea Plan vision. More specifically, it meets planning for a mixture of housing for a diverse demographic and development orientation towards the street as the development utilizes alleyways.

Conclusion: The proposal meets the requirements of this section.

20.420 Higher Density Residential

Finding: Per table 20.420.030-1 attached single-family dwellings are permitted provided the minimum required residential density is met on an overall project basis.

20.420.040 Minimum and Maximum Densities

Finding: The site carries two zoning designations; R-9 and R-22. Allowed net density in the R-9 district ranges between 5.9 to 8.7 units per acre. The allowed net density in the R-22 is 18.1 to 22 units per acre. Net lot area excludes public and private streets, stormwater facilities and unbuildable critical areas (slopes). As noted in the table below, the combined maximum number of units allowed on this site is 96, while the minimum required is 70. The proposal is for 70 units which are all single-family dwellings.

Zone	Total Net Area	Minimum Units Required	Maximum Units Allowed
R-9	2.30 (100,325 sf)	14	20
R-22	3.09 (134,733 sf)	56	68
Required		70	96

The density proposed falls within the acceptable range of minimum 70 units; maximum units of 96.

20.420.050 Development Standards

Finding: Development Standards are listed in the table below for the R-9 and R22 zoning districts.

Standard	R-9	R-22
Minimum Lot Size	5,000 sf	1,500 sf*
Maximum Lot Coverage	50percent	50percent
Minimum Lot width	45 feet	20 feet
Minimum Lot Depth	65 feet	50 feet
<i>Minimum Setbacks</i>		
Front Yard	10 feet	10 feet
Rear Yard	5 feet	0 feet** / 5 feet
Side Yard	0 feet* / 5 feet**	0 feet / 5 feet
Garage/carport from public/private street R.O.W or sidewalk easement	18 feet	18 feet***
Maximum Height	35 feet	50 feet
Minimum Landscaping Requirements (percentage of total net area)	10percent	10percent

R-9

* Subject to VMC 20.910.050 Zero Lot Line Development

** For each additional 10 feet of building height, or fraction thereof, over 25 feet, add 2 feet to the setback to a maximum of 10 feet on each side or rear yard.

R-22

* Provided the required residential density is met on an overall project basis.

** See requirements for zero lot line developments pursuant to Section 20.810.050 VMC.

*** There must be a minimum of 20' maneuvering space from entrance edge of garage/carport to approved edge of alley

The R-9 lot sizes range from 2,450 square feet to 3,800 square feet; the multi-family lots each exceed 1,500 square feet. As previously mentioned, the applicant is requesting an adjustment to the minimum allowable lot size in the R-9 via a Planned Development. Justification for this request is listed in that section of this report. Staff has no issues with this request.

Lot width and depths requirements do not apply for Planned Developments per VMC 20.260.060. The applicant proposes to adhere to VMC 20.927 Narrow Lot Developments criteria. All lots have a proposed depth of 70 feet or greater.

Setbacks requirements for each lot will be reviewed for compliance at the time of building permits review. The applicant has shown the ability to meet the required setbacks.

20.691 112th Avenue Corridor District

Finding: The site is located within the 112th Avenue Corridor Plan District. Per VMC 20.691.030(B), properties within the Plan District shall comply with their respective code requirements and development standards **and** meet the intent of the 112th Avenue Corridor Design Guidelines. The applicant has designed the site incorporating design guidelines for the 112th Corridor into the overall plan, including building placement, roadway locations, pocket parks, alley access, sidewalks and a pedestrian trail system through the site.

The site has approximately 311 feet of street frontage along 112th Avenue. This street is classified as a four-lane principal arterial with center left turn and bike lanes, has a 50-foot centerline right of way and is a heavily traveled main thoroughfare. In the interest of safety, the entrances to the living units are not proposed to front 112th Avenue.

Design Requirements of the 112th Corridor Subarea Plan:

- All new development, streets, and street improvements shall meet the intent of the adopted 112th Avenue Corridor Design Guidelines.

Finding: The design calls for interior alleyway access where applicable which minimize interruptions to sidewalks and pedestrian flow promoting safe and attractive streetscapes as required in the subarea plan. The applicant proposes front porches that protrude into the front yard setback as permitted in VMC 20.927. This meets the intent of the design guidelines for creating a welcoming building frontage that engages the sidewalks.

- All new development shall meet the intent of the connecting street, trails and open spaces illustrated on the Conceptual Site Plan within the 112th Avenue Corridor Design Guidelines.

Finding: The applicant's design incorporates a trail system leading from connecting the subject site to the NE 16th Street frontage. The trail includes trees and small turf areas as landscape elements required by the Corridor Design Guidelines.

- Street connections between adjacent properties need not be opened until such time as the connecting roadway on each property is constructed to urban standard, consistent with Vancouver's street standard plans.

Finding: The applicant is not proposing any phasing for this project. Connections will be opened at the time of project completion.

Staff finds the proposed development and the adjustments requested in the Planned District meets the overall intent of the 112th Avenue Corridor Plan district.

20.710 Archaeological Resource Protection

Finding: An archaeological predetermination was conducted on the site by Archaeological Services LLC dated Nov. 21, 2017. The predetermination found no evidence of archaeological materials on the site. The report was reviewed by the city's contract archaeologist who concurred with the findings.

Place the following on the final plat: **If any archaeological deposits are found during construction, work shall stop and the City of Vancouver's Community & Economic Development and the Washington State Department of Archaeology and Historic Preservation shall be notified.**

Conclusion: As conditioned, the proposal meets the requirements of this section.

20.770 Tree Conservation

Finding: Based on a net building area of 5.50 acres, a minimum of 165 trees are required. The Level V tree plan shows 171.5 to be planted. Of the 171.5 proposed units, 90.5 units are from retained trees. This meets the minimum tree density requirements of 30 tree units per acre.

Street trees are required to be planted along all street frontages, one per 30 feet of frontage. Street trees will be planted along NE 16th Street and adjacent streets fronting the subject site.

Conclusion: The applicant meets the requirements of this section.

20.790 SEPA

Finding: The applicant submitted an environmental checklist for review (Exhibit 8). Staff issued a Notice of Application and Optional SEPA Determination of Nonsignificance (DNS) Nov. 30, 2018. A Final Notice of Determination of Nonsignificance (DNS) was issued Jan. 3, 2019.

The appeal period ended January 17, 2019. No appeals were received.

Conclusion: The application meets the requirements of this section.

20.915 Impact Fees

Finding: This project is subject to park, transportation and school impact fees. For a single-family residential subdivision, a per-lot impact fee shall be calculated at the time of preliminary plat approval, **noted on the face of the final plat**, and imposed on a per-lot basis at the time of individual building permit issuance.

Impact fees for the multi-family development shall be paid prior to building permit issuance.

Fee Type	Fee per new single-family dwelling
Park District C	\$2,142
Evergreen School District	\$6,100
Cascade/I 205 Mill Plain Overlay	\$729.96

The fees shall be re-calculated for building permit applications filed more than three years following the date of the preliminary approval.

Conclusion: As conditioned, the applicant meets the requirements of this section.

20.927 Narrow Lot Development

Finding: All of the lots in this subdivision are 40 feet or less in width which requires adherence to the narrow lot development chapter.

20.927.030 Narrow Lot Development Approval Criteria

- *Conflicts on narrow lots shall be eliminated.*

Finding: The applicant has submitted a development plan showing that utilities, driveways, street trees, etc. have been located and designed to minimize conflicts with one another.

- *Adequate guest parking shall be provided.*

Finding: per VMC 20.927.030(B), guest parking shall be one parking space provided per every three narrow lots. The applicant is proposing 70 lots which equates to 23 required guest parking spaces. The applicant current provides 18 parking spaces.

Depict the five additional guest parking spaces required on the final site development plan.

- *Solid waste and recycling collection and access shall be provided.*

Finding: Where access is not feasible common collection points shall be established and are noted on site plans. Where collection is not feasible in front of the residence or via an alley, a designated common collection point will be established. Specifically lots along the private tracts will be required to bring their carts to the public street for collection due to limited access along the private tracts in accordance with VMC 20.927.040.A.3(c-d).

20.927.040 Narrow lot Development Standards

1. On and off-site improvements plan required.

Finding: The applicant has submitted a development plan showing that utilities, driveways, street trees, etc. have been located and designed to minimize conflicts with one another. The plan shows street widths, planter strips, sidewalks, light poles, fire hydrants and mail boxes. City water and sanitary sewer have reviewed placement of lines and meters to each narrow lot.

2. Standards for guest parking in common areas

Finding: Adequate guest parking shall be provided. Per VMC 20.927.030(B), at least one guest parking space for every three narrow lots in the development shall be provided. With 70 narrow lots, 23 guest parking spaces are required for this development. The development plans show 18 spaces which is short of the requirement.

3. Standards for Solid Waste and recycling access and collections.

Finding: Proposed plans for the western portion of the site show Lots 1 through 8 have frontage along a 16-foot narrow looped alley and private track. This narrow and curved alley may limit the ability of collection vehicles to maneuver safely to all points of the affected lots. As a condition of approval, the applicant can submit an access and collection plan that demonstrates recycling truck maneuvering is feasible at the narrow looped alley as proposed, or provide an alternate location for Lots 1 through 8 to stage their carts for collection. The applicant shall ensure the designated cart set out points allow for carts to be spaced with three feet between to permit automated collection.

4. Standards for alleys and lots with alley access

Finding: Alleys are highly effective in addressing conflicts at the front street. Alleys shall be within a 20-foot access easement and consist of 16 feet of paving. The alley easement width is shown at 24 feet with 16 feet of paving meeting this minimum requirement. **A note shall be recorded on the plat regarding maintenance of the alleys as the responsibility of a homeowner's association.**

The applicant has proposed 48 lots with alley access.

5. Narrow Driveways

Finding: Proposed driveways are required to be no wider than 10 feet and where possible on adjoining lots, shall be grouped in close proximity to create space along street frontages. The applicant is proposing driveways on Lots 5 through 26 within the development. The proposed driveways meet the 10-foot maximum width requirement. Additionally when possible, lots sharing a zero lot line contain driveways and garages are located on adjoining sides.

20.927.050 Incentives for Providing Alleys

Finding: Per VMC 20.927.050(F)(3), an incentive is allowed for providing alley access to at least 50 percent of the total number of lots. Of the 70 lots proposed with this development, 48 of them have alley access which equates to 69 percent of the total lots. This exceeds the minimum requirement to apply the incentive.

One of the incentives is allowance for covered porches which consume at least 40 percent of the front width of the residence to encroach up to six feet into the required front setback. The applicant is proposing covered porches that extend into the front yard setback of 10 feet up to the maximum six feet

20.925 Landscaping

Finding: Ten percent of the net lot area of each single-family lot shall be landscaped. Compliance with this requirement will be verified at the time of building permit review for each of the single-family lot.

Street tree requirement. Add street trees between 20-30 feet on center depending on conflicts such as street lights along NE 112th. Street trees shall not be more than 30 feet on center. Street trees shall be planted within planter strips or for attached sidewalks, three to four feet behind attached sidewalks. Utilize utility friendly street trees due to overhead powerline such as: Persian Parrotia (Parrotia persica ‘Ruby Vase’ or ‘Vanessa’) or Rocky Mountain Glow Maple (Acer grandidentatum). The applicant is proposing to utilize Stellar Pink Dogwood, October Glory Maple and Black Tupelo as street trees.

Street trees are required for all projects fronting on a public street, private street or private drive. The tree plan submitted shows street trees proposed along the street frontages. This requirement has been met as proposed.

Conclusion: The application meets the requirements of this section.

20.945 Parking

Finding: Each new single-family residence will require one off-street parking space. The space must be a minimum 9 feet wide by 17 feet deep, paved and located outside the minimum setbacks. Each lot will be reviewed for compliance with this requirement at the time of building permit.

As discussed in the narrow lot section of this report, 18 guest parking spaces have been provided throughout the single-family portion of this development. Five additional guest parking spaces are required prior to final plat approval.

As previously mentioned, **add five more guest parking spaces to the development prior to final plat approval.**

Conclusion: As conditioned, the applicant meets the requirements of this section.

20.970 Solid Waste Disposal and Recycling

Finding: The proposed senior housing development consisting of single-family residences located along NE 16th St between NE 112th Ave and NE 115th Ave will either have alley collection or stage their carts along the public street for collection. Future residences shall be informed of cart setout locations.

Conclusion: The application was reviewed by solid waste and the applicant has demonstrated that the standards for solid waste cart setout can be met for the development.

Finding: The provisions for collection vehicles to safely maneuver within the site have been met for most lots in the development, specifically in the alley and along the public streets.

Where access is not feasible common collection points shall be established and are noted on the site plans. Where collection is not feasible in front of the residence or via an alley, a designated common collection point will be established. Specifically lots along the private tracts will be required to bring their carts to the public street for collection due to limited access along the private tracts in accordance with VMC 20.927.040.A.3(c-d).

Proposed plans for the western portion of the site show Lots 1 through 8 have frontage along a 16-foot narrow looped alley and private track. This narrow and curved alley may limit the ability of collection vehicles to maneuver safely to all points of the affected lots. **As a condition of approval, the applicant can submit an access and collection plan that demonstrates recycling truck maneuvering is feasible at the narrow looped alley as proposed, or provide an alternate location for Lots 1 through 8 to stage their carts for collection.** The applicant shall ensure the designated cart set out points allow for carts to be spaced with three feet between to permit automated collection.

Conclusion: The proposal has satisfies solid waste requirements for providing collection vehicle access, as conditioned.

11.70 Transportation Concurrency

Finding: The applicant is proposing a Planned Development 70-lot subdivision. The project is located at the northeast corner of the intersection of NE 112th Avenue and NE 16th Street. Access to the site will be by way of the existing NE 16th Street and an extension of NE 115th Avenue across BPA right of way to NE 18th Street. The developer will partner with the city to construct this length of NE 115th Avenue.

The applicant submitted a Traffic Impact Analysis (TIA) dated Oct. 23, 2018, from Kittelson & Associates. Trip generation rates were based on the Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition, utilizing Land Use Code 251 – Senior Adult Housing - Detached. Based on this information, the proposed project will generate 258 new Average Daily

Trips (ADT), including 42 new a.m. peak hour trips and 34 new p.m. peak hour trips. The submitted documentation fulfills the city's requirements for concurrency analysis.

Pursuant to VMC 11.70.090, the segment of NE 112th Avenue between Mill Plain Boulevard and NE 28th Street is designated as a Category 1 Concurrency corridor, which stipulates that the corridor is operating at or above the city's adopted level of service standards. Pursuant to the TIA, the proposed development will distribute 27 new p.m. peak hour trips to this corridor. This is not anticipated to cause the corridor to drop below the adopted level of service standard.

The proposed use is located within the #280 Transportation Analysis Zone. The proposed project contributes PM peak hour trips to the following Transportation Management Zones (TMZ):

Corridor Name	Corridor Limit	PM Peak Trips
NE 18th Street	NE 112th Ave to NE 138th Ave	7
NE 18th Street	NE 138th Ave to NE 162nd Ave	2
NE 28th Street	18th Street to NE 112th Ave	8
NE 28th Street	NE 112th Ave to NE 138th Ave	2
NE 112th Avenue	Mill Plain Blvd. to NE 28th Street	27
NE 112th Avenue	NE 28th Street to NE 51st Street	17
NE 136th Avenue	Mill Plain Blvd. to NE 28th Street	1

Based on the above table, **prior to the issuance of civil plan approval, the applicant shall pay concurrency modeling fees totaling \$1,500.00.** Pursuant to the applicant's information, the project will not distribute trips to any other Transportation Management Zones.

Transportation Impact Fees (TIF) are imposed per VMC 20.915. See the section of this staff report addressing VMC 20.915 for calculation of TIF.

Conclusion: The proposed development meets the requirements of VMC 11.70 as conditioned.

11.80 Transportation – Street & Development Standards

Finding: The applicant is proposing a Planned Development 70-lot subdivision. The project is located at the northeast corner of the intersection of NE 112th Avenue and NE 16th Street. Access to the site will be by way of the existing NE 16th Street and an extension of NE 115th Avenue across BPA right of way to NE 18th Street. The developer will partner with the city to construct this length of NE 115th Avenue.

Northeast 112th Avenue is designated a four-lane principal arterial with center left turn and bike lanes which requires a minimum 50 feet half-width right of way per city standard plan T10-06. The existing road along the property frontage of NE 112th Avenue includes asphalt roadway, curb, gutter, street lighting and storm drainage. Per city standard plan T10-06, the paved street half-width of NE 112th Ave is required to be a minimum of 35 feet measured from the face of curb to the centerline. However, the applicant will not be required to add additional pavement width along the frontage of this project, unless indicated as a safety or capacity mitigation in the traffic analysis.

Prior to the issuance of final subdivision approval, the applicant shall install City of Vancouver standard frontage improvements along NE 112th Avenue including right of way dedication as needed to meet the minimum required half-width, detached sidewalks, street lighting, ADA ramps, planting strip, traffic control devices as warranted, and storm drainage as required by the city stormwater ordinance. The sidewalk shall be placed at the back of the right of way at the appropriate elevation so that when NE 112th Avenue is reconstructed to the standard the sidewalk will not need to be replaced. The design shall include transition to existing sidewalks on adjacent properties.

Northeast 16th Street is designated a local access street which requires a minimum 25 feet half-width right of way and 16 feet paved street half-width per city standard plan T10-15A. The eastern half of the existing road along the property frontage of NE 16th Street is asphalt roadway with no curb; the other half of the road is gravel only. The gravel road is only used by city staff for access to the adjacent water tower, known as Water Station #7; the road is gated and is not currently accessible to the public.

Prior to the issuance of final subdivision approval, the applicant shall install the following City of Vancouver standard frontage improvements along NE 16th Street:

- From NE 113th Avenue to the western property line of Water Station #7, the applicant shall install standard frontage improvements per T10-03 – Local Access and Loop Road Half Street Construction; including right of way dedication as needed to meet the minimum standard, detached sidewalks, street lighting, ADA ramps, planting strip, and traffic control devices as warranted. The pavement width shall be 25 feet.
- Across the entire street frontage of Water Station #7, the applicant will be required to meet the full-width street requirements of city standard T10-15A. Such improvements include full-width pavement. Also included will be curb-and-gutter, detached sidewalks, planting strips, and street lighting on both sides of the street. A driveway approach for the water station must be constructed and the sidewalk on the south side of the street must connect with the existing dead-end sidewalk near the east property line of Water Station #7.
- From the eastern property line of Water Station #7 to the east end of the subdivision, the applicant shall dedicate right of way as necessary to meet the standard, and install City of Vancouver standard frontage improvements including curb, gutter, detached sidewalks, planting strip, street lighting, ADA ramps, traffic control devices as warranted, and storm drainage as required by the city stormwater ordinance.

Northeast 115th Avenue is designated a local access street which requires a minimum 50 feet full-width right of way and 32 feet paved street full-width per city standard plan T10-15A. **Prior to the issuance of final subdivision approval, within the boundaries of the subdivision property, the applicant shall install City of Vancouver standard frontage improvements along NE 115th Avenue including curb, gutter, detached sidewalks, planting strip, street lighting, ADA ramps, traffic control devices as warranted, and storm drainage as required by the city stormwater ordinance.**

The city is currently working with the applicant to address the need for construction of NE 115th Avenue from the proposed subdivision across BPA property to connect to the existing signalized intersection at NE 18th Street and NE Four Seasons Lane. The applicant will be expected to

contribute to the cost of design and construction of this connection. The general principles guiding the pending agreement with the applicant are as follows:

- As part of the next phase of the NE 18th Street upgrades, the city will work with BPA to acquire the necessary right of way for NE 115th Avenue from the existing NE 18th Street / Four Seasons Lane intersection southward to connect with the proposed Four Seasons South Subdivision.
- The developer will be responsible for a portion of the design and construction costs for the length of NE 115th Avenue within this right of way across BPA property. The developer's costs associated with this design and construction will be eligible for TIF credits up to the maximum amount of TIFs owed for the subdivision project.
- The developer will commit to a design of the subdivision layout that does not include any connection of NE 16th Street to NE 112th Avenue. It may be possible to vacate the existing unused NE 16th Street right of way to increase the overall subdivision project area.
- If any element of this agreement is delayed, the subdivision project can still move forward, taking full access to the arterial network at the newly constructed signalized intersection at NE 18th Street and NE 118th Avenue.

The details of the partnership between the applicant and the city to design and construct this necessary street improvement are still being negotiated. **Prior to the issuance of civil plan approval, the applicant shall enter into an agreement with the City of Vancouver to assist in the design and construction of NE 115th Avenue from the proposed subdivision, across BPA property, to connect to the existing signalized intersection at NE 18th Street and NE Four Seasons Lane.**

The interior streets within the subdivision including NE 113th Avenue and NE 17th Street are designated local access streets which require a minimum 50 feet right of way and 28 feet paved street width per city standard plan T10-15B. **Prior to the issuance of final subdivision approval, the applicant shall install City of Vancouver standard frontage improvements along NE 113th Avenue and NE 17th Street including right of way dedication, detached sidewalks, street lighting, ADA ramps, planting strip, traffic control devices as warranted, and storm drainage as required by the city stormwater ordinance.**

The proposed alleys in the subdivision will be built to Narrow Lot standards, which require a minimum 24 feet full-width right of way and 16 feet paved street full-width per city standard plan T10-25A and B. **Prior to the issuance of final subdivision approval, the applicant shall install City of Vancouver standard full-width improvements along the alleys including flat curbs, center valley gutter, street lighting, and storm drainage as required by the city stormwater ordinance.**

The applicant's Traffic Impact Analysis contains several recommendations regarding the placement of stop signs at key intersections within or adjacent to the development. These include the following:

- NE 115th Avenue northbound approach to NE 16th Street
- NE 118th Avenue southbound approach to NE 16th Street
- All three of the proposed southbound site access approaches to NE 16th Street

Prior to the issuance of final subdivision approval, the applicant shall coordinate with the city's traffic engineer to provide stop signs at the locations specified in the applicant's traffic impact analysis. Information pertaining to the placement of the new stop signs shall be included in the signing and striping plan section of the approved civil plans. Signing and striping plans are required even if not proposing any new striping in the public right of way. If no new striping is proposed then the plan should indicate what exists.

Street lighting is required on public streets per VMC 11.80.090. Any substandard street lighting shall be required to be upgraded to current city standards as part of this project. Street lighting shall be installed and/or updated to meet the design standards per city standard plans T21-01A through T21-01D. If the applicant proposes to retain the existing lighting or install lighting that exceeds the maximum spacing requirement a photometric analysis will be required to ensure the lighting level standards are met. If the maximum spacing per T21-01A is met, the photometric analysis is not necessary.

IES files for lighting software can be obtained from lighting manufacturer. Use lighting materials from the City of Vancouver approved material list. New lights will be LED and existing HPS lights will be retrofitted to LED unless otherwise noted by Traffic. Any new or existing lights that are within ten feet of primary power and/neutral lines, will require the developer to raise the power lines. The developer will need to work with Clark Public Utilities for requirements and costs.

Per City of Vancouver street lighting policy; where existing street lights are mounted on Clark Public Utilities wood poles, the street lights shall be changed to current standards. However, when no roadway or sidewalk improvements are being installed within an existing neighborhood, the use of an aerial design with a **Type W** standard (wood pole mounting) may be approved by the city's Transportation engineer.

Conclusion: The proposed development meets the requirements of VMC 11.80 as conditioned.

14.01 Water

Finding: City records indicate existing utilities are as follows:

- 12-inch DI main in NE 112th Avenue with an 8-inch DI stub approximately 225 feet north of NE 16th Street
- 8-inch DI main in NE 18th Street
- 8-inch DI main in NE 115th Avenue south of NE 16th Street
- 16-inch DI main in NE 16th Street

At the east end of the project, the applicant will install a 16-inch x 8-inch tee, 16-inch butterfly valve and an 8-inch gate valve onto the 16-inch main in NE 16th Street. Extending an 8-inch DI main in north and looping the 8-inch DI main through the site as needed to serve all required fire hydrants, water meters and fire protection services. Connect the onsite main to the existing 8-inch stub off of the 12-inch main in NE 112th Avenue. An 8-inch DI main will also need to be extended to the 8-inch main in NE 18th Street.

Additional requirements may be outlined during the detailed site plan review process, meeting the water requirements as detailed in the *General Requirements & Details for the Design and Construction of Water, Sanitary Sewer and Surface Water Systems* (latest revision).

Conclusion: The submitted plans indicate the requirements can be met.

14.03 Sanitary Sewer

Finding: An existing sewer flows north along the west side of 112th. A public stub extends east to the north flag stem of the subject lot. A stub marker (#21236) marks the upstream end. This sewer was constructed in 2011 by the NE 18th Street Improvements (City Project #083110). A plan view is shown on sheet U07 of the record drawings. A sewer main fee will be due if the project connects to this line.

A second sewer is located in NE 16th Street, east of the approximate alignment of NE 114th Avenue. A cleanout (#15230) marks the upstream end. The sewer main is thought to be about 13 feet deep. This sewer was constructed in 1993 as part of water station project (XB772). Plan and profile views are shown on Sheet C-7 of the record drawings.

A third sewer flows north from 16th Street within a 20-foot wide sewer easement along the west property line of the east lot (110235000) of the development. The sewer is 8-inch PVC and is within an easement (Developer project #SB1114) The easement was granted by Beaudoin and recorded Sept. 10, 1993 (recording #9309100142).

This development was asked to extend an 8-inch diameter public sewer south, across the frontage of the development, in NE 112th Avenue, from City MH #21237, at sufficient slope and depth to serve properties on the west side of NE 112th Avenue to the north of NE 14th Street, to a point even with the south property line of the subject parcel. A similar extension has also been required of the apartment project currently under review on the opposite side of 112th Avenue (Developer project #PRJ-155732), and this extension is currently planned to be constructed by the Salvation Army Project (Developer project #PRJ-154308).

Sewer service requires the applicant to extend an 8-inch diameter public sewer main on-site to front each lot of the development. Extend public sewer on-site by constructing a manhole over the existing main fronting the east side of the development.

Alternately, the applicant shall extend 8-inch diameter public sewer on-site from the existing stub (or from a new manhole constructed over the sewer extension in NE 112th Avenue) to front each building to be served. Again, a sewer main fee will be due if the project connects to this public sewer.

Public mains not located in the public right of way are to be placed in public easements dedicated to the City of Vancouver. Easements shall be 15 feet wide or greater. Extend public sewers in the public right of way or accessible paved areas if possible. All easements must be submitted on the City of Vancouver's Easement Form. Submittal of a recordable public sanitary sewer easement will be a condition of plan approval. The easement is intended to allow required access by the city and its representatives, and to prevent any structure or tree from interfering with the facility or hindering access to it. Easements shall be paved or covered with approved landscaping (not to include trees). The easements shall extend at least five feet past the end of the main. Sewer mains shall be located at least five feet inside the edge of the easement.

The applicant shall install separate 4-inch minimum diameter service laterals from the new public sewer to serve each of the residential lots. Connect the service lateral to public sewer per City of Vancouver Standard Plan Series S-1.4.

Conclusion: Public sanitary sewer is available at the site and construction standards for public sewer construction and the construction of sewer lateral connections can be met.

(Prior to Construction)

Obtain all required permits to complete the sewer construction.

(Prior to Final Plat Approval)

Satisfy all of the submittal and other related requirements itemized in the projects upcoming Notification of Civil Plan Approval (plan approval letter).

(Prior to Occupancy)

Public sewer (possibly) built by this project, service laterals and connections to public sewer shall meet City of Vancouver construction inspection requirements.

14.24 Erosion Control

Finding: This project proposes construction of a senior-oriented, 70-lot subdivision. The development site consists of four parcels and covers approximately 9.5 acres. Currently the site contains seven buildings and driveways. The applicant has stated the final grade will be close to the current grades.

The applicant has submitted an erosion/sediment control plan to meet the requirements of VMC 14.24.

The applicant is also required to submit a Construction Stormwater Pollution Prevention Plan (SWPPP) to the city, prior to final civil plan approval.

Conclusion: As conditioned, the applicant has demonstrated that the City of Vancouver Erosion Control ordinance (VMC 14.24) can be met.

14.25 Stormwater

Finding: The proposed development will create approximately 5.59 acres of new impervious surface area and convert 3.9 acres to lawn and landscaping area. Therefore, all stormwater minimum requirements #1 through #9 apply to the proposed development.

The applicant proposes to construct several bio retention cells to capture runoff from the on-site pollution generating surfaces and provide water quality treatment. Bio retention facilities are approved best management practices (BMP) by the Stormwater Management Manual for Western Washington and the City of Vancouver Municipal Code (VMC 14.25).

The applicant also proposes to construct infiltration trenches and drywells to meet the city's water quantity control requirement. The applicant has submitted a geotechnical evaluation report to support the proposed stormwater system. Staff finds the proposed stormwater BMP feasible.

The applicant is required to dedicate an easement to the City of Vancouver for access and inspection of the stormwater facilities.

Conclusion: As conditioned, the proposed stormwater management system meets City of Vancouver water quality treatment and water quantity control requirements.

Title 16 Fire

Finding: The fire department has reviewed the proposed project and determined that it can meet the requirements of VMC Title 16 and the International Fire Code.

Staff Report Conditions for Approval

Prior to Civil Plan Approval

New and existing fire hydrant locations shall be shown

Prior to Plat Approval

If attached dwellings require fire sprinkler protection, a note shall be included on the plat stating that all buildings require fire sprinkler protection.

Prior to combustible construction

1. Fire hydrants for emergency use shall be established and maintained.
2. Street identification signs shall be installed for emergency response.

During construction

1. Temporary address signage shall be visible and legible from the street fronting the property for emergency response during construction.

Prior to Issuance of Certificate of Occupancy

1. Address signage shall be visible and legible from the street fronting the property for emergency response. If applicable, individual suite numbers shall be posted at the suite doors.
2. Any fire protection features identified as being required during the construction permit review shall be installed and approved prior to occupancy.
3. Fire lane signs shall be posted throughout the site in accordance with the approved sign and striping plans.

Conclusion: As conditioned, the applicant meets the requirements of this section.

RECOMMENDATION

Staff hereby recommends approval of the planned development, subdivision and boundary line adjustment with conditions as noted below and throughout this report. Based upon the analysis and findings herein, the criteria for approval have been satisfactorily met, or shall be met with the conditions of approval and no significant adverse impacts have been identified. This approval does not grant the right to permits, but only determines the development can meet the requirements of the applicable ordinances as described in this report.

CONDITIONS OF APPROVAL

Prior to Civil Plan Approval

1. Submit for civil plan review with ten (10) new sets of check prints showing all the revisions requested, two (2) sets of all necessary reports (geotechnical, hydrology, traffic analysis, road modification, etc.), and any redlines documents that were returned during the preliminary review process. Submit these to the Community and Economic Development Department Permit Center; request engineering staff for counter assistance. For questions on these requirements please contact 360-487-7804.
2. Grading plan review fees will be due upon submittal of civil plans for review. Contact Permit Center staff at 360-487-7802 to obtain a fee quote.
3. Prior to the issuance of civil plan approval, the applicant shall pay concurrency modeling fees totaling \$1,500.00.
4. Prior to the issuance of civil plan approval, the applicant shall enter into an agreement with the City of Vancouver to assist in the design and construction of NE 115th Avenue from the proposed subdivision, across BPA property, to connect to the existing signalized intersection at NE 18th Street and NE Four Seasons Lane.
5. New and existing fire hydrant locations shall be shown

Prior to Commencing Public Improvement Construction

6. Obtain all required permits to complete the sewer construction.
7. Fire hydrants for emergency use shall be established and maintained.
8. Street identification signs shall be installed for emergency response.

During Public Improvement Construction

9. Temporary address signage shall be visible and legible from the street fronting the property for emergency response during construction.

Prior to Final Plat Approval

10. Submit a final plat application along with five (5) full size copies and 1 reduced 8 ½ x 11 copy of the proposed plat and tree/landscape plan. Applicants can be found under Building, Planning and Environments on the City of Vancouver website, www.cityofvancouver.us.

11. The following note shall be placed on the final plat: “If any archaeological deposits are found during construction, work shall stop and the City of Vancouver’s Community & Economic Development and the Washington State Department of Archaeology and Historic Preservation shall be notified.”
12. The following note shall be placed on the final plat: “Development within this subdivision is subject to an approved tree plan. Tree removal is subject to approval by the City of Vancouver. Street trees must be planted prior to occupancy per the approved plan.”
13. Indicate the following as a note on the final plat: minimum lot size 2,400 square feet, maximum lot coverage for single story structures 75 percent, maximum lot coverage for two-story structures 68 percent, and the corresponding lot numbers dedicated as two-story structures.
14. The following note shall be placed on the final plat: Home Owner Association is responsible for maintenance of all open space tracts listed on this plat.
15. A note shall be recorded on the plat requiring maintenance of the common parking areas as the responsibility of a homeowner’s association.
16. Submit an access and collection plan that demonstrates recycling truck maneuvering is feasible at the narrow looped alley as proposed, or provide an alternate location for Lots 1 – 8 to stage their carts for collection.
17. Prior to the issuance of final subdivision approval, the applicant shall install City of Vancouver standard frontage improvements along NE 112th Avenue including right of way dedication as needed to meet the minimum required half-width, detached sidewalks, street lighting, ADA ramps, planting strip, traffic control devices as warranted, and storm drainage as required by the city stormwater ordinance. The sidewalk shall be placed at the back of the right of way at the appropriate elevation so that when NE 112th Avenue is reconstructed to the standard the sidewalk will not need to be replaced. The design shall include transition to existing sidewalks on adjacent properties.
18. Prior to the issuance of Final Subdivision Approval, the applicant shall install the following City of Vancouver standard frontage improvements along NE 16th Street:
 - From NE 113th Avenue to the western property line of Water Station #7, the applicant shall install standard frontage improvements per T10-03 – Local Access and Loop Road Half Street Construction; including right of way dedication as needed to meet the minimum standard, detached sidewalks, street lighting, ADA ramps, planting strip, and traffic control devices as warranted. The pavement width shall be 25 feet.
 - Across the entire street frontage of Water Station #7, the applicant will be required to meet the full-width street requirements of city standard T10-15A. Such improvements include full-width pavement. Also included will be curb-and-gutter, detached sidewalks, planting strips, and street lighting on both sides of the street. A driveway approach for the water station must be constructed and the

sidewalk on the south side of the street must connect with the existing dead-end sidewalk near the east property line of Water Station #7.

- From the eastern property line of Water Station #7 to the east end of the subdivision, the applicant shall dedicate right of way as necessary to meet the standard, and install City of Vancouver standard frontage improvements including curb, gutter, detached sidewalks, planting strip, street lighting, ADA ramps, traffic control devices as warranted, and storm drainage as required by the city stormwater ordinance.
19. Prior to the issuance of final subdivision approval, within the boundaries of the subdivision property, the applicant shall install City of Vancouver standard frontage improvements along NE 115th Avenue including curb, gutter, detached sidewalks, planting strip, street lighting, ADA ramps, traffic control devices as warranted, and storm drainage as required by the city stormwater ordinance.
 20. Prior to the issuance of final subdivision approval, the applicant shall install City of Vancouver standard frontage improvements along NE 113th Avenue and NE 17th Street including right of way dedication, detached sidewalks, street lighting, ADA ramps, planting strip, traffic control devices as warranted, and storm drainage as required by the city stormwater ordinance.
 21. Prior to the issuance of final subdivision approval, the applicant shall install City of Vancouver standard full-width improvements along the alleys including flat curbs, center valley gutter, street lighting, and storm drainage as required by the city stormwater ordinance.
 22. Prior to the issuance of final subdivision approval, the applicant shall coordinate with the city's traffic engineer to provide stop signs at the locations specified in the applicant's traffic impact analysis. Information pertaining to the placement of the new stop signs shall be included in the signing and striping plan section of the approved civil plans. Signing and striping plans are required even if not proposing any new striping in the public right of way. If no new striping is proposed then the plan should indicate what exists.
 23. Satisfy all of the submittal and other related requirements itemized in the projects upcoming Notification of Civil Plan Approval (plan approval letter).
 24. If attached dwellings require fire sprinkler protection, a note shall be included on the plat stating that all buildings require fire sprinkler protection.
 25. Dedicate an easement to the City of Vancouver for access and inspection of the stormwater facilities on the final plat.
 26. Depict the five additional guest parking spaces required on the final site development plan.

27. Place a note shall on the plat regarding maintenance of the alleys as the responsibility of a homeowner's association.

Prior to Issuance of any Building/Development Permits

28. Public sewer (possibly) built by this project, service laterals and connections to public sewer shall meet City of Vancouver construction inspection requirements.
29. Address signage shall be visible and legible from the street fronting the property for emergency response. If applicable, individual suite numbers shall be posted at the suite doors.
30. Any fire protection features identified as being required during the construction permit review shall be installed and approved prior to occupancy.
31. Fire lane signs shall be posted throughout the site in accordance with the approved sign and striping plans.

EXHIBITS

1. Staff Report
2. Application
3. Applicant Narrative
4. Applicant's Supplemental Narrative
5. Preliminary Plat Reduced Copy
6. Affidavit of mailing/posting dated Nov. 30, 2018
7. Notice of Application, Public Hearing and Optional SEPA DNS Nov. 30, 2018
8. SEPA Checklist dated Sept. 28, 2018
9. Geotech Report prepared by Columbia West dated Dec. 4, 2017 **
10. Letter from Department of Ecology dated Jan. 2, 2019
11. Letter from Clark County Public Health dated Aug. 21, 2017
12. City of Vancouver Traffic Impact Calculation Worksheet dated Jan. 22, 2019
13. Slope Easement - 4783753 EAS
14. Public Comment
15. Final Determination of Nonsignificance dated Jan. 3, 2019
16. 112th Avenue Subarea guidelines**
17. Traffic Study **

**Because of the size of the exhibit, it is not included with this report. The document is available for review at Community & Economic Development Department, 415 W 6th Street. If you would like to review the document, check in at the reception area of the Permit Center between the hours of 8 a.m.–12:30 p.m. and 1:30 p.m.–4 p.m., except Wednesday, when permit center hours begin at 9 a.m.



Planning Permit Application
LAND USE PRELIMINARY APPLICATION (LUP)

415 W 6th ST - Vancouver, WA 98660
PO Box 1985 - Vancouver, WA 98668
Phone (360) 487-7800
www.cityofvancouver.us

EXHIBIT

2

Type Of Work		
☐ Type I	☐ Type II	☒ Type III
☒ Type IV	☐ Tree Removal Only **	
Use Type (Check One Box Only)		
☒ Single Family	☐ Commercial	☐ Multi-Family
☐ Industrial	☐ Residential	☐ Duplex
☐ Wireless Communications Facility (new) please see VMC 20.890		
Process Type		
☒ Standard	☐ Streamline	

Project Site Information And Location	
Project site address:	1611 & 1619 NE 112th Avenue
Suite/bldg./apt #:	
Project name:	Four Seasons South PUD
Tax Assessor Serial Number:	110250-000, 110251-000, 110252-000, 110235-000
Nearest intersection if no site address:	

Description Of Project
Proposal to subdivide 9.47 acres into 70 single family 55+ lots
110250-000, 110251-000, 110252-000 (Kilada Village, LLC)
110235-000 (Joseph and Gayle Beaudoin)

PROPERTY OWNER	
Name	Joseph and Gayle Beaudoin
Address:	701 NE 112th Avenue
City/State/Zip:	Vancouver, WA 98684
Phone:	
E-mail:	

APPLICANT	
Name	Four Seasons Subdivision, LLC
Address:	7223 NE Hazel Dell Avenue
City/State/Zip:	Vancouver, WA 98665
Phone:	(360) 600-8813
E-mail (required):	Patrick@GinnRealtyGroup.com

ELECTRONIC PLANS SUBMITTER*	
Name	Lisa Harker
Address:	7223 NE Hazel Dell Avenue
City/State/Zip:	Vancouver, WA 98665
Phone:	(360) 768-5034
E-mail (required):	projects@ginndevelopment.com
ePermits Username (if existing account)	dhaake

Additional Information		
Special Review Type: (if applicable)	☐ Tenant Improvement ☐ Other	
	☐ Unoccupied Commercial/Utility Structure	
Plan Approval Type: (if applicable)	☐ Conceptual	☐ Detailed ☐ Hybrid
	Sewage Disposal: ☐ Septic ☒ Public	
Water Source:	☐ Private Well ☒ Public	
# of Units:		
# of Proposed Lots:	70	
# of Acres:	9.47	
Size:	☒ Up to 25 acres ☐ Over 25 acres	
Impervious Area sf:	222,592	
Square Feet:	Ground Floor:	
	Upper Floor:	

Notice
<i>I/we understand that per VMC 20.210.090 (Review for Counter Complete Status), if it is determined that the application is not complete, the City shall immediately reject and return the application.</i>
<i>If submitting electronically, I/we understand that if my electronic plan submission is deemed to be incomplete I will receive notification after the prescreening process and review will not begin.</i>
<i>I/we agree that City of Vancouver staff may enter upon the subject property at any reasonable time to consider the merits of the application, to take photographs and to post public notices.</i>

Required Signatures	
Applicant signature:	
Print name: Patrick Ginn	Date: 9-26-10
Property Owner signature:	
Print name: Joe F Beaudoin	Date: 9-26-12

* Please note that the contact listed as "Electronic Plans Submitter" should be the individual responsible for accessing ePlans, (electronic plan review software), and will receive all ePlans correspondence.



Planning Permit Application

LAND USE PRELIMINARY APPLICATION (LUP)

415 W 6th ST ~ Vancouver, WA 98660
PO Box 1995 ~ Vancouver, WA 98668
Phone (360) 487-7800
www.cityofvancouver.us

Type Of Work		
☐ Type I	☐ Type II	☒ Type III
☒ Type IV	☐ Tree Removal Only **	
Use Type (Check One Box Only)		
☒ Single Family	☐ Commercial	☐ Multi-Family
☐ Industrial	☐ Residential	☐ Duplex
☐ Wireless Communications Facility (new) please see VMC 20.890		
Process Type		
☒ Standard	☐ Streamline	

Project Site Information And Location	
Project site address:	1611 & 1619 NE 112th Avenue
Suite/bldg./apt #:	
Project name:	Four Seasons South PUD
Tax Assessor Serial Number:	110250-000, 110251-000, 110252-000, 110235-000
Nearest intersection if no site address:	

Description Of Project
Proposal to subdivide 9.47 acres into 70 single family 55+ lots
110250-000, 110251-000, 110252-000 (Kilada Village, LLC)
110235-000 (Joseph and Gayle Beaudoin)

PROPERTY OWNER	
Name	Kilada Walnut Village LLC
Address:	PO Box 61982
City/State/Zip:	Vancouver, WA 98666
Phone:	
E-mail:	

APPLICANT	
Name	Four Seasons Subdivision, LLC
Address:	7223 NE Hazel Dell Avenue
City/State/Zip:	Vancouver, WA 98665
Phone:	(360) 600-8813
E-mail (required):	Patrick@GinnRealtyGroup.com

ELECTRONIC PLANS SUBMITTER*	
Name	Lisa Harker
Address:	7223 NE Hazel Dell Avenue
City/State/Zip:	Vancouver, WA 98665
Phone:	(360) 768-5034
E-mail (required):	projects@ginndevelopment.com
ePermits Username (if existing account)	dhaake

Additional Information		
Special Review Type: (if applicable)	☐ Tenant Improvement	☐ Other
	☐ Unoccupied Commercial/Utility Structure	
Plan Approval Type: (if applicable)	☐ Conceptual	☐ Detailed
	☐ Hybrid	
Sewage Disposal:	☐ Septic ☒ Public	
Water Source:	☐ Private Well ☒ Public	
# of Units:		
# of Proposed Lots:	70	
# of Acres:	9.47	
Size:	☒ Up to 25 acres ☐ Over 25 acres	
Impervious Area sf:	222,592	
Square Feet:	Ground Floor:	
	Upper Floor:	

Notice
<i>I/we understand that per VMC 20.210.090 (Review for Counter Complete Status), if it is determined that the application is not complete, the City shall immediately reject and return the application.</i>
<i>If submitting electronically, I/we understand that if my electronic plan submission is deemed to be incomplete I will receive notification after the prescreening process and review will not begin.</i>
<i>I/we agree that City of Vancouver staff may enter upon the subject property at any reasonable time to consider the merits of the application, to take photographs and to post public notices.</i>

Required Signatures	
Applicant signature:	
Print name:	Patrick Ginn
Date:	9-26-2018
Property Owner signature:	
Print name:	GEORGE FASSILIS
Date:	9/18/18

* Please note that the contact listed as "Electronic Plans Submitter" should be the individual responsible for accessing ePlans, (electronic plan review software), and will receive all ePlans correspondence.



**PROJECT NARRATIVE
FOUR SEASON SOUTH PLANNED DEVELOPMENT**

Project Name:

Four Seasons South (a 55 and older planned development community)

Proposal:

The objective for the project is to create a seniors-oriented, 70-lot development. The site consists of 4 parcels and is zoned both R-9 and R-22.

The proposal includes some zero lot line attached and a majority of zero lot line detached single-family dwelling units. The design incorporates alley access for most lots, and designated guest parking areas are provided in addition to on-street parking.

A 20-foot wide trail, running north-south is proposed through the project connecting NE 16th Street to the north boundary of the project at the Bonneville Power Administration (BPA) Powerlines right-of-way.

Two private open spaces and storm tracts are proposed one each on the west side.

The applicant is requesting, subdivision and conceptual and detailed planned development approval. As part of the planned development application, an adjustment to the maximum lot coverage standard is requested.

Applicant/Contact

Ginn Development, LLC
c/o Phil Wuest
7223 NE Hazel Dell Ave.
Vancouver, WA 98665

Property Owner

Parcel 110235-000
Joe and Gayle Beaudoin
701 NE 112th Avenue
Vancouver WA 98684

Parcels 110250-000, 110251-000, 110252-000
Kilada Walnut Village, LLC
PO Box 61982
Vancouver WA 98666

Background

The site is located on the east side of NE 112th Avenue, north of NE 16th Street and south of the BPA right of way, which is located south of NE 18th Street. The site consists of parcels 110250-000, 110251-000, 110252-000 and 110235-000. The site contains several outbuildings, field grasses, bushes, an orchard and a few mature trees.

The proposed project contains a total of 9.47 acres. 4.68 acres are zoned R-22 (Parcels 110250-000, 110251-000, 110252-000) and 4.79 acres are zoned R-9 (parcel 110235-000). However, the gross site development will only be 8.47 acres. A one-acre parcel for the existing home will be removed via a boundary line adjustment prior to subdivision, pursuant to VMC 20.410.040.2.b. The zoning is divided at the approximate midpoint between the parcels from east to west. The entire site is within the NE 112th Avenue Corridor Plan District.

**PROJECT NARRATIVE
FOUR SEASON SOUTH PLANNED DEVELOPMENT**

Project Name:

Four Seasons South (a 55 and older planned development community)

Proposal:

The objective for the project is to create a seniors-oriented, 70-lot development. The site consists of 4 parcels and is zoned both R-9 and R-22.

The proposal includes some zero lot line attached and a majority of zero lot line detached single-family dwelling units. The design incorporates alley access for most lots, and designated guest parking areas are provided in addition to on-street parking.

A 20-foot wide trail, running north-south is proposed through the project connecting NE 16th Street to the north boundary of the project at the Bonneville Power Administration (BPA) Powerlines right-of-way.

Two private open spaces and storm tracts are proposed one each on the west side.

The applicant is requesting, subdivision and conceptual and detailed planned development approval. As part of the planned development application, an adjustment to the maximum lot coverage standard is requested.

Applicant/Contact

Ginn Development, LLC
c/o Phil Wuest
7223 NE Hazel Dell Ave.
Vancouver, WA 98665

Property Owner

Parcel 110235-000
Joe and Gayle Beaudoin
701 NE 112th Avenue
Vancouver WA 98684

Parcels 110250-000, 110251-000, 110252-000
Kilada Walnut Village, LLC
PO Box 61982
Vancouver WA 98666

Background

The site is located on the east side of NE 112th Avenue, north of NE 16th Street and south of the BPA right of way, which is located south of NE 18th Street. The site consists of parcels 110250-000, 110251-000, 110252-000 and 110235-000. The site contains several outbuildings, field grasses, bushes, an orchard and a few mature trees.

The proposed project contains a total of 9.47 acres. 4.68 acres are zoned R-22 (Parcels 110250-000, 110251-000, 110252-000) and 4.79 acres are zoned R-9 (parcel 110235-000). However, the gross site development will only be 8.47 acres. A one-acre parcel for the existing home will be removed via a boundary line adjustment prior to subdivision, pursuant to VMC 20.410.040.2.b. The zoning is divided at the approximate midpoint between the parcels from east to west. The entire site is within the NE 112th Avenue Corridor Plan District.

The site has access to NE 18th Street to the north via NE 16th Street east to NE 118th Avenue. The site also has access to NE 112th Avenue via NE 16th Street.

The zoning on the property to the north is R-9 and R-22 and aligns with the zoning districts of the site. However, it is owned by BPA and is vacant except for cultivated tree and vegetables, which is allowed under an agricultural easement benefitting the property proposed for development.

The property to the south of the R-22-zoned portion of the project, on the south side of NE 6th Street, is also zoned R-22. There are two parcels. One is owned by Marjory Leggett. County records show there are no structures on that parcel. However, the county aerial photos appear to indicate a house near NE 112th Avenue. That site forested.

The remainder of the R-22-zoned land adjacent to the project site is owned by the City of Vancouver and is the location of a municipal water station.

Along the R-9 southern boundary, on the south side of NE 16th Street, the area is developed as the Cascade Crest Subdivision recorded in 1993. This is a single-family residential development.

The property east of the site is zoned R-6. The land use is single-family residential. The site was subdivided as Evergreen Meadows in 1969.

The area to the west, on the west side of NE 112th Avenue is zoned R-22. County records indicate there are no buildings of any value on the site.

VMC Title 20 Land Use and Development Code

Chapter 20.210 Decision-Making Procedures

Response

The applicant is proposing a planned development subdivision. Per Table 20.210.020 – 1, Summary of Development Applications by Type of Decision-Making Procedure, subdivisions are subject to a Type III review process and Planned Developments are subject to a Type IV process.

Subsection 20.210.220.D indicates when more than one application is submitted for a given development, and those applications are subject to different types of procedure, then all of the applications are subject to the highest type of procedure that applies to any of the applications...

As such, the application is subject to the Type IV process, and, because it is less than 25 acres, the final City decision will be rendered by the City's hearing examiner.

Chapter 20.260 Planned Developments

20.260.010 Purpose

Response

This proposal seeks to create a cohesive planned community for adults 55 and over that desire to live close to live in the Four Seasons activity center in the heart of east Vancouver. The community is planned to provide single-level housing, two-car garages, well designed and finished homes with on-site open space amenities and convenient proximity to groceries, retail opportunities and health care services.

20.260.020 Applicability

A. Applicable in all zones.

The planned development is a development vehicle that may be used in all base zoning districts except in the Park, Greenway and Natural Area districts.

Response

The applicant is proposing a planned development on land with both R-9 and R-22 zones. Planned developments may be allowed each of these zones.

B. Permitted uses

The applicability provisions at 20.260.020.B.1.a.(1) and (2) indicate single-family detached residential units and two or more single-family attached residential units are allowed by right within planned developments in the R-9 zone. This section also indicates a 5% density bonus is allowed per the provision of 20.260.060 (D).

20.260.020.B.2.a.(1) and (2) indicate single-family detached residential units and two or more single-family attached residential units are allowed by right within planned developments in the R-22 zone. The section also states a 5% density bonus is allowed per the provision of 20.260.060 (D).

Response

Planned development may be allowed on the subject site. Also, the applicant is allowed a 5% density bonus. Per 20.260.020.B, single-family detached and single-family attached are permitted by right in both the R-9 and the R-22 zones.

Eighteen attached single-family residential units and 52 detached single-family unit are proposed. Associated with the planned development, an adjustment is requested to the maximum lot coverage standards allowed in both the R-9 and R-22 zone.

Because the site is proposed for narrow lots and more than 50% of the lots will be provided alley access (discussed in more detail below), the base zone lot coverage is 55% on the R-9 portion and 65% on the R-22 portion of the site. This Planned Development proposal requests an adjustment to 75% lot coverage. The purpose of the lot coverage request is to accommodate the planned 55 and older community. This development will consist exclusively of single-level two-car-garage homes. Including two-car garages and all living space on a single floor to provide accessibility for an aging population takes more space on each lot. At the same time, some outside area is preserved on each lot for pleasant landscaping, without a heavy ongoing maintenance burden for the future owners.

C. More than one base zone.

20.260.020.C addresses applications involving more than one zoning district. It states "When a site contains land that is in more than one zoning district, the allowed and conditional uses at the required minimum and maximum densities, if applicable, shall be proportionate to the land within the development site devoted to each zoning district. The zoning may be shifted around the site provided that the same proportion acreage of each zoning district is retained. The concept and detailed plans shall explicitly illustrate such physical reconfiguration of the site and shall be used as the basis for all subsequent land use reviews."

Response

The proposal contains 4.79 acres are zoned R-9 (although, as mentioned above, this parcel will be reduced to 3.79 acres via a boundary line adjustment prior to subdivision) and 4.68 acres zoned R-22. The gross site acreage after the BLA will be 8.47. The minimum and maximum densities in the R-9 zone are 5.9 to 8.7 dwelling units per acre. In the R-22 zone the allowed densities range from 18.1 - 22 units per acre. These are based on net density.

The proposed density related to the R-9 zoned area is 12.61 units per acre. The proposed density related to the R-22 zoned area is 12.8 units per acre.

The maximum net density allowed in the R-9 zone is 8.7 units per acres. The minimum net density allowed in the R-22 zone is 18.1 units per acre.

The minimum number of units allowed in the R-9 portion of the site is 14. The maximum number of units is 20.

In the R-22 zoned area the minimum number of units allowed is 58 and the maximum number of units allowed is 70.

For the entire proposal, the combined minimum number of units is 72. The combined maximum number of units allowed is 90. The applicant proposes 70 units

20.260.030 Approval Process.

A. Elements of approval process.

The 20.260.030.A describes the approval process for planned developments. It indicates the two elements of the planned development approval process are:

1. Approval of the planned development concept development plan which contains a substantial level of detail for the whole project; and
2. Approval of the detailed site plan(s) to be constructed in one or more phases that provide all of the additional detail not contained in the concept plan.

Response

Although the code indicates there two elements of the planned development approval process, 20.260.030.C Concurrent reviews, indicates an applicant may file two or more related requests concurrently. The applicant is filing for concept development plan, detail site plan and subdivision approval.

B. Decision-making process

Response

20.260.030.B describes the decision-making process. The applicant is aware of the decision-making process. No further response is required.

C. Concurrent reviews.

An applicant may file two or more related requests concurrently. These concurrent reviews will be reviewed by the procedure type of the higher/highest level, that is, if one review is subject to a Type III process and the other a Type II process, both will be subject to a Type III review process.

Response

As indicated above, the requested action is approval of a concept development plan, detail site plan and subdivision approval concurrently. The proposal includes a planned development, planned development require a Type IV review process. Therefore, the entire application is subject to the Type IV review standards.

D. Adjustments.

20.260.030.D addresses adjustments. It states adjustments to numerical development standards in the underlying zoning district shall meet the criteria contained in Section 20.260.050(B) VMC below in lieu of requirements for variances contained in Chapter 20.290 VMC. The exception to this is a request to exceed the maximum height permitted in the underlying zone, which will require a concurrent variance request per 20.290 VMC.

Response

The applicant is requesting an adjustment to the maximum lot coverage standard. Under the narrow lot standards, the maximum allowed lot coverage is 55% in the R-9 zone and 65% in the R-22 zone. The applicant is requesting a maximum lot coverage of 75% for the entire development. This is addressed fully in response to 20.260.050.B.

The applicant is also requesting an adjustment to the minimum required lot area in the R-9-portion of the proposal.

20.260.040 Time Limits

Response

The applicant is aware of the time limits associated with the planned development process. No comments from the applicant are required at this time.

20.260.050 Approval Criteria

A. Concept development plan approval criteria. To receive approval for a planned development, the applicant shall demonstrate compliance with all of the following criteria:

1. Content. The concept plan contains all of the components required in Section 20.260.070. Compliance with all applicable standards. The proposed development and uses comply with all applicable standards of the Title, except where adjustments are being approved as part of the concept plan application, pursuant to Section 20.260.030 (D)(2).

Response

Compliance with the provisions of 20.260.070 are addressed under the response to that subsection on page #

2. Architectural and site design. The proposed development demonstrates the use of innovative, aesthetic, energy-efficient and environmentally-friendly architectural and site design.

Response

Within the application materials at Section 10, the applicant has submitted detailed drawings addressing the architecture and site design.

3. Transportation system capacity. There is either sufficient capacity in the transportation system to safely support the development proposed in all future phases or there will be adequate capacity by the time each phase of development is completed.

Response

The applicant has submitted a traffic study prepared by Kittleson and Associates, Inc. addressing trip generation, trip distribution and traffic impacts prepared pursuant to City-required traffic study standards (See Section 7)

4. Availability of public services. There is either sufficient capacity within public services such as water supply, police and fire services, and sanitary waste and storm water disposal, to adequately serve the development proposed in all future phases, or there will be adequate capacity available by the time each phase of development is completed.

Response

The pre-application conference report dated Aug. 23, 2018, indicated public utilities were available or could be extended to the site. Stormwater facilities will be required to meet the standards contained in VMC 14.25.

5. Protection of designated resources. City-designated resources such as historic landmarks, significant trees and sensitive natural resources are protected in compliance with the standards in this and other Titles of the VMC.

Response

The pre-application report indicated, no resources designated for protection on the project site. However, although the site is not within an area of high probability of encountering artifact, an archaeological predetermination is required as the site contains more than 5 acres.

Archaeological Services of Clark County completed an archaeological predetermination of the site. Their findings no further action is required (see Section 11).

6. Compatibility with adjacent uses. The concept plan contains design, landscaping, parking/traffic management and multi-modal transportation elements that limit conflicts between the planned development and adjacent uses. If zoning districts are shifted per Section 20.260.020(C) VMC, there shall be a demonstration that the reconfiguration of uses is compatible with surrounding uses by means of appropriate setbacks, design features or other techniques.

Response

To the east, the land uses are residential. One tier of the proposed residential development abuts the existing residential. To the south the land uses are single-family residential, the city of Vancouver water station and a vacant tract. To the west is NE 112th Avenue. This major arterial separates the proposal from the land to the west, to the north is the BPA right-of-way. This approximately 340-foot-wide right-of-way separates the proposed development from the higher density residentially zoned to the north.

The proposed use is single-family residential. The current uses to the east and south of the project are single-family residential.

7. Mitigation of off-site impacts. All potential off-site impacts including litter, noise, shading, glare and traffic, will be identified and mitigated to the extent practicable.

Response

The proposal is for single-family residential development. Litter, noise shading glare and traffic are not generally off-site impacts associated with single-family dwellings.

The proposal is required to meet concurrency standards, including demonstration of compliance with City transportation concurrency and safety standards which is established in the Applicant's traffic study. Areas for solid waste disposal and recycling collection will be provided. Access for collection vehicle access will also be provided.

The proposed structures will be single level. Significant shading is not anticipated. Related to glare, lighting is anticipated to be typical of a residential neighborhood.

- B. Adjustment approval criteria. Adjustments to numerical development standards may be processed as part of the request for concept if the applicant can demonstrate compliance with all of the following approval criteria:

1. The adjustment(s) is warranted given site conditions and/or characteristics of the design.
2. The benefits accruing from the implementation of the adjustment outweigh any potential adverse impacts.
3. Any impacts resulting from the adjustment are mitigated to the extent practical.

Response

The applicant requests two adjustments. The first is to the maximum lot coverage standard. The second is to the minimum lot area requirement,

Maximum lot coverage adjustment request

The site has two zoning designations; R-9 and R-22. In each zone, the maximum lot coverage allowed 50% (Tables 20.410.050– 1 and 20.420.050– 1).

The proposal is also subject to the narrow lot standards. Section 20.927.050, Incentives for Providing Alleys states any development subject to this chapter which provides alley access to at least 50 percent of the total number of lots shall qualify for the following modifications to development standards:

Subsection B states the maximum lot coverage may be increased as follows:

- 1. In lower density residential districts, maximum lot coverage shall be 55%.*
- 2. In higher density residential districts, maximum lot coverage shall be 65%.*

The proposal provides alley access to 48 of the proposed 70 lots. This exceeds the 50% criterion. Per the provisions of Section 20.260.050.B, the applicant requests an adjustment to increase the allowed maximum lot coverage to 75% for each residential lot.

The adjustment is warranted given the characteristics of the design. The project will be limited to residents ages 55 and older by covenant. The proposal provides modest single-story homes on smaller lots with less need of maintenance.

The design includes 33,653 square feet of common open space, including recreational open space and passive open space including slope and storm tracts/slope easements.

The proposal is not expected to have any adverse impacts. The required setbacks of the underlying zones will be met. Storm drainage will be addressed. All required utilities and facilities will be provided. The residential density is within the allowed range. Parking and landscaping standards will be met.

The proposal allows for the housing type most appropriate for an older population. Because the community is proposed to be limited to owners 55 years of age and older, single level structures will allow for long-term aging in place. Building a home on one-story requires more floor space and, therefore, more lot coverage. At the same time, less landscaping reduces the burden of ongoing yard maintenance.

As indicated above, no adverse impacts are anticipated. Except for lot coverage adjustment, all standards are met.

Minimum lot area standard adjustment request

The minimum lot area standard in the R-9 zone is 5,000 square feet. The minimum lot area standard in the R-22 zone is 1,500 square feet. The site contains 3.79 gross acres of R-9 zoned land and 4.68 gross acres of R-22 zoned land.

The proposed lots range from 2,450 square feet to 3,858 square feet. The average lot area is 2,881.34 square feet. The applicant is requesting the minimum lot area required be reduced to 2,400 square feet.

The adjustment is warranted as the average lot areas within the proposal exceed the blended average minimum lot area requirements to create a cohesive community design for a 55 and older community.

The proposal is not anticipated to have any adverse impacts. The total number of residential units will be less than the maximum number of units allowed by the current zoning districts.

The required setbacks of the underlying zones will be met. Storm drainage will be addressed. All required utilities and facilities will be provided. The residential density is within the allowed range. Parking and landscaping standards will be met.

The proposal allows for an innovative approach to single-family residential development.

- C. Conditions of approval. The review authority shall impose any conditions of approval necessary to mitigate potentially adverse impacts on surrounding properties to the greatest extent practicable.

Response

The applicant recognizes the review authority can impose conditions necessary to address potentially adverse impacts. However, as indicated above, no adverse impacts are anticipated.

- D. Detailed site plan approval criteria. During the site plan review process, the Planning Official shall approve the detailed development plan for one or more phases of the development upon finding that

the final plan conforms to the approved conceptual development plan, including all conditions of approval, unless the modification of the concept plan is sought concurrently as described in 20.260.030 (C)(6) VMC.

Response

The applicant requests concept development plan approval, detailed site plan approval of the entire development and preliminary land division approval as allowed by 20.260.030.D.

20.260.060 Development Standards.

- A. Minimum development size. There shall be no minimum site size for any type of planned development.

Response

The total post BLA site area is 8.47 acres.

- B. Applicability of base zone development standards. The provisions of the base zone are applicable as follows. When the zoning districts within the planned development have been shifted as permitted in Section 20.260.020 (C) VMC, the applicable development standards for the underlying zones shall shift accordingly.

1. Lot dimensional standards: The minimum lot depth and lot width standards shall not apply.

Response

No response required

2. Lot coverage: The site coverage provisions of the base zone shall apply.

Response

The proposal has two zoning designations. The western portion is zoned R-22 and the eastern portion R-9. In each zone, the maximum lot coverage allowed 50% (Tables 20.410.050– 1 and 20.420.050– 1).

The proposal is also subject to the narrow lot standards. Section 20.927.050, Incentives for Providing Alleys states any development subject to this chapter which provides alley access to at least 50 percent of the total number of lots shall qualify for the following modifications to development standards:

Subsection B states the maximum lot coverage may be increased as follows:

1. *In lower density residential districts, maximum lot coverage shall be 55%.*
2. *In higher density residential districts, maximum lot coverage shall be 65%.*

The proposal provides alley access to 48 of the proposed 70 lots. This exceeds the 50% criterion. Per the provisions of Section 20.260.050.B, the applicant requests an adjustment to increase the allowed maximum lot coverage to 75% for each residential lot.

3. Setbacks

- a. Front and rear yard setbacks for structures at the perimeter of the project shall be the same as required by the base zone except when an adjustment is approved, per Section 20.260.030(D).

Response

Per Table 20.410.050-1, the minimum front yard setback in the R-9 zone is 10 feet, except for garages/carports which required 18 feet. The rear yard setback is 5 feet.

Per Table 20.420.050– 1, the minimum front yard setback in the R-22 zone is 10 feet, except for garages/carports which required 18 feet. The rear yard setback is 0 feet or 5 feet

The site is also subject to the narrow lot standards. Under incentives for alleys, at 20.927.050.F.2 the code allows the minimum rear yard setback from edge of alley pavement to garage or carport may be either 4' or at least 18'. Lots with alley access will have 4-foot rear yard setbacks. Lots without alley access will have 5-foot rear yard setbacks.

Lots with the garage fronting public street will have the garages setback 18 feet from the right-of-way. The minimum front setback for house is 10 feet in the R-9 and R-22 zones. The Applicant anticipates using the setback exception provided for in VMC 20.927.050.F.3, so that front porches can be integrated into the building and community design.

- b. The side yard setback provisions shall not apply except that all detached structures shall meet the City's adopted building code requirements for type of construction.

Response

The project incorporates the zero lot line provisions contained in 20.910.050. 20.910.050.A states the minimum setback on the adjacent lot to the zero-setback side yard lot shall be either zero or 5 feet. The proposal will meet the requirement of that code section by recording the required easements and covenant and incorporating the required building design provisions.

- c. Front yard and rear yard setback requirements in the base zone setback shall not apply to structures on the interior of the project except that any garage facing a street shall be set back a minimum of 18 feet from the front or side street property line.

Response

All buildings will meet the front and rear yard setback standards as modified by the narrow lot standards (including allowance of front-porch encroachment into the setback) and the zero lot line standards.

- d. All other provisions of the base zone shall apply except as modified pursuant to this Chapter, except for maximum height for which a variance shall be sought, as governed by Chapter 20.290 VMC.

Response

The minimum lot area standards apply unless modified by an adjustment. The minimum lot area requirement in the R-9 zone is 5,000 square feet. The minimum lot area standard in the R-22 zone is 1,500 square feet. The applicant requests an adjustment under the planned development process.

The applicant also requests approval of an adjustment to the maximum allowed lot coverage. As addressed above, the request is to allow up to 75% lot coverage on all residential lots in the development for a uniform range of lot sizes throughout the planned development.

4. The Planning Commission or Hearings Examiner can reduce the minimum lot size requirement for attached single family residential uses in planned developments.

Response

The applicant has requested approval of an adjustment to the minimum lot size standard and the maximum lot coverage standards in order to provide a uniform range of lot sizes for single story homes.

- C. Common open space. In exchange for the approval of higher residential densities, smaller lots and relaxed development standards, the developer of a planned development is required to provide common open space for the active and passive recreational activities of residents, employees and visitors. Such space will be aggregated wherever feasible and shall consist of a combination of landscaped and paved (hardscaped) areas. Such common open space shall include some combination of the following: plazas, arbors, sitting areas, picnic areas, playing fields and trails to accommodate a variety of active and passive activities and promote visual interest.

1. In planned developments, the following requirements shall apply.
 - a. At least 10% of the gross area of the site must be devoted to such open space. Such space must be fully accessible to the residents, employees, visitors and/or other users of the site. Reduction of this standard in PDs of two acres or more is prohibited. A reduction of this standard in PDs of less than two acres is subject to an adjustment per Section 20.260.030(D) VMC using approval criteria in Section 20.260.050(B) VMC.

Response

The site has a gross area of 8.47 acres. Therefore, 0.847 acres must be open space.

- b. Fenced yards associated with buildings immediately adjacent to designated open space and landscaping in parking lots shall not count toward the total requirement.
- c. Environmentally-constrained land within the planned development, including wetlands, geologically hazardous areas, sensitive wildlife habitats, pursuant to Section 20.740 VMC or native vegetation and healthy soil preservation pursuant to 20.770 VMC or stormwater facilities pursuant to Chapter 14.25 VMC; may be used to meet up to 50% of the total requirement specified in Subsection (a) above, provided that these areas are not fenced and are either accessible to pedestrians to the extent practical or are visually accessible from adjacent and adjoining common open space.

Response

0.849 acres of open space are incorporated into the design.

2. The common open space designated to meet this requirement shall be permanently maintained by and conveyed to one of the following:
 - a. A homeowners' or property owners' association as regulated by State law.
 - b. A public agency that agrees to maintain the common open space and any buildings, structures or improvements placed within it.

Response

The open space, trail tract and front yards of each home will be maintained by the homeowners' association.

3. The applicant may not seek a variance or adjustment to reduce the minimum open space requirement specified in Subsection (2)(a) above.

Response

The applicant is not seeking a variance or adjustment to reduce the minimum open space requirement.

5. The open space created under this provision is not subject to the Park Impact Fee (PIF) credit unless so authorized by the Vancouver-Clark Parks Department.

Response

The applicant is aware of this provision and has not requested the City of Vancouver Parks and Recreation Department to authorize Park Impact Fee Credits.

D. Residential density

1. On-site density transfers. An applicant for a planned development may shift allowed residential densities around the site to protect and preserve critical or sensitive areas while providing the overall maximum density permitted by the underlying zoning district.
2. Density bonuses. An applicant for a planned development shall be entitled to an automatic residential density bonus of 5% above the maximum density allowed in the underlying base zone on the portions of the site devoted to housing.

Response

Proposed residential density calculations are provided above and meet overall density requirements. (see discussion under 20.260.020.C, above.

20.260.070 Concept Development Plan Submission Requirements.

- A. Existing conditions. An application for a planned development shall contain the following information related to existing conditions on the site, presented in narrative, tabular and/or graphic formats:

1. Vicinity map that identifies surrounding uses within 400 feet of the site boundary.

Response

A vicinity map, meeting this requirement is included in the application plan set.

2. Zoning map that identifies base and overlay zoning designations for the site and surrounding properties uses within 400 feet of the site boundary.

Response

The zoning map is included in the plan set.

3. Site description including the following information provided in narrative, tabular and/or graphic formats:
 - a. Topography and natural resources including 100-year flood plain; natural drainage patterns and courses; wetlands, rivers, springs, seeps, closed depression areas, and other water bodies; aquifer and wellhead protection areas; professional survey of existing vegetation and significant stands of trees and individual trees with a caliper greater than 6"; significant fish

and wildlife habitat, and professional soils report including hydraulic conductivity, groundwater depths and geological hazards such as steep slopes greater than 15%, unstable, impermeable or weak soils. Exhibit must include a site plan with no greater than five- (5) foot contours for slopes of 0– 10% and no greater than two-(2) feet for slopes greater than 10%.
20.260 - 11

Response

*The topography is shown on the existing conditions plan of the engineering plan set (see plan set)
The site is not impacted by the 100-year flood plain; natural drainage patterns and courses; wetlands, rivers, springs, seeps, closed depression areas, and other water bodies; aquifer or wellhead protection areas.*

The Existing Conditions plan sheet also locates the existing trees and structures on the site and indicates existing contours at 1-foot intervals. There are not slopes greater than 15%. A geotechnical report was prepared by Columbia West Engineering (See Section 5).

- b. Open space inventory including all natural and landscaped areas.

Response

The existing open space areas are indicated on the Existing Conditions plan (see plan set).

- c. Inventory of cultural, historic and/or archaeological resources on the site, if any.

Response

As the site contains more than 5 acres, the applicant has submitted an archaeological predetermination report prepared by Archaeological Services of Clark County. The findings of the report were no additional review is required.

- d. Existing buildings, if any, including use, location, size and date of construction.

Response

The Existing Conditions plan sheet indicates the existing buildings; showing their location and size. Clark County GIS records indicate several out buildings were constructed in 1995. These records, however, do not indicate the construction date for others.

- e. Existing on-site pedestrian, bicycle and vehicular circulation system, if any.

Response

The Existing Conditions plan sheet of the submitted plans addresses this (see preliminary plan set).

- f. Inventory of existing vehicular and bicycle parking spaces and location of surface and structured parking facilities, if any.

Response

There are no formal designated vehicle or bicycle parking space on the site. There are no parking structures.

- g. Location and size of all public and private utilities on the site including water, sanitary sewer, storm water retention/treatment facilities, and electrical, telephone and data transmission lines.

Response

The Existing Conditions plan sheet addresses this.

- h. Location of all public and private easements.

Response

The Existing Conditions plan sheet (see plan set) addresses this requirement.

- i. A description of the type, design and characteristics of surrounding properties.

Response

The area to the north is the BPA powerline right-of-way. This site is currently cultivated under an agricultural easement benefitting the development properties. To the west is NE 112th Avenue. The development on the west side of NE 112th consists of the BPA right-of way, a large wooded lot which the Clark County GIS indicates has no structures and the Salvation Army facility.

To the south the land uses include a large wooded lot with a residence, a City of Vancouver water tower and the Cascade Crest Subdivision which is a single-family detached residential subdivision developed in the mid-1990s.

To the west is the Evergreen Meadows subdivision. Approved in 1969 and developed over the following years as a single-family detached subdivision.

- 4. Detailed description of the transportation system within and adjacent to the site including:
 - a. Street classification of all internal and adjacent streets.

Response

The adjacent streets include:

- *NE 112th Avenue, a 4-lane designated Principal Arterial,*
- *NE 16th Street, a designated Local Access street; and*
- *NE 115th Avenue, a designated Local Access street.*

All internal streets, including alleys, will be public streets. The Existing Conditions plan depicts the improvements to the existing streets. The preliminary engineering plans depict the proposed street improvements.

- b. Transit service availability.

Response

C-TRAN Route 177, Evergreen Express to Portland, runs along NE 18th Street. However, the only stop is at the Evergreen Park and Ride on 138th Avenue. C-TRAN Routes 80 and 30 run through the intersection of NE 28th Street and NE 112th Avenue, a little over ½ mile from the site

- c. Baseline traffic impact study prepared by a licensed engineer to include information as required by the City's Traffic Engineer.

Response

A traffic study has been prepared by Kittelson & Associates, Inc. Transportation Engineering & Planning December 22, 2017 with an updated letter dated September 27, 2018 (see Section 7)

6. Analysis of existing infrastructure capacity on and in the vicinity of the site.

Response

The city of Vancouver provided comments regarding the existing infrastructure at the pre-application conference on August 23, 2018 (PIR-156552). The conference report indicated public infrastructure was available or could be made available to service the requirements of this development.

7. SEPA checklist.

Response

The SEPA Checklist has been completed and is attached as Section 4 of this application..

8. Applicable review fees.

Response

Review fees will be determined during the pre-submittal review process and paid at the time of submittal.

- B. Planning history. Summary of all previous known land use cases affecting the applicant's property and a list of all outstanding conditions of approval that either have not been addressed in the past and/or that remain in force at the time of the application.

Response

The site was the subject of a pre-applicating conference on August 23, 2018 (PIR-156552). County GIS records indicate two other pre-applications; PIR-52386 on March 30, 2016 and PIR-64574 on Sep. 18, 2017.

No development requests were processed associated with the 2016 and 2017 Pre-Application conferences.

C. Proposed development plan.

1. Description of all proposed development within the planned development, presented in narrative, tabular and graphic formats:
 - a. Underlying zoning district boundaries. If these are shifted around the site as permitted by Section 20.260.020, the existing and proposed configuration of zoning districts shall be illustrated.

Response

The site has two zoning districts; R-9 and R-22. The applicant does not intend to shift the zoning districts. Rather the applicant requests to blend the zoning districts via the requested adjustment.

Both the R-9 and the R-22 zone allow single-family detached and attached dwelling units (Table 20.410.030 – 1. Single-family attached dwelling unit in the R-9 zone are subject to Section 20.260.020.B.1.a(2), Planned Development and subject to Section 20.910.050 VMC, zero lot line requirements). The R-22 zone also allows single-family attached and detached dwelling units Provided the minimum required residential density is met, on an overall project basis.

Each zone allows attached and detached single-family dwellings. There are caveats relating to density and planned unit development. The difference between what is allowed in the two zones is density.

The applicant proposes to blend the densities of the two zones and apply it to the entire development.

- b. Description of the mix of uses, including number of units and/or total gross square feet devoted to each, and approximate location on the site.

Response

The proposal consists of 70 attached and detached single story single-family residential dwelling units intended for households of individuals 55 years of age and older. Included in the design is open space, designated guest parking, and storm facilities (see preliminary plan set).

- c. All other site improvements including the approximate size and location of walls, barriers and fences; surface and structured parking facilities; bicycle parking facilities; on-site pedestrian, transit and vehicular circulation; transit stops and pedestrian/transit amenities; and open space and landscaped areas.

Response

The proposed concept plan addresses each of these facets related to the development (see preliminary plan set).

- d. The conceptual location of new and/or expanded existing public and private infrastructure including water, sanitary sewer, stormwater management facilities; and electrical, telephone and data transmission lines. This includes wireless telecommunications facilities.

Response

The proposed concept plan addresses each of these facets related to the development (see preliminary plan set).

- 2. Phasing plan for implementation of the proposed development.

Response

The development will not be phased.

- 3. Summary of development intensity at full build-out including average floor area ratio and lot coverage.

Response

Lot coverage will range from 68% to 75%, depending on final lot size and product type mix. Because these will be single-story structures, FAR will be the same as the percentage of lot coverage.

- 4. Summary of transportation facilities including:
 - a. Traffic impact study prepared by a licensed engineer that describes traffic impacts associated with each phase of development and at full build-out of the project, and a plan for accommodating this traffic in compliance with Title 11. The specific content of the traffic impact study shall be determined by the City's Traffic Engineer.

Response

A traffic study was prepared by Kittelson & Associates (see Section 7)

- b. Parking impact study describing the parking demand associated with each phase of the development and at full build-out of the project, and a mitigation plan for accommodating parking demand on the site.

Response

The proposal is for 70 single-family dwellings. The standard parking requirement for single-family residential development is 1 parking space per dwelling unit (Table 20.945.070-2). The project must also meet the standards for narrow lot developments. The narrow lot standards require designated guest parking at a rate of one guest parking space for every three narrow lots in the development (Section 20.927.030.B).

Each home is currently intended to have a two-car garage. The project plans submitted with this development illustrate available parking on NE 16th Street, the proposed NE 17th Street, and in two parking tracts located within the development and to be maintained by an owners' association. A total of 46 off-site parking spots are provided (including allowed parking on NE 16th Street and the new NE 17th Street), which exceeds the 23 off-site spaces required by the City's narrow lot code

- c. Concurrent or proposed street vacations, with a description of potential parking and traffic/pedestrian impacts, if any, and appropriated measures to mitigate these impacts.

Response

No street vacations are requested.

- 5. Plan for protecting designated environmental, historic/cultural and open space resources.

There are no designated environmental, historic/cultural and open space resources associated with the site.

- 6. Design standards that will govern the orientation and design of buildings and other improvements include but are not limited to the following. Applicants for planned developments shall be encouraged to use building techniques and materials that result in projects that architecturally attractive, durable and energy-efficient.

- a. Architecture, including design standards and building materials board(s), for buildings, fences, walls and other structures.

Response

The Applicant intends to build a development that is architecturally attractive, durable and energy efficient. Lot width, product type, and product placement on each lot is intended to be varied to create variety and interest. Front porches and architectural detail on each structure will enhance the curb appeal for individual homes and the attractiveness of the community overall. The CCRs governing the community will include design standards and a mechanism for review and approval of improvements of changes to building design after initial construction.

The application includes architectural design elements for the development.

- b. Landscaping, including design standards and standard plant list. Native plant materials are preferred.

Response

Landscaping, consistent with city standards, will be professionally designed, installed and maintained in all common areas and for the front yard of each home. The applicant has provided a programmatic landscaping plan depicting the general design concepts and potential list of plant materials.

- c. Pedestrian circulation, including development standards, amenities and materials.

Response

The proposal includes standard street frontage throughout for pedestrian circulation and includes a recreational trail connection and two open spaces that will be available for use by residents.

- d. Bicycle parking facilities, including specifications.

Response

These are single family homes. It is anticipated that all bicycle parking will be at each residence

- e. Signs.

Response

No monument signs are anticipated

- f. Lighting.

Response

Lighting will be installed consistent with City requirements.

Response. The applicant has provided a conceptual plan addressing the above enumerated design elements (see preliminary plans)

Section 20.260.080 Detailed Development Plan Submission Requirements.

A. **Submission requirements.** At the time of construction of a project or phase of development that was approved as part of the concept development plan, the applicant shall submit the following documentation demonstrating that the proposed project or phase is in substantial compliance with that contained in the original approval by means of a site plan review, using procedures contained in 20.270 VMC. An application submitted for a detailed development shall include the following:

1. Detailed site plan.
2. Elevations of all buildings.
3. Landscape plan.
4. Erosion control plan.
5. Stormwater management plan including low impact development site analysis determining feasibility of using LID techniques.
6. Narrative documenting the following:
 - a. Compliance with all development and design standards in the base zone, as modified in the initial concept plan approval.

- b. Compliance with all relevant conditions of approval.
 - c. Consistency with traffic, parking and infrastructure plans contained in the initial concept plan approval.
- A. Submission requirements. At the time of construction of a project or phase of development that was approved as part of the concept development plan, the applicant shall submit the following documentation demonstrating that the proposed project or phase is in substantial compliance with that contained in the original approval by means of a site plan review, using procedures contained in 20.270 VMC. An application submitted for a detailed development shall include the following:
- 1. Detailed site plan.
Section 20.270.040.C, a proposed site development plan must include the following:
 - 1. The proposed site and its dimensions and area, orientation relative to north.
 - 2. Abutting properties or, if abutting properties extend more than 100' from the site, the portion of abutting properties within 100' of the site, and the approximate location of structures and uses on abutting property or portion of the abutting property.
 - 3. The location and dimensions of proposed development, including the following:
 - a. Streets and other rights-of-way and public or private access easements on and adjoining the site;
 - b. Vehicle, pedestrian and bicycle parking and circulation areas, including handicapped parking stalls and disembarking areas, accessible route of travel, proposed ramp and signage as required by WAC 51-40;
 - c. Loading and service areas;
 - d. Active or passive recreational or open space features;
 - e. Above-ground utilities;
 - f. Existing structures to be retained on the site and their distance from property lines;
 - g. Proposed structures on the site, including signs, fences, etc., and their distance from property lines;
 - h. The location and type of proposed outdoor lighting and existing lighting to be retained; and
 - i. The size and location of solid waste and recyclables storage areas.

Response

The applicant has provided a detailed site plan, prepared by SGA Engineering & Design, addressing all the applicable information for this proposal.

- 2. Elevations of all buildings.

Response

Architectural elevations have been provided by Boulevard Homes shown in section 10

- 3. Landscape plan.

Response

A landscape plan, prepared by SGA is included in the plan set.

- 4. Erosion control plan.

Response

An erosion control plan, prepared by SGA Engineering & Design, is included in the civil plan submittal.

5. Stormwater management plan including low impact development site analysis determining feasibility of using LID techniques.

Response

A stormwater management plan, prepared by SGA & Associates is, include in the civil plan submittal.

6. Narrative documenting the following:
 - a. Compliance with all development and design standards in the base zone, as modified in the initial concept plan approval.
 - b. Compliance with all relevant conditions of approval.
 - c. Consistency with traffic, parking and infrastructure plans contained in the initial concept plan.

Response

The applicant is requesting both conceptual and detailed approval of the proposed planned development. The narrative is included in the application is applicable to both the concept and detailed planned development application.

Section 20.260.090 Vesting.

- A. Applicability. A planned development shall be reviewed under this Chapter and the zoning, development and other land use control ordinances contained in Titles 11, 12, 14, and 20 of the Vancouver Municipal Code, and any uncodified ordinances modifying the same, in effect on the date a concept plan application has been deemed fully complete by the City. For the purposes of this section, a vested concept plan application shall mean that the applicant is entitled to implement the planned development or any portion of it described in the application under the zoning, development and land use ordinances applied by the City in its review of the planned development application.

Response

The applicant is aware of the planned development vesting provisions.

- B. Subsequent Regulations. An applicant may have the option of subjecting its development to any subsequently enacted land use ordinances. However, should an applicant choose to subject its development to a subsequently enacted land use ordinance, this shall have the effect of subjecting the development to all land use ordinances enacted after the application is vested, unless the city and applicant agree otherwise. In order for the Planning Official to grant such a request, the applicant must demonstrate how later enacted ordinance(s) will benefit both the project and the City while maintaining consistency with the comprehensive plan. Applicant must also demonstrate that use of later enacted ordinances will not conflict with other ordinances the development remains subject to and will not be significantly detrimental to the health, safety, or general welfare of the City. Planning Official shall review and either approve the request or determine if a new application must be submitted.

Response

The applicant is aware of the subsequent regulations provision.

20.260.100 Concurrency.

- A. **Applicability.** An applicant for a planned development shall be entitled to reserve capacity in the transportation system for the proposed development's trip generation and shall be deemed to have achieved transportation concurrency, under the concurrency rules and regulations in effect at the time that the concept plan application is vested under 20.260.090 VMC above, if (1) the applicant obtains a certificate of concurrency for all or any portion of its proposed development under Chapter Title 11 VMC, Transportation Concurrency; or (2) the applicant and the City enter into a development agreement as regulated by State statute (36.70B.170 et seq. RCW), which by its terms reserves capacity in the transportation system and includes a finding of transportation concurrency. The term for the concurrency determination shall be set as the term in the certificate of concurrency or the development agreement.

Response

The applicant is aware of the concurrency applicability provision. A traffic impact analysis, prepared by Kittelson & Associates, Inc. Transportation Engineering & Planning, is included in the application materials (Exhibit) The traffic Impact analysis provides the information required for the City to render a concurrency determination.

Chapter 20.320 Subdivisions

20.320.015 Applicability.

All divisions of land except those listed in Subsection (D) below, shall be subject to the requirements of this Section.

- A. Short subdivisions. A short subdivision is a land partition containing nine (9) or fewer lots.
B. Subdivisions. A subdivision is a land partition containing ten (10) or more lots.
C. Infill Subdivisions and Short Subdivisions, pursuant to additional requirements of Section 20.920 VMC.

Response.

The application is for approval of a 70-lot subdivision with additional tracts for open space, storm facilities, parking and slopes. The subdivision process is applicable to this request.

- D. Exemptions. The provisions of this Chapter shall not apply to the following:
1. Cemeteries and burial plots while used for that purpose.
 2. Divisions of land into lots or tracts, each of which is 1/64 of a section of land or larger, or 10 acres or larger, if the land is not capable of description as a fraction of a section of land. For purposes of computing the size of any lot under this item which borders on a street or road, excluding limited-access streets or roads, the lot size shall be expanded to include that area which would be bounded by the centerline of the road or street, and the side lot lines of the lot running perpendicular to such centerline.
 3. Divisions and/or acquisitions of land pursuant to condemnation or threat of condemnation by a government agency public purposes.
 4. Divisions of land made by testamentary provisions, or the laws of descent.
 5. Divisions of land made by subjecting a portion of a parcel or tract of land to Chapter 64.34 RCW (Condominiums) if the Planning Official has approved a binding site plan in accordance with Chapter 20.330 VMC.
 6. Divisions of land into lots or tracts classified for industrial or commercial use, when the Planning Official has approved a binding site plan for use of the land in accordance with Chapter 20.330 VMC.

7. A division made for the purpose of adjusting boundary lines which does not create any additional lots, tracts, parcels, sites or divisions, nor any lots, tracts, parcels, sites or divisions which contain insufficient area and/or dimensions to meet the minimum requirements for width, depth and/or area for a lot.
8. Divisions created by a court order that result in lots that conform to the requirements of this Title.

Response

None of the above-described exemptions apply.

Section 20.320.020 Approval Process.

A. Decision-making process

1. Short subdivisions. The Planning Official shall approve, approve with conditions or deny an application for a short subdivision preliminary plat by means of a Type II procedure, pursuant to 20.285.050 VMC, using approval criteria contained in Section 20.320.040 VMC, and additional requirements of 20.920 VMC if a qualifying infill development, and 20.927 VMC if a qualifying narrow lot development.
2. Subdivisions. The Hearings Examiner shall approve, approve with conditions or deny an application for a subdivision preliminary plat by means of a Type III procedure, pursuant to 20.210.060 VMC, using approval criteria contained in Section 20.320.040 VMC, and additional requirements of 20.920 VMC if a qualifying infill development or 20.927 if a narrow lot development.

Response

The application includes a planned development approval request as well as a preliminary subdivision plat request. The planned development contains less than 25 acres. Therefore, both requests will be considered by the Hearings Examiner.

Also, as the application includes a planned development and planned developments are considered by the city council, the preliminary plat will also be considered by the city council. The preliminary subdivision is subject to a Type IV application process.

- B. Term of preliminary plat approval.** Approval of a preliminary short subdivision or subdivision shall be valid for a period of seven years, except as provided by RCW 58.17.140(3)b, subject to verification of utility availability, during which time an application for final plat meeting all the requirements of this Chapter and all conditions of preliminary plat approval shall be made; provided, that extensions of preliminary short subdivision or subdivision plat approval may be granted in accordance with the procedures and criteria set forth in Section (D) below.

Response

The applicant is aware of the term of preliminary plat approval.

- C. Phasing.** The developer may develop the short subdivision or subdivision in phases. Any phasing proposal shall be submitted with application materials for the preliminary plat and approved by the Review Authority, except that the Planning Official may approve a phasing plan for an approved

short subdivision or subdivision by means of a Type I procedure, governed by 20.210.040 VMC Type I Applications upon finding that:

1. The phasing plan includes all land identified within the legal notice of the approval hearing;
2. The sequence of phased development is identified by map;
3. Each phase shall constitute an independent project meeting all of the requirements for density, open space, public and private infrastructure, landscaping, pedestrian and vehicle circulation etc.; and
4. The Director of Public Works and Transportation Manager have approved the necessary documents to determine that all streets, sanitary and storm sewers, water and other public improvements, including but not limited to drainage improvements, and erosion control measures are assured.

Response

The applicant is not requesting phasing.

D. Extensions. Extension requests shall be reviewed in accordance with the following criteria:

1. An initial one-year extension request, which has been filed at least 30 days prior to the expiration of the seven-year period, shall be reviewed by the Planning Official by means of a Type I procedure, as governed by Section 20.210.040 VMC, upon showing that the applicant has attempted in good faith to meet the conditions for the final plat within the seven-year period.
2. Two additional two-year extension requests may be granted by the Planning Official by means of a Type II procedure, as governed by Section 20.210.050 VMC, providing the applicant demonstrates compliance with all of the following criteria:
 - a. The applicant has pursued compliance with all conditions of preliminary plat approval and submitting the final plat in good faith; and
 - b. There have been no changes to the Comprehensive Plan, zoning ordinance, development standards or other applicable codes that are inconsistent with the approved preliminary plat.

Response

The applicant is aware of the preliminary plat extension provisions.

3. Short subdivisions or subdivisions that have been approved for phased development pursuant to Subsection (C) above may receive subsequent two-year extensions in accordance with the criteria of Subsection (D)(2) above so long as at least one phase received final plat approval and was properly recorded within four years prior to each such subsequent extension request.

Response

The application does not include a short plat.

- E. Transportation concurrency. The approval of extensions notwithstanding, the applicant shall comply with the provisions of Chapter 11.95 VMC, Transportation Concurrency.

Response

Included in the application is a traffic impact analysis prepared by Kittelson & Associates, Inc. Transportation Engineering & Planning. The traffic Impact analysis provides the information required for the City to make a concurrency determination.

- F. Land transfer agreements. Agreements to transfer land prior to final plat are authorized, provided, that the performance of an offer or agreement to sell, lease or otherwise transfer a lot, tract or parcel of land following preliminary plat or short plat approval is expressly conditioned on the recording of the final plat or short plat containing the lot, tract or parcel and shall comply with the requirements of 58.17.205 RCW.

Response

The applicant is aware of the preliminary plat land transfer agreements provisions.

Section 20.320.030 Preliminary Plat Application Requirements.

- A. Application. The applicant shall provide one original and eight copies of the application for a preliminary plat of a short subdivision or subdivision consisting of the following information:
1. Subdivision or short subdivision name that must be other than the name of an existing subdivision, addition or plat recorded in Clark County Washington.
 2. Name, mailing address, and telephone number of the owner and/or developer;
 3. Name, mailing address, telephone number, and signature of person preparing the application
 4. Date;
 5. Location, including $\frac{1}{4}$ of $\frac{1}{4}$ section, section, township, range and, as applicable, donation land claim and/or subdivision;
 6. Total parcel area in acres and square feet;
 7. Comprehensive Plan and zoning designations;
 8. Existing and proposed land uses;
 9. Number and size of residential, commercial and industrial lots;
 10. Names of all utility purveyors;
 11. Signatures of all property owners; and
 12. Fee, as governed by Chapter 20.180 VMC.

Response

The applicant has submitted the form required. All application materials area provided in electronic format as required.

- B. Preliminary plat information. The applicant shall provide one original and eight copies of the following information. Drawings shall be on sheets not larger than 24" X 36". Preliminary plats shall be drawn at a scale of 1" = 50' or larger. Plans for the preliminary plat will not be accepted if they are not collated and folded.
1. Existing conditions plan. The preliminary plat application shall include the following information on one or more to-scale drawings:
 - a. A vicinity map showing streets and access points, pedestrian and bicycle pathways, transit stops and utility locations within a 500' radius of the site;
 - b. The site size, dimensions and orientation relative to true north;

- c. Remaining easements
- d. The location, name and dimensions of public and private streets adjoining the site, identifying whether the streets are public or private;
- e. Location, dimension, and purpose of existing easements;
- f. The location of existing structures and other improvements on the site, including buildings, driveways, parking, loading, pedestrian and bicycle paths, passive or active recreational facilities or open space and utilities;
- g. Elevation of the site at 2' contour intervals for grades 0% to 10% and at 5' contour intervals for grades more than 10%;
- h. The location of natural conditions such as:
 - 1. Waterbodies, the 100-year floodplain, aquatic habitats, natural drainage courses, wetlands, springs, seeps, closed depression areas, groundwater elevations, aquifers, and wellhead protection areas;
 - 2. Geological hazard areas such as slopes in excess of 15%, unstable or weak soils, soils with high erosion potential, rock outcroppings, and areas of healthy native soils and hydraulic conductivity;
 - 3. Existing vegetation including stands of trees and individual trees with a caliper greater than 6", additional information necessary to comply with VMC 20.770 Tree, Vegetation, and Soil Conservation, and areas of wildlife habitat.

Response

The applicant has provided an Existing Conditions Plan, prepared by SGA Engineering & Design. The plan addresses all the applicable existing conditions elements.

- 2. Preliminary plat. The proposed preliminary plat shall include the following information presented on one or more drawings. Plans shall be on sheets not larger than 24" x 36". Preliminary plats shall be drawn at a scale of 1" = 50' or larger. Other scales may be used with the approval of the Planning Official. Plans for the preliminary plat will not be accepted if they are not collated and folded.
 - a. The proposed site and its dimensions and area.
 - b. Proposed lots, tracts and easements including dimensions individual lot areas and total acreage.
 - c. Abutting properties or, if abutting properties extend more than 100' from the site, the portion of abutting properties within 100' of the site, and the approximate location of structures and uses on abutting property or portion of the abutting property.
 - d. The location and dimensions of development, including but not limited to the following:
 - 1. Streets and other rights-of-way and public or private access easements on and adjoining the site;
 - 2. Vehicle, and bicycle parking and pedestrian bicycle and vehicular circulation areas;
 - 3. Loading and service areas;
 - 4. Active or passive recreational or open space features;
 - 5. All utilities;
 - 6. Existing structures to be retained on the site and their distance from proposed property lines;
 - 7. Proposed structures on the site, including signs and fences, and their distance from property lines if known at time of land division;
 - 8. The location and type of proposed outdoor lighting and existing lighting to be retained if known at time of land division.; and

9. Boundary delineation of any wetlands including required buffers and shoreline setback lines if applicable

Response

The applicant has submitted a preliminary plat prepared by SGA Engineering & Design addressing each of applicable elements describe above.

3. Narrative. A Preliminary plat application shall include the following:
 - a. A comprehensive narrative addressing how the development complies with the technical standards in Section 20.320.080 VMC; other applicable standards of this Title and the policies of the Comprehensive Plan outlined by staff as being applicable to the proposed development

Response

Please see detailed narrative related to 20.320.080 below

- b. Description of the uses proposed for the site;

Response

The application is for approval of a planned development subdivision. The applicant proposed to develop 70 single-family attached and detached dwellings for residents 55 and over. The development will contain open spaces, a north-south trail through the development and tracts for storm facilities and sloped areas.

- c. Phasing plan, if applicable;

Response

Phasing is not requested.

- d. Construction schedule;

Response

Construction will begin in spring 2019.

- e. Any variances requested pursuant to the regulations in Chapter 20.290 VMC;

Response

The applicant has not requested any variances under 20.290. The applicant has requested two adjustments. One to the maximum lot coverage standards and the other the minimum lot area requirements in R-9 zone. These are requested pursuant to the provisions of 20.260.050.B, relating to planned developments.

The applicant is also using the provision of the narrow lot standards to allow for encroachments in to front yard setback as allowed by 20.927.050.F.3.k

- f. Existing covenants or restrictions and easements, if applicable; and

Response

County GIS indicates easements.

- g. History of any previous subdivisions and short subdivisions of the property.

Response

The proposal is within the Northwestern Home Lots recorded Aug. 9, 1909

- 4. Supplementary information. One original and eight copies, collated and folded, of the following supplemental information shall also be submitted unless otherwise indicated in parentheses:
 - a. Environmental checklist that complies with Chapter 20.790 VMC, SEPA Regulations,
 - b. Legal description;
 - c. Reproducible copies of all plans identified in 8 1/2 x 11" format;
 - d. Assessor's map(s) showing all properties within 1,000' of the plat boundary;
 - e. Results of any completed percolation tests, if applicable (four copies);
 - f. 1 copy of the proposed plat map, reduced to fit on either 8-1/2" X 11" or 11" X 17" paper;
 - g. Geotechnical/soils survey (four copies), if applicable;
 - h. Tree, vegetation, and soil plan that complies with the requirements of Chapter 20.770 VMC, Tree, Vegetation, and Soil Conservation;
 - i. Preliminary grading, erosion prevention and stormwater plans
 - 1. Grading Plan indicating areas of soil protection and compaction prevention.
 - 2. Erosion Prevention measures as required in VMC 14.24, and
 - 3. Stormwater Site Plan as required in VMC 14.25,
 - j. Archaeological Pre-Determination Report, if applicable, that complies with the requirements of Chapter 20.710 VMC, Archaeological Resource Protection (four copies);
 - k. Sales history. A deed history of all applicable properties dating back to 1969 or to the date when a legal lot determination was made (one copy);
 - l. Clark County Health Department Review Evaluation Form or copy of application to the Clark County Health Department (four copies);
 - m. Pre-application conference notes; and
 - n. Certified mailing list. Current Clark County Assessor map(s) showing the property(ies) within a 500' radius of the site, per the requirements in Chapter 20.210.050 and 20.210.060 VMC, Decision-Making Procedures, and two sets of mailing labels with the names and addresses of owners of all properties within the 500' radius. Such list shall be certified as accurate and complete by the Clark County Assessor, a title company. For non-owner occupied properties, provide mailing labels addressed to "occupant" as can be determined from available County Assessor records (two copies).
 - o. Request for Certificate of Concurrence or Certificate of Concurrence Survey and applicable traffic studies.

Response

With the exception of the archaeological predetermination report, all materials will submitted electronically.

Section 20.320.040 Preliminary Plat Approval Criteria.

Approval criteria. To grant approval of a preliminary short subdivision or subdivision, the applicant must demonstrate compliance with all of the following criteria:

- A. Public facilities provision. Appropriate provisions to the extent necessary to mitigate an impact of the development have been made for transportation, water, storm drainage, erosion control and

sanitary sewage disposal methods that are consistent with the City's current ordinances, standards and plans;

Response

The applicant has submitted preliminary civil engineering plans and reports addressing for transportation, water, storm drainage, erosion control and sanitary sewage disposal. The plan submittal includes:

- *A traffic impact analysis prepared by Kittelson & Associates;*
- *Preliminary street engineering plans;*
- *Preliminary water extension plans;*
- *Preliminary stormwater report;*
- *Preliminary grading plans which also address stormwater control;*
- *Preliminary erosion control plans; and*
- *Preliminary sanitary sewer engineering plans.*

- B. Proposed improvements. Appropriate provisions have been made for proposed streets, alleys and public ways, utilities and other improvements that are consistent with the City's current ordinances, standards and plans, and Department of Health and/or Washington State Department of Transportation standards and plans, where applicable;

Response

The improvement will be based on the plans approved by the city of Vancouver. The applicant has received a review from the Clark County Health Department relating the existing septic tanks or wells on the site.

- C. Open space and dedications. Appropriate provisions to the extent necessary to mitigate an impact of the development have been made for open space, parks, schools, dedications, easements and reservations;

Response

The applicant does not propose to dedicate land for open space, public parks, or public schools. The development will pay park and school impact fees.

The proposal does include dedication of a public pathway, running north-south approximately at the midpoint of the development. The development will provide private open space for the residents and their guests.

- D. Physical characteristics. The design of the proposed short subdivision or subdivision site has taken into consideration the physical features of the site, including but not limited, to: topography, soil conditions, susceptibility to flooding, inundation or swamp conditions, steep slopes or unique natural features such as wildlife habitat or wetlands;

Response

As shown on the existing conditions plans and the preliminary grading plans, the site is not encumbered by its physical conditions.

- E. Re-platting of existing subdivisions. When re-platting an existing subdivision, the short subdivision or subdivision shall comply with all of the terms and conditions of the existing subdivision's conditions of approval;

Response

The proposal is within the Northwestern Home Lots recorded Aug. 9, 1909

- F. Compliance with all requirements of this title. The proposed short subdivision or subdivision complies with all applicable requirements of this title unless modified through the approval; and

Response

This narrative indicates the proposal complies with the applicable requirements of this title. No variances have been requested.

- G. Compliance with State requirements. That the proposed short subdivision or subdivision complies with the requirements of RCW 58.17.110.

Response

the requirements of RCW 58.17.110 are addressed as follows:

- (1) The city, town, or county legislative body shall inquire into the public use and interest proposed to be served by the establishment of the subdivision and dedication. It shall determine: (a) If appropriate provisions are made for, but not limited to, the public health, safety, and general welfare, for open spaces, drainage ways, streets or roads, alleys, other public ways, transit stops, potable water supplies, sanitary wastes, parks and recreation, playgrounds, schools and schoolgrounds, and shall consider all other relevant facts, including sidewalks and other planning features that assure safe walking conditions for students who only walk to and from school; and (b) whether the public interest will be served by the subdivision and dedication.

Response

The applicant has demonstrated appropriate provisions can be made for all required public utilities. The development is designed meet the public safety provisions of Building and Fire Codes. The Clark County Health Department has completed and evaluation of the site relating to wells and septic tanks.

As indicated in the traffic impact analysis, this development will not have a significant impact on the level of service.

Parks and schools will receive impact fees from the development. The development is in the Evergreen School District. The impacted schools include Fircrest Elementary School, located at 12001 NE 9th St., Cascade Middle School, located at 13900 NE 18th Street and Evergreen High School, located at 14300 NE 18th St.(see Section 8).

The site is zoned for residential use. The use conforms to the comprehensive plan and complies with the various city of Vancouver zoning standards. Development of this site as proposed will not degrade the environment and will provide a needed, innovative, housing type. The proposal is in the public interest.

- (2) A proposed subdivision and dedication shall not be approved unless the city, town, or county legislative body makes written findings that: (a) Appropriate provisions are made for the public health, safety, and general welfare and for such open spaces, drainage ways, streets or roads, alleys,

other public ways, transit stops, potable water supplies, sanitary wastes, parks and recreation, playgrounds, schools and schoolgrounds and all other relevant facts, including sidewalks and other planning features that assure safe walking conditions for students who only walk to and from school; and (b) the public use and interest will be served by the platting of such subdivision and dedication. If it finds that the proposed subdivision and dedication make such appropriate provisions and that the public use and interest will be served, then the legislative body shall approve the proposed subdivision and dedication. Dedication of land to any public body, provision of public improvements to serve the subdivision, and/or impact fees imposed under RCW 82.02.050 through 82.02.090 may be required as a condition of subdivision approval. Dedications shall be clearly shown on the final plat. No dedication, provision of public improvements, or impact fees imposed under RCW 82.02.050 through 82.02.090 shall be allowed that constitutes an unconstitutional taking of private property. The legislative body shall not as a condition to the approval of any subdivision require a release from damages to be procured from other property owners.

Response

The applicant has shown the subdivision will be developed in conformance with all applicable regulations. The hearing examiner's Final Order will contain finds address addressing these standards.

- (3) *If the preliminary plat includes a dedication of a public park with an area of less than two acres and the donor has designated that the park be named in honor of a deceased individual of good character, the city, town, or county legislative body must adopt the designated name.*

Response

The proposal does not include public park dedication.

- (4) *f water supply is to be provided by a groundwater withdrawal exempt from permitting under RCW 90.44.050, the applicant's compliance with RCW 90.44.050 and with applicable rules adopted pursuant to chapters 90.22 and 90.54 RCW is sufficient in determining appropriate provisions for water supply for a subdivision, dedication, or short subdivision under this chapter.*

Response

Water will be provided by the city of Vancouver.

- H. Narrow Lot Additional Criteria. Land divisions which contain one or more residential lots having a width of less than 40 feet shall meet additional criteria of VMC 20.927.030 A, B and C.

Response

The project includes narrow lots. Compliance with the narrow lot standards is addressed later in this narrative.

Section 20.320.050 Final Plat Application.

Response

Not applicable currently.

Section 20.320.060 Final Plat Approval.

Response

Not applicable currently.

Section 20.320.070 Technical Standards.

A. Subdivision Layout and Required Improvements

1. Principles of acceptability. The short subdivision or subdivision shall conform to the Comprehensive Plan. The short subdivision or subdivision shall conform to the requirements of the state law and to the standards established by this Title.

Response

The comprehensive plan designations for this site are Urban Low Density Residential (UL) and Urban Higher Density Residential (UH). The zoning of the site reflects the comprehensive plan designations. The UL area is zoned R-9 and the UH area is zoned R-22.

As shown throughout this narrative, the proposed uses are allowed in both zoning designations. As the use is based on the zoning and the zoning is based on the comprehensive plan, proposed subdivision will conform to the comprehensive plan.

- a. Street improvement standards. All proposed streets and street improvements shall comply with the provisions of Title 11 and approved transportation standards details on file with the Public Works Department.

Response

Engineering plans addressing street improvements have been submitted for review and comment. These plans address the standards set forth in Title 11. The city has the authority to approve as submitted, require revisions needed for approval or deny the application.

Once completed, the proposed will comply with all applicable provisions of Title 20.

- b. Blocks. The length, width and shape of blocks shall be designed with due regard to providing adequate building sites for the use contemplated; consideration of the needs for convenient access, circulation, control, safety of motor vehicular, bicycle and pedestrian traffic and recognition of limitations and opportunities of topography.

Response

There are two blocks surrounded by streets. The distance between the centerline of proposed NE 113th Avenue and proposed NE 115th Avenue is approximately 580 feet. The distance between the centerline of proposed NE 15th Avenue and the at the eastern edge of the project is approximately 520 feet. The distance from the centerline of Ne 16th street and the centerline of proposed NE 17th Street is approximately 220 feet.

The layout allows for building lots that range from 2,450 square feet to 3,858 square feet. Street and alley access are provided. A trail runs north-south through the development.

The site is relatively flat and is not a limitation on the site's development.

- c. Blocks shall not exceed 1,300' in length between street lines, except blocks adjacent to arterial streets or unless a previous adjacent layout or topographical conditions justify variation. The recommended minimum distance between intersections of arterial streets is 1,800'. Minimum length of a block shall not be less than 180'.

Response

All blocks are less than 1,300 feet between streets. All blocks are greater than 180 feet between streets.

NE 112th Avenue is a Principal Arterial. No additional intersections with NE 112th Avenue are proposed.

d. Easements

1. Utility lines. Easements for sewers, drainage, water lines, electric lines or other public use utilities shall be provided. The size and location of the easement shall be reviewed and approved by the appropriate utility provider.

Response

Locations of utility lines will be determined during the engineering review process. Each provider must approve the utility location prior to receiving engineering approval.

2. Watercourses. If a subdivision is traversed by a watercourse, such as a drainageway, channel or stream, there shall be provided a stormwater easement for the width of the watercourse plus 15' on each side of the watercourse. Streets or parkways parallel to a major watercourse may be required.

Response

There are no watercourses on the site.

3. Pedestrian/bicycle ways in and through residential subdivisions. In blocks over 800' in length, a pedestrian/bicycle way with a minimum width of 16' shall be required through the middle of the block when required by the Transportation Manager for public convenience and safety; 12' of the 16' corridor shall be paved in a durable material. If unusual conditions require blocks longer than 1,200' in length, two pedestrian/bicycle ways shall be required. When required by the Transportation Manager for public convenience and safety, pedestrian ways shall be required to connect cul-de-sacs or to pass through unusually shaped lots.

Response

Although no lots exceed 800 feet, a pedestrian/bike path is proposed running north-south through the development. It runs from NE 16th Street to the BPA right-of-way. The trail easement is 20-feet wide.

- e. Flag lots. Flag lots may be permitted, provided that the minimum width of the flag stem be 15' for a single lot and 20' for a shared flag access, and it is in compliance with fire access standards contained in VMC 16.04.150. No more than four lots may be accessed from a single flag stem. A private maintenance agreement shall be recorded for driveways which serve more than one lot.

Response

No flag lots are proposed.

- f. Lot side lines. Side lines, as far as practical, shall run at right angles to the street on which the lot faces.

Response

All lot side lines run at approximately right angle to the existing and proposed streets.

- g. Lot frontage. With the exception of flag lots, all lots shall abut on a public or private street with a minimum frontage of not less than 20'.

Response

All proposed lot have frontages greater than 20 feet on public street or private road.

- h. Lot depth and setbacks. Lots fronting or accessing on primary or secondary arterials shall be avoided when possible. If lots front on arterials, the lots shall have an average minimum depth of 100'.

Response

None of the proposed lots front or have access to an arterial.

- i. Parks and playgrounds. The Review Authority shall see that appropriate provision is made for parks and playgrounds to serve the proposed subdivision.

Response

No public parks or playgrounds are proposed on the site. The applicant is aware Park Impact Fees will be required to address the need for public parks.

- j. Narrow Lot Land Divisions. Land divisions which contain one or more residential lots having a width or less than 40 feet shall meet the development standards of VMC 20.927.040.

Response

The development does contain residential lots having a width or less than 40 feet. This narrative addresses the development standards of VMC 20.927.040 related to this application.

- k. Existing trees. All subdivision developments shall comply with the tree and vegetation management provisions contained in Chapter 20.770 VMC, Tree Conservation.

Response

A tree plan has been prepared. it addresses the provisions of 20.770 that apply to this application (see preliminary plan set).

- 2. Procedure for installation. In addition to other requirements, improvements installed by the developer of the short subdivision or subdivision, either as a requirement of these regulations or at his own option, shall conform to the requirements of this Title and improvement standards, specifications, inspections and procedures as set forth by the city and administered by the Department of Public Works and Community and Economic Development Department, and shall be installed in accordance with the following procedures:
 - a. Public work shall not commence until civil engineering plans, prepared in accordance with the requirements of the city, have been approved by the city: all required permits have been obtained and a pre-construction conference has been conducted. Public work shall not be commenced until the city has been notified in advance.
 - b. If work has been discontinued for any reason, it shall not be resumed until the city has been notified.

- c. Public improvements shall be constructed under the inspection and to the satisfaction of the Director of Public Works or their designee. The city may require changes in typical sections and details in the public interest if unusual conditions arise during construction to warrant the change.
- d. All underground utilities, sanitary sewers and storm drains installed in the streets by the developer of the short subdivision or subdivision shall be constructed prior to the surfacing of streets. Stubs for service connections and underground utilities and sanitary sewers shall be placed to a length precluding the necessity for disturbing the street improvements when surface connections are made.
- e. A plan showing all improvements "as built" shall be filed with the Development Review Services upon the completion of the improvements.
- f. Public improvements required. Improvements to be installed at the expense of the owner of the short subdivision or subdivision are as follows:
 - 1. All full-width streets, sidewalks, curbs and gutters, including alleys, within or adjacent to the subdivision or short subdivision; streets adjacent but only partially within the short subdivision or subdivision; and the extension of short subdivision or subdivision streets to the intercepting paving line of existing streets with which short subdivision or subdivision streets intersect shall be graded for the full right-of-way width and improved to the city's improvement standards and specifications.
 - 2. Half-width roads. In situations where the property being developed does not permit full-width public streets, half roads having a minimum right-of-way or easement and roadway improvement width of 1/2 of the design width may be permitted when placed adjacent to adjoining property so long as there is no physical obstruction or development constraint prohibiting the completion of the street on such adjoining property; provided, that public street half-width shall be a minimum of 20' wide. Public half-width streets serving six or more parcels shall be required to dedicate additional right-of-way as necessary to provide for a minimum of 1' of right-of-way beyond the edge of the sidewalk. Further, additional right-of-way or easement may be required between the edge of the roadway and the property line for construction clearance, slopes or other features. Half-width public streets shall serve a maximum of 200 ADT. If the number of trips generated is greater than 200 ADT, the street shall be widened to full-width standards. Parking shall be prohibited along any half-width street and necessary signs and pavement markings shall be the responsibility of the developer.
 - 3. Bench marks. Elevation bench marks shall be established within the subdivision with elevations to U.S. Geological Survey datum.
 - 4. Surface drainage systems shall be provided within the subdivision or short subdivision. The design of the drainage system within the short subdivision or subdivision shall be in accordance with the standards set forth by VMC 14.25, as administered by the Department of Public Works.
 - 5. Erosion control and stormwater quality. Facilities shall be provided within the short subdivision or subdivision to enhance stormwater runoff and protect existing and future drainage facilities. The design of the erosion control and stormwater quality system shall be in accordance with the standards set forth by the city, pursuant to VMC 14.24 and 14.25, as administered by the Department of Public Works.
 - 6. Sanitary sewers. Sanitary sewers shall be installed to serve the short subdivision or subdivision and to connect the short subdivision or subdivision to existing mains. In the event that it is impractical to connect the short subdivision or subdivision to the city trunk sewer system, the Review Authority may authorize the use of septic tanks if the

- lot area is adequate, taking into consideration the physical characteristics of the area determined by the County Health Department.
7. Water system. Water lines with valves and fire hydrants serving the short subdivision or subdivision and connecting the subdivision or short subdivision to the city mains shall be installed according to specifications of the city, pursuant to Title 14 VMC, Water and Sewer Facilities, as administered by the Department of Public Works.
 8. Sidewalks. Sidewalks shall be installed along both sides of each street within and/or adjacent to the short subdivision or subdivision, unless exempted by approval of a Roadway Modification, by the Review Authority and along pedestrian ways of the short subdivision or subdivision. Sidewalks shall be installed according to the specifications of the city, pursuant to Title 11 VMC, Streets and Sidewalks, as administered by the Department of Public Works.
 9. Street trees. Street trees shall be planted along both sides of each street within the short subdivision or subdivision and along any portion of the short subdivision or subdivision that fronts upon an existing street. Street trees shall be planted 30' on-center and be of a species approved by the city Planning Official.
 10. Other. When special conditions are encountered in the plans for improvements such as fill section requiring the placement of guardrails, ditches requiring drainage appurtenances, or other protection against erosion such as slopes requiring use of sod and/or seeding, such improvements shall be considered as an integral part of the improvement construction. Such special improvements shall be approved by the Director of Public Works or Transportation Manager prior to commencement of construction.

Response

The applicant is aware of procedures for installation and will adhere to them as required.

- g. Conditions of agreements
 1. Subdivisions. Before the City Council approval is certified on the plat of a subdivision, the developer shall either install required improvements and repair any damage to the existing streets or other facilities damaged due to the development of a the subdivision, or at the city's discretion execute and file with the City Clerk an agreement between herself/himself and the city specifying a period not to exceed two years in which the required improvements and repairs shall be completed and providing that if work is not completed within the period specified, the city may complete the work and recover the full cost and expense from the subdivider.
 2. Short subdivisions. Before the Planning Official's approval is certified on the plat of a short subdivision, the developer shall either install the required improvements and repair any damage to the existing streets or other facilities damaged due to the development of a the short subdivision, or at the city's discretion execute and file with the City Clerk an agreement between himself and the city specifying a period not to exceed two years in which required improvements and repairs shall be completed and providing that if work is not completed within the period specified, the city may complete the work and recover the full cost and expense from the developer of the short subdivision.
 3. Escrow or other form of security acceptable to the city required – Public Improvements. The city may accept from the developer of any short subdivision or subdivision, in lieu of completion and acceptance of certain approved required public improvements prior to

approval of a final plat, an escrow agreement or other form of security acceptable to the city which secures and provides for the actual construction and installation of the improvements of the conditions of plat approval and subject to the following:

- a. Use of escrow or other form of security acceptable to the city in lieu of completion and acceptance of such required private improvements shall include:
 1. Approved public transportation system improvements, including sidewalks and streetlights, provided emergency access improvements are constructed on-site as needed;
 2. Approved water system improvements;
 3. Approved sanitary sewer improvements;
 4. Approved public stormwater collection and management facilities; and
 5. Approved landscaping and street trees, including installation and maintenance costs.
 - b. The developer shall submit a written request and the appropriate forms to the Development Review Services, and the Director of Public Works, or designee, for review, which shall include the following information:
 1. A scheduled unit cost breakdown for project work to be completed presented as Exhibit "A", an agreement will not be accepted without an approved unit cost breakdown for the project.
 2. The executed escrow agreement in a form approved by the city.
 3. Any other documents deemed necessary by the city.
 4. Applicable processing fee.
 - c. Upon approval of an escrow or other form of security acceptable to the city, recording of the final plat is allowed, provided all other conditions to be met prior to final plat approval have been satisfied.
4. Escrow or other form of security acceptable to the city required – Private Improvements. The city may accept from the developer of any subdivision or short subdivision, in lieu of completion and acceptance of certain approved required private improvements prior to approval of a final plat, an escrow agreement or other form of security, acceptable to the city, which secures and provides for the actual construction and installation of the private improvements or the performance of the conditions of agreement for plat and subject to the following:
- a. Use of escrow or other form of security acceptable to the city in lieu of completion and acceptance of such required private improvements shall be limited to:
 1. Approved private transportation system improvements, including sidewalks and streetlights, provided emergency access improvements are constructed on-site as needed;
 2. Approved private stormwater collection and management facilities;
 3. Approved landscaping and trees to meet minimum on-site tree density, including installation and maintenance costs.
 - b. The developer shall submit a written request along with the appropriate forms to the Planning Official for review.
 - c. Each escrow or other form of security acceptable to the city request shall include the following:
 1. A scheduled cost breakdown for project work to be completed presented as Exhibit "A", an escrow agreement shall not be accepted without an approved unit cost breakdown for the remaining improvements.

2. A draft escrow agreement in a form provided by the city.
3. An irrevocable license signed by the owner of subject property to run with the property which provides the city with the right to allow the employees, agents, or contractors of the city to go on access the subject property for the purpose of inspecting and, if necessary, doing completing the work or making the improvements covered by the escrow or other form of security acceptable to the city.
4. Any other documents deemed necessary by the city.
5. Applicable processing fee.
- d. Upon approval of an escrow or other form of security acceptable by to the city, recording of the final plat is allowed, provided all other conditions required to be met prior to the final plat approval have been satisfied.
5. Amount of escrow or other form of security acceptable to the city. Such assurance of full and faithful performance shall be for a sum approved by the Planning Official as sufficient to cover the cost of the improvements and repairs, including related engineering and incidental expenses.
6. Failure to carry out agreement. In the event the developer of the short subdivision or subdivision fails to carry out provisions of the agreement and the city has un-reimbursed costs or expenses resulting from such failure, the escrow or other form of security acceptable to the city shall be forfeited and the money shall be paid to the city to defray its costs. If the amount of the escrow or other form of security acceptable to the city exceeds the cost and expense incurred by the city, the city shall release the remainder and if the amount of the escrow or other form of security acceptable to the city is less than the cost and expense incurred by the city, the subdivider shall be liable to the city for the difference.
7. Guarantee of workmanship and materials. It shall be required that a 110% maintenance bond or bonds be posted to guarantee all workmanship and material for a period of one year from the date of the acceptance of the improvements by the city. This is provided that in the judgment of the Director of Public Works any defects are not the result of public abuse, misuse or acts of God. City inspection does not give relief from the one-year guarantee on workmanship.
8. Release of escrow or security. Upon completion of required improvements, the subdivider shall request in writing that the Planning Official or Director of Public Works release all or a portion of the funds held in escrow. Such improvements shall be inspected and accepted as complete by the city prior to the release of any such escrow funds, or portion thereof.

Response

The applicant is aware of the conditions of agreement provisions and will comply during the final plat approval process.

- B. Public improvements plan. Where public improvements are required, plans for such improvements shall be submitted to the Director of Public Works. Public improvements shall be designed by or under the direct supervision of a licensed professional civil engineer as required by statute, pursuant to 18.08, 18.43, and 18.96 RCW, and shall meet, as a minimum, the requirements of Section 20.320.080(A) VMC. The engineer shall certify the plans by seal and signature. Such certification shall contain the following: (1) subdivision name; (2) name, mailing address, and telephone number

of engineer preparing the plan; and (3) date, including month and year. All public improvement plans shall be submitted for review and approval by the Director of Public Works.

Response

All public improvement plans will be designed under the guidance of licensed professional engineer. That engineer will certify the plans by their seal and signature. All public improvement plans will be submitted for review and approval by the city of Vancouver.

- C. Monument-setting. All monuments set in subdivisions shall be at least ½" X 24" steel bar or rod, or equivalent, with durable cap imprinted with the license number of the land surveyor setting the monument.
1. Centerline monument-setting After paving, except as provided in, Subsection (4) below, monuments shall be driven flush with the finished road surface at the following intersections:
 - a. Street centerline intersections;
 - b. Points of intersection of curves if placement falls within the paved area or otherwise, at the beginnings and endings of curves;
 - c. Intersections of the plat boundaries and street centerlines.
 2. Property line monument-setting. All front corners, rear corners, and beginnings and endings of curves shall be set with monuments, except as provided in Subsection (4) below. In cases where street curbs are concentric and/or parallel with front right-of-way lines, front property-line monuments may be provided by brass screws or concrete nails with the surveyor's license number at the intersections of curb lines and the projections of side property lines. If curb monuments are used, it shall be noted on the plat, and also that such monuments are good for projection of line only and not for distance.

Response

All required monumentation will be completed prior to final plat recordation.

3. Post-monument-setting. All monuments for the exterior boundaries of the short subdivision or subdivision shall be set and referenced on the plat prior to plat recording. Interior monuments need not be set prior to recording if the developer certifies that the interior monuments shall be set within 90 days of final short subdivision or subdivision construction inspection by the Director of Public Works, and if the developer guarantees such interior monument-setting.
4. Post-monument-setting bonds. In lieu of setting interior monuments prior to final plat recording as provided in Section 20.320.080 (C)(2) VMC, the Director of Public Works may accept a bond in an amount and with surety and conditions satisfactory to him/her, or other secure method as the Director of Public Works may require, providing for and securing to the city the actual setting of the interior monuments as provided in Section 20.320.080 (C)(2) VMC and to be enforced by the Director of Public Works by appropriate legal and equitable remedies.

Response

All required monumentation will be completed prior to final plat recordation. Post-monumentation is not proposed.

- D. Survey standards. All surveys shall comply with standards set forth by state statutes, drafting standards of this Title, and WAC 332-130, except that linear closures after azimuth adjustment shall be at least a ratio of 1:10,000 for WAC 332-130-090. Where conflicts are identified, the most restrictive standard shall prevail.

1. Elevations of vertical information. Where required, any elevations or vertical information shall have an accuracy of third-order specifications as published by the U.S. Department of Commerce in a bulletin entitled "Classification, Standards of Accuracy, and General Specifications of Geodetic Control Surveys," and bench marks with the datum used shall be shown on the plat.

Response

The survey for the final plat is required to meet these standards.

E. Drafting standards

1. Preferred scale proportions. The preferred scale proportions for preliminary and final plat are ratios as follows:
 - a. 1:600 or 1"=50'
 - b. 1:1,200 or 1" = 100' and 1:2,400; or 1" = 200'; but in no case shall the proportion exceed 1:2,400.
2. Final plat drawing requirements. The final plat shall be drawn with ink upon three-mil mylar film, or equivalent; said sheets to be 30" X 21", with a 1" border on each side.
3. Lettering. Lettering shall be at least 0.08" high, and the perimeter of the final plat shall be depicted with heavier lines (dashed) than the remaining portion of the plat.
4. Location. All data necessary for the location in the field of all points within the plat shall be shown. Straight lines shall be designated with bearing and distance; curves shall be designated by arc length, central angle and radius. All dimensions shall be in feet or meters, and decimals thereof to the nearest 1/100 of a foot, or 5/1,000 of a meter; except that angles shall be in degrees to the nearest second.

Response

The drafting standards are a requirement. The applicant is aware of the standards and the need to comply with those standards to receive final plat approval.

Section 20.320.080 Other Provisions.

- A. Variances. One or more variances may be requested relating to any of the design or development standards contained within Section 20.320.070 VMC except those for which variances are expressly prohibited, as listed in Chapter 20.290.010 VMC. These shall be requested concurrently subject to the procedural requirements and approval criteria contained in Chapter 20.290.040 VMC. No variances to procedural regulations are permitted.

Response

The applicant has not requested a variance to any standard contained in 20.320.070.

B. Proximity to agricultural and mineral activities

1. All plats or development approvals under this Title issued for residential development activities within 1/4 mile of lands zoned agricultural or from existing agricultural or mineral resource operations shall be accompanied by a notice provided by the Planning Official. Said notice shall include the following disclosure:
 - a. The subject property is within 1/4 mile of designated agricultural land or mineral resource land as applicable, on which a variety of commercial activities may occur that are not compatible with residential development for certain periods of limited duration. Potential discomforts or inconveniences may include, but are not limited to: noise, odors, fumes,

dust, smoke, insects, operation of machinery, including aircraft, during any hour period, storage and disposal of manure, and the application by spraying or otherwise of chemical fertilizers, soil amendments, herbicides and pesticides.

- b. In the case of subdivision plats, short subdivision plats or recorded binding site plans, such notice shall also be recorded separately with the Clark County Auditor.

Response

The site abuts the BPA right-of-way. Although zoned the same as the proposal, it is used currently for agriculture, under an agricultural easement benefitting the development properties. As such, the Planning Official is required to provide the notice as outlined above and record the notice separately with the Clark County Auditor

2. All plats or development approvals under this Title issued for residential development activities shall provide a barrier such as fencing or vegetation between the immediately-adjacent residential lots and agricultural and mineral resource activities. A natural buffer, such as a wetland, swale or berm, may substitute for the barrier upon approval of the Planning Official. Lots with street frontage are not required to provide a barrier between residential uses and an adjacent agricultural or mineral resource activity across the street.

Response

The proposal includes a trail connecting to the BPA right-of-way. Other than the connection, fences will be provided along the norther boundary of the project.

C. Subdivisions of commercially and industrially zoned properties

Response

The site is not zoned commercial. This provision is not applicable to this development.

- D. Revisions of recorded plats. The subdivider shall file the final short plat or plat and attached documents for record with the Clark County Auditor. Any alteration or modification of a short subdivision or subdivision plat shall be undertaken pursuant to all applicable development standards including regulations established in 58.17.215-220 RCW by a Type II or Type III process, respectively.

Response

The proposal is within the Northwestern Home Lots recorded Aug. 9, 1909

The adjustment is warranted given the site characteristics of the design. The applicant is proposing uniform density across the development site.

Chapter 20.410 Lower Density Residential Districts

20.410.030 Uses

Table 20.410.030-1 indicates single dwelling detached units are permitted in the R-9 zone. It also indicates attached units are a Limited Use. The footnote 18 indicates these uses are allowed subject to Section 20.260.020.B.1.a(2), Planned Development and subject to Section 20.910.050 VMC, zero lot line requirements.

Response

The application includes a planned development application and will incorporate zero lot line developments. The single dwelling attached, and detached uses are allowed as incorporated into the applicant's proposal.

20.410.040 Minimum and Maximum Densities.

Table 20.410.040-1

The following is an excerpt of Table 20.410.040-1 relating to the R-9 zone:

Table 20.410.040-1 Minimum and Maximum Densities and Lot Sizes ¹				
Zone	Minimum Lot Size	Maximum Net Density	Maximum Average Size	Minimum Net Density
R-9	5,000 square feet	8.7 units per acre	7,400 square feet	5.9 units per acre

Response

The development site is subject to 2 zoning classifications. It is zoned both R-9 and R-22. The applicant proposes to blend the zones to meet the density. How the overall development meets the applicable provisions is specifically addressed above in the planned development portion of this report (see response to 20.260.020.C)

20.410.050 Development Standards

Table 20.410.050-1 contains the development standards applicable to the R-9 zone. The following is an excerpt of Table 20.410.050-1; Development standards.

Development Standards in Lower-density Residential Zones	
STANDARD	R-9 ZONE
Minimum Lot Sizes	5,000 square feet
Maximum Lot Size	7,400 square feet
Maximum Lot Coverage	50%
Minimum Lot Width ⁵	45 feet
Minimum Lot Depth ⁵	
Minimum Setbacks	
Front yard	10 feet
Rear and through yards ⁴	5 feet
Side yard	0' ¹ / _{5'} ²
Street side yard	10 feet
Garage/Carport from public/private street right of way or sidewalk easement	18 feet
Garage/Carport from alley ³	5 feet
Maximum Height	35 feet
Minimum Off-Street Parking Spaces	1
Minimum Landscaping Requirement (percentage of total net area)	10%

¹ Subject to Chapter 20.910.050 VMC.

² For each additional 10 feet of building height, or fraction thereof, over 25 feet, add 2 feet to the setback to a maximum of 10 feet on each side or rear yard.

³ There must be a minimum of 20' maneuvering space from entrance edge of the carport or garage to opposite edge of the alley.

⁴ A through lot will be treated as an interior rear yard, especially with respect to placement of principal and accessory structures, location of parking and height of fences only when there is no vehicular access to the abutting street. If access occurs then the through lot yard will be treated in all respects as a front yard.

⁵ Smaller lot sizes and dimensions may be allowed subject to VMC 20.920, Infill Development Standards.

Response

The applicant is requesting a planned development. Under the provisions of 20.260.060, development standards may be modified. Compliance is addressed in this narrative in response to the planned development provisions. In addition, the proposed development is being reviewed under the City's narrow lot code, which varies some of the lot standards set forth above, particularly lot coverage and setbacks. These items are addressed in detail above.

Chapter 20.420 Higher Density Residential Districts

20.420.030 Uses.

Table 20.420.030–1 indicates single dwelling units, attached are permitted in the R-22 zone, provided the minimum required residential density is met, on an overall project basis. The table also indicates single dwelling units, detached are permitted in the R-22 zone, provided the minimum required residential density is met, on an overall project basis.

Response

The application includes a planned development application and will incorporate zero lot line developments. The single dwelling attached, and detached uses are allowed as incorporated into the applicant's proposal.

20.420.040 Minimum and Maximum Densities.

The following is an excerpt from Table 20.420.040-1 relating to the R-22 zone.

Table 20.420.040-1 Minimum and Maximum Densities	
Zone District	Minimum and Maximum Net Density
R-22	18.1 - 22 units per acre

Response

The development site is subject to 2 zoning classifications. It is zoned both R-9 and R-22. The applicant proposes to blend the zones, through the Planned Development process, to meet overall site density. How the overall development meets the applicable provisions is specifically addressed above in the planned development portion of this report (see 20.260.020.C).

20.420.050 Development Standards.

Table 20.420.050-1 contains the development standards applicable to the R-22 zone. The following is an excerpt of Table 20.420.050-1; Development standards.

Table 20.420.050 – 1 - Development Standards	
Standard	R-22 Zone
Minimum Lot Size	1,500 sf ¹
Maximum Lot Coverage	50%
Minimum Lot Width	20 feet
Minimum Lot Depth	50 feet
Minimum Setbacks	

Front yard	10 feet
Rear and Through lot yard	0 feet ² /5 feet
Side yard	0 feet ² /5 feet
Street side yard	10 feet
Garage/carport from public/private street right of way or sidewalk easement	18 feet
Garage/carport from alley	5 feet ⁴
Maximum Height	50 feet
Minimum Landscaping Requirement (percentage of total net area)	10%

¹ Provided the required residential density is met on an overall project basis.

² See requirements for zero lot line developments pursuant to Section 20.910.050 VMC.

³ This footnote has been deleted.

⁴ There must be a minimum of 20' maneuvering space from entrance edge of garage/carport to approved edge of alley

Response

The applicant is requesting a planned development. Under the provisions of 20.260.060, development standards may be modified. Compliance is addressed in this narrative in response to the planned development provisions. The proposal is also governed by the City's Narrow Lot Code, which modifies some provisions of the base zone, including lot coverage and setbacks. This is discussed in detail above.

Chapter 20.691 112th Avenue Corridor Plan District.

20.691.020 112th Avenue Corridor Plan District Area.

Per Figure 20.691-1, the proposal is within the 112th Avenue Corridor Plan District Area, General, Figure 2, Plan Concept

Response

Figure 2, Plan Concept, indicates the site is in an area designated as support urban agriculture. The plan does not describe the concept of "support urban agriculture" or provide guidelines relating to uses adjoining agricultural use.

The development does not support urban agriculture. Agriculture may continue within the BPA property and the proposed approximately 1-acre parcel. Per Tables 20.410.030 – 1 and Table 20.420.030–1, both the R-9 and the R-22 zone allow agricultural uses.

The use of the BPA property for cultivating trees and vegetables, is allowed under an agricultural easement benefitting the property proposed for development. The applicant is proposing an urban residential development.

Figure 2, Plan Concept, also indicates trails across this site to provide pedestrian and bicycle travel. This proposal will have such a trail running north-south through the site. This conforms to the Plan Concept (Figure 2) on page 5 of the Design Guidelines.

Development within the Plan District shall be subject to the development standards contained in Sections 20.410, 20.420, 20.430, and 20.450 except as modified herein.

20.691.030 Allowed Uses.

- A. Development Agreements in existence on the effective date of this ordinance control the uses and development standards of some of the properties in the Plan District. In order to protect the investments made in reliance upon such agreements, improvements made, existing uses or site plans approved consistent with these agreements are not non-conforming.

Response

There are no development agreements with the city related to this property.

- B. Zoning designation. Properties within the Plan District shall comply with their respective code requirements and the development standards and meet the intent of the 112th Avenue Corridor Design Guidelines.

Response

The applicant through various applications and plans has demonstrated the proposed development complies with respective code requirements.

- C. Properties with recorded Development Agreements prior to the adoption of this District, may follow the provisions of this Plan District related to allowed uses and development standards. Properties with such Development Agreement shall develop under one of the following options:

1. Under the provisions for uses and standards determined by the recorded Development Agreements, or
2. Under the provisions of the zoning code including uses and standards as it exists on the date of development application, or
3. Under the provisions for uses determined by the Development Agreements and code standards existing on the date of vested application as provided for under VMC 20.210.110, Vesting of Applications.

Response

There are no recorded development agreements regarding this site

- D. Drive-up uses - Properties zoned Community Commercial located east of the existing Four Seasons Safeway development, west of Four Seasons Lane, north of Angelo Drive and south of NE 28th Avenue, as depicted in Figure 20.691-2, shall be allowed uses under VMC 20.430.030 except that automobile service stations are prohibited and that only two drive-through facilities shall be allowed.

Response

The site is zoned R-9 and R-22; it is not zoned commercial. Drive-up uses re not proposed.

20.691.040 Development Standards and Guidelines.

Development within the Plan District shall be subject to the development standards contained in Sections 20.410, 20.420, 20.430, and 20.450 except as modified herein.

Response

The applicant has provided findings related to compliance with the applicable standards contained in 20.410 and 20.420.

- A. All new development, streets, and street improvements shall meet the intent of the adopted 112th Avenue Corridor Design Guidelines (Ordinance M-4005).

Response

Relating to sidewalks, C.2 Pedestrian Amenities outlines the following guidelines:

- B. All new development shall meet the intent of the connecting streets, trails and open spaces illustrated on the Conceptual Site Plan within the 112th Avenue Corridor Design Guidelines.

C.2.1 Durable Pedestrian Furniture

Pedestrian furniture provided in public spaces should be made of durable, vandal and weather-resistant materials that do not retain rainwater and can be reasonably maintained over an extended period of time.

Response

The applicant is not proposing and pedestrian furniture.

C.2.2 Pedestrian Amenities

Pedestrian amenities should be included along all street frontages featuring non-residential and mixed-use development (this includes internal streets and walkways in front of commercial, office or mixed use. ...

Response.

This a residential non-mixed-use development. This section does not apply.

C.3 Gateways/Street Corners

C.3.1 Gateway/Street Corners

Development at the highly visible gateway/street corner sites should provide decorative design elements at the street corner. Applicable corners include the 9th and 18th Street intersections along 112th Avenue plus the corners highlighted in Figure 13 along NE 28th Street.

Response.

This is not applicable to this application as the project does not include any of the listed intersections.

C.4 Open Space

C.4.1 Trail Corridors

Large site development (greater than 2 acres) should incorporate a connected system of attractive trail corridors upon which developments can be structured around. The site plan in Figure 3 and Figure 14 illustrates an example of how such a trail system could be integrated with developments in the area between NE 18th and 28th Streets, east of NE 112th Avenue.

Response

Figure 2, Plan Concept, indicates a trail across this site to provide pedestrian and bicycle travel. This proposal will have such a trail running north-south through the site. This conforms to the Plan Concept (Figure 2) on page 5 of the Design Guidelines.

D. Access, Circulation and Parking

Response

Streets and sidewalks are designed to the meet the applicable standards of this section as indicated on the civil engineering plans. Parking will be provided by residential garages. Guest parking will be provide on-street and in guest parking areas.

E. Building Design
E.1 Architectural Scale and Building Mass

Response

This section does not apply to single-family residential uses.

F. Landscaping and Screening

Response

The applicant has provided a landscaping plan.

Relating Section E. Building Design Standards, there are no standards addressing single-family buildings.

Response

Figure 20.691-1 indicates the proposal is located within the 112th Avenue Corridor Plan District, As such the proposal is subject applicable provision of the plan district.

Chapter 20.927 NARROW LOT DEVELOPMENTS

20.927.020 Applicability

The approval criteria and development standards of this chapter shall apply to any residential short subdivision or subdivision, including infill development, which has one or more narrow lots, defined as a lot with less than 40 feet in width, exclusive of flag lots. Compliance with applicable standards shall be determined at the time of preliminary plat approval, in accordance with VMC 20.320, Subdivisions. (M-3778, Added, 12/04/2006, Sec 2)

20.927.030 Narrow Lot Development Approval Criteria

Approval criteria. In order for the City to grant approval of a preliminary short subdivision or subdivision, the applicant shall demonstrate compliance with the following criteria, which shall be in addition to the preliminary subdivision approval criteria of VMC 20.320.040 A-G:

- A. Conflicts on narrow lots shall be eliminated. The development has been designed to eliminate conflicts between on-site and off-site improvements and features associated with narrow lots. Specifically, the location, size, and design of features including driveways, public and private utilities (water, fire hydrants, sewer, roof infiltration, gas, cable, phone, electricity, etc.), on-street parking spaces, street trees, existing trees, light poles, common mailboxes, street signs, etc., shall be considered in the design of the development and coordinated to eliminate conflicts with one another and meet minimum spacing requirements.
- B. Adequate guest parking shall be provided. The development has been designed to provide for at least one guest parking space for every three narrow lots in the development. Such spaces may be located on-street (on local access or loop classification roadways only) or in common parking areas subject to the development standards of 20.927.040A2.
- C. Solid waste and recycling collection and access shall be provided. The development shall be designed to provide for safe access and maneuvering by solid waste and recycling collection vehicles to designated collection points for each lot.

Section 20.927.040 Narrow Lot Development Standards

A. Implementation of Performance Standards. Various design options may be proposed to address the approval criteria of Section 20.927.030 A-C. For example, the use of alleys, narrow driveways, or shared driveways - either separately or in combination – are considered to be effective solutions to many identified conflicts. In addressing the above criteria, the following development standards shall apply:

1. On-site and off-site improvements plan required. A development plan that demonstrates that utilities, driveways, street trees, etc., have been located and designed to minimize conflicts with one another shall be submitted with the preliminary land division application and incorporated into the civil engineering plan set. Such plan shall, at a minimum, show all of the following features:
 - a. Proposed location and width of streets, sidewalks, and landscape strips;
 - b. Proposed location, species, and size of required street trees;
 - c. Proposed guest parking spaces as required by VMC 20.927.030B and .040A2;
 - d. Proposed location of other infrastructure including light poles, fire hydrants, and community mailboxes (may be reserved areas) and existing overhead lines;
 - e. Proposed location and width of driveways (narrow lots only);
 - f. Proposed location of public water line, water meter, and sewer line to serve each narrow lot;
 - g. Proposed location and dimensions of areas reserved on each narrow lot for private utilities (phone, cable, gas, electric, etc.) and roof infiltration systems;

Response

The applicant has provided plans and documents addressing the features

2. Standards for guest parking in common areas.
 - a. Common areas reserved for guest parking shall have no more than five (5) parking stalls in each area unless applicant demonstrates required parking cannot otherwise be provided.
 - b. Common guest parking areas shall be improved to City parking lot standards including a permanent surface, striping, curbing, 3' tall screening, and treatment of storm water runoff. Use of pervious paving is encouraged.
 - c. Such spaces may be designed to allow for backing movements directly into local access or loop streets only.
 - d. Common parking areas shall be maintained by a homeowners' association according to a maintenance agreement to be recorded with the plat.

Response

The applicant has provided plans and documents addressing the features

3. Standards for solid waste and recycling access and collection.
 - a. An access plan for solid waste and recycling collection service to all lots in the development shall be submitted with the land division application.
 - b. The access and collection plan shall show a designated collection point for each lot and the ability of collection vehicles to maneuver safely to all points of collection, based on a 35' long by 10' wide vehicle.
 - c. Where collection is not feasible on each lot, a designated common collection point to serve up to four lots, located no further than 150 feet from any lot it serves, may be provided. Common collection points shall be shown on the solid waste and recycling plan, and sized to accommodate the carts and bins associated with the city's garbage, yard debris and

recycling collection system. System specifics may be obtained from the City's Solid Waste Services department.

- d. Designated collection points shall be located adjacent to alleys or streets but shall not obstruct sidewalks, bike lanes, or vision clearance triangles.

Response

The applicant has provided plans and documents addressing these standards.

3a. Standards for alleys and lots with alley access. Lots with access from side or rear alleys are highly effective in addressing conflicts at the front street. Where provided, alleys and lots served by alleys shall meet the following standards:

- a. Alleys shall consist of 16' paved width within a 20' public right-of-way or private easement, and shall be constructed in accordance with approved City standards. Width of alleys designated as fire apparatus access lanes shall be as approved by the Fire Marshal.
- b. All lots adjacent to an alley, existing or proposed, shall provide access to the garage or parking space from the alley, not the adjacent street. Residences with access from alleys shall be oriented to face the public or private street, not the alley.
- c. Alleys shall connect with a public or private street at both ends, unless otherwise approved by the Transportation Manager.
- d. Maintenance of private alleys shall be the responsibility of the homeowner's association, and a maintenance agreement shall be recorded with the plat.
- e. Subdivisions which provide access from alleys to at least 50% of lots shall be eligible for modifications to certain development standards, as specified in VMC 20.927.050.

Response

The applicant has provided plans and documents addressing these standards.

4. Shared driveways. Where provided for narrow lots, shared driveways shall meet the following requirements:

- a. Shared driveways serving two adjacent lots shall be no wider than 30', measured at the driveway throat, unless the applicant demonstrates on the development plan that a wider driveway will not result in conflicts.
- b. Shared driveways which provide access to more than two lots shall be no wider than 18', measured at the driveway throat, and shall be within a 20' minimum wide easement.
- c. Only one curbcut is permitted per shared driveway.
- d. Shared driveways shall be constructed in accordance with approved shared driveway standards.
- e. Garages accessed from shared driveways shall be either single car-width and located no closer to the street than the front wall (not porch) of the residence or, if wider than a single car garage, set back at least 5' from the front wall (not porch) of the residence.

Response

The applicant has provided plans and documents addressing these requirements.

5. Narrow driveways. Where provided for a narrow lot, narrow driveways shall meet the following requirements:

- a. Narrow driveways shall be no wider than 10' measured at the driveway throat, unless the applicant demonstrates on the development plan that a wider driveway will not result in conflicts.
- b. Where possible, narrow driveways on adjoining lots shall be grouped in close proximity to create space along the frontage for parking, trees, utilities, etc.
- c. Narrow driveways shall be constructed in accordance with adopted narrow driveway standards.
- d. Garages accessed from narrow driveways shall be either single car-width and located no closer to the street than the front wall (not porch) of the residence or, if wider than a single car garage, set back at least 5' from the front wall (not porch) of the residence.

Response

The applicant has provided plans and documents addressing these requirements

SUPPLEMENTAL PROJECT NARRATIVE FOUR SEASON SOUTH PLANNED DEVELOPMENT

Project Name:

Four Seasons South (a planned development community)

Summary:

This supplemental narrative is submitted in response to changed project conditions arising from the City of Vancouver Transportation Department's request to abandon NE 16th Street altogether and to build a new offsite roadway connecting the proposed development to the existing signal at NE 18th Street and Four Seasons Lane.

It also addresses the change from an exclusively 55+ community to one available to all buyers in the market for new homes, a potential modification to product type, and lot coverage.

Background:

The general objective and design theme for the project remains the same: to create a seniors-oriented, 70-lot development. The site consists of 4 parcels and is zoned both R-9 and R-22.

In response to the Applicant's proposal, the City has requested the Applicant's cooperation to abandon NE 16th Street (to improve the safety and operation of NE 112th Avenue in the vicinity of the Project) and to create a new off-site connection to the existing signal on NE 18th Street. The proposed changes are roughly illustrated in Ex. A, attached hereto, and below.



There are two effects of the change on the Project. First, the new connection will create an attractive route through the proposed development to an existing signal. Because access/circulation for nearby neighborhoods to the south and east is somewhat constrained, it is expected that this new connection to the City's arterial system will see significant amounts of daily local through traffic generated from existing surrounding neighborhoods. This type of through traffic is not ideal and may not have the same market appeal as the Applicant's original proposal, which would not have had any through traffic, at least for the homes close to the proposed NE 115th Avenue. The second effect is to increase the cost of construction of the project. The change will benefit the City in terms of increased operational efficiency of the NE 18th Street / NE 112th Avenue intersection.

Because of the potential for both reduced desirability of the homes for sale to buyers that are 55 and older (because of increased levels of through traffic) and the increased cost associated with building 300' of additional roadway, the Applicant is seeking minor changes to the community design to both accommodate the City's request for the off-site connection and to keep the project on equivalent financial footing.

Proposed Changes:

As mentioned above, the Applicant would like to open the project for sale to all potential buyers rather than limiting sales to just those 55 and older. The Applicant believes that the proposed product type will have high appeal and will attract a majority of 55 and older buyers but there is no need artificially limit the pool of potential buyers of relatively affordable single level homes to those buyers. Other, younger buyers may also desire, for various reasons, to purchase smaller, single level homes with limited yard area to maintain and should not be excluded from that opportunity.

An associated change would be to allow up to 20% of the units (14 units of the proposed 70) to be two-stories to provide an option for additional living space and introduce additional architectural variety to the Project. This would allow the Applicant some flexibility to respond to market conditions while maintaining the overall concept of a small-lot, primarily single-level home development.

Modifications/Additions to the Original Narrative:

Chapter 20.260 Planned Developments

20.260.010 Purpose

Response

This proposal seeks to create a cohesive planned community ~~for~~ attractive to adults 55 and over that desire to live close to live in the Four Seasons activity center in the heart of east Vancouver. The community is planned to provide single-level housing, two-car garages, well designed and finished homes with on-site open space amenities and convenient proximity to groceries, retail opportunities and health care services. The homes may be purchased by any buyer and will not be exclusively for older buyers, but the Applicant believes that the homes will be particularly attractive to older buyers seeking to downsize and live closer to urban services and amenities.

Planned Developments, Applicability:

A. Applicable in all zones.

The planned development is a development vehicle that may be used in all base zoning districts except in the Park, Greenway and Natural Area districts.

Response

The applicant is proposing a planned development on land with both R-9 and R-22 zones. Planned developments may be allowed each of these zones. The changes proposed in this supplemental narrative, offered in response to the City's request for a new offsite roadway connection, do not affect the applicability of the Planned Development ordinance. This proposal still includes higher than average open space, smaller lots with primarily single level homes and proposed amenities that will appeal to a range of buyers. The Project, with various lot sizes and configurations (alley load, single level, two level, etc.) will include higher than average architectural variability. Front porches will aid in creating and maintaining community as owners take possession of homes and get to know their neighbors.

Planned Developments, Permitted Uses:

B. Permitted uses

The applicability provisions at 20.260.020.B.1.a.(1) and (2) indicate single-family detached residential units and two or more single-family attached residential units are allowed by right within planned developments in the R-9 zone. This section also indicates a 5% density bonus is allowed per the provision of 20.260.060 (D).

20.260.020.B.2.a.(1) and (2) indicate single-family detached residential units and two or more single-family attached residential units are allowed by right within planned developments in the R-22 zone. The section also states a 5% density bonus is allowed per the provision of 20.260.060 (D).

Response

Planned development may be allowed on the subject site. Also, the applicant is allowed a 5% density bonus.

Per 20.260.020.B, single-family detached and single-family attached are permitted by right in both the R-9 and the R-22 zones.

Eighteen attached single-family residential units and 52 detached single-family unit are proposed. Associated with the planned development, an adjustment is requested to the maximum lot coverage standards allowed in both the R-9 and R-22 zone.

Because the site is proposed for narrow lots and more than 50% of the lots will be provided alley access (discussed in more detail below), the base zone lot coverage is 55% on the R-9 portion and 65% on the R-22 portion of the site. This Planned Development proposal requests an adjustment to 75% lot coverage. The purpose of the lot coverage request is to accommodate the single level housing that will be attractive to buyers that are planned-55 and oldercommunity. This development will consist ~~exclusively~~ primarily (at least 80%) of single-level two-car-garage homes. The single level homes will include two-car garages and all living space on a single floor to provide accessibility for an aging population takes more space on each lot. At the same time, some outside area is preserved on each lot for pleasant landscaping, without a heavy ongoing maintenance burden for the future owners.

Lot Coverage Adjustment:

The requested adjustment would increase lot coverage from the base zone amount to 75% to provide for sufficient ground-floor building area for single-level dwellings and to provide additional amenities that will enhance the community. Specifically, a portion of the increased lot coverage will be allocated to inclusion of front porches which are allowed under City code in the front yard setback area where homes are alley loaded. This supplemental narrative includes an exhibit showing a typical plan view and how the porch will be incorporated into the building and community design.

There are two base zoning districts included in the proposed Planned Development, R-9 and R-22. Both zoning districts have a maximum lot coverage of 50% but both are also modified by VMC 20.927.050 to allow 60% lot coverage as of right where more than fifty percent of the proposed homes on narrow lots will be served by alleyways. More than fifty percent of the proposed lots will be accessed via alleys, so the applicable base lot coverage is 60%. The applicant is seeking 75% lot coverage to accommodate single-level primarily detached homes on narrow lots.

The site design is based on meeting the minimum allowable density (70 lots) on the combined site (R-9 & R-22) on smaller lots and targeting the underserved market segment for single-level homes for entry level buyers and/or homes for downsizing baby boomers. As can be seen on the proposed preliminary plat, lot sizes vary from 2450 square feet to 3400-3800 square feet. These lot sizes will accommodate a home for single level living with a two-car garage and three bedrooms, but only at 70% to 75% lot coverage. Conditioned living space for a three bedroom home will typically be about 1550-2260 square feet (average of around 1800) and a two-car garage (necessary, we believe, due to the location of the property) will be approximately 460 square feet. Thus, the combined ground floor area for a three bedroom, single level home is 2200 square feet. Because the lots vary between 2450 to around 3500, 75% lot coverage will allow for around 2000 square feet buildings, including garages, which allows for a reasonable home design. Finally, the Applicant also wants to include front porches on the alley load lots as an additional community amenity and to create character and livability and the front porches will count against allowable lot coverage.

Because the Applicant is seeking to both meeting minimum density and provide housing in an underserved market segment, the adjustment is warranted to accommodate the proposed community design.

The use of maximum lot coverage percentages in the zoning code is interesting in light of minimum and maximum lot dimensions, densities and setbacks. It is an issue that is not addressed in the City's narrow lot code but probably should be. More affordable housing for both those entering the housing market for the first time and for those families downsizing from larger homes is lacking in Vancouver. In this case, higher lot coverage will allow for a lower price point in exchange for smaller individual yards.

Through the Planned Development ordinance, we are proposing to build homes with smaller yards but more community open space and off-site guest parking. The proposed development includes 10% open space on three separate tracts and a trail tract that provides access through the site to the BPA right-of-way on the north side of the development site. The project also proposes off-site guest parking in three separate areas and significant opportunities for on-street parking in front of homes because of the alley-load design.

The combination of community open space, off-site parking and homes with single-level living, smaller yards and 2-car garages outweighs the proposed increase in lot coverage from 60% to 75%. 75% would be a maximum. In most cases we believe that lot coverage will be between 68%-72%. All homes will still meet all required setbacks and heights will be limited due to the single level living design.

As noted above, the community design includes significant open space and parking and will meet all setback requirements under the code. The goal of increasing lot coverage is to build homes for single

level living that include a similar level of functionality to traditional two-level homes, and to do so on smaller, more urban lots. In this context, the impact of smaller yards is mitigated by including more community space and parking. The benefit is a housing product in very short supply in the City of Vancouver.

Transportation System Capacity:

Transportation system capacity. There is either sufficient capacity in the transportation system to safely support the development proposed in all future phases or there will be adequate capacity by the time each phase of development is completed.

Response

The applicant has submitted a traffic study prepared by Kittleson and Associates, Inc. addressing trip generation, trip distribution and traffic impacts prepared pursuant to City-required traffic study standards. This study can be updated with revised trip generation to reflect the all-ages nature of the proposed development. The Applicant has been working closely with the City of Vancouver Transportation and does not anticipate any additional traffic impacts.

Mix of Uses:

- b. Description of the mix of uses, including number of units and/or total gross square feet devoted to each, and approximate location on the site.

Response

The proposal consists of 70 attached and detached primarily single story single-family residential dwelling units intended for any buyer but particularly attractive to households of individuals 55 years of age and older. Included in the design is open space, designated guest parking, and storm facilities (see preliminary plan set).

Development Intensity:

3. Summary of development intensity at full build-out including average floor area ratio and lot coverage.

Response

Lot coverage will range from 68% to 75%, depending on final lot size and product type mix. Because these will be primarily single-story structures, FAR will mostly be the same as the percentage of lot coverage.

4. Summary of transportation facilities including:
 - a. Traffic impact study prepared by a licensed engineer that describes traffic impacts associated with each phase of development and at full build-out of the project, and a plan for accommodating this traffic in compliance with Title 11. The specific content of the traffic impact study shall be determined by the City's Traffic Engineer.

Response

A traffic study was prepared by Kittelson & Associates (see Section 7) and will be updated as may be required by the transportation department to reflect higher trip generation associated with open market housing.

- c. Concurrent or proposed street vacations, with a description of potential parking and traffic/pedestrian impacts, if any, and appropriated measures to mitigate these impacts.

Response

No street vacations are necessarily requested although, in response to the City's request, the Applicant will submit a request for vacation of NE 16th Street west of the proposed NE 113th Avenue serving the Project. The street vacation is not necessary to the Project but can be incorporated, either as additional yard space for proposed lots 1-4 or maintained by the HOA as open space with a pedestrian connection to 112th Avenue.

- a. Architecture, including design standards and building materials board(s), for buildings, fences, walls and other structures.

Response

The Applicant intends to build a development that is architecturally attractive, durable and energy efficient. Lot width, product type, and product placement on each lot is intended to be varied to create variety and interest. Front porches (included in the front yard setbacks as allowed under the City's narrow lot code for projects served more than 50% by alley access, which contributes to lot coverage) and architectural detail on each structure will enhance the curb appeal for individual homes and the attractiveness of the community overall. The CCRs governing the community will include design standards and a mechanism for review and approval of improvements of changes to building design after initial construction.

The application includes architectural design elements for the development.

Concurrency:

20.260.100 Concurrency.

- A. Applicability. An applicant for a planned development shall be entitled to reserve capacity in the transportation system for the proposed development's trip generation and shall be deemed to have achieved transportation concurrency, under the concurrency rules and regulations in effect at the time that the concept plan application is vested under 20.260.090 VMC above, if (1) the applicant obtains a certificate of concurrency for all or any portion of its proposed development under Chapter Title 11 VMC, Transportation Concurrency; or (2) the applicant and the City enter into a development agreement as regulated by State statute (36.70B.170 et seq. RCW), which by its terms reserves capacity in the transportation system and includes a finding of transportation concurrency. The term for the concurrency determination shall be set as the term in the certificate of concurrency or the development agreement.

Response

The applicant is aware of the concurrency applicability provision. A traffic impact analysis, prepared by Kittelson & Associates, Inc. Transportation Engineering & Planning, is included in the application materials (Exhibit) The traffic Impact analysis provides the information required for the City to render a

concurrency determination. The traffic study will be updated as may be required by the City to account for additional trip generation from a standard (rather than 55 and older) community.

Proposed Improvements:

- B. Proposed improvements. Appropriate provisions have been made for proposed streets, alleys and public ways, utilities and other improvements that are consistent with the City's current ordinances, standards and plans, and Department of Health and/or Washington State Department of Transportation standards and plans, where applicable;

Response

The improvement will be based on the plans approved by the city of Vancouver. The applicant has received a review from the Clark County Health Department relating the existing septic tanks or wells on the site. The project will include a new section of offsite roadway connecting the Project and existing roadway network to NE 18th Street.

Open Space and Dedications:

- C. Open space and dedications. Appropriate provisions to the extent necessary to mitigate an impact of the development have been made for open space, parks, schools, dedications, easements and reservations;

Response

The applicant does not propose to dedicate land for open space, public parks, or public schools. The development will pay park and school impact fees.

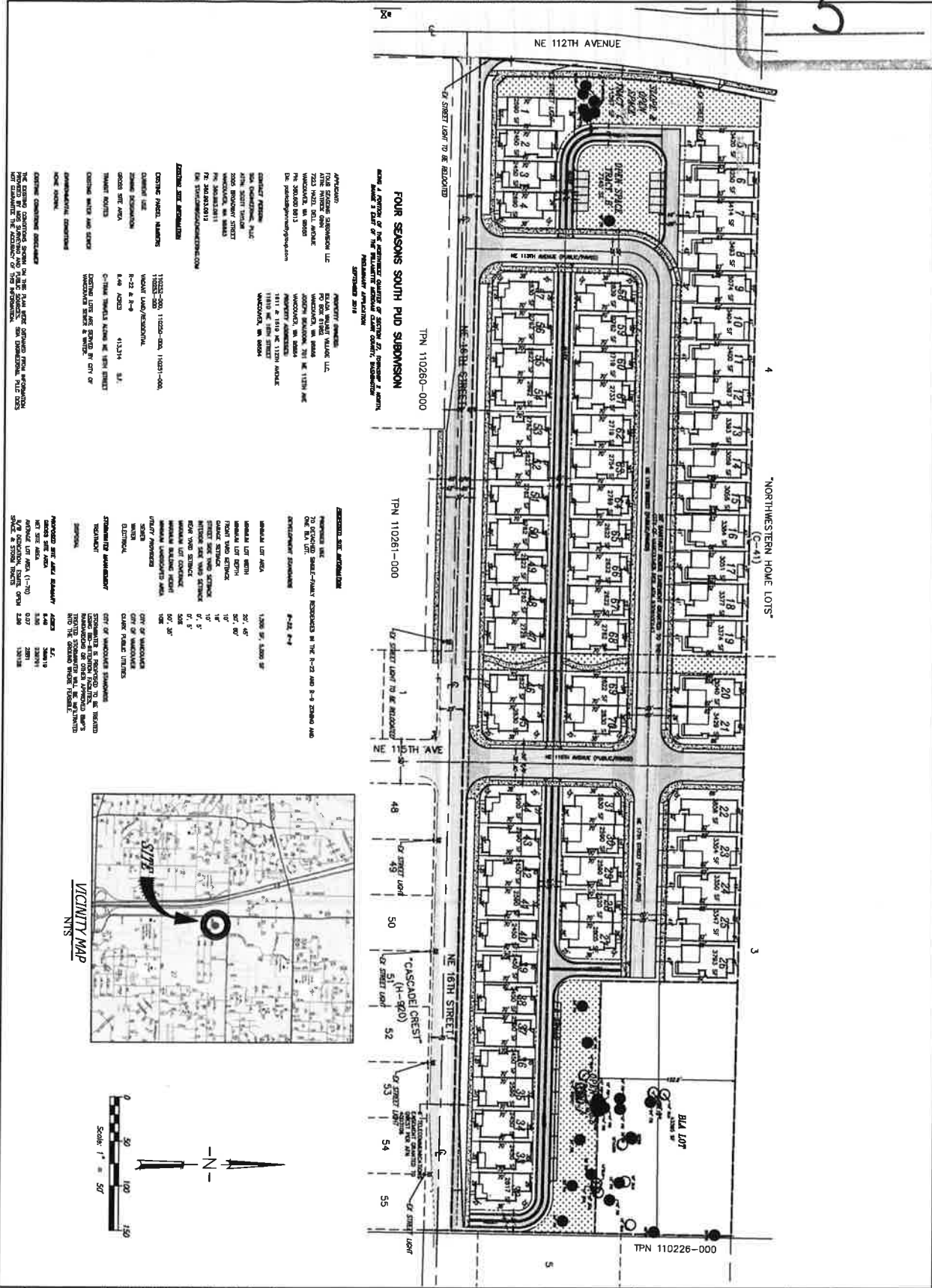
The proposal does include dedication of a public pathway, running north-south approximately at the midpoint of the development. The development will provide private open space for the residents and their guests. The development may include an open space tract and pedestrian connection along the existing NE 16th Street ROW, if vacated by the City of Vancouver.

Barriers between Homes and Agricultural Uses:

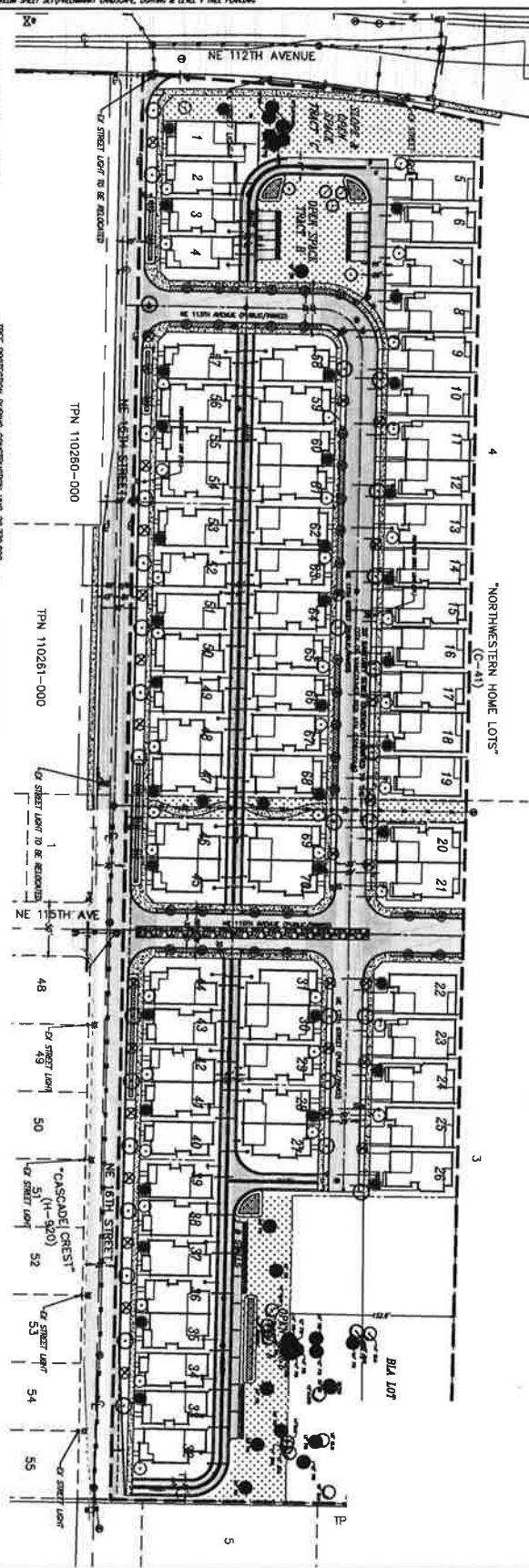
2. All plats or development approvals under this Title issued for residential development activities shall provide a barrier such as fencing or vegetation between the immediately-adjacent residential lots and agricultural and mineral resource activities. A natural buffer, such as a wetland, swale or berm, may substitute for the barrier upon approval of the Planning Official. Lots with street frontage are not required to provide a barrier between residential uses and an adjacent agricultural or mineral resource activity across the street.

Response

The proposal includes a trail connecting to the BPA right-of-way and new roadway connection to and through the BPA ROW to NE 18th Street. Other than these connections, fences will be provided along the norther boundary of the project.

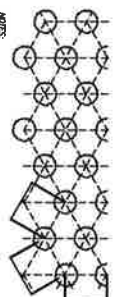


DATE ENGINEERED - LAND PLANNING DEVELOPMENT SERVICES LANDSCAPE ARCHITECTURE 3005 BROADWAY VANCOUVER, WA 98102 PHONE (206) 953-0911 FAX (206) 953-0912		DESIGNED BY: SGT/SM DRAWN BY: SGT/SM CHECKED BY: JTM/SMT SCALE: 1" = 50'	
DATE NUMBER 1942	SHEET PREL.0	PRELIMINARY REVISIONS	
FOUR SEASONS SOUTH P.U.D. SUBDIVISION			
CITY OF VANCOUVER		WASHINGTON	

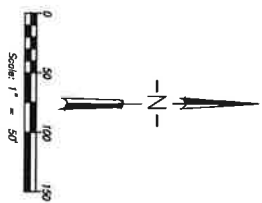
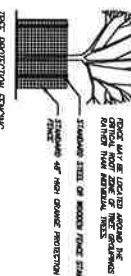


PINE IN DISTANCE DATA				
TIME SINCE LAST SIGHT	NUMBER OF TREES	TREES LEFT OF TRAIL	TOTAL TREES LEFT	
1-5"	2	1.0	2	4.3
6-12"	3	1.0	3	3.7
13-15"	3	1.0	3	3.0
16-20"	4	2	6	2.6
21-25"	4	7	11	2.0
26-30"	1	10	11	1.5
31-40"	1	15	16	1.3
TOTAL TREES LEFT RECORDED				40.5

1. RACED: BLACK & WHITE. 2. SEX: MALE. 3. AGE: 20. 4. HEIGHT: 5' 10". 5. WEIGHT: 160. 6. BUILD: MEDIUM. 7. EYES: BROWN. 8. HAIR: BLACK. 9. COMPLEXION: FAIR. 10. TATTOOS: NONE. 11. SCARS: NONE. 12. ALIEN REGISTRATION: NONE. 13. MILITARY SERVICE: NONE. 14. EDUCATION: HIGH SCHOOL GRAD. 15. EMPLOYMENT: UNEMPLOYED. 16. RESIDENCE: 1234 MAIN ST, NEW YORK, NY. 17. DATE OF BIRTH: 01/01/1960. 18. SOCIAL SECURITY NUMBER: 123-45-6789. 19. MARITAL STATUS: SINGLE. 20. PARENTS: FATHER: JOHN DOE, MOTHER: JANE DOE. 21. SIBLINGS: NONE. 22. PREVIOUS CRIMINAL RECORD: NONE. 23. CURRENT CRIMINAL RECORD: NONE. 24. DRUG USE: NONE. 25. ALCOHOL USE: NONE. 26. MENTAL HEALTH: NONE. 27. PHYSICAL HEALTH: NONE. 28. ADDITIONAL INFORMATION: NONE.

[illegible]

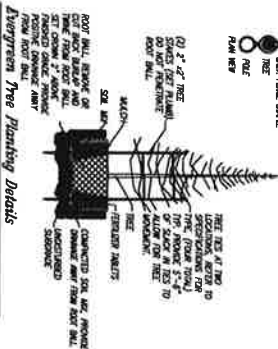
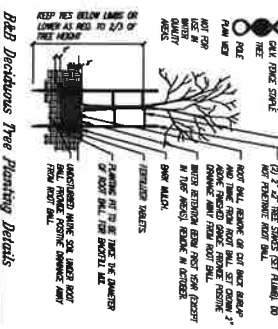
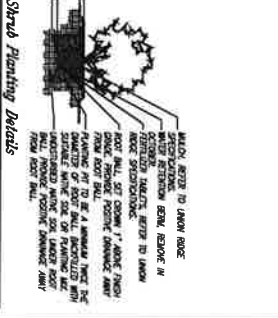
ALL GROUND COVER SHALL BE PLANTED AT EQUAL TRIANGULAR SPACING AS SPECIFIED IN PLANNING LEGEND. GROUND COVER TO BE LOKED ONE HALF OF SPECIFIED SPACING DISTANCE FROM ANY HAD SURFACE. UNLESS OTHERWISE SPECIFIED, SPECIFICATIONS ARE INCLUDED WITHIN PLAN SHEETS. LANDSCAPE NOTES AND SPECIFICATIONS REFER TO ALL PRIOR TO BIDDING AND CONSTRUCTION.

[illegible]

TRUNK MAY BE LOCATED ANYWHERE IN THE CRITICAL ROOT ZONE OF THE GROUNDSURF RATHER THAN IMMEDIATELY UNDER THE CROWN

STANDARD STEEL OR WOODEN FENCE FLANK

STANDARD 48" HIGH ORANGE PROTECTION FENCE

[illegible][illegible][illegible]



Affidavit of Mailing
FOUR SEASONS SOUTH PUD
PRJ-156552/LUP-70974

This is to certify that I, Clarissa Bowen, caused to have mailed copies of the NOA-DNS for the above-named project to those persons or agencies listed on the attached list.

Signature _____

Date Mailed 11/30/2018

STATE OF WASHINGTON
County of Clark

I certify that I know, or have satisfactory evidence that Clarissa Bowen signed this instrument and acknowledged it to be a free and voluntary act for the uses and purposes mentioned in the instrument.



Date 11-30-18

Johnnie L. Hildreth
Signature of Notary Public

Title: Notary Public

h:\templates\affidavit



P.O. Box 1995 • Vancouver, WA 98668-1995
www.cityofvancouver.us

Nov. 30, 2018

**Notice of Application, Public Hearing and
Optional SEPA Determination of Nonsignificance (DNS)
Four Seasons South PUD
PRJ-156552/LUP-70974**

Request: A planned unit development to create a senior-oriented 70-lot single-family subdivision and a boundary line adjustment.

Application was submitted Oct. 3, 2018, and deemed fully complete Nov. 16, 2018.

Location: Tax Lots 110251000, 110252000, 110250000, and 110235000 located in the NW Quarter of Section 27, Township 2N, Range 2E of the Willamette Meridian.

Applicant/Contact: Patrick Ginn, Four Seasons Subdivision LLC. 800 Tenney Road #110-348 Vancouver, Washington 98671

Property

Owners: Kilada Walnut Village LLC. PO Box 61982, Vancouver, Washington 98666
Joseph and Gayle Beaudoin 701 NE 112th Ave., Vancouver, Washington 98684

Public Hearing Scheduled: Land Use Hearing conducted by the Hearing Examiner
Tuesday, February 19, 2019 6 p.m.
Council Chambers, 2nd Floor of City Hall
415 W. 6th St., Vancouver, Washington

Under the authority of VMC 20.790.230, the City of Vancouver will use the optional combined determination of nonsignificance (DNS) and notice of application process. Based on the initial review of the proposed project, the City of Vancouver expects to issue a DNS on the proposal, finding the project will not create probable significant adverse environmental impacts.

The comment period for the notice of application may be the only opportunity to comment on the environmental impacts of the proposal. The proposal may include mitigation measures under applicable codes, and the review process may incorporate or require mitigation measures regardless of whether an environmental impact statement is prepared.

Comments on the project received before 4 p.m., Jan. 2, 2019, will be incorporated into the staff report; comments received after that date will be presented at the hearing.

This notice is intended to inform potentially interested parties about the threshold determination and the public hearing, and to invite them to appear before the hearing examiner, to offer oral testimony, or to submit written statements for the record. A decision by the hearing examiner may be appealed to City Council by the applicant or any aggrieved person. Such an appeal must be in writing and be filed with Community and Economic Development Department within 14 calendar days after the hearing examiner's decision is mailed. In the absence of such appeal, the examiner's decision shall be final and conclusive.

Procedural appeals to the SEPA determination shall be filed in writing within 14 calendar days following the last day of the comment period. The hearing examiner's decision of the SEPA procedural appeal shall be final and not subject to further administrative appeal.

Substantive SEPA appeals shall be filed in writing within 14 calendar days of the issuance of staff's decision approving, conditioning, or denying the project.

A copy of the final determination may be obtained upon written request. Please include any one of the project numbers listed.

Information regarding this application may be examined at the Permit Center, located at 415 W. 6th Street, Vancouver, WA, Monday through Friday between the hours of 8 a.m. and 12:30 p.m. and 1:30 p.m. and 4 p.m., except Wednesday, when Permit Center hours begin at 9 a.m.

Case Manager: Kristian Corbin, Associate Planner 360-487-7818

E-mail: kristian.corbin@cityofvancouver.us

Mailing Address: Community & Economic Development Dept., PO Box 1995, Vancouver, WA 98668


Name

11-30-18
Date

Coverage of this hearing is being cablecast live on Clark/Vancouver Television Channel 23, Comcast Cable Television System. For replay dates and times, please check newspaper listings or telephone 360-487-8703.

Vancouver City Hall is served by C-Tran Routes 2, 3, 4, 25, 30, 32, 37 and 105. For schedule information, telephone C-Tran, 360-695-0123.



SUBMIT TO:
City of Vancouver
Community & Economic Development
415 W. 6th ST
Vancouver, WA 98660
www.cityofvancouver.us

SEPA ENVIRONMENTAL CHECKLIST

WAC 197-11-960

Property Owner: Four Seasons Subdivision LLC Telephone: 360-600-8813
(Print or Type Name)

Mailing Address: 7223 NE Hazel Dell Ave Vancouver, WA 98665
(No., City, State, ZIP)

Applicant: Patrick Ginn Telephone: 360-600-8813
(Print or Type Name)

Mailing Address: 7223 NE Hazel Dell Avenue Vancouver, WA 98665
(No., City, State, ZIP)

Relationship to Owner: Same

Tax Assessor Serial Number(s): 110250-000, 110251-000, 110252-000, 110235-000

Legal description: Lot(s) N/A Block(s) Plat name N/A
(If a Metes and Bounds description, check here ☐, and attach narrative to this application.)

Site Address (if any): 1611 & 1619 NE 112th Avenue

☒ Include 8½" x 11" copies of ☒ Quarter Section Map, ☒ Topographic Map, ☒ Scaled Site Plan. Delineate site on maps.
Notice to Applicants: You must use the current revision of this form or your application will not be accepted. If you use our disk version of this form (MS Word 6.0) you may not alter the format. Make sure you have the current version before submittal.

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

Instructions for applicants: [\[help\]](#)

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals: [\[help\]](#)

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements -that do not contribute meaningfully to the analysis of the proposal.

A. BACKGROUND [\[help\]](#)

1. Name of proposed project, if applicable: [\[help\]](#)
Four Seasons South Subdivision
2. Name of applicant: [\[help\]](#)
Patrick Ginn
3. Address and phone number of applicant and contact person: [\[help\]](#)
7223 NE Hazel Dell Avenue Vancouver, WA. 98665
(360) 600-8813
4. Date checklist prepared: [\[help\]](#)
09/04/2018
5. Agency requesting checklist: [\[help\]](#)
City of Vancouver
6. Proposed timing or schedule (including phasing, if applicable): [\[help\]](#)
Spring 2019
7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain. [\[help\]](#)
None known.
8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal. [\[help\]](#)
The project will be designed and developed in accordance with state & local requirements for stormwater management, erosion control, and any other environmental standards.
9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain. [\[help\]](#) None known at this time.
10. List any government approvals or permits that will be needed for your proposal, if known. [\[help\]](#)
Clark County Health Department Review & City of Vancouver planning, engineering, and construction approvals and permits.
11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.) [\[help\]](#)
This project proposes to develop 9.47 acres into 70 single-family, age 55 and over, residential lots.
12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist. [\[help\]](#)
The project is located at 1611 & 1619 NE 112nd Avenue.
Parcel #'s: 110250-000, 110251-000, 110252-000, 110235-000

B. ENVIRONMENTAL ELEMENTS [\[help\]](#)**1. Earth**

- a. General description of the site [\[help\]](#)
(circle one): Flat, rolling, hilly, steep slopes, mountainous,
other _____
Most of the site contains moderate slopes. The site slopes from west to east.
- b. What is the steepest slope on the site (approximate percent slope)? [\[help\]](#)
15%
- c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils. [\[help\]](#)
Wind River Gravelly Loam (WrB and WrF)
- d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe. [\[help\]](#)
None known.
- e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill. [\[help\]](#)
Grading for the development is estimated to move approx. 100,000 cubic yards of soil. More accurate quantities will be available following final engineering.
- f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe. [\[help\]](#)
Yes, heavy rain or wind during construction could cause erosion. The project will implement appropriate erosion control measures.
- g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)? [\[help\]](#)
Approximately 60%
- h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any: [\[help\]](#)
The project will comply with applicable city and state erosion control measures. Measures to control erosion may include but are not limited to: silt fencing, mulching, seeding, inlet protection etc...

2. Air

- a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known. [\[help\]](#)
Air may get dusty during construction when the weather is dry. Construction vehicles & equipment with gasoline powered engines will emit exhaust. Odorous fumes will be released from asphalt paving and
- b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe. [\[help\]](#)
None known.
- c. Proposed measures to reduce or control emissions or other impacts to air, if any: [\[help\]](#)
Erosion control measures will help to control dust.

3. Water

a. Surface Water: [\[help\]](#)

- 1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into. [\[help\]](#)
No.
- 2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans. [\[help\]](#)
No
- 3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material. [\[help\]](#)
N/A
- 4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known. [\[help\]](#)
No
- 5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan. [\[help\]](#)
No
- 6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge. [\[help\]](#)
No

b. Ground Water:

- 1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known. [\[help\]](#)
Ground water will not be withdrawn. Stormwater will be treated and infiltrated on site using approved BMP's. Quantity varies depending on rainfall.
- 2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve. [\[help\]](#)
N/A

c. Water runoff (including stormwater):

- 1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe. [\[help\]](#)
The source of runoff is rainfall. Roof runoff will be infiltrated on site. Pavement runoff will be treated in rain gardens or other approved methods and infiltrated on site.

- 2) Could waste materials enter ground or surface waters? If so, generally describe. [\[help\]](#)
In large storm events that exceed the treatment thresholds, oils etc... from pavement may be discharged directly into the overflow system. Sewage will be discharged to public facilities.
- 3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe. No
- 4) Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:
Sewage will be discharged to public facilities. Storm water will be treated and discharged in accordance with the City and State water quality requirements.

4. Plants [\[help\]](#)

- a. Check the types of vegetation found on the site: [\[help\]](#)
☒ deciduous tree: alder, maple, aspen, other
☐ evergreen tree: fir, cedar, pine, other
☐ shrubs
☒ grass
☐ pasture
☐ crop or grain
☐ Orchards, vineyards or other permanent crops.
☐ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
☐ water plants: water lily, eelgrass, milfoil, other
☐ other types of vegetation
- b. What kind and amount of vegetation will be removed or altered? [\[help\]](#)
All vegetation in developing areas will be removed.
- c. List threatened and endangered species known to be on or near the site. [\[help\]](#)
None
- d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any: [\[help\]](#)
The site will be fully landscaped during development. Native plants will be used when and where appropriate.
- e. List all noxious weeds and invasive species known to be on or near the site.
None

5. Animals

- a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site. Examples include: [\[help\]](#)
 birds: hawk, heron, eagle, songbirds, other:
 mammals: deer, bear, elk, beaver, other:
 fish: bass, salmon, trout, herring, shellfish, other:
- b. List any threatened and endangered species known to be on or near the site. [\[help\]](#)
None known
- c. Is the site part of a migration route? If so, explain. [\[help\]](#)
The Pacific Flyway migration route stretches from north from Alaska, south to Mexico, west into the Pacific Ocean, and east to the Rocky Mountains. This site lies within that geographical area.

- d. Proposed measures to preserve or enhance wildlife, if any: [\[help\]](#)
Wildlife habitat on the site is extremely low. The landscape plantings, rain garden plantings, and slope stabilization plantings will provide food and cover for small birds, insects, mammals, and soil organisms.
- e. List any invasive animal species known to be on or near the site.
None known

6. Energy and natural resources

- a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc. [\[help\]](#)
Electricity will be used for powering wall outlets, appliances, and lights in the new homes.
Electricity or natural gas will be used to heat the units.
- b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe. [\[help\]](#) No
- c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any: [\[help\]](#)
Buildings will be designed and constructed to meet the most current standards for energy efficiency.

7. Environmental health

- a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste that could occur as a result of this proposal? If so, describe. [\[help\]](#)
None known
 - 1) Describe any known or possible contamination at the site from present or past uses.
None known
 - 2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.
None known
 - 3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.
None known
 - 4) Describe special emergency services that might be required.
The project will be served by fire, police, and ambulance after completion.
 - 5) Proposed measures to reduce or control environmental health hazards, if any:
The site will be served by public water and sewer. Storm water will be treated before it is infiltrated on site.
- b. Noise
 - 1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)? [\[help\]](#)
The site is bordered by NE 112nd Avenue and NE 16th Street.
Some background traffic noise will be ongoing.

- 2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site. [\[help\]](#)
In the short term, noise from construction will come from the site during allowed construction hours. In the long-term, traffic will add a small amount of noise.
- 3) Proposed measures to reduce or control noise impacts, if any: [\[help\]](#)
Construction noise will be limited to allowed hours. Ongoing noise is not expected to be significant.

8. Land and shoreline use

- a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe. [\[help\]](#)
The site has existing homes and outbuildings and is underdeveloped. The surrounding properties are single-family residences, zoned R-9, and R-22.
- b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use? [\[help\]](#) Yes, a portion of the project is a farm
 - 1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:
No
- c. Describe any structures on the site. [\[help\]](#)
A single-family residence and several outbuildings.
- d. Will any structures be demolished? If so, what? [\[help\]](#)
Yes, the outbuildings will be demolished.
- e. What is the current zoning classification of the site? [\[help\]](#)
R-9 and R-22.
- f. What is the current comprehensive plan designation of the site? [\[help\]](#)
UL & UH
- g. If applicable, what is the current shoreline master program designation of the site? [\[help\]](#) N/A
- h. Has any part of the site been classified as a critical area by the city or county? If so, specify. [\[help\]](#) No
- i. Approximately how many people would reside or work in the completed project? [\[help\]](#)
158
- j. Approximately how many people would the completed project displace? [\[help\]](#)
2

- k. Proposed measures to avoid or reduce displacement impacts, if any: [\[help\]](#)
N/A
- l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any: [\[help\]](#)
The project will be designed to meet the requirements of the City of Vancouver.
- m. Proposed measures to ensure the proposal is compatible with nearby agricultural and forest lands of long-term commercial significance, if any:
N/A

9. Housing

- a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing. [\[help\]](#)
70 new, age 55 and older residences, middle income.
- b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing. [\[help\]](#)
Two middle income homes.
- c. Proposed measures to reduce or control housing impacts, if any: [\[help\]](#)
N/A

10. Aesthetics

- a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed? [\[help\]](#)
Up to 35' R-9 and 50' R-22. The building material will be wood or composite siding. The two homes and outbuildings will be removed from the site.
- b. What views in the immediate vicinity would be altered or obstructed? [\[help\]](#)
None
- c. Proposed measures to reduce or control aesthetic impacts, if any: [\[help\]](#)
Landscaping will be used to soften and improve the aesthetics of the site.

11. Light and glare

- a. What type of light or glare will the proposal produce? What time of day would it mainly occur? [\[help\]](#) The proposed roads will have lighting at night.
- b. Could light or glare from the finished project be a safety hazard or interfere with views? [\[help\]](#)
Not to be expected
- c. What existing off-site sources of light or glare may affect your proposal? [\[help\]](#)
NE 112th Avenue has existing street lighting.
- d. Proposed measures to reduce or control light and glare impacts, if any: [\[help\]](#)
Light fixtures will be shielded to reduce off-site glare.

12. Recreation

- a. What designated and informal recreational opportunities are in the immediate vicinity?
[help] Burnt Bridge Creek Greenway/Trail is north of the site. There are city parks to the south and east.
- b. Would the proposed project displace any existing recreational uses? If so, describe.
[help] No
- c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any: [help]
This project will pay park impact fees.

13. Historic and cultural preservation

- a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers located on or near the site? If so, specifically describe. [help]
None known.
- b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources. [help]
No
- c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc. [help]
N/A
- d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.
N/A

14. Transportation

- a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.
[help]
NE 16th Street will serve the site.
- b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop? [help]
There is a C-tran route #30 that runs along NE 28th Street to the north.
- c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate? [help]
Approximately 280 new parking spaces, 2 will be eliminated

- d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private). [\[help\]](#)
Yes, NE 16th Street will be improved on the south side as well as constructing full interior streets to connect to existing infrastructure adjacent to the site.
- e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe. [\[help\]](#)
No
- f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates? [\[help\]](#) 299 average daily trips
- g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.
No
- h. Proposed measures to reduce or control transportation impacts, if any: [\[help\]](#)
The project will pay traffic impact fees, and comply with transportation concurrency requirements.

15. Public Services

- a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe. [\[help\]](#) The project will add to the need for all of the services mentioned.
- b. Proposed measures to reduce or control direct impacts on public services, if any. [\[help\]](#) The project will pay impact fees to offset the additional service costs. The project will also design the project to meet current fire safety regulations.

16. Utilities

- a. Circle utilities currently available at the site: [\[help\]](#)
electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other
- b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed. [\[help\]](#) Water & Sewer - City of Vancouver
Telephone - CenturyLink
Electricity - Clark PUD
Gas - NW Natural
Refuse - Waste Connections

C. SIGNATURE [\[HELP\]](#)

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: 

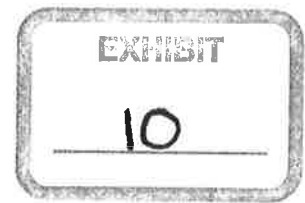
Name of signee: Lisa Harker

Position and Agency/Organization: Pre Development Project Manager

Date Submitted: 9/23/18

EXHIBIT 9
Geotechnical Report
Prepared By
Columbia West
Dated
Dec. 4, 2017

Because of the size of the exhibit, it is not included with this report. The document is available for review at Community & Economic Development Department, 415 W 6th Street, on the first floor. If you would like to review the document, check in at the reception area of the Permit Center between the hours of 8 a.m.–12:30 p.m. and 1:30 p.m.–4 p.m., except Wednesday, when permit center hours begin at 9 a.m.



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

January 2, 2019

Kristian Corbin, Associate Planner
City of Vancouver
Community & Economics Development
PO Box 1995
Vancouver, WA 98668

Dear Kristian Corbin:

Thank you for the opportunity to comment on the optional determination of nonsignificance/notice of application for the Four Seasons South Subdivision PUD Project (PRJ-156552 & LUP-70974) located at 1611 and 1619 Northeast 112th Avenue as proposed by Patrick Ginn, Four Seasons Subdivision LLC. The Department of Ecology (Ecology) reviewed the environmental checklist and has the following comment(s):

SOLID WASTE MANAGEMENT: Derek Rockett (360) 407-6287

All grading and filling of land must utilize only clean fill. All other materials may be considered solid waste and permit approval may be required from your local jurisdictional health department prior to filling. All removed debris resulting from this project must be disposed of at an approved site. Contact the local jurisdictional health department for proper management of these materials.

WATER QUALITY: Chris Montague-Breakwell (360) 407-6364

Erosion control measures must be in place prior to any clearing, grading, or construction. These control measures must be effective to prevent stormwater runoff from carrying soil and other pollutants into surface water or stormdrains that lead to waters of the state. Sand, silt, clay particles, and soil will damage aquatic habitat and are considered to be pollutants.

Any discharge of sediment-laden runoff or other pollutants to waters of the state is in violation of Chapter 90.48 RCW, Water Pollution Control, and WAC 173-201A, Water Quality Standards for Surface Waters of the State of Washington, and is subject to enforcement action.

The following construction activities require coverage under the Construction Stormwater General Permit:

1. Clearing, grading and/or excavation that results in the disturbance of one or more acres **and** discharges stormwater to surface waters of the State; and

2. Clearing, grading and/or excavation on sites smaller than one acre that are part of a larger common plan of development or sale, if the common plan of development or sale will ultimately disturb one acre or more **and** discharge stormwater to surface waters of the State.
 - a) This includes forest practices (including, but not limited to, class IV conversions) that are part of a construction activity that will result in the disturbance of one or more acres, **and** discharge to surface waters of the State; and
3. Any size construction activity discharging stormwater to waters of the State that Ecology:
 - a) Determines to be a significant contributor of pollutants to waters of the State of Washington.
 - b) Reasonably expects to cause a violation of any water quality standard.

If there are known soil/ground water contaminants present on-site, additional information (including, but not limited to: temporary erosion and sediment control plans; stormwater pollution prevention plan; list of known contaminants with concentrations and depths found; a site map depicting the sample location(s); and additional studies/reports regarding contaminant(s)) will be required to be submitted.

You may apply online or obtain an application from Ecology's website at: <http://www.ecy.wa.gov/programs/wq/stormwater/construction/> - Application. Construction site operators must apply for a permit at least 60 days prior to discharging stormwater from construction activities and must submit it on or before the date of the first public notice.

Ecology's comments are based upon information provided by the lead agency. As such, they may not constitute an exhaustive list of the various authorizations that must be obtained or legal requirements that must be fulfilled in order to carry out the proposed action.

If you have any questions or would like to respond to these comments, please contact the appropriate reviewing staff listed above.

Department of Ecology
Southwest Regional Office

(CC:201806680)

cc: Derek Rockett, SWM
Chris Montague-Breakwell, WQ
Patrick Ginn, Four Seasons Subdivision, LLC (Applicant)
Kilada Walnut Village, LLC (Owner)
Joseph and Gayle Beaudoin (Owner)



proud past, promising future

CLARK COUNTY
WASHINGTON

PUBLIC HEALTH
Environmental Public Health

August 21, 2017

Four Seasons Subdivision, LLC
C/O SGA Engineering
Attn: Lisa Harker
2005 Broadway
Vancouver, WA 98663

RE: **REVISED** Conditional Development Review Evaluation for "Four Seasons South Subdivision" located at 1611 NE 112th Avenue & 11610 NE 16th Street (SR 28692 & 27855; Tax Parcels 110235000, 11025000, 110251000 & 110252000; PRJ-156552/PIR-64574)

****Final approval by Health Department required**

Ms. Harker:

The Development Review Evaluation of the site described above has been completed. This evaluation is limited to the area of the proposed development. The findings are:

On-site Sewage Systems (CCC 24.17, WAC 246-272A, CCC 40.370, RCW 58.17):

The mobile home at 11610 NE 16th Street is served by an on-site sewage system (ON7839). The former residence at 1619 NE 112th Avenue was served by an on-site sewage system which may not have been properly abandoned when the house was demolished about 2010. There appears to have also been a residence at 1611 NE 112th Avenue that was removed after 1978 which would have been served by an on-site sewage system. Prior to final plat approval the sewage system at 11610 NE 16th Street and any other sewage systems found during development must be properly abandoned with written verification submitted to Public Health.

Proper system abandonment requires tank pumping and reporting by a Clark County Certified pumper, breaking in the tank lid, and filling the cavity with compacted soil. Please note that any pump chambers, cesspools, or drywells must also be abandoned in this manner.

The proposed development must connect to an approved public sewer system. A copy of the final acceptance letter from the purveyor shall be submitted along with the final plat (Mylar).

Water Systems (WAC 173-160, WAC 246-290, CCC 40.370, RCW 58.17):

There is a well on the west side of a small shed with an outside sink to the west of the mobile home at 11610 NE 16th Street. There is also a locked shed remaining on the middle parcel with the 1611 address that appears likely to be a well house.

P.O. Box 9825 • Vancouver, WA 98666-8825 • tel: [360] 397-8428 • fax: [360] 397-8084 • www.clark.wa.gov

Page 2

As per WAC 173-160-381; the well at 11610 plus any well found in the shed or any other well found during development must be properly decommissioned by a Washington State licensed well driller. If no well is found in the shed on the 1611 address parcel, photo documentation that no well is present in this shed is required prior to final plat approval.

The proposed development must connect to an approved public water system. A copy of the final acceptance letter or equivalent from the purveyor shall be submitted along with the final plat (Mylar).

Other Issues

All the existing structures will be removed according to the proposed preliminary plat. Demolition waste and debris must be disposed of appropriately according to city demolition permit requirements.

If you have any questions concerning this letter, please contact me at (360) 397-8428, ext. 7254.

Sincerely,



Carla Sowder, R.S.
Environmental Health Specialist

CC: City of Vancouver Community & Economic Development Dept., Attn: Kristian Corbin



City of Vancouver Transportation Services
Trip and Traffic Impact Fee Calculation Worksheet
Application Number: PRJ-156552



Project Name: ePlans Four Seasons South Subdivision	Date: 1/22/2019 12:00:00 AM
Project Address: 1611 NE 112TH AVE	TAZ: TA280
Project Number: PRJ-156552	Primary Corridor: 112TH #1
ENG Number:	Parcel 1 ID: 110250000
TIF District: Cascade	Parcel 2 ID:
TIF Overlay District: Overlay - Mill Plain / I-205	Parcel 3 ID:

Existing Site Trips ^^										
LU Description	ITE LU Code	Existing AM Peak Rate	Existing PM Peak Rate	Existing ADT Rate	Unit of Measure	Size**		Existing AM Peak Trips	Existing PM Peak Trips	Existing ADT
^^ equals zero if this is a new development on greenfield or if old use has been gone > 1 year.								Existing Trips Total		

New Trip Generation Calculation										
LU Description	ITE LU Code	AM Peak Rate	PM Peak Rate	ADT Rate	Unit of Measure*	Size**		New AM Peak	New PM Peak	New ADT
Senior Adult Housing--detached	251	0.22	0.27	3.68	1	70		42	34	258
*Unit of measure = ITE Unit by which total size is divided by in order to calc. trip generation								New Project Trips		
**Size - Total size of development, eg 10 dwelling units or 50,000 sqf.								42	34	258
***% reduction applied to trip generation, eg. .35 passby reduction for 100 trips - (1 - .35) * 100 = .65 - from approved traffic impact study only								Net New Project Trips (new trip = existing trips)		
****% reduction applied to trip generation, eg. .10 internal capture reduction for 100 trips - (1 - .10) * 100 = .9 * 100 = 90 - from approved traffic impact study only								42	34	258

Traffic Impact Fee Calculation									
LU Description	ITE LU Code	Proposed Project ADT	Net New Proj ADT	TIF Rate/Trip	TIF Overlay rate/trip	BEF Reduction = .3 for retail commercial uses & ITE LU 912	Tax Reduction	TIF Due	Overlay TIF Due
Senior Adult Housing--detached	251	258	258.00	223	10		0.15	\$48,903.90	\$2,193.00
Sum		258	258					TIF Totals:	\$48,903.90 \$2,193.00

Concurrency Monitoring Fees			
Corridor	PM Peak Trips	Cost/Trip	max. \$1500/corridor
NE 112th Ave to NE 138th Ave	7	\$48.00	\$336.00
Burton Rd: Andresen to NE 112th Ave	8	\$48.00	\$384.00
NE 112th Ave to NE 138th Ave	2	\$48.00	\$96.00
Mill Plain Blvd to NE 28th St	27	\$48.00	\$1,296.00
NE 138th Ave to NE 162nd Ave	2	\$48.00	\$96.00
NE 28th St to NE 51st St	17	\$48.00	\$816.00
Mill Plain Blvd to NE 28TH	1	\$48.00	\$48.00
Total Monitoring Fee =			\$3,072.00

Total Modeling Fee = \$3,072.00

Disclaimer: This information is provided based on the TIF program in place as of the date shown above and is only an estimate of the fee. The fee will be recalculated based on approved development dimensions and reflecting any changes to the TIF program that are applicable. Per VMC20.97.060 B, ...for non-residential development, the impact fee shall be calculated at the time of site plan approval or building permit application if the proposed development is not sufficiently defined to permit such calculations. Notwithstanding the foregoing, the fee shall be re-calculated for building permit applications filed more than 3 years following the date of the applicable preliminary plat, preliminary short plat or site plan approval. See VMC20.97 for more information. Note: TIF Overlay fees cannot be paid with TIF Credits from a district other than the TIF Overlay district.



City of Vancouver Transportation Services
Trip and Traffic Impact Fee Calculation Worksheet

Application Number: PRJ-156552

Project Name:	ePlans Four Seasons South Subdivision	Date:	1/22/2019 12:00:00 AM
Project Address:	1611 NE 112TH AVE	TAZ:	TA280
Project Number:	PRJ-156552	Primary Corridor:	112TH #1
ENG Number:		Parcel 1 ID:	110250000
TIF District:	Cascade	Parcel 2 ID:	
TIF Overlay District:	Overlay - Mill Plain / I-205	Parcel 3 ID:	

Proportionate Shares				
Case Number	Project	Fee/Unit	Trips/Lots	Final Fee
Total Proportionate Share Fees =				

COMMENTS:

ePlans Four Seasons South Subdivision

District: Cascade	District TIF =	\$48,903.90
Overlay - Mill Plain / I-205	Overlay TIF =	\$2,193.00
	Total TIF =	\$51,096.90
SF Dwellings Fee per SFDU		

Disclaimer: This information is provided based on the TIF program in place as of the date shown above and is only an estimate of the fee. The fee will be recalculated based on approved development dimensions and reflecting any changes to the TIF program that are applicable. Per VMC20.97.060 B, ...for non-residential development, the impact fee shall be calculated at the time of site plan approval or building permit application if the proposed development is not sufficiently defined to permit such calculations. Notwithstanding the foregoing, the fee shall be re-calculated for building permit applications filed more than 3 years following the date of the applicable preliminary plat, preliminary short plat or site plan approval. See VMC20.97 for more information. Note: TIF Overlay fees cannot be paid with TIF Credits from a district other than the TIF Overlay district.

4783753 EAS

RecFee - \$123.00 Pages: 12 - CHICAGO TITLE INSURANCE CO
Clark County, WA 08/08/2011 11:27**When recorded return to:**Chris Malone
City of Vancouver
4400 NE 77th Avenue Ste. 350 / P.O. Box 1995
Vancouver, WA 98668

Filed for record at the request of:

CHICAGO TITLE
COMPANY1111 Main Street, Suite 200
Vancouver, WA 98660

Escrow No.: K159462

Real Estate Excise Tax

Ch. 11 Rev. Laws 1951

EXEMPT

Affd. # 8 Date 8.8.11

For details of tax paid see

Affd. # 8 Doug Lasher

Clark County Treasurer

By X Deputy**DOCUMENT TITLE(S)**

Slope Easement

REFERENCE NUMBER(S) OF DOCUMENTS ASSIGNED OR RELEASED: _____

Additional reference numbers on page _____ of document

GRANTOR(S)

Agnes Nuttman Family Limited Partnership, a Washington limited Partnership, et al

☒ Additional names on page 2 of document**GRANTEE(S)**

City of Vancouver, a Municipal Corporation

☐ Additional names on page _____ of document**ABBREVIATED LEGAL DESCRIPTION**

Lot 4, Block 4 - Homes Lots, Volume: C Page: 41

Complete legal description is on page 7-12 of document**TAX PARCEL NUMBER(S)**

110250-000, 110251-000 and 110252-000

Additional Tax Accounts are on page _____ of document

The Auditor/Recorder will rely on the information provided on this form. The staff will not read the document to verify the accuracy or completeness of the indexing information provided herein.

"I am signing below and paying an additional \$50 recording fee (as provided in RCW 36.18.010 and referred to as an emergency nonstandard document), because this document does not meet margin and formatting requirements. Furthermore, I hereby understand that the recording process may cover up or otherwise obscure some part of the text of the original document as a result of this request."

Patricia Bender

Signature of Requesting Party

Note to submitter: Do not sign above nor pay additional \$50 fee if the document meets margin/formatting requirements

SLOPE EASEMENT

Grantor(s): Agnes Nuttman Family Limited Partnership, a Washington Limited Partnership, et al
Grantee: City of Vancouver, a Municipal Corporation
Abbreviated Legal: Lot 4, Northwest Homes Lots, Volume: C Page: 41
Tax Parcel No.: 110250-000, 110251-000, and 110252-000
Project: NE 18th Street From 112th Ave. to Four Seasons Lane
Project Parcel: 82 and 83

THE GRANTORS, Agnes Nuttman Family Limited Partnership, a Washington Limited Partnership, their heirs, or assigns as to Parcel I, and Jeanne D. Wright, Trustee of the Agnes M. Nuttman Living Trust, dated December 29, 1997 and David L. Nuttman, Jeanne D. Wright and Judy A. Nuttman, who acquired title as Judy A. McIntyre, each as their separate estate, for and in consideration of mutual benefits and in further consideration of the general public welfare and of the peculiar and special benefits to accrue to us therefrom, do(es) by these presents grant and convey to the City of Vancouver, a Municipal Corporation, for the use of the public, an easement and privilege to construct and maintain cuts and/or fills for slopes occasioned by the original grading and maintenance of grades for street purposes along, across, and upon the following described real property situated in the City of Vancouver, together with the right to enter upon said premises at any time with all necessary men, material, and equipment for the purposes of constructing, inspecting, repairing, and maintaining the same, to wit:

See Exhibits "A", "B", "C", and "D" attached hereto and incorporated by reference and made part of this document as though fully incorporated herein.

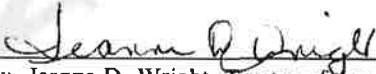
It is understood and agreed that, in the event the grantor, their heirs, or assigns, shall excavate and/or place an embankment upon the area covered by this slope easement to the level of the grade abutting thereon, all rights of the grantee herein shall cease and terminate.

It is understood and agreed that, the City of Vancouver shall maintain all improvements within the slope easement until such time that the slope easement is requested to be relinquished by the grantor(s) unless the slope is damaged by actions of the grantor(s), their heirs, or assigns.

It is understood and agreed that, the rights of the grantee herein shall cease and terminate in the event that the grantor(s), their heirs, or assigns, request in writing that the slope easement be terminated and the grantee confirms in writing that the slope can safely be maintained in perpetuity by the grantor(s), their heirs, or assigns without causing harm to the traveling public.

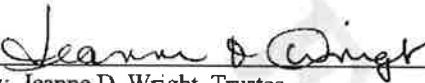
GRANTOR(s), as to parcel 1

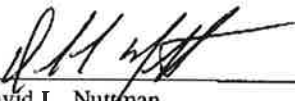
Agnes Nuttman Family Limited Partnership

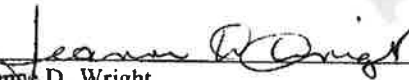

By: Jeanne D. Wright, Trustee of the Agnes M. Living Trust, dated December 29, 1997,
General Partner

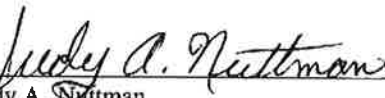
GRANTOR(s), as to parcel 2

Agnes M. Nuttman Living Trust, dated December 29, 1997

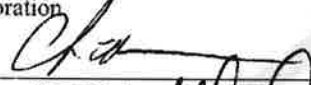

By: Jeanne D. Wright, Trustee

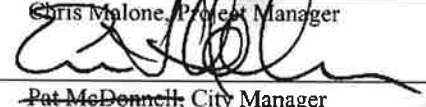

David L. Nuttman


Jeanne D. Wright

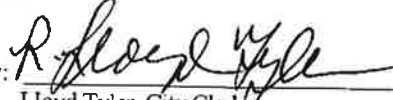

Judy A. Nuttman

Accepted on behalf of the
CITY OF VANCOUVER, a municipal
corporation

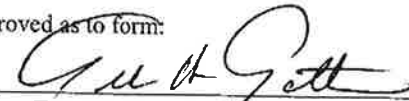
By: 
Chris Malone, Project Manager

By: 
Pat McDonnell, City Manager
ERIC HOLMES

Attest:

By: 
Lloyd Tyler, City Clerk
By: ~~Carrie Lewellen, Deputy City Clerk~~

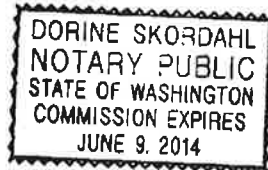
Approved as to form:


Ted H. Gathe, City Attorney

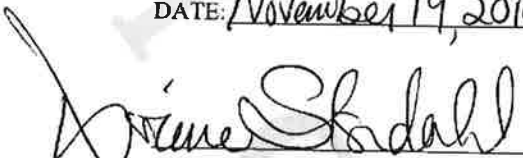
STATE OF WASHINGTON

COUNTY OF CLARK

I hereby certify that I know or have satisfactory evidence that David L. Nuttman, Jeanne D. Wright and Judy A. Nuttman appeared before me, and said persons acknowledged that they signed this instrument and acknowledged it to be their free and voluntary act for the uses and purposes mentioned in this instrument.



DATE: November 19, 2010


Notary Public in and for State of WA
residing at Vancouver
My commission expires 6-9-2014

STATE OF WASHINGTON

ss.

COUNTY OF CLARK

On this day 19th of November, 2010, before me, the undersigned, A Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared Jeanne D. Wright, to me known to be the Trustee of Agnes M. Nuttman Living Trust dated December 29, 1997 as General Partner for the Agnes Nuttman Family Limited Partnership, a Washington limited liability partnership, the entity that executed the foregoing instrument, and acknowledged the said instrument to be the free and voluntary act and deed of the said entity, for the uses and purposes therein mentioned, and on oath stated that she is authorized to execute the said instrument on behalf of the said entity.

WITNESS my hand and official seal hereto affixed the day and year in the certificate above written.

Dorine Skordahl
Signature of Notary Public

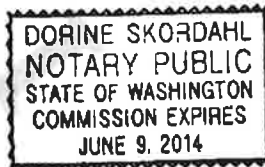
Notary Public in and for the State of Washington

Residing at

Vancouver

My Commission Expires:

6-9-2014



Acknowledgment - Corporation - Trust or - Partnership

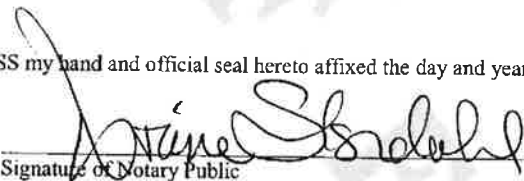
STATE OF WASHINGTON

ss.

COUNTY OF CLARK

On this day 19th of November, 2010, before me, the undersigned, A Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared Jeanne D. Wright, to me known to be the Trustee of Agnes M. Nuttman Living Trust dated December 29, 1997, the entity that executed the foregoing instrument, and acknowledged the said instrument to be the free and voluntary act and deed of the said entity, for the uses and purposes therein mentioned, and on oath stated that she is authorized to execute the said instrument on behalf of the said entity.

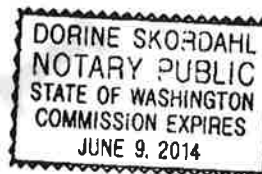
WITNESS my hand and official seal hereto affixed the day and year in the certificate above written.


Signature of Notary Public

Notary Public in and for the State of Washington

Residing at Vancouver

My Commission Expires: 6-9-2014



Acknowledgment - Corporation - Trust or - Partnership



Legal Description
Right-of-way Acquisition, Slope Easement, & Temporary Construction Permit
Parcel 83 – Nuttman Property

PARCEL I (a)

Right-of-way Acquisition

Being a parcel of land located in the Northwest One-Quarter of Section 27, Township 2 North, Range 2 East, Willamette Meridian, Clark County Washington and being a portion of that property conveyed to Agnes M. Family Limited Partnership, by deed recorded under Auditor's File No. 9806300561 in the Clark County Deed Records, said parcel being more particularly described as follows:

Commencing from the northwest corner of said Section 27; thence $S00^{\circ}25'54''W$, along the West line of said Section 27, 415.38 feet to the Westerly extension of the North line of that parcel described in deed recorded under Auditor's File No. 9806300561 in the Clark County Deed Records; thence along said Westerly extension $S88^{\circ}48'47''E$ 45.00 feet to the East right-of-way line of NE 112th Avenue and the True Point of Beginning of the herein described parcel of land; thence along said North line $S88^{\circ}48'47''E$ 10.85 feet to the beginning of a 199.01 foot radius non-tangent curve to the left; thence along said non-tangent curve to the left through a central angle of $03^{\circ}45'18''$ (chord bears $S12^{\circ}52'55''W$ 13.04 feet) 13.04 feet to the beginning of a 970.00 foot radius compound curve to the left; thence along said compound curve to the left through a central angle of $00^{\circ}43'57''$ (chord bears $S10^{\circ}38'17''W$ 12.40 feet) 12.40 feet to a point of non-tangency; thence $N88^{\circ}48'47''W$ 5.84 feet to said East right-of-way line; thence along said East right-of-way line $N00^{\circ}25'54''E$ 25.00 feet to the True Point of Beginning. Containing 204 square feet more or less.

Slope Easement

Being a slope easement located in the Northwest One-Quarter of Section 27, Township 2 North, Range 2 East, Willamette Meridian, Clark County Washington and being a portion of that property conveyed to Agnes M. Family Limited Partnership, by deed recorded under Auditor's File No. 9806300561 in the Clark County Deed Records, said easement being more particularly described as follows:

Commencing from the northwest corner of said Section 27; thence $S00^{\circ}25'54''W$, along the West line of said Section 27, 415.38 feet to the Westerly extension of the North line of that parcel described in deed recorded under Auditor's File No. 9806300561 in the Clark County Deed Records; thence along said Westerly extension and said North line $S88^{\circ}48'47''E$ 55.85 feet to the beginning of a 199.01 foot radius non-tangent curve to the left, and the True Point of Beginning of the herein described parcel of land; thence along said non-tangent curve to the left through a central angle of $03^{\circ}45'18''$ (chord bears $S12^{\circ}52'55''W$ 13.04 feet) 13.04 feet to the beginning of a 970.00 foot radius compound curve to the left; thence along said compound

300 W 15th Street • Vancouver, WA 98660 • 360/695-3488 tel • 360/695-8767 fax

curve to the left through a central angle of $00^{\circ}43'57''$ (chord bears $S10^{\circ}38'17''W$ 12.40 feet) 12.40 feet to a point of non-tangency; thence $N88^{\circ}48'47''W$ 5.84 feet to the East right-of-way line of NE 112th Avenue; thence along said East right-of-way line, $S00^{\circ}25'54''W$ 3.42 feet to an angle point, thence continuing along said East right-of-way line, $S04^{\circ}43'15''W$ 113.10 feet to an angle point; thence leaving said East right-of-way line, $S88^{\circ}48'47''E$ 12.00 feet to an angle point; thence $N14^{\circ}51'37''E$ 145.82 feet to said North line of that parcel described in deed recorded under Auditor's File No. 980630056; thence along said North line $N88^{\circ}48'47''W$ 29.00 feet to the True point of Beginning.

Temporary Construction Permit

Being a temporary construction permit located in the Northwest One-Quarter of Section 27, Township 2 North, Range 2 East, Willamette Meridian, Clark County Washington and being a portion of that property conveyed to Agnes M. Family Limited Partnership, by deed recorded under Auditor's File No. 9806300561 in the Clark County Deed Records, said temporary construction permit being more particularly described as follows:

Commencing from the northwest corner of said Section 27; thence $S00^{\circ}25'54''W$, along the West line of said Section 27, 415.38 feet to the Westerly extension of the North line of that parcel described in deed recorded under Auditor's File No. 9806300561 in the Clark County Deed Records; thence along said Westerly extension and said North line $S88^{\circ}48'47''E$ 84.85 feet to the True Point of Beginning of the herein described parcel of land; thence leaving said North line $S14^{\circ}51'37''W$ 145.82 feet to an angle point; thence $N88^{\circ}48'47''W$ 12.00 feet to the East right-of-way line of NE 112th Avenue; thence along said East right-of-way line, $S04^{\circ}43'15''W$ 97.67 feet to the South line of said parcel; thence along said South line $S88^{\circ}50'12''E$ 115.80 feet to an angle point; thence leaving said South line $N00^{\circ}25'06''E$ 10.48 feet to an angle point; thence $N88^{\circ}28'10''W$ 95.39 feet to an angle point; thence $N01^{\circ}09'40''E$ 52.11 feet to an angle point; thence $N63^{\circ}30'43''E$ 73.84 feet to an angle point; thence $N01^{\circ}09'40''E$ 19.12 feet to an angle point; thence $N88^{\circ}50'20''W$ 54.24 feet to an angle point; thence $N17^{\circ}41'44''E$ 127.86 feet to the North line of said parcel described in deed recorded under Auditor's File No. 9806300561; thence along said North line $N88^{\circ}48'47''W$ 15.23 feet to the True Point of Beginning.



7-30-09

300 W 15th Street • Vancouver, WA 98660 • 360/695-3488 tel • 360/695-8767 fax



Legal Description
Right-of-way Acquisition & Slope Easement
Parcel 82 – Nuttman Property
PARCEL II (c)

Right-of-way Acquisition

Being a parcel of land located in the Northwest One-Quarter of Section 27, Township 2 North, Range 2 East, Willamette Meridian, Clark County Washington and being a portion of that property conveyed to Agnes M. Nuttman Living Trust, by deed recorded under Deed Document No. 3096273 in the Clark County Deed Records, said parcel being more particularly described as follows:

Commencing from the northwest corner of said Section 27; thence S00°25'54"W, along the West line of said Section 27, 415.38 feet to the Westerly extension of the South line of that parcel described in deed recorded under Deed Document No. 3096273 in the Clark County Deed Records; thence along said Westerly extension S88°48'47"E 45.00 feet to the East right-of-way line of NE 112th Avenue and the True Point of Beginning of the herein described parcel of land; thence along said South line S88°48'47"E 10.85 feet to the beginning of a 1063.00 foot radius non-tangent curve to the left; thence along said non-tangent curve to the left through a central angle of 04°07'32" (chord bears N12°40'30"E 76.53 feet) 76.54 feet to the South line of the Bonneville Power Administration right-of-way; thence along said South right-of-way line N88°48'47"W 27.08 feet to said East right-of-way line; thence along said East right-of-way line S00°25'54"W 75.00 feet to the True Point of Beginning. Containing 1,457 square feet more or less.

Slope Easement

Being a slope easement located in the Northwest One-Quarter of Section 27, Township 2 North, Range 2 East, Willamette Meridian, Clark County Washington and being a portion of that property conveyed to Agnes M. Nuttman Living Trust, by deed recorded under Deed Document No. 3096273 in the Clark County Deed Records, said easement being more particularly described as follows:

Commencing from the northwest corner of said Section 27; thence S00°25'54"W, along the West line of said Section 27, 415.38 feet to the Westerly extension of the South line of that parcel described in deed recorded under Deed Document No. 3096273 in the Clark County Deed Records; thence along said Westerly extension and South line S88°48'47"E 55.85 feet to the beginning of a 1063.00 foot radius non-tangent curve to the left, and the True Point of Beginning of the herein described parcel of land; thence along said non-tangent curve to the left through a central angle of 04°07'32" (chord bears N12°40'30"E 76.53 feet) 76.54 feet to the South line of the Bonneville Power Administration right-of-way; thence along said South right-of-

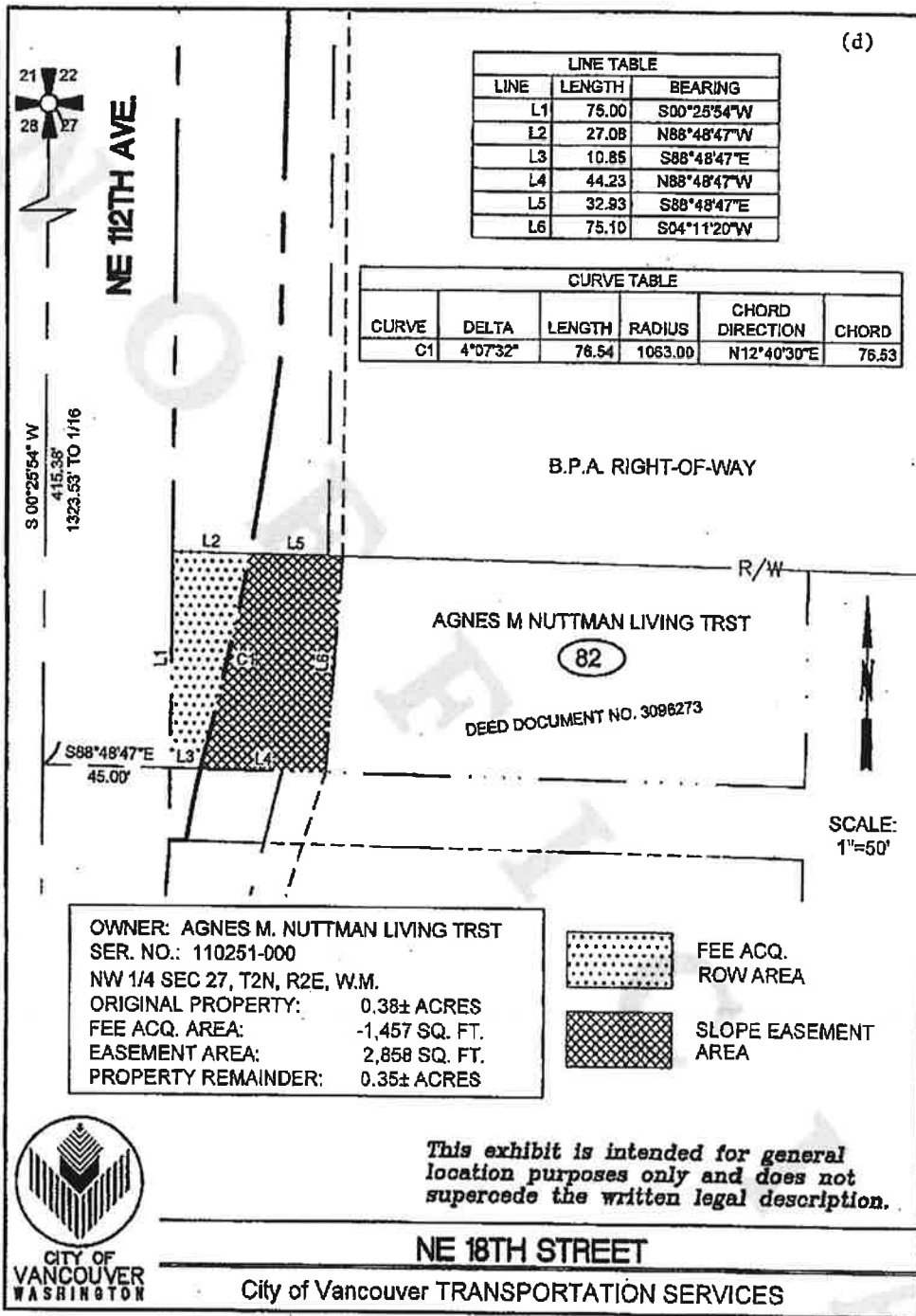
300 W 15th Street · Vancouver, WA 98660 · 360/695-3488 tel · 360/695-8767 fax

way line S88°48'47"E 32.93 feet to an angle point; thence leaving said South line, S04°11'20"W 75.10 feet to the South line of said deed recorded under Deed Document No. 3098273; thence along said South line N88°48'47"W 44.23 feet to the True Point of Beginning.

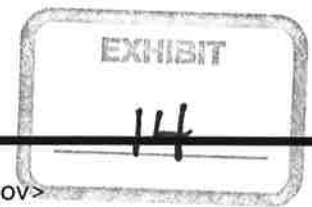


300 W 15th Street • Vancouver, WA 98660 • 360/695-3488 tel • 360/695-8767 fax

Clark Auditor Mon Aug 08 11:27:06 PDT 2011 4783753 Page 11



Corbin, Kristian



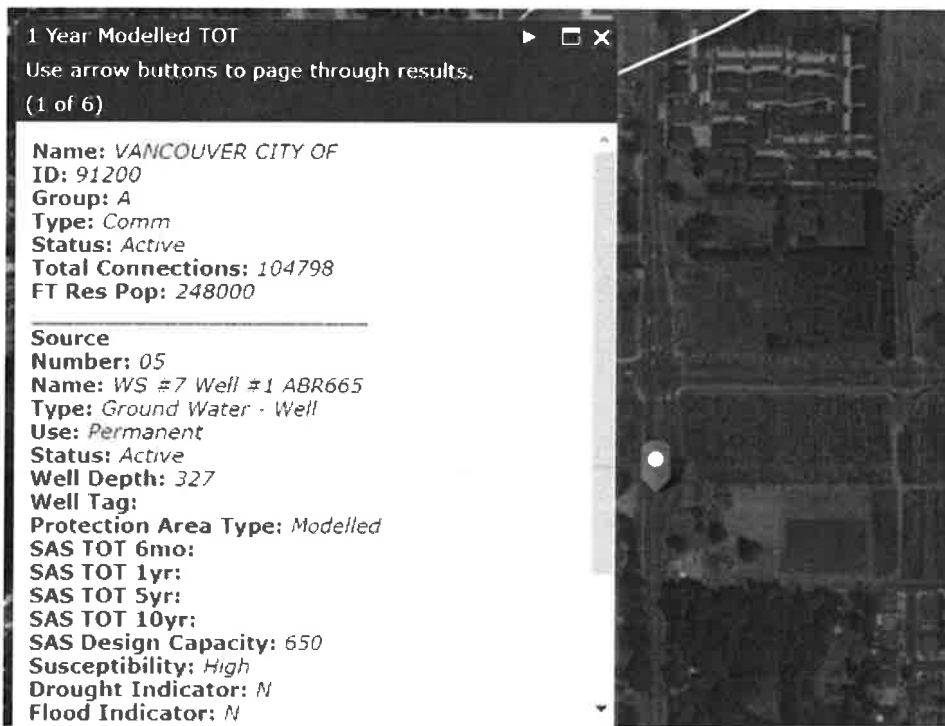
From: Johnson, Deborah L (DOH) <deborah.johnson@doh.wa.gov>
Sent: Tuesday, January 8, 2019 5:20 PM
To: Corbin, Kristian
Cc: Wilson, Brian E; Pollock, R. Scott (DOH); Schultz, Fern M (DOH)
Subject: Comments- File #PRJ-156552 & LUP-70974, Four Seasons South Subdivision PUD (SEPA #201900020)

Follow Up Flag: Follow up
Flag Status: Flagged

CAUTION: This email originated from outside of the City of Vancouver. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hello,

We noticed that an ODNS has been issued for this project. This site is located just slightly south of the Four Seasons Apartments project we commented on earlier today (appended below), & the site is within the same wellhead protection area so, irrespective of the SEPA process, should likewise be evaluated under Ch. 14.26 VMC, including those terms specifically applicable to special protection areas.



###

Thank you for your consideration. Please let me know if you have any questions or need additional information.

Deborah Johnson

Wellhead Protection Specialist
Office of Drinking Water
Environmental Public Health Division
Washington State Department of Health
deborah.johnson@doh.wa.gov



From: Johnson, Deborah L (DOH)

Sent: Tuesday, January 8, 2019 2:46 PM

To: 'mark.person@cityofvancouver.us' <mark.person@cityofvancouver.us>

Cc: 'brian.e.wilson@cityofvancouver.us' <brian.e.wilson@cityofvancouver.us>

Subject: Comments- File #PRJ-160848 & LUP-71764, Four Seasons Apartments Ph. II (SEPA #201900063)

Hello,

Thank you for the opportunity to review and comment upon the [NOA/ODNS](#) for the proposed PLS project. We have the following comments on the project:

Critical Areas. The SEPA checklist (Q. #B.8.h) indicates that there are no designated critical areas on site. While critical aquifer recharge areas (CARAs) are a form of critical area under [RCW 36.70A.030\(5\)](#), Vancouver's critical areas provisions (Ch. 20.740 VMC) do not encompass CARAs, instead referring to Ch. 14.26 VMC (VMC 20.740.010.B). VMC 14.26.115.B.1 identifies the entirety of Vancouver as being a CARA.

Ss. B.2 of this code identifies special protection areas inside the CARA, including property within 1,900 feet of "any municipal water supply well." Municipal wells are defined in VMC 14.26.110 to include City-owned Group A community water systems. There is a significant disparity between the Vancouver code definition & that in state regulations, under which wellhead protection areas (WHPAs), which are set by the purveyor in keeping with [WAC 246-290-135](#) as approved by DOH, are not limited to 1,900 feet from a well & may vary considerably in size depending on the approach taken in identifying them.

The proposed project site lies within the WHPA associated with two City of Vancouver wells (see details below) & appears to be within 1,900 feet of each source. It appears the project should be evaluated under Ch. 14.26 VMC, including those terms specifically applicable to special protection areas.

City of Vancouver, 1-year modeled time of travel, Sources #5 & #10, Wells #1 ABR665 & #2 AFP658

1 Year Modelled TOT

Use arrow buttons to page through results.

(1 of 6)

Name: VANCOUVER CITY OF

ID: 91200

Group: A

Type: Comm

Status: Active

Total Connections: 104798

FT Res Pop: 248000

Source

Number: 05

Name: WS #7 Well #1 ABR665

Type: Ground Water - Well

Use: Permanent

Status: Active

Well Depth: 327

Well Tag:

Protection Area Type: Modelled

SAS TOT 6mo:

SAS TOT 1yr:

SAS TOT 5yr:

SAS TOT 10yr:

SAS Design Capacity: 650

Susceptibility: High

Drought Indicator: N

Flood Indicator: N



Map source: <https://fortress.wa.gov/doh/eh/maps/SWAP/index.html>

###

This concludes our comments. Please let me know if you have any questions or need additional information.

For distribution of future SEPA notices, please note that our new email is SEPA.reviewteam@doh.wa.gov.

Deborah Johnson

Wellhead Protection Specialist
Office of Drinking Water
Environmental Public Health Division
Washington State Department of Health
deborah.johnson@doh.wa.gov
360-236-3133 | www.doh.wa.gov





P.O. Box 1995 • Vancouver, WA 98668-1995
www.cityofvancouver.us

EXHIBIT

15

January 3, 2019

**Notice of Final Determination of Nonsignificance (DNS)
Four Seasons South PUD
PRJ-156552/LUP-70974**

The city issued a DNS for this project Nov. 30, 2018; this determination is retained. The city received two comments from Department of Ecology. It has been determined the following described project will not have a probable significant adverse impact on the environment. Under the authority of WAC 197-11-330(1) and 197-11-350, a determination of nonsignificance has been issued.

Proponent: Patrick Ginn, Four Seasons Subdivision LLC. 800 Tenney Road #110-348 Vancouver, Washington 98671

Description: A planned unit development to create a senior-oriented 70-lot single-family subdivision and a boundary line adjustment.

Location: Tax Lots 110251000, 110252000, 110250000, and 110235000 located in the NW Quarter of Section 27, Township 2N, Range 2E of the Willamette Meridian.

Requests to appeal this decision must be made in writing within 14 calendar days after the date the decision is mailed. The letter of appeal shall state the case number designated by the city, the name of the applicant, name and signature of each petitioner, a statement showing that each petitioner is entitled to file the appeal under VMC Chapter 20.210, the specific aspect(s) of the SEPA issue being appealed, the reasons each aspect is in error as a matter of fact or law, and the evidence relied on to prove the error. A substantive appeal of the SEPA determination must be filed in conjunction with and within the limitation period applicable to an available administrative appeal of the applicable permit or approval (VMC 20.790.640.D).

All appeals, along with the required fee, must be received by 4 p.m., January 17, 2019.

Submit the appeal request and fee to Community & Economic Development Department, Permit Center, 415 W. 6th Street, or mail to PO Box 1995, Vancouver, WA 98668-1995.

Permit center hours are 8 a.m.–12:30 p.m. and 1:30 p.m.–4 p.m., except Wednesday, when permit center hours begin at 9 a.m.

Responsible Official: Kristian Corbin, Assistant Planner, PO Box 1995, Vancouver, WA 98668
Telephone: 360-487-7818
Email: kristian.corbin@cityofvancouver.us


Kristian Corbin

1-3-19
Date

EXHIBIT 16

112th Avenue Subarea Guidelines

Because of the size of the exhibit, it is not included with this report. The document is available for review at Community & Economic Development Department, 415 W 6th Street, on the first floor. If you would like to review the document, check in at the reception area of the Permit Center between the hours of 8 a.m.–12:30 p.m. and 1:30 p.m.–4 p.m., except Wednesday, when permit center hours begin at 9 a.m.

EXHIBIT 17
Traffic Study
Prepared By
Kittelson & Associates
Dated
Oct. 23, 2018

Because of the size of the exhibit, it is not included with this report. The document is available for review at Community & Economic Development Department, 415 W 6th Street, on the first floor. If you would like to review the document, check in at the reception area of the Permit Center between the hours of 8 a.m.–12:30 p.m. and 1:30 p.m.–4 p.m., except Wednesday, when permit center hours begin at 9 a.m.

Geotechnical Site Investigation

Four Seasons South

Vancouver, Washington

December 4, 2017

Geotechnical ■ Environmental ■ Special Inspections

Columbia West
E n g i n e e r i n g , I n c



11917 NE 95th Street
Vancouver, Washington
98682

Phone: 360-823-2900

Fax: 360-823-2901



**GEOTECHNICAL SITE INVESTIGATION
FOUR SEASONS SOUTH
VANCOUVER, WASHINGTON**

Prepared For:

**Mr. Patrick Ginn
Four Seasons Subdivision, LLC
800 NE Tenney Road, Suite 110-348
Vancouver, Washington 98685**

Site Location:

**1611 & 1619 NE 112th Avenue and
11610 NE 16th Street
Parcel Nos. 110251-000, 110252-000, 110250-000,
and 110235-000
Vancouver, Washington 98684**

Prepared By:

**Columbia West Engineering, Inc.
11917 NE 95th Street
Vancouver, Washington 98682
Phone: 360-823-2900
Fax: 360-823-2901**

Date Prepared:

December 4, 2017

TABLE OF CONTENTS

LIST OF FIGURES	ii
LIST OF APPENDICES	iii
1.0 INTRODUCTION	1
1.1 General Site Information	1
1.2 Proposed Development	1
2.0 REGIONAL GEOLOGY AND SOIL CONDITIONS	1
3.0 REGIONAL SEISMOLOGY	2
4.0 GEOTECHNICAL AND GEOLOGIC FIELD INVESTIGATION	4
4.1 Surface Investigation and Site Description	4
4.2 Subsurface Exploration and Investigation	5
4.2.1 Soil Type Description	5
4.2.2 Groundwater	6
5.0 DESIGN RECOMMENDATIONS	6
5.1 Site Preparation and Grading	6
5.1.1 Existing Fill	7
5.2 Engineered Structural Fill	8
5.3 Cut and Fill Slopes	8
5.4 Foundations	9
5.5 Settlement	10
5.6 Excavation	10
5.7 Lateral Earth Pressure	10
5.8 Seismic Design Considerations	11
5.9 Drainage	12
5.10 Infiltration Testing Results	13
5.11 Bituminous Asphalt and Portland Cement Concrete	14
5.12 Wet Weather Construction Methods and Techniques	15
5.13 Erosion Control Measures	16
5.14 Soil Shrink/Swell Potential	17
5.15 Utility Installation	17
6.0 CONCLUSION AND LIMITATIONS	17
REFERENCES	
FIGURES	
APPENDICES	

LIST OF FIGURES

<u>Number</u>	<u>Title</u>
1	Site Location Map
2	Exploration Location Map
3	Typical Cut and Fill Slope Cross-Section
4	Minimum Foundation Slope Setback Detail
5	Typical Foundation Drain Detail
6	Typical Perforated Drain Pipe Trench Detail

LIST OF APPENDICES

<u>Number</u>	<u>Title</u>
A	Analytical Laboratory Test Reports
B	Exploration Logs
C	Soil Classification Information
D	Photo Log
E	Report Limitations and Important Information

GEOTECHNICAL SITE INVESTIGATION

FOUR SEASONS SOUTH

VANCOUVER, WASHINGTON

1.0 INTRODUCTION

Columbia West Engineering, Inc. (Columbia West) was retained by Four Seasons Subdivision, LLC, to conduct a geotechnical site investigation for the proposed Four Seasons South residential development project located in Vancouver, Washington. The purpose of the investigation was to observe and assess subsurface soil conditions at specific locations and provide geotechnical engineering analyses, planning, and design recommendations for the proposed development. The specific scope of services was outlined in Columbia West's proposal dated October 18, 2017. This report summarizes the investigation and provides field assessment documentation and laboratory analytical test reports. This report is subject to the limitations expressed in Section 6.0, *Conclusion and Limitations*, and Appendix E.

1.1 General Site Information

As indicated on Figures 1 and 2, the subject site is located at 1619 and 1611 NE 112th Avenue; and 11610 NE 16th Street in Vancouver, Washington. The site is comprised of tax parcels 110251000, 110250000, 110252000, and 110235000, totaling approximately 9.47 acres. The regulatory jurisdictional agency is the City of Vancouver, Washington. The approximate latitude and longitude are N 45° 38' 03" and W 122° 33' 19", and the legal description is a portion of the NW ¼ of Section 27, T2N, R2E, Willamette Meridian. Parcel 110235000 (eastern 4.79 acres of the site) was inaccessible at the time of this investigation. Therefore, additional field exploration will be required to confirm whether the recommendations contained in this report are applicable parcel 110235000.

1.2 Proposed Development

Review of preliminary plans provided by SGA Engineering, Inc. indicates that proposed development will consist of a 90-lot single-family residential subdivision. Improvements will also include asphalt concrete roadways and parking areas, underground utilities, and stormwater management facilities. Columbia West has not reviewed preliminary grading plans but understands that minor cut and fill will likely be proposed at the property. This report is based upon the proposed development as described above and may not be applicable if modified.

2.0 REGIONAL GEOLOGY AND SOIL CONDITIONS

The subject site lies within the Willamette Valley/Puget Sound Lowland, a wide physiographic depression flanked by the mountainous Coast Range on the west and the Cascade Range on the east. Inclined or uplifted structural zones within the Willamette Valley/Puget Sound Lowland constitute highland areas and depressed structural zones form sediment-filled basins. The site is located in the central portion of the

Portland/Vancouver Basin, an open, somewhat elliptical, northwest-trending syncline approximately 60 miles wide.

According to the *Geologic Map of the Vancouver and Orchards Quadrangles and Parts of the Portland and Mount Tabor Quadrangles, Clark County, Washington, and Multnomah County, Oregon* (U.S. Geological Survey Scientific Investigations Map 3357), near-surface soils are expected to consist of upper-Pleistocene, rhythmically bedded, coarse-grained periglacial deposits derived from catastrophic outburst floods of Glacial Lake Missoula (Qfg).

The *Web Soil Survey* (United States Department of Agriculture, Natural Resource Conservation Service [USDA NRCS], 2017 Website) identifies surface soils as Wind River gravelly loam. Although soil conditions may vary from the broad USDA descriptions, Wind River soils are generally medium- to coarse-textured sands and gravels and somewhat excessively drained. Wind River soils typically exhibit rapid permeability, low shear strength, and slight to very severe erosion hazard based primarily on slope grade.

3.0 REGIONAL SEISMOLOGY

Recent research and subsurface mapping investigations within the Pacific Northwest appear to suggest the historic potential risk for a large earthquake event with strong localized ground movement may be underestimated. Past earthquakes in the Pacific Northwest appear to have caused landslides and ground subsidence, in addition to severe flooding near coastal areas. Earthquakes may also induce soil liquefaction, which occurs when elevated horizontal ground acceleration and velocity cause soil particles to interact as a fluid as opposed to a solid. Liquefaction of soil can result in lateral spreading and temporary loss of bearing capacity and shear strength.

There are at least four major known fault zones in the vicinity of the site that may be capable of generating potentially destructive horizontal accelerations. These fault zones are described briefly in the following text.

Portland Hills Fault Zone

The Portland Hills Fault Zone consists of several northwest-trending faults located along the northeastern margin of the Tualatin Mountains, also known as the Portland Hills, and the southwest margin of the Portland Basin. The fault zone is approximately 25 to 30 miles in length and is located approximately 10 miles southwest of the site. According to *Seismic Design Mapping, State of Oregon* (Geomatrix Consultants, 1995), there is no definitive consensus among geologists as to the zone fault type. Several alternate interpretations have been suggested.

According to the *USGS Earthquake Hazards Program*, the fault was originally mapped as a down-to-the-northeast normal fault, but has also been mapped as part of a regional-scale zone of right-lateral, oblique slip faults, and as a steep escarpment caused by asymmetrical folding above a south-west dipping, blind thrust fault. The Portland Hills fault offsets Miocene Columbia River Basalts, and Miocene to Pliocene sedimentary rocks of the Troutdale Formation. No fault scarps on surficial Quaternary deposits have been

described along the fault trace, and the fault is mapped as buried by the Pleistocene-aged Missoula flood deposits.

However, evidence suggests that fault movement has impacted shallow Holocene deposits and deeper Pleistocene sediments. Seismologists recorded a M3.2 earthquake thought to be associated with the fault zone near Kelly Point Park in November 2012, a M3.9 earthquake thought to be associated with the fault zone near Kelly Point Park in April 2003, and a M3.5 earthquake possibly associated with the fault zone occurred approximately 1.3 miles east of the fault in 1991. Therefore, the Portland Hills Fault Zone is generally thought to be potentially active and capable of producing possible damaging earthquakes.

Gales Creek-Newberg-Mt. Angel Fault Zone

Located approximately 30 miles southwest of the site, the northwest-striking, approximately 50-mile long Gales Creek-Newberg-Mt. Angel Structural Zone forms the northwestern boundary between the Oregon Coast Range and the Willamette Valley, and consists of a series of discontinuous northwest-trending faults. The southern end of the fault zone forms the southwest margin of the Tualatin basin. Possible late-Quaternary geomorphic surface deformation may exist along the structural zone (Geomatrix Consultants, 1995).

According to the *USGS Earthquake Hazards Program*, the Mount Angel fault is mapped as a high-angle, reverse-oblique fault, which offsets Miocene rocks of the Columbia River Basalts, and Miocene and Pliocene sedimentary rocks. The fault appears to have controlled emplacement of the Frenchman Spring Member of the Wanapum Basalts, and thus must have a history that predates the Miocene age of these rocks. No unequivocal evidence of deformation of Quaternary deposits has been described, but a thick sequence of sediments deposited by the Missoula floods covers much of the southern part of the fault trace.

Although no definitive evidence of impacts to Holocene sediments have clearly been identified, the Mount Angel fault appears to have been the location of minor earthquake swarms in 1990 near Woodburn, Oregon, and a M5.6 earthquake in March 1993 near Scotts Mills, approximately four miles south of the mapped extent of the Mt. Angel fault. It is unclear if the earthquake occurred along the fault zone or a parallel structure. Therefore, the Gales Creek-Newberg-Mt. Angel Structural Zone is considered potentially active.

Lacamas Lake-Sandy River Fault Zone

The northwest-trending Lacamas Lake Fault and northeast-trending Sandy River Fault intersect north of Camas, Washington approximately 7 ½ miles southeast of the site, and form part of the northeastern margin of the Portland basin. According to *Geology and Groundwater Conditions of Clark County Washington* (USGS Water Supply Paper 1600, Mundorff, 1964) and the *Geologic Map of the Lake Oswego Quadrangle* (Oregon DOGAMI Series GMS-59, 1989), the Lacamas Lake fault zone consists of shear contact between

the Troutdale Formation and underlying Oligocene andesite-basalt bedrock. Secondary shear contact associated with the fault zone may have produced a series of prominent northwest-southeast geomorphic lineaments in proximity to the site.

According to the *USGS Earthquake Hazards Program* the fault has been mapped as a normal fault with down-to-the-southwest displacement, and has also been described as a steeply northeast or southwest-dipping, oblique, right-lateral, slip-fault. The trace of the Lacamas Lake fault is marked by the very linear lower reach of Lacamas Creek. No fault scarps on Quaternary surficial deposits have been described. The Lacamas Lake fault offsets Pliocene-aged sedimentary conglomerates generally identified as the Troutdale formation, and Pliocene- to Pleistocene-aged basalts generally identified as the Boring Lava formation.

Recent seismic reflection data across the probable trace of the fault under the Columbia River yielded no unequivocal evidence of displacement underlying the Missoula flood deposits, however, recorded mild seismic activity during the recent past indicates this area may be potentially seismogenic.

Cascadia Subduction Zone

The Cascadia Subduction Zone has recently been recognized as a potential source of strong earthquake activity in the Portland/Vancouver Basin. This phenomenon is the result of the earth's large tectonic plate movement. Geologic evidence indicates that volcanic ocean floor activity along the Juan de Fuca ridge in the Pacific Ocean causes the Juan de Fuca Plate to perpetually move east and subduct under the North American Continental Plate. The subduction zone results in historic volcanic and potential earthquake activity in proximity to the plate interface, believed to lie approximately 20 to 50 miles west of the general location of the Oregon and Washington coast (Geomatrix Consultants, 1995).

4.0 GEOTECHNICAL AND GEOLOGIC FIELD INVESTIGATION

A geotechnical field investigation consisting of visual reconnaissance, six test pits (TP-1 through TP-6), and three infiltration tests was conducted at the site on November 3, 2017. Test pits were explored with a track-mounted excavator. Subsurface soil profiles were logged in accordance with Unified Soil Classification System (USCS) specifications. Disturbed soil samples were collected from relevant soil horizons and submitted for laboratory analysis. Analytical laboratory test results are presented in Appendix A. Exploration locations are indicated on Figure 2. Subsurface exploration logs are presented in Appendix B. Soil descriptions and classification information are provided in Appendix C. A photo log is presented in Appendix D.

4.1 Surface Investigation and Site Description

The approximate 9.47-acre subject site consists of four parcels located east of NE 112th Avenue and north of NE 16th Street in Vancouver, Washington. Field reconnaissance and review of site topographic mapping indicates relatively flat to gently sloping terrain with grades generally ranging from 0 to 15 percent. Site elevations range from approximately 296 feet above mean sea level (amsl) in the northern central portion of the site to 312 feet

amsl in the southern portion of parcel 110252000. Currently, the site appears minimally developed with three outbuildings on the western portion of the site, three outbuildings on the northeastern portion of the site, and several gravel roadways bordering the agricultural plots characterizing much of the site. Vegetation within the western portion of the site primarily consist of grass in open areas with sparse tree coverage. The eastern half of parcel 110252000 and western half of parcel 110235000 are currently being used for agricultural purposes. The eastern half of parcel 110235000 appears to be covered with grassy areas in the northern portion, more densely populated trees in the central portion, and small stockpiles of mulch and tree logs in the southern portion.

4.2 Subsurface Exploration and Investigation

Test pit explorations TP-1 through TP-6 were advanced at the site to a maximum depth of 14.0 feet below ground surface (bgs). Exploration locations were selected to observe subsurface soil characteristics in proximity to proposed development areas and are indicated on Figure 2.

4.2.1 Soil Type Description

The field investigation indicated the site is generally covered with approximately 4 to 18 inches of sod and topsoil in the observed locations. Underlying the topsoil layer, subsurface soils resembling native USDA Wind River soil series descriptions were generally encountered. Subsurface lithology was reasonably consistent at all explored locations and may generally be described by soil types identified in the following text.

Soil Type 1 – Undocumented FILL

Soil Type 1 was observed to primarily consist of native materials previously excavated and repurposed on the site as FILL. Beneath the topsoil layer in test pit TP-6 and in the northern portion of test pit TP-1, Soil Type 1A was observed to consist of dark brown, moist, medium dense clayey SAND with gravel. These materials extended to approximately 8.5 feet bgs in the northern portion of test pit TP-1 where they were underlain by Soil Type 3. In test pit TP-6, these clayey sand materials extended to approximately 5 feet bgs where they were underlain by additional repurposed native FILL, designated as Soil Type 1B. Soil Type 1B was observed to consist of dark gray, damp, poorly-graded SAND with gravel and clayey sand lenses and layers. Soil Type 1B was observed below Soil Type 1A in test pit TP-6 and extended to approximately 9 feet bgs where it was underlain by Soil Type 3.

Soil Type 2 – Clayey SAND

Soil Type 2 was observed to primarily consist of brown, moist, medium dense, clayey SAND. Soil Type 2 was observed below the topsoil layer in the southern portion of test pit TP-1 and in test pits TP-3 through TP-5. Soil Type 2 extended approximately four feet bgs where it was underlain by Soil Type 3.

Analytical laboratory testing conducted upon a representative soil sample obtained from test pit TP-2 indicated approximately 28 percent by weight passing the No. 200 sieve and an in situ moisture content of approximately 19 percent. Atterberg Limits analysis

indicated the tested sample of Soil Type 2 had a liquid limit of 34 and a plasticity index of 14. The laboratory tested sample of Soil Type 2 is classified SC according to USCS specifications and A-2-6(1) according to AASHTO specifications.

Soil Type 3 – Poorly-graded SAND

Soil Type 3 was observed to consist of dark gray, damp to moist, medium dense poorly-graded SAND with silt and dark gray, damp, poorly-graded SAND. Soil Type 3 was observed below Soil Types 1A and 2 in the northern and southern portions of test pit TP-1, respectively; below Soil Type 1B in test pit TP-6; and below Soil Type 2 in test pits TP-2, through TP-5. Soil Type 3 extended to the maximum depth of exploration in all test pits.

Analytical laboratory testing conducted upon a representative soil sample obtained from test pit TP-4 indicated approximately 1 percent by weight passing the No. 200 sieve and an in situ moisture content of approximately 10 percent. Atterberg Limits analysis indicated the tested sample of Soil Type 3 is nonplastic. The laboratory tested sample of Soil Type 3 is classified SP according to USCS specifications and A-1-b(0) according to AASHTO specifications.

4.2.2 Groundwater

Groundwater was not encountered in the test pit excavations to the maximum explored depth of 14.0 feet bgs. According to *Clark County Maps Online*, groundwater within the vicinity is approximately 100 feet bgs. Groundwater levels are often subject to seasonal variance and may rise during extended periods of increased precipitation. Perched groundwater may also be present in localized areas. Seeps and springs may become evident during site grading, primarily along slopes or in areas cut below existing grade. Structures, roads, and drainage design should be planned accordingly.

5.0 DESIGN RECOMMENDATIONS

The geotechnical site investigation suggests the proposed development is generally compatible with surface and subsurface soils, provided the recommendations presented in this report are utilized and incorporated into the design and construction processes. Design recommendations are presented in the following text sections. As previously mentioned, parcel 110235000 was inaccessible at the time of this investigation. Therefore, additional field exploration will be required to confirm that the below recommendations are applicable to that portion of the site.

5.1 Site Preparation and Grading

Vegetation, organic material, unsuitable fill, and deleterious material that may be encountered should be cleared from areas identified for structures and site grading. Vegetation, other organic material, and debris should be removed from the site. Stripped topsoil should also be removed, or used only as landscape fill in nonstructural areas with slopes less than 25 percent. The anticipated stripping depth for sod and highly organic topsoil is anticipated to vary between 4 and 18 inches. The required stripping depth may increase in areas of existing fill, heavy organics, agricultural plots, or previously existing structures. Actual stripping depths should be determined based upon visual observations

made during construction when soil conditions are exposed. The post construction maximum depth of landscape fill placed or spread at any location onsite should not exceed one foot.

Previously disturbed soil, debris, or unconsolidated fill encountered during grading or construction activities should be removed completely and thoroughly from structural areas. Based on observations made during the field investigation, undocumented fill materials are present in certain locations throughout the site. Approximate areas observed to contain undocumented fill material are indicated on Figure 2. Additional filled areas may be uncovered during construction operations. Further evaluation by Columbia West will be required to determine whether these materials are suitable for reuse as structural fill on the site.

Demolition work prior to site improvements construction may generate unsuitable fill and disturbed soils in areas of old foundations, basement walls, utilities, and debris. These materials should also be thoroughly removed from structural areas and backfilled with engineered structural fill.

Test pits excavated during site exploration were backfilled loosely with onsite soils. These test pits should be located and properly backfilled with structural fill during site improvements construction. Trees, stumps, and associated roots should also be removed from structural areas, individually and carefully. Resulting cavities and excavation areas should be backfilled with engineered structural fill.

Site grading activities should be performed in accordance with requirements specified in the 2015 *International Building Code* (IBC), Chapter 18 and Appendix J, with exceptions noted in the text herein. Site preparation, soil stripping, and grading activities should be observed and documented by Columbia West.

5.1.1 Existing Fill

As previously discussed and indicated in Figure 2, existing fill was observed at the subject site in test pits TP-1 and TP-6. Subsurface exploration and field reconnaissance indicate that existing fill, in the areas observed, primarily consists of dark brown clayey sand with gravel and dark gray poorly-graded sand with gravel and clayey sand lenses and layers. Site observations and subsurface exploration indicated that existing fill extended up to 9 feet below ground surface in the areas explored.

Existing fill (Soil Type 1) and other previously disturbed soils or debris should be removed completely and thoroughly from proposed building footprints. In some areas, existing fill may directly overlie vegetation and the original topsoil layer. This material should also be removed completely from proposed building locations. Upon removal of existing fill, Columbia West should observe the exposed subgrade.

Based upon Columbia West's investigation, most existing fill soils (Soil Type 1) appear to be acceptable for reuse as structural fill, provided materials are observed to exhibit index properties similar to those observed during this investigation and that construction adheres to the specifications presented in this report. Portions of existing fill found to contain highly

organic or clayey soils, debris, or other deleterious material should be removed. Recommendations regarding the suitability of reusing existing fill soils as structural fill material should be provided in the field by Columbia West during construction. It should be noted that the limited scope of exploration conducted for this investigation cannot wholly eliminate uncertainty regarding the presence of unsuitable soils in areas not explored.

5.2 Engineered Structural Fill

Areas proposed for fill placement should be appropriately prepared as described in the preceding text. Surface soils should then be scarified and compacted prior to additional fill placement. Engineered structural fill should be placed in loose lifts not exceeding 12 inches in depth and compacted using standard conventional compaction equipment. The soil moisture content should be within two percentage points of optimum conditions. A field density at least equal to 95 percent of the maximum dry density, obtained from the standard Proctor moisture-density relationship test (ASTM D698), is recommended for structural fill placement. For engineered structural fill placed on sloped grades, the area should be benched to provide a horizontal surface for compaction.

Compaction of engineered structural fill should be verified by nuclear gauge field compaction testing performed in accordance with ASTM D6938. Field compaction testing should be performed for each vertical foot of engineered fill placed. Engineered fill placement should be observed by Columbia West.

Engineered structural fill placement activities should be performed during dry summer months if possible. Clean native soils may be suitable for use as structural fill if adequately dried or moisture-conditioned to achieve recommended compaction specifications. Native soils may require addition of moisture during late summer months or after extended periods of warm dry weather. Compacted fine-textured fill soils should be covered shortly after placement to maintain moisture conditions and minimize shrink swell potential.

If adequate compaction is not achievable with clean native soils, import structural fill consisting of granular fill meeting WSDOT specifications for *Gravel Borrow 9-03.14(1)* is recommended.

Representative samples of proposed engineered structural fill should be submitted for laboratory analysis and approval by Columbia West prior to placement. Laboratory analyses should include particle-size gradation and standard Proctor moisture-density analysis.

5.3 Cut and Fill Slopes

Fill placed on existing grades steeper than 5H:1V should be horizontally benched at least 10 feet into the slope. Fill slopes greater than six feet in height should be vertically keyed into existing subsurface soil. A typical fill slope cross-section is shown in Figure 3. Drainage implementations, including subdrains or perforated drain pipe trenches, may also be necessary in proximity to cut and fill slopes if seeps or springs are encountered. Drainage design may be performed on a case-by-case basis. Extent, depth, and location

of drainage may be determined in the field by Columbia West during construction when soil conditions are exposed. Failure to provide adequate drainage may result in soil sloughing, settlement, or erosion.

Final cut or fill slopes at the site should not exceed 2H:1V without individual slope stability analysis. The values above assume a minimum horizontal setback for loads of 10 feet from top of cut or fill slope face or overall slope height divided by three (H/3), whichever is greater. A minimum slope setback detail for structures is presented in Figure 4.

Concentrated drainage or water flow over the face of slopes should be prohibited, and adequate protection against erosion is required. Fill slopes should be constructed by placing fill material in maximum 12-inch level lifts, compacting as described in Section 5.2, *Engineered Structural Fill* and horizontally benching where appropriate. Fill slopes should be overbuilt, compacted, and trimmed at least two feet horizontally to provide adequate compaction of the outer slope face. Proper cut and fill slope construction is critical to overall project stability and should be observed and documented by Columbia West.

5.4 Foundations

Residential foundations are anticipated to consist of shallow continuous perimeter or column spread footings. Footings should be designed by a licensed structural engineer and conform to the recommendations below. Typical residential building loads are not expected to exceed approximately 2 to 3 kips per foot for perimeter footings or 10 kips per column. If actual loading exceeds anticipated loading, additional analysis should be conducted for the specific load conditions and proposed footing dimensions.

The existing ground surface should be prepared as described in Section 5.1, *Site Preparation and Grading*, and Section 5.2, *Engineered Structural Fill*. Foundations should bear upon firm native soil or engineered structural fill.

To evaluate bearing capacity for proposed structures, serviceability and reliability of shear resistance for subsurface soils was considered. Allowable bearing capacity is typically a function of footing dimension and subsurface soil properties, including settlement and shear resistance. Based upon in situ field testing and laboratory analysis, the estimated allowable bearing capacity for well-drained foundations prepared as described above is 1,500 psf. Bearing capacity may be increased by one-third for transient lateral forces such as seismic or wind. The estimated coefficient of friction between in situ compacted native soil or engineered structural fill and in-place poured concrete is 0.45. Lateral forces may also be resisted by an assumed passive soil equivalent fluid pressure of 250 psf/f against embedded footings. The upper six inches of soil should be neglected in passive pressure calculations.

As previously mentioned, parcel 110235000 was inaccessible at the time of this investigation. Therefore, additional field exploration will be required to confirm that the above allowable bearing capacity value and the below corresponding settlement estimates are applicable to that portion of the site.

Footings should extend to a depth at least 18 inches below lowest adjacent grade to provide adequate bearing capacity and protection against frost heave. Foundations constructed during wet weather conditions will require over-excavation of saturated subgrade soils and granular structural backfill prior to concrete placement. Over-excavation recommendations should be provided by Columbia West during foundation excavation and construction. Excavations adjacent to foundations should not extend within a 1.5H:1V angle projected down from the outside bottom footing edge without additional geotechnical analysis.

Foundations should not be permitted to bear upon existing fill or disturbed soil. Because soil is often heterogeneous and anisotropic, Columbia West should observe foundation excavations prior to placing forms or reinforcing bar to verify subgrade support conditions are as anticipated in this report.

5.5 Settlement

Total long-term static footing displacement for shallow foundations constructed as described in this report is not anticipated to exceed approximately 1 inch. Differential settlement between comparably loaded footing elements is not expected to exceed approximately ½ inch over a span of 50 feet. The resulting vertical displacement after loading may be due to elastic distortion, dissipation of excess pore pressure, or soil creep.

5.6 Excavation

Soils at the site were explored to a maximum depth of 14.0 feet using a track-mounted excavator. Bedrock was not observed within test pit explorations and blasting or specialized rock-excavation techniques are not anticipated.

Groundwater was not encountered within the test pit excavations, however, perched groundwater layers may exist in other areas of the site depending on seasonal fluctuations of the water table.

Based upon laboratory analysis and field testing, near-surface soils may be Washington State Industrial Safety and Health Administration (WISHA) Type C. For temporary open-cut excavations deeper than four feet, but less than 20 feet in soils of these types, the maximum allowable slope is 1.5H:1V. WISHA soil type should be confirmed during field construction activities by the contractor. Soil is often anisotropic and heterogeneous, and it is possible that WISHA soil types determined in the field may differ from those described above.

The contractor should be held responsible for site safety, sloping, and shoring. Columbia West is not responsible for contractor activities and in no case should excavation be conducted in excess of all applicable local, state, and federal laws.

5.7 Lateral Earth Pressure

If retaining walls are proposed, lateral earth pressures should be carefully considered in the design process. Hydrostatic pressure and additional surcharge loading should also be considered. Retained material may include engineered structural backfill or undisturbed native soil. Structural wall backfill should consist of imported granular material meeting

Section 9-03.12(2) of WSDOT Standard Specifications. Backfill should be prepared and compacted to at least 95 percent of maximum dry density as determined by the modified Proctor test (ASTM D1557). Recommended parameters for lateral earth pressures for retained soils and engineered structural backfill consisting of imported granular fill meeting WSDOT specifications for *Gravel Backfill for Walls 9-03.12(2)* are presented in Table 1.

The design parameters presented in Table 1 are valid for static loading cases only and are based upon in situ existing soils or compacted granular fill. The recommended earth pressures do not include surcharge loads, dynamic loading, hydrostatic pressure, or seismic design.

Table 1. Lateral Earth Pressure Parameters for Level Backfill

Retained Soil	Equivalent Fluid Pressure for Level Backfill			Wet Density	Drained Internal Angle of Friction
	At-rest	Active	Passive		
Undisturbed native Clayey SAND (Soil Type 2)	58 pcf	38 pcf	345 pcf	115 pcf	30°
Undisturbed native Poorly-graded SAND (Soil Type 3)	56 pcf	37 pcf	391 pcf	120 pcf	32°
Approved Structural Backfill Material	52 pcf	32 pcf	568 pcf	135 pcf	38°
WSDOT 9-03.12(2) compacted aggregate backfill					

* The upper 6 inches of soil should be neglected in passive pressure calculations. If exterior grade from top or toe of retaining wall is sloped, Columbia West should be contacted to provide location-specific lateral earth pressures.

If seismic design is required for unrestrained walls, seismic forces may be calculated by superimposing a uniform lateral force of $10H^2$ pounds per lineal foot of wall, where H is the total wall height in feet. The resultant force should be applied at 0.6H from the base of the wall.

A continuous one-foot-thick zone of free-draining, washed, open-graded 1-inch by 2-inch drain rock and a 4-inch perforated gravity drain pipe is assumed behind retaining walls. Geotextile filter fabric should be placed between the drain rock and backfill soil. Specifications for drainpipe design are presented in Section 5.9, *Drainage*. If walls cannot be gravity drained, saturated base conditions and/or applicable hydrostatic pressures should be assumed.

Final retaining wall design should be reviewed and approved by Columbia West. Retaining wall subgrade and backfill activities should also be observed and tested for compliance with recommended specifications by Columbia West during construction.

5.8 Seismic Design Considerations

According to the *United States Geologic Survey (USGS) 2012 Seismic Design Maps Summary Report*, the anticipated peak ground and maximum considered earthquake spectral response accelerations resulting from seismic activity for the subject site are summarized in Table 2.

Table 2. Approximate Probabilistic Ground Motion Values for ‘firm rock’ sites based on subject property longitude and latitude

	2% Probability of Exceedance in 50 yrs
Peak Ground Acceleration	0.39 g
0.2 sec Spectral Acceleration	0.90 g
1.0 sec Spectral Acceleration	0.39 g

The listed probabilistic ground motion values are based upon “firm rock” sites with an assumed shear wave velocity of 2,500 ft/s in the upper 100 feet of soil profile. These values should be adjusted for site class effects by applying site coefficients F_a and F_v as defined in 2015 IBC Tables 1613.3.3(1) and (2); the PGA should be adjusted by applying the site coefficient F_{PGA} as defined by *ASCE 7, Chapter 11, Table 11.8-1*. The site coefficients are intended to more accurately characterize estimated peak ground and respective earthquake spectral response accelerations by considering site-specific soil characteristics and index properties.

The *Site Class Map of Clark County, Washington* (Washington State Department of Natural Resources, 2004), indicates site soils may be represented by Site Class C. Based upon observed subsurface soil conditions at the site and review of well logs and local geologic maps, site soils may be considered to be Site Class C as defined in 2015 IBC Section 1613.3.5. This site class designation indicates that some amplification of seismic energy may occur during a seismic event because of subsurface conditions.

Localized peak ground accelerations exceeding the adjusted values may occur in some areas in direct proximity to an earthquake’s origin. This may be a result of amplification of seismic energy due to depth to competent bedrock, compression and shear wave velocity of bedrock, presence and thickness of loose, unconsolidated alluvial deposits, soil plasticity, grain size, and other factors.

Identification of specific seismic response spectra is beyond the scope of this investigation. If site structures are designed in accordance with recommendations specified in the *2015 IBC*, the potential for peak ground accelerations in excess of the adjusted and amplified values should be understood.

5.9 Drainage

At a minimum, site drainage should include surface water collection and conveyance to properly designed stormwater management structures and facilities. Drainage design in general should conform to City of Vancouver regulations. Finished site grading should be conducted with positive drainage away from structures. Depressions or shallow areas that may retain ponding water should be avoided. Roof drains, low-point drains, and perimeter foundation drains are recommended for structures. Drains should consist of separate

systems and gravity flow with a minimum two-percent slope away from foundations into the stormwater system or approved discharge location.

Perimeter foundation drains should consist of 3-inch perforated PVC pipe surrounded by a minimum of 1 ft³ of clean, washed drain rock per linear foot of pipe and wrapped with geotextile filter fabric. Open-graded drain rock with a maximum particle size of 3 inches and less than 2 percent passing the No. 200 sieve is recommended. Geotextile filter fabric should consist of Mirafi 140N or approved equivalent, with AOS between No. 70 and No. 100 sieve. The water permittivity should be greater than 1.5/sec. Figure 5 presents a typical foundation drain. Perimeter drains may limit increased hydrostatic pressure beneath footings and assist in reducing potential perched moisture areas.

Subdrains should also be considered if portions of the site are cut below surrounding grades. Shallow groundwater, springs, or seeps should be conveyed via drainage channel or perforated pipe into the stormwater management system or an approved discharge. Recommendations for design and installation of perforated drainage pipe may be performed on a case-by-case basis by the geotechnical engineer during construction. Failure to provide adequate surface and sub-surface drainage may result in soil slumping or unanticipated settlement of structures exceeding tolerable limits. A typical perforated drain pipe trench detail is presented in Figure 6.

Foundation drains and subdrains should be closely monitored after construction to assess their effectiveness. If additional surface or shallow subsurface seeps become evident, the drainage provisions may require modification or additional drains. Columbia West should be consulted to provide appropriate recommendations.

5.10 Infiltration Testing Results

To investigate the feasibility of subsurface disposal of stormwater, Columbia West conducted in situ infiltration testing at two locations within the project area on November 3, 2017. Results of in situ infiltration testing are presented in Table 3. The soil classifications presented in Table 3 are based upon laboratory analysis when available. The measured infiltration rates are presented as a coefficient of permeability (k) and have been reported without application of a factor of safety. As previously mentioned, parcel 110235000 was inaccessible at the time of this investigation. Therefore, additional infiltration testing should be performed on that portion of the site before the design of infiltration facilities is finalized.

As indicated in Table 3, tests were conducted in test pits TP-2 and TP-4 at the indicated depths. Soils in the tested locations were observed and sampled where appropriate to adequately characterize the subsurface profile. Tested native soils are classified as clayey SAND (SC); and poorly-graded SAND (SP). Soil laboratory analytical test reports are provided in Appendix A.

Single-ring, falling head infiltration testing was performed by inserting three-inch diameter pipes into the soil at the noted depths. The tests were conducted by filling the pipes with water and measuring time relative to changes in hydraulic head at regular intervals. Using

Darcy's Law for saturated flow in homogeneous media, the coefficient of permeability (k) was then calculated.

Table 3. Infiltration Test Data

Infiltration Test No.	Location (See Figure 2)	Approximate Test Depth (feet bgs)	Groundwater Depth (feet bgs)	Soil Type*	Passing No. 200 Sieve (%)	Measured Infiltration Rate (Coefficient of Permeability, k) (inches/hour)**
IT-2.1	TP-2 (See Figure 2)	2.0	Not Encountered	SC, Clayey SAND	28.0	8.8
IT-2.2	TP-2 (See Figure 2)	6.0	Not Encountered	SP, Poorly-graded SAND*	-	> 250
IT-4.1	TP-4 (See Figure 2)	6.5	Not Encountered	SP, Poorly-graded SAND	1.0	232

* Indicates visual soil classification.

** Infiltration rate as defined by soil's approximate vertical coefficient of permeability [k].

The reported infiltration rates, as defined by the soil's vertical coefficient of permeability, reflect approximate raw observed data, without application of a factor of safety. An appropriate correction factor should be developed for proposed stormwater facilities and applied to the observed infiltration rates prior to use in design calculations.

Infiltration facilities should be protected from erosion, especially during construction. Improperly designed or constructed systems may become fouled or plugged with mud or micaceous sediment. Excavation and preparation of stormwater disposal facilities should be closely monitored by Columbia West. An emergency overflow discharge point should be provided.

It is important to note that site soil conditions and localized infiltration capability may be variable. Therefore, infiltration rates should be verified by additional testing during construction when subgrade soils are exposed. Subgrade soils should be observed by Columbia West to verify soil index properties pertaining to infiltration are similar to those at the tested locations.

The observed infiltration rates provided in Table 3 are based upon an assumed adequate separation distance between the infiltrating surface and the ground water table and Columbia West's observations during limited subsurface exploration. Therefore, they may not be an accurate indicator of post-developed long-term system performance. It should be understood that systems may require additional infiltration capacity if submerged or mounded conditions are present, or construction verification testing or future performance indicate the system is not functioning according to original tested and designed parameters.

5.11 Bituminous Asphalt and Portland Cement Concrete

Based upon review of preliminary site plans, proposed development will include new private asphalt concrete parking areas and drive aisles. Columbia West recommends

adherence to City of Vancouver standards for street improvements in the public right-of-way.

For dry weather construction, pavement surface sections should bear upon competent subgrade consisting of scarified and compacted native soil or engineered structural fill. Wet weather pavement construction is discussed in Section 5.14, *Wet Weather Construction Methods and Techniques*. Subgrade conditions should be evaluated and tested by Columbia West prior to placement of crushed aggregate base. Subgrade evaluation should include nuclear gauge density testing and wheel proof-roll observations conducted with a 12-cubic yard, double-axle dump truck or equivalent. Nuclear gauge density testing should be conducted at 150-foot intervals or as determined by the onsite geotechnical engineer. Subgrade soil should be compacted to at least 95 percent of the modified Proctor dry density, as determined by ASTM D1557. Areas of observed deflection or rutting during proof-roll evaluation should be excavated to a firm surface and replaced with compacted crushed aggregate.

Crushed aggregate base should be compacted and tested in accordance with the specifications outlined above. Asphalt concrete pavement should be compacted to at least 91 percent of maximum Rice density. Nuclear gauge density testing should be conducted to verify adherence to recommended specifications. Testing frequency should be in accordance with Washington Department of Transportation and City of Vancouver specifications.

Portland cement concrete curbs and sidewalks should be installed in accordance with City of Vancouver specifications. Curb and sidewalk aggregate base should be observed and proof-rolled by Columbia West. Soft areas that deflect or rut should be stabilized prior to pouring concrete. Field sampling and testing of concrete during installation should be performed in accordance with ASTM C172. This includes casting a set of at least four cylindrical concrete specimens at a minimum frequency of one set per 100 cubic yards of poured concrete. The concrete test cylinders should be molded and cured in accordance with ASTM C31 and tested for compressive strength in accordance with ASTM C39. Concrete sampling and testing should also adhere to Washington Department of Transportation and City of Vancouver specifications, where applicable, in addition to the above mentioned ASTM standards and specifications.

5.12 Wet Weather Construction Methods and Techniques

Wet weather construction often results in significant shear strength reduction and soft areas that may rut or deflect. Installation of granular working layers may be necessary to provide a firm support base and sustain construction equipment. Granular layers should consist of all-weather gravel, 2x4-inch gabion, or other similar material (six-inch maximum size with less than five percent passing the No. 200 sieve).

Construction equipment traffic across exposed soil should be minimized. Equipment traffic induces dynamic loading, which may result in weak areas and significant reduction in shear strength for wet soils. Wet weather construction may also result in generation of

significant excess quantities of soft wet soil. This material should be removed from the site or stockpiled in a designated area.

Construction during wet weather conditions may require increased base thickness. Over-excavation of subgrade soils or subgrade amendment with lime and/or cement may be necessary to provide a firm base upon which to place crushed aggregate. Geotextile filter fabric is also recommended. If soil amendment with lime or cement is considered, Columbia West should be contacted to provide appropriate recommendations based upon observed field conditions and desired performance criteria.

Crushed aggregate base should be installed in a single lift with trucks end-dumping from an advancing pad of granular fill. During extended wet periods, stripping activities may also need to be conducted from an advancing pad of granular fill. Once installed, the crushed aggregate base should be compacted with several passes from a static drum roller. A vibratory compactor is not recommended because it may further disturb the subgrade. Subdrains may also be necessary to provide subgrade drainage and maintain structural integrity.

Crushed aggregate base should be compacted to at least 95 percent of maximum dry density according to the modified Proctor density test (ASTM D1557). Compaction should be verified by nuclear gauge density testing. Observation of a proof-roll with a loaded dump truck is also recommended as an indication of the compacted aggregate's performance.

It should be understood that wet weather construction is risky and costly. Columbia West should observe and document wet weather construction activities. Proper construction methods and techniques are critical to overall project integrity.

5.13 Erosion Control Measures

Based upon field observations and laboratory testing, the erosion hazard for site soils in flat to shallow-gradient portions of the property is likely to be low. The potential for erosion generally increases in sloped areas. Therefore, disturbance to vegetation in sloped areas should be minimized during construction activities. Soil is also prone to erosion if unprotected and unvegetated during periods of increased precipitation. Erosion can be minimized by performing construction activities during dry summer months.

Site-specific erosion control measures should be implemented to address the maintenance of exposed areas. This may include silt fence, biofilter bags, straw wattles, or other suitable methods. During construction activities, exposed areas should be well-compacted and protected from erosion with visqueen, surface tactifier, or other means, as appropriate. Temporary slopes or exposed areas may be covered with straw, crushed aggregate, or riprap in localized areas to minimize erosion. Erosion and water runoff during wet weather conditions may be controlled by application of strategically placed channels and small detention depressions with overflow pipes.

After grading, exposed surfaces should be vegetated as soon as possible with erosion-resistant native vegetation. Jute mesh or straw may be applied to enhance

vegetation. Once established, vegetation should be properly maintained. Disturbance to existing native vegetation and surrounding organic soil should also be minimized during construction activities.

5.14 Soil Shrink/Swell Potential

Based upon laboratory analysis, near-surface soils contain as much as 28 percent by weight passing the No. 200 sieve and have low to moderate plasticity. This indicates low potential for soil shrinking or swelling.

5.15 Utility Installation

Utility installation may require subsurface excavation and trenching. Excavation, trenching and shoring should conform to federal (Occupational Safety and Health Administration) (OSHA) (29 CFR, Part 1926) and *WISHA* (WAC, Chapter 296-155) regulations. Site soils may slough when cut vertically and sudden precipitation events or perched groundwater may result in accumulation of water within excavation zones and trenches.

Utilities should be installed in general accordance with manufacturer's recommendations. Utility trench backfill should consist of crushed aggregate or other coarse-textured, free-draining material acceptable to the client, the City of Vancouver, and Columbia West. Trench backfill material within 18 inches of the top of utility pipes should be hand compacted (i.e., no heavy compaction equipment). The remaining backfill should be compacted to at least 95 percent of maximum dry density as determined by the standard Proctor moisture-density test (ASTM D698). Clean, free-draining, fine bedding sand is recommended for use in the pipe zone. With exception of the pipe zone, backfill should be placed in loose lifts not exceeding 12 inches in thickness.

Compaction of utility trench backfill material should be verified by nuclear gauge field compaction testing performed in accordance with ASTM D6938. It is recommended that field compaction testing be performed at 200-foot intervals along the utility trench centerline at the surface and midpoint depth of the trench. Compaction frequency and specifications may be modified for non-structural areas in accordance with recommendations of the site geotechnical engineer.

6.0 CONCLUSION AND LIMITATIONS

This geotechnical site investigation report was prepared in accordance with accepted standard conventional principles and practices of geotechnical engineering. This investigation pertains only to material tested and observed as of the date of this report, and is based upon proposed site development as described in the text herein. This report is a professional opinion containing recommendations established by engineering interpretations of subsurface soils based upon conditions observed during site exploration. Soil conditions may differ between tested locations or over time. Slight variations may produce impacts to the performance of structural facilities if not adequately addressed. This underscores the importance of diligent QA/QC construction observation and testing to verify soil conditions are as anticipated in this report.

Therefore, this report contains several recommendations for field observation and testing by Columbia West personnel during construction activities. Columbia West cannot accept responsibility for deviations from recommendations described in this report. Future performance of structural facilities is often related to the degree of construction observation by qualified personnel. These services should be performed to the full extent recommended.

This report is not an environmental assessment and should not be construed as a representative warranty of site subsurface conditions. The discovery of adverse environmental conditions, or subsurface soils that deviate significantly from those described in this report, should immediately prompt further investigation. The above statements are in lieu of all other statements expressed or implied.

This report was prepared solely for the client and is not to be reproduced without prior authorization from Columbia West. Final engineering plans and specifications for the project should be reviewed and approved by Columbia West as they relate to geotechnical and grading issues prior to final design approval. Columbia West is not responsible for independent conclusions or recommendations made by other parties based upon information presented in this report. Unless a particular service was expressly included in the scope, it was not performed and there should be no assumptions based upon services not provided. Additional report limitations and important information about this document are presented in Appendix E. This information should be carefully read and understood by the client and other parties reviewing this document.

Sincerely,

COLUMBIA WEST ENGINEERING, Inc.

Lance V. Lehto, PE, GE
President



REFERENCES

Annual Book of ASTM Standards, Soil and Rock (I), v04.08, American Society for Testing and Materials, 1999.

Beeson, M.H., Tolan, T.L., Madin, I.P., *Geologic Map of the Lake Oswego Quadrangle, Clackamas, Multnomah, and Washington Counties, Oregon*; Oregon Department of Geology and Mineral Industries; Geological Map Series GMS-59, 1989.

Clark County Maps Online (<http://gis.clark.wa.gov/ccgis/mol/property.htm>)

Geomatrix Consultants, *Seismic Design Mapping, State of Oregon*, January 1995.

International Building Code: *2015 International Building Code, 2015 edition*, International Code Council, 2015.

O'Conner, J.E., Cannon, C.M., Mangano, J.F., and Evarts, R.C., 2016, *Geologic Map of the Vancouver and Orchards Quadrangles and Parts of the Portland and Mount Tabor Quadrangles, Clark County, Washington, and Multnomah County, Oregon*, U.S. Geological Survey Scientific Investigations Map 3357

Safety and Health Regulations for Construction, 29 CFR Part 1926, Occupational Safety and Health Administration (OSHA), revised July 1, 2001.

Safety Standards for Construction Work, Part N, Excavation, Trenching and Shoring, Washington Administrative Code, Chapter 296-155, Division of Industrial Safety and Health, Washington Department of Labor and Industries, February, 1993.

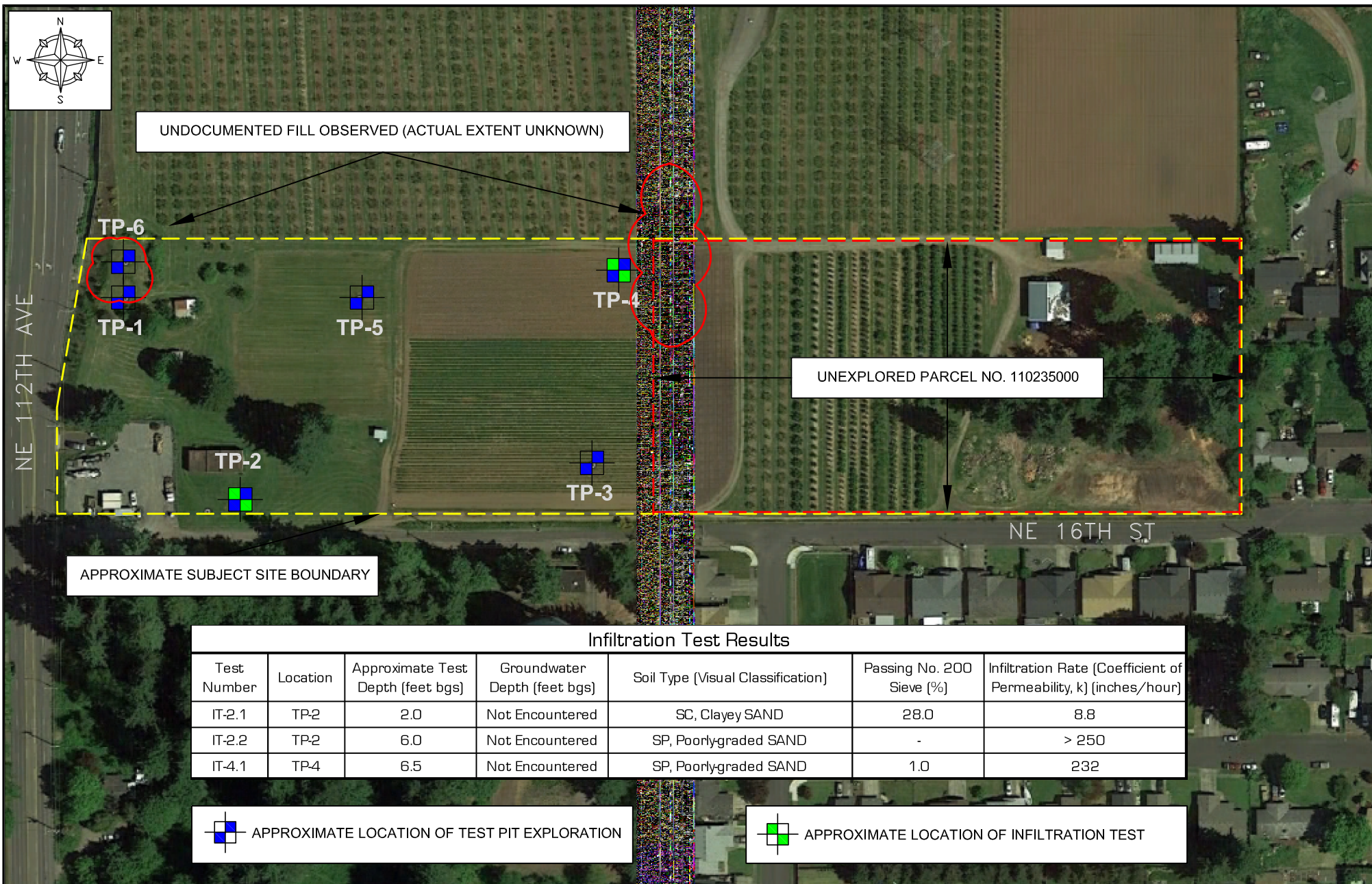
United States Geologic Survey (USGS), *2012 Seismic Design Maps, Web Application*, Accessed October 2016

Wong, Ivan, et al, *Earthquake Scenario and Probabilistic Earthquake Ground Shaking Maps for the Portland, Oregon, Metropolitan Area*, IMS-16, Oregon Department of Geology and Mineral Industries, 2000.

Palmer, Stephen P., Magsino, Sammantha L., Poelstra, James L., and Niggemann, Rebecca A., *Site Class Map of Clark County, Washington*; Washington State Department of Natural Resources, September 2004.

Web Soil Survey, Natural Resources Conservation Service, United States Department of Agriculture *2017 website* (<http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>).

FIGURES



Infiltration Test Results						
Test Number	Location	Approximate Test Depth (feet bgs)	Groundwater Depth (feet bgs)	Soil Type (Visual Classification)	Passing No. 200 Sieve (%)	Infiltration Rate (Coefficient of Permeability, k) (inches/hour)
IT-2.1	TP-2	2.0	Not Encountered	SC, Clayey SAND	28.0	8.8
IT-2.2	TP-2	6.0	Not Encountered	SP, Poorlygraded SAND	-	> 250
IT-4.1	TP-4	6.5	Not Encountered	SP, Poorlygraded SAND	1.0	232



APPROXIMATE LOCATION OF TEST PIT EXPLORATION



APPROXIMATE LOCATION OF INFILTRATION TEST

NOTES:

1. SITE LOCATION: 1619 NE 112TH AVE, VANCOUVER, WASHINGTON.
2. SITE CONSISTS OF PARCELS 110252000, 110251000, 110250000, AND 110235000 TOTALING APPROXIMATELY 9.47 ACRES.
3. DRAWING IS NOT TO SCALE.
4. AERIAL PHOTO SOURCED FROM GOOGLE EARTH.
5. EXPLORATION LOCATIONS ARE APPROXIMATE AND NOT SURVEYED.
6. TEST PITS BACKFILLED LOOSELY WITH ONSITE SOIL ON NOVEMBER 3, 2017.

Geotechnical • Environmental • Special Inspections
Columbia West
 Engineering, Inc.
 11917 NE 95th STREET
 VANCOUVER, WASHINGTON 98682
 PHONE: 360-823-2900 FAX: 360-823-2901
 www.columbiawestengineering.com

Design:

Checked: ASR

Client: FSS, LLC

Job No: 17306

CAD File: FIGURE 2

Scale: NONE

Drawn: JFM

Date: 11/14/17

Rev By Date

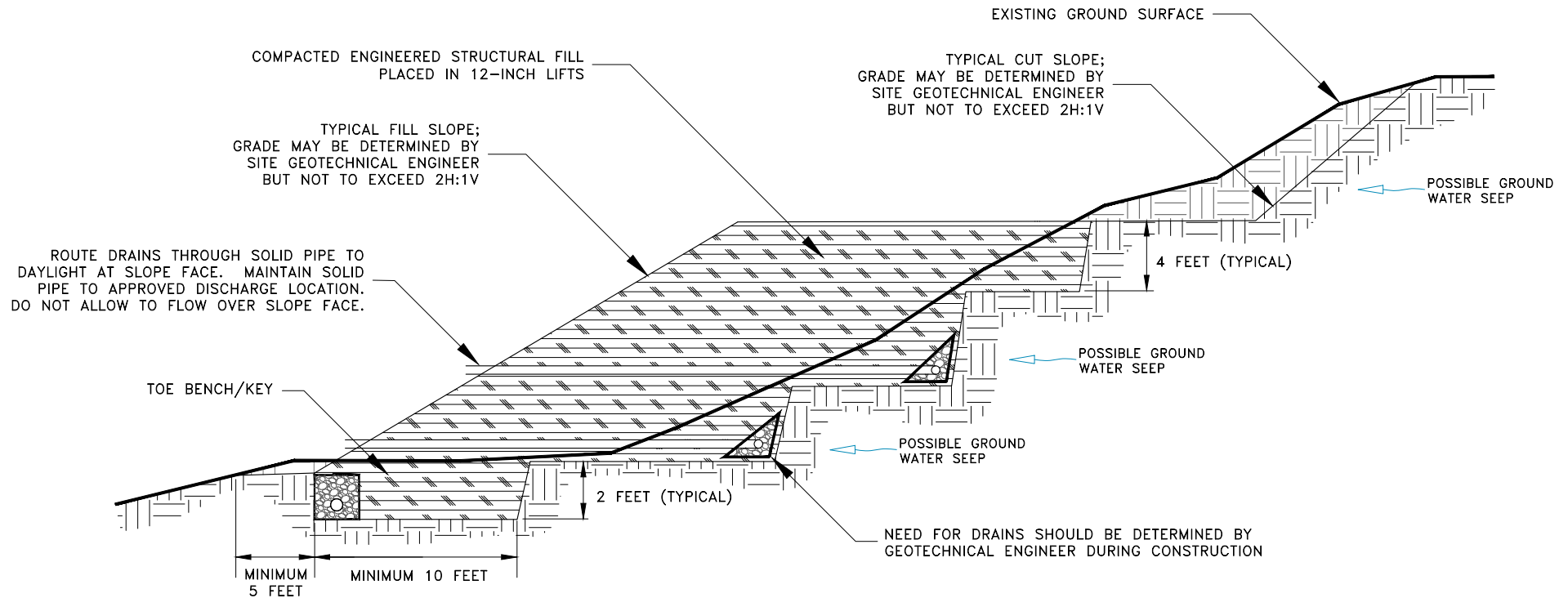
01 JFM 12/1/17

EXPLORATION LOCATION MAP

FOUR SEASONS SOUTH
 VANCOUVER, WASHINGTON

FIGURE
 2

TYPICAL CUT AND FILL SLOPE CROSS-SECTION

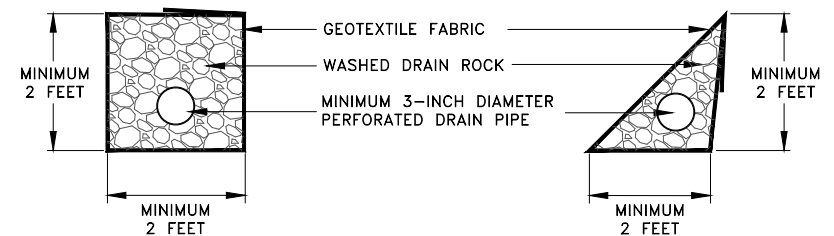


DRAIN SPECIFICATIONS

GEOTEXTILE FABRIC SHALL CONSIST OF MIRAFI 140N OR APPROVED EQUIVALENT WITH AOS BETWEEN No. 70 AND No. 100 SIEVE.

WASHED DRAIN ROCK SHALL BE OPEN-GRADED ANGULAR DRAIN ROCK WITH LESS THAN 2 PERCENT PASSING THE No. 200 SIEVE AND A MAXIMUM PARTICLE SIZE OF 3 INCHES.

TYPICAL DRAIN SECTION DETAIL



TYPICAL CUT AND FILL
SLOPE CROSS-SECTION

FOUR SEASONS SOUTH
VANCOUVER, WASHINGTON

FIGURE
3

Geotechnical • Environmental • Special Inspections
Columbia West
Engineering, Inc.

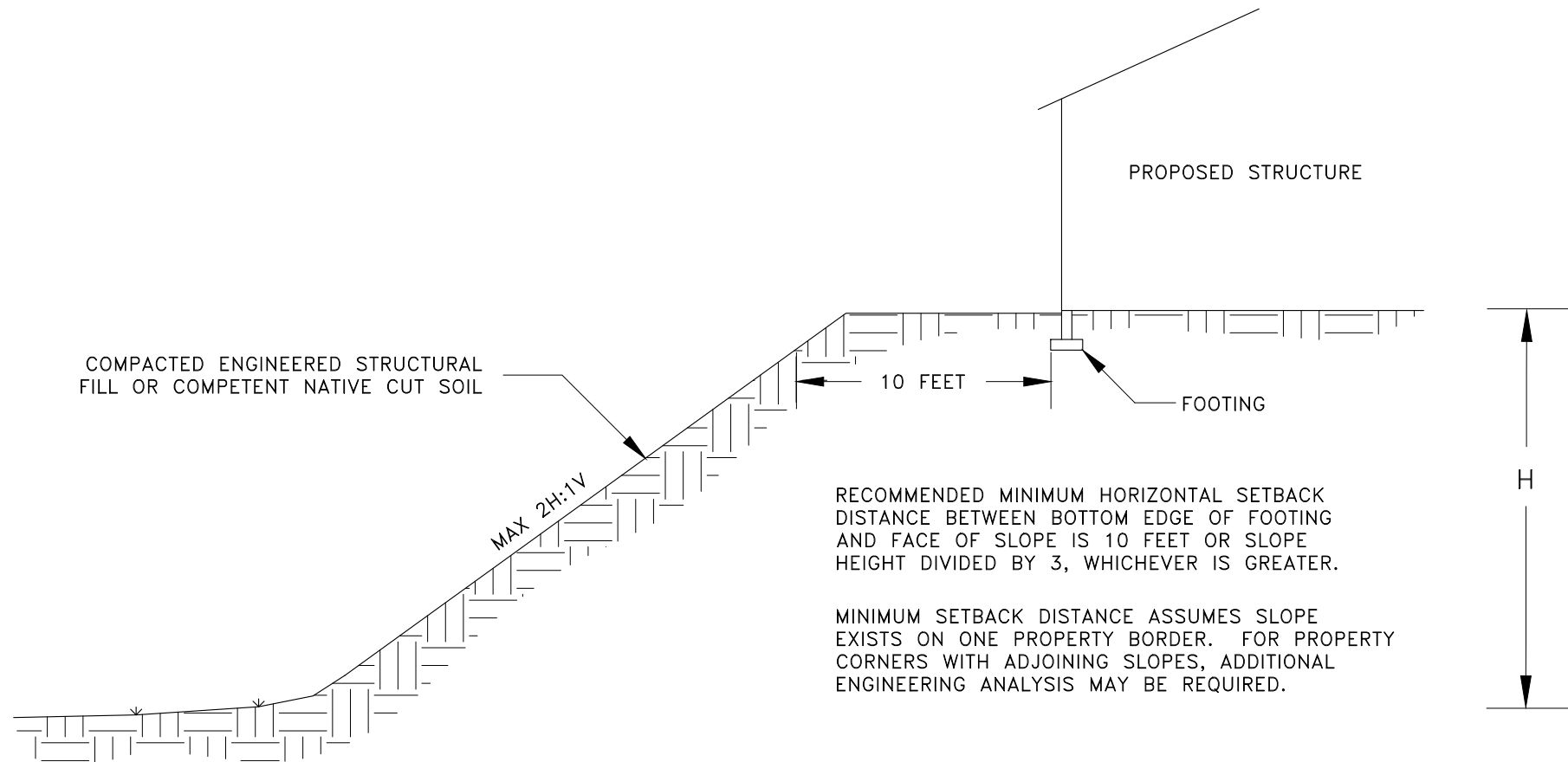
11917 NE 95th STREET
VANCOUVER, WASHINGTON 98682
PHONE: 360-823-2900 FAX: 360-823-2901
www.columbiawestengineering.com

Design:	Drawn: JFM
Checked: ASR	Date: 11/21/17
Client: FSS, LLC	Rev By Date
Job No: 17306	
CAD File: FIGURE 3	
Scale: NONE	

NOTES:

1. DRAWING IS NOT TO SCALE.
2. SLOPES AND PROFILES SHOWN ARE APPROXIMATE.
3. DRAWING REPRESENTS TYPICAL FILL AND CUT SLOPE SECTION, AND MAY NOT BE SITE-SPECIFIC.

MINIMUM FOUNDATION SLOPE SETBACK DETAIL



- NOTES:
1. DRAWING IS NOT TO SCALE.
 2. SLOPES AND PROFILES SHOWN ARE APPROXIMATE.
 3. DRAWING REPRESENTS TYPICAL FOUNDATION SETBACK DETAIL, AND MAY NOT BE SITE-SPECIFIC.

Geotechnical ■ Environmental ■ Special Inspections

Columbia West
Engineering, Inc.

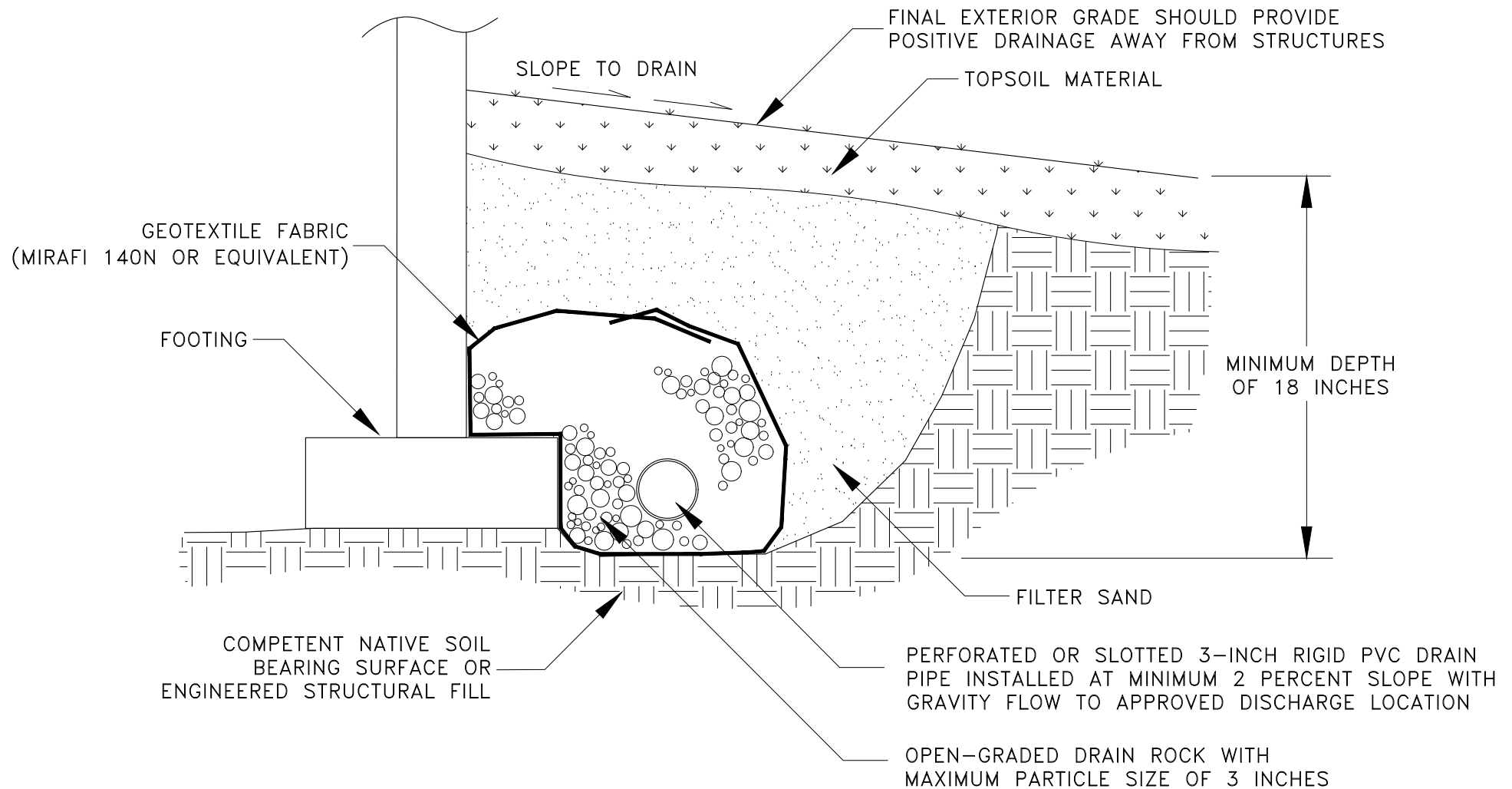
11917 NE 95th STREET
VANCOUVER, WASHINGTON 98682
PHONE: 360-823-2900 FAX: 360-823-2901
www.columbiawestengineering.com

Design:	Drawn: JFM
Checked: ASR	Date: 11/21/17
Client: FSS, LLC	Rev By Date
Job No: 17306	
CAD File: FIGURE 4	
Scale: NONE	

TYPICAL MINIMUM SLOPE SETBACK DETAIL
FOUR SEASONS SOUTH VANCOUVER, WASHINGTON

FIGURE 4

TYPICAL PERIMETER FOOTING DRAIN DETAIL



- NOTES:
1. DRAWING IS NOT TO SCALE.
 2. SLOPES AND PROFILES SHOWN ARE APPROXIMATE.
 3. DRAWING REPRESENTS TYPICAL FOUNDATION SETBACK DETAIL, AND MAY NOT BE SITE-SPECIFIC.

Geotechnical ■ Environmental ■ Special Inspections

Columbia West
Engineering, Inc.

11917 NE 95th STREET
VANCOUVER, WASHINGTON 98682
PHONE: 360-823-2900 FAX: 360-823-2901
www.columbiawestengineering.com

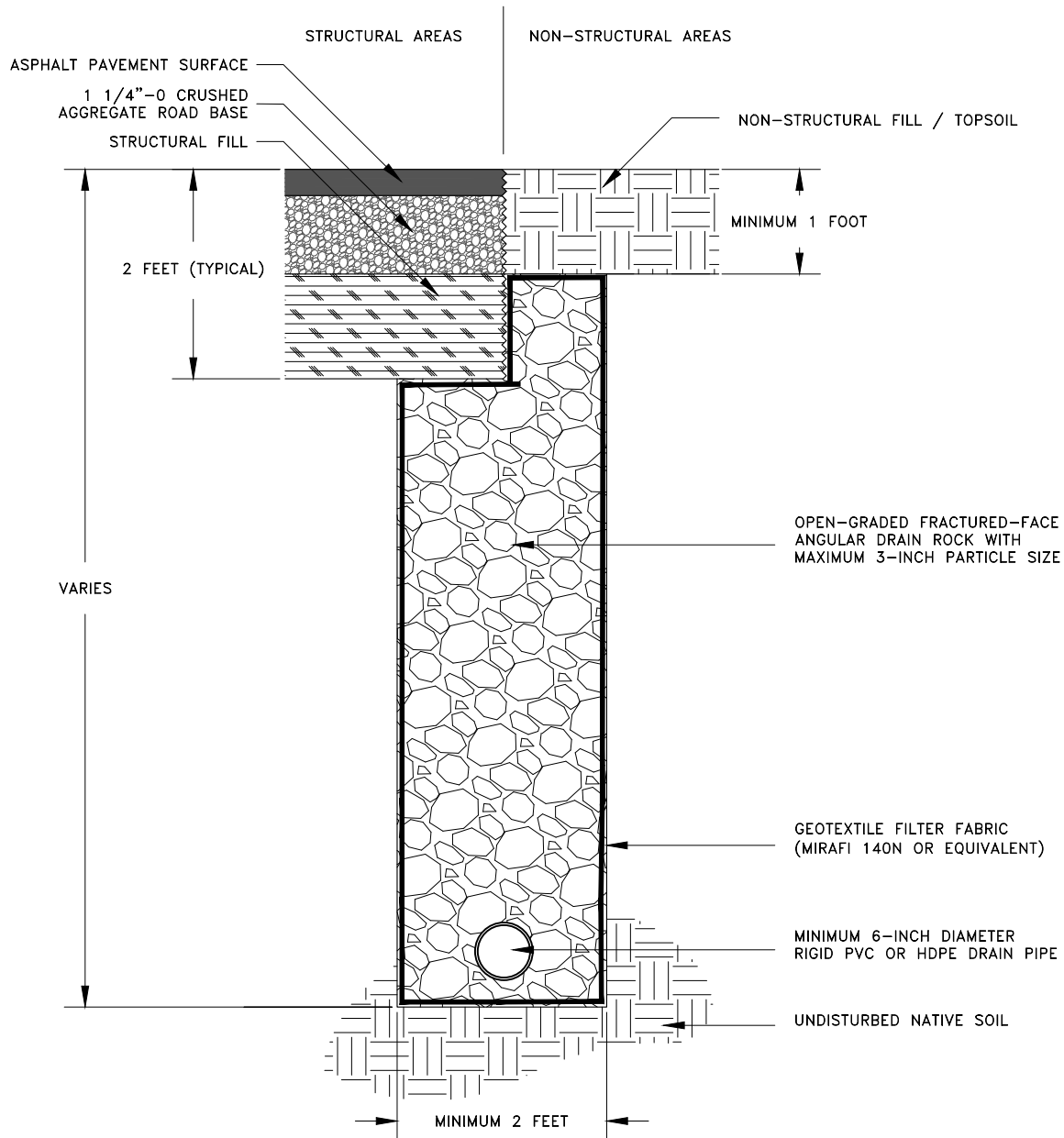
Design:	Drawn: JFM
Checked: ASR	Date: 11/21/17
Client: FSS, LLC	Rev By Date
Job No: 17306	
CAD File: FIGURE 5	
Scale: NONE	

TYPICAL PERIMETER
FOOTING DRAIN DETAIL

FOUR SEASONS SOUTH
VANCOUVER, WASHINGTON

FIGURE
5

TYPICAL PERFORATED DRAIN PIPE TRENCH DETAIL



NOTE: LOCATION, INVERT ELEVATION, DEPTH OF TRENCH, AND EXTENT OF PERFORATED PIPE REQUIRED MAY BE MODIFIED BY THE GEOTECHNICAL ENGINEER DURING CONSTRUCTION BASED UPON FIELD OBSERVATION AND SITE-SPECIFIC SOIL CONDITIONS.

APPENDIX A

LABORATORY TEST RESULTS

PARTICLE-SIZE ANALYSIS REPORT

PROJECT Four Seasons South Vancouver, Washington		CLIENT Mr. Patrick Ginn Four Seasons Subdivision, LLC 800 NE Tenney Road, Suite 110-348 Vancouver, Washington 98685		PROJECT NO. 17306		LAB ID S17-908																																																																																																																																																																																											
				REPORT DATE 11/21/17		FIELD ID TP2.1																																																																																																																																																																																											
				DATE SAMPLED 11/03/17		SAMPLED BY JFM																																																																																																																																																																																											
MATERIAL DATA																																																																																																																																																																																																	
MATERIAL SAMPLED Clayey SAND		MATERIAL SOURCE Test Pit TP-02 depth = 2 feet		USCS SOIL TYPE SC, Clayey Sand																																																																																																																																																																																													
SPECIFICATIONS none		AASHTO SOIL TYPE A-2-6(1)																																																																																																																																																																																															
LABORATORY TEST DATA																																																																																																																																																																																																	
LABORATORY EQUIPMENT Rainhart "Mary Ann" Sifter 637				TEST PROCEDURE ASTM D6913, D422																																																																																																																																																																																													
ADDITIONAL DATA				SIEVE DATA																																																																																																																																																																																													
initial dry mass (g) = 1744.3 as-received moisture content = 18.7% liquid limit = 34 plastic limit = 20 plasticity index = 14 fineness modulus = n/a				% sieve loss = 0.05% coefficient of curvature, C_c = n/a coefficient of uniformity, C_u = n/a effective size, $D_{(10)}$ = n/a $D_{(30)}$ = 0.100 mm $D_{(60)}$ = 0.918 mm																																																																																																																																																																																													
				% gravel = 8.2% % sand = 63.8% % silt and clay = 28.0%																																																																																																																																																																																													
				<table border="1"> <thead> <tr> <th colspan="2">SIEVE SIZE</th> <th colspan="4">PERCENT PASSING</th> </tr> <tr> <th>US</th> <th>mm</th> <th>act.</th> <th>interp.</th> <th>max</th> <th>min</th> </tr> </thead> <tbody> <tr><td>6.00"</td><td>150.0</td><td></td><td>100.0%</td><td></td><td></td></tr> <tr><td>4.00"</td><td>100.0</td><td></td><td>100.0%</td><td></td><td></td></tr> <tr><td>3.00"</td><td>75.0</td><td></td><td>100.0%</td><td></td><td></td></tr> <tr><td>2.50"</td><td>63.0</td><td></td><td>100.0%</td><td></td><td></td></tr> <tr><td>2.00"</td><td>50.0</td><td></td><td>100.0%</td><td></td><td></td></tr> <tr><td>1.75"</td><td>45.0</td><td></td><td>100.0%</td><td></td><td></td></tr> <tr><td>1.50"</td><td>37.5</td><td></td><td>100.0%</td><td></td><td></td></tr> <tr><td>1.25"</td><td>31.5</td><td></td><td>100.0%</td><td></td><td></td></tr> <tr><td>1.00"</td><td>25.0</td><td></td><td>100.0%</td><td></td><td></td></tr> <tr><td>7/8"</td><td>22.4</td><td></td><td>100.0%</td><td></td><td></td></tr> <tr><td>3/4"</td><td>19.0</td><td>100.0%</td><td></td><td></td><td></td></tr> <tr><td>5/8"</td><td>16.0</td><td>98.8%</td><td></td><td></td><td></td></tr> <tr><td>1/2"</td><td>12.5</td><td>98.2%</td><td></td><td></td><td></td></tr> <tr><td>3/8"</td><td>9.50</td><td>97.1%</td><td></td><td></td><td></td></tr> <tr><td>1/4"</td><td>6.30</td><td>94.3%</td><td></td><td></td><td></td></tr> <tr><td>#4</td><td>4.75</td><td>91.8%</td><td></td><td></td><td></td></tr> <tr><td>#8</td><td>2.36</td><td></td><td>78.5%</td><td></td><td></td></tr> <tr><td>#10</td><td>2.00</td><td>75.4%</td><td></td><td></td><td></td></tr> <tr><td>#16</td><td>1.18</td><td></td><td>65.0%</td><td></td><td></td></tr> <tr><td>#20</td><td>0.850</td><td>58.5%</td><td></td><td></td><td></td></tr> <tr><td>#30</td><td>0.600</td><td></td><td>53.0%</td><td></td><td></td></tr> <tr><td>#40</td><td>0.425</td><td>47.6%</td><td></td><td></td><td></td></tr> <tr><td>#50</td><td>0.300</td><td></td><td>41.5%</td><td></td><td></td></tr> <tr><td>#60</td><td>0.250</td><td>38.4%</td><td></td><td></td><td></td></tr> <tr><td>#80</td><td>0.180</td><td></td><td>34.8%</td><td></td><td></td></tr> <tr><td>#100</td><td>0.150</td><td>32.8%</td><td></td><td></td><td></td></tr> <tr><td>#140</td><td>0.106</td><td></td><td>30.4%</td><td></td><td></td></tr> <tr><td>#170</td><td>0.090</td><td></td><td>29.2%</td><td></td><td></td></tr> <tr><td>#200</td><td>0.075</td><td>28.0%</td><td></td><td></td><td></td></tr> </tbody> </table>				SIEVE SIZE		PERCENT PASSING				US	mm	act.	interp.	max	min	6.00"	150.0		100.0%			4.00"	100.0		100.0%			3.00"	75.0		100.0%			2.50"	63.0		100.0%			2.00"	50.0		100.0%			1.75"	45.0		100.0%			1.50"	37.5		100.0%			1.25"	31.5		100.0%			1.00"	25.0		100.0%			7/8"	22.4		100.0%			3/4"	19.0	100.0%				5/8"	16.0	98.8%				1/2"	12.5	98.2%				3/8"	9.50	97.1%				1/4"	6.30	94.3%				#4	4.75	91.8%				#8	2.36		78.5%			#10	2.00	75.4%				#16	1.18		65.0%			#20	0.850	58.5%				#30	0.600		53.0%			#40	0.425	47.6%				#50	0.300		41.5%			#60	0.250	38.4%				#80	0.180		34.8%			#100	0.150	32.8%				#140	0.106		30.4%			#170	0.090		29.2%			#200	0.075	28.0%			
SIEVE SIZE		PERCENT PASSING																																																																																																																																																																																															
US	mm	act.	interp.	max	min																																																																																																																																																																																												
6.00"	150.0		100.0%																																																																																																																																																																																														
4.00"	100.0		100.0%																																																																																																																																																																																														
3.00"	75.0		100.0%																																																																																																																																																																																														
2.50"	63.0		100.0%																																																																																																																																																																																														
2.00"	50.0		100.0%																																																																																																																																																																																														
1.75"	45.0		100.0%																																																																																																																																																																																														
1.50"	37.5		100.0%																																																																																																																																																																																														
1.25"	31.5		100.0%																																																																																																																																																																																														
1.00"	25.0		100.0%																																																																																																																																																																																														
7/8"	22.4		100.0%																																																																																																																																																																																														
3/4"	19.0	100.0%																																																																																																																																																																																															
5/8"	16.0	98.8%																																																																																																																																																																																															
1/2"	12.5	98.2%																																																																																																																																																																																															
3/8"	9.50	97.1%																																																																																																																																																																																															
1/4"	6.30	94.3%																																																																																																																																																																																															
#4	4.75	91.8%																																																																																																																																																																																															
#8	2.36		78.5%																																																																																																																																																																																														
#10	2.00	75.4%																																																																																																																																																																																															
#16	1.18		65.0%																																																																																																																																																																																														
#20	0.850	58.5%																																																																																																																																																																																															
#30	0.600		53.0%																																																																																																																																																																																														
#40	0.425	47.6%																																																																																																																																																																																															
#50	0.300		41.5%																																																																																																																																																																																														
#60	0.250	38.4%																																																																																																																																																																																															
#80	0.180		34.8%																																																																																																																																																																																														
#100	0.150	32.8%																																																																																																																																																																																															
#140	0.106		30.4%																																																																																																																																																																																														
#170	0.090		29.2%																																																																																																																																																																																														
#200	0.075	28.0%																																																																																																																																																																																															
GRAIN SIZE DISTRIBUTION 				DATE TESTED 11/14/17																																																																																																																																																																																													
				TESTED BY RTT																																																																																																																																																																																													

ATTERBERG LIMITS REPORT

PROJECT Four Seasons South Vancouver, Washington	CLIENT Mr. Patrick Ginn Four Seasons Subdivision, LLC 800 NE Tenney Road, Suite 110-348 Vancouver, Washington 98685	PROJECT NO. 17306	LAB ID S17-908
		REPORT DATE 11/21/17	FIELD ID TP2.1
		DATE SAMPLED 11/03/17	SAMPLED BY JFM

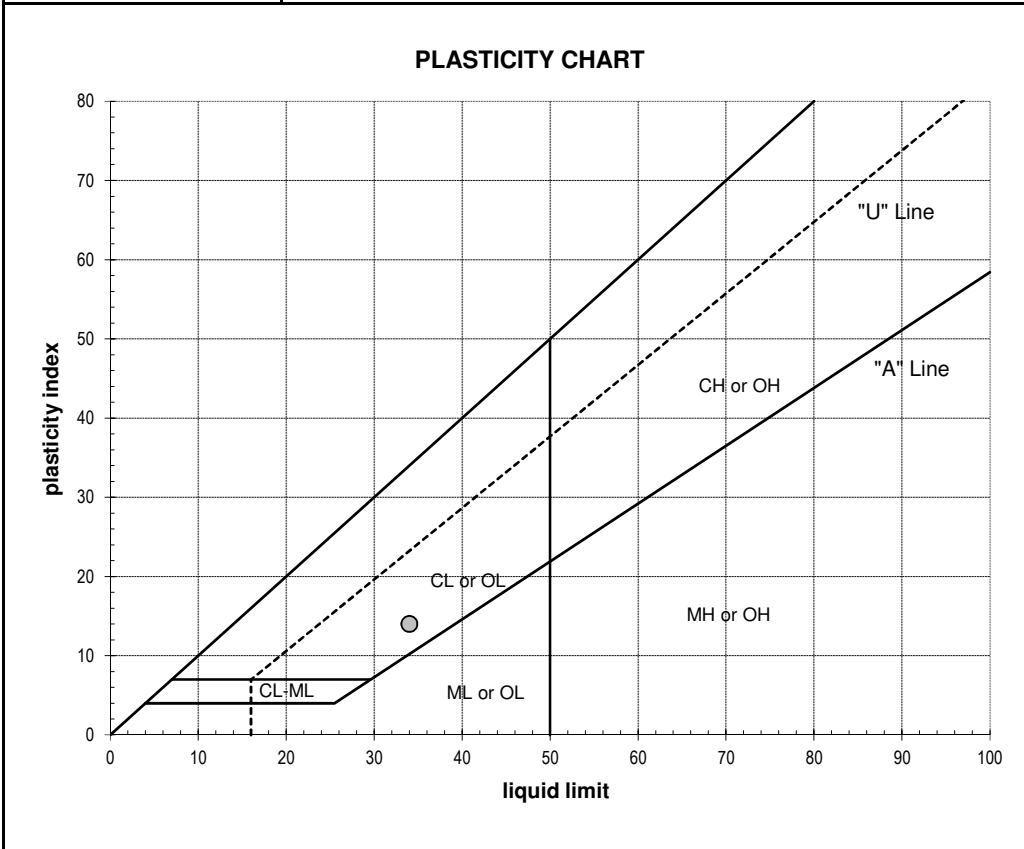
MATERIAL DATA

MATERIAL SAMPLED Clayey SAND	MATERIAL SOURCE Test Pit TP-02 depth = 2 feet	USCS SOIL TYPE SC, Clayey Sand
---------------------------------	---	-----------------------------------

LABORATORY TEST DATA

LABORATORY EQUIPMENT Liquid Limit Machine, Hand Rolled	TEST PROCEDURE ASTM D4318
---	------------------------------

ATTERBERG LIMITS	LIQUID LIMIT DETERMINATION				LIQUID LIMIT 	
liquid limit = 34	①	②	③	④		
plastic limit = 20	wet soil + pan weight, g =	33.54	32.97	33.41		
plasticity index = 14	dry soil + pan weight, g =	30.43	29.99	30.17		
	pan weight, g =	20.83	20.87	20.85		
	N (blows) =	35	27	19		
	moisture, % =	32.4 %	32.7 %	34.8 %		
SHRINKAGE	PLASTIC LIMIT DETERMINATION					
shrinkage limit = n/a	①	②	③	④		
shrinkage ratio = n/a	wet soil + pan weight, g =	28.18	28.07			
	dry soil + pan weight, g =	26.97	26.89			
	pan weight, g =	20.79	20.85			
	moisture, % =	19.6 %	19.5 %			



ADDITIONAL DATA

% gravel = 8.2%
 % sand = 63.8%
 % silt and clay = 28.0%
 % silt = n/a
 % clay = n/a
 moisture content = 18.7%

DATE TESTED 11/16/17	TESTED BY MJR
-------------------------	------------------

[Signature]

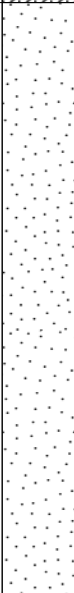
PARTICLE-SIZE ANALYSIS REPORT

PROJECT Four Seasons South Vancouver, Washington		CLIENT Mr. Patrick Ginn Four Seasons Subdivision, LLC 800 NE Tenney Road, Suite 110-348 Vancouver, Washington 98685		PROJECT NO. 17306		LAB ID S17-909																																																																																																																																																																																											
				REPORT DATE 11/21/17		FIELD ID TP4.1																																																																																																																																																																																											
				DATE SAMPLED 11/03/17		SAMPLED BY JFM																																																																																																																																																																																											
MATERIAL DATA																																																																																																																																																																																																	
MATERIAL SAMPLED Poorly graded SAND		MATERIAL SOURCE Test Pit TP-04 depth = 6 feet		USCS SOIL TYPE SP, Poorly graded Sand																																																																																																																																																																																													
SPECIFICATIONS none				AASHTO SOIL TYPE A-1-b(0)																																																																																																																																																																																													
LABORATORY TEST DATA																																																																																																																																																																																																	
LABORATORY EQUIPMENT Rainhart "Mary Ann" Sifter 637				TEST PROCEDURE ASTM D6913, D422																																																																																																																																																																																													
ADDITIONAL DATA				SIEVE DATA																																																																																																																																																																																													
initial dry mass (g) = 1744.3 as-received moisture content = 9.8% liquid limit = - plastic limit = - plasticity index = NP fineness modulus = n/a				% sieve loss = 0.03% coefficient of curvature, C_c = 0.98 coefficient of uniformity, C_u = 3.29 effective size, $D_{(10)}$ = 0.405 mm $D_{(30)}$ = 0.727 mm $D_{(60)}$ = 1.331 mm																																																																																																																																																																																													
				% gravel = 1.1% % sand = 97.9% % silt and clay = 1.0%																																																																																																																																																																																													
				<table border="1"> <thead> <tr> <th colspan="2">SIEVE SIZE</th> <th colspan="2">PERCENT PASSING</th> <th colspan="2">SPECS</th> </tr> <tr> <th>US</th> <th>mm</th> <th>act.</th> <th>interp.</th> <th>max</th> <th>min</th> </tr> </thead> <tbody> <tr><td>6.00"</td><td>150.0</td><td></td><td>100.0%</td><td></td><td></td></tr> <tr><td>4.00"</td><td>100.0</td><td></td><td>100.0%</td><td></td><td></td></tr> <tr><td>3.00"</td><td>75.0</td><td></td><td>100.0%</td><td></td><td></td></tr> <tr><td>2.50"</td><td>63.0</td><td></td><td>100.0%</td><td></td><td></td></tr> <tr><td>2.00"</td><td>50.0</td><td></td><td>100.0%</td><td></td><td></td></tr> <tr><td>1.75"</td><td>45.0</td><td></td><td>100.0%</td><td></td><td></td></tr> <tr><td>1.50"</td><td>37.5</td><td></td><td>100.0%</td><td></td><td></td></tr> <tr><td>1.25"</td><td>31.5</td><td></td><td>100.0%</td><td></td><td></td></tr> <tr><td>1.00"</td><td>25.0</td><td></td><td>100.0%</td><td></td><td></td></tr> <tr><td>7/8"</td><td>22.4</td><td></td><td>100.0%</td><td></td><td></td></tr> <tr><td>3/4"</td><td>19.0</td><td></td><td>100.0%</td><td></td><td></td></tr> <tr><td>5/8"</td><td>16.0</td><td>100.0%</td><td></td><td></td><td></td></tr> <tr><td>1/2"</td><td>12.5</td><td>99.6%</td><td></td><td></td><td></td></tr> <tr><td>3/8"</td><td>9.50</td><td>99.5%</td><td></td><td></td><td></td></tr> <tr><td>1/4"</td><td>6.30</td><td>99.3%</td><td></td><td></td><td></td></tr> <tr><td>#4</td><td>4.75</td><td>98.9%</td><td></td><td></td><td></td></tr> <tr><td>#8</td><td>2.36</td><td></td><td>85.3%</td><td></td><td></td></tr> <tr><td>#10</td><td>2.00</td><td>82.1%</td><td></td><td></td><td></td></tr> <tr><td>#16</td><td>1.18</td><td></td><td>53.5%</td><td></td><td></td></tr> <tr><td>#20</td><td>0.850</td><td>35.6%</td><td></td><td></td><td></td></tr> <tr><td>#30</td><td>0.600</td><td></td><td>23.1%</td><td></td><td></td></tr> <tr><td>#40</td><td>0.425</td><td>10.6%</td><td></td><td></td><td></td></tr> <tr><td>#50</td><td>0.300</td><td></td><td>6.1%</td><td></td><td></td></tr> <tr><td>#60</td><td>0.250</td><td>3.8%</td><td></td><td></td><td></td></tr> <tr><td>#80</td><td>0.180</td><td></td><td>2.5%</td><td></td><td></td></tr> <tr><td>#100</td><td>0.150</td><td>1.8%</td><td></td><td></td><td></td></tr> <tr><td>#140</td><td>0.106</td><td></td><td>1.4%</td><td></td><td></td></tr> <tr><td>#170</td><td>0.090</td><td></td><td>1.2%</td><td></td><td></td></tr> <tr><td>#200</td><td>0.075</td><td>1.0%</td><td></td><td></td><td></td></tr> </tbody> </table>				SIEVE SIZE		PERCENT PASSING		SPECS		US	mm	act.	interp.	max	min	6.00"	150.0		100.0%			4.00"	100.0		100.0%			3.00"	75.0		100.0%			2.50"	63.0		100.0%			2.00"	50.0		100.0%			1.75"	45.0		100.0%			1.50"	37.5		100.0%			1.25"	31.5		100.0%			1.00"	25.0		100.0%			7/8"	22.4		100.0%			3/4"	19.0		100.0%			5/8"	16.0	100.0%				1/2"	12.5	99.6%				3/8"	9.50	99.5%				1/4"	6.30	99.3%				#4	4.75	98.9%				#8	2.36		85.3%			#10	2.00	82.1%				#16	1.18		53.5%			#20	0.850	35.6%				#30	0.600		23.1%			#40	0.425	10.6%				#50	0.300		6.1%			#60	0.250	3.8%				#80	0.180		2.5%			#100	0.150	1.8%				#140	0.106		1.4%			#170	0.090		1.2%			#200	0.075	1.0%			
SIEVE SIZE		PERCENT PASSING		SPECS																																																																																																																																																																																													
US	mm	act.	interp.	max	min																																																																																																																																																																																												
6.00"	150.0		100.0%																																																																																																																																																																																														
4.00"	100.0		100.0%																																																																																																																																																																																														
3.00"	75.0		100.0%																																																																																																																																																																																														
2.50"	63.0		100.0%																																																																																																																																																																																														
2.00"	50.0		100.0%																																																																																																																																																																																														
1.75"	45.0		100.0%																																																																																																																																																																																														
1.50"	37.5		100.0%																																																																																																																																																																																														
1.25"	31.5		100.0%																																																																																																																																																																																														
1.00"	25.0		100.0%																																																																																																																																																																																														
7/8"	22.4		100.0%																																																																																																																																																																																														
3/4"	19.0		100.0%																																																																																																																																																																																														
5/8"	16.0	100.0%																																																																																																																																																																																															
1/2"	12.5	99.6%																																																																																																																																																																																															
3/8"	9.50	99.5%																																																																																																																																																																																															
1/4"	6.30	99.3%																																																																																																																																																																																															
#4	4.75	98.9%																																																																																																																																																																																															
#8	2.36		85.3%																																																																																																																																																																																														
#10	2.00	82.1%																																																																																																																																																																																															
#16	1.18		53.5%																																																																																																																																																																																														
#20	0.850	35.6%																																																																																																																																																																																															
#30	0.600		23.1%																																																																																																																																																																																														
#40	0.425	10.6%																																																																																																																																																																																															
#50	0.300		6.1%																																																																																																																																																																																														
#60	0.250	3.8%																																																																																																																																																																																															
#80	0.180		2.5%																																																																																																																																																																																														
#100	0.150	1.8%																																																																																																																																																																																															
#140	0.106		1.4%																																																																																																																																																																																														
#170	0.090		1.2%																																																																																																																																																																																														
#200	0.075	1.0%																																																																																																																																																																																															
GRAIN SIZE DISTRIBUTION 				DATE TESTED 11/14/17																																																																																																																																																																																													
				TESTED BY RTT																																																																																																																																																																																													

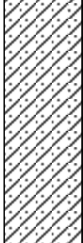
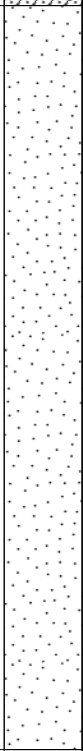
APPENDIX B

SUBSURFACE EXPLORATION LOGS

TEST PIT LOG

PROJECT NAME Four Seasons South						CLIENT Four Seasons Subdivision, LLC		PROJECT NO. 17306		TEST PIT NO. TP-1	
PROJECT LOCATION Vancouver, Washington						CONTRACTOR L&S Contractors		EQUIPMENT Excavator		ENGINEER JFM	
TEST PIT LOCATION See Figure 2						APPROX. SURFACE ELEVATION 312 ft amsl		GROUNDWATER DEPTH Not encountered		START TIME 0920	
FINISH TIME 0940											
Depth (feet)	Sample Field ID	SCS Soil Survey Description	AASHTO Soil Type	USCS Soil Type	Graphic Log	LITHOLOGIC DESCRIPTION AND REMARKS	Moisture Content (%)	Passing No. 200 Sieve (%)	Liquid Limit	Plasticity Index	Infiltration Testing
0						Approximately 6 to 8 inches of grass and topsoil.					
		Wind River gravelly loam	A-2	SC		Dark brown clayey SAND with some gravel, moist, medium dense [Soil Type 2].					
5			A-1	SP		Dark gray poorly-graded SAND with trace of gravel, damp, medium dense [Soil Type 3]. Fines content decreasing with depth.					
10						North and south portions of test pit consistent at 8.5 feet bgs (*see note below).					
15						Bottom of test pit at 12.0 feet. Groundwater not encountered.					
20						*The above profile is representative of the south portion of test pit TP-1. The north portion of TP-1 consisted of fill materials, similar to those encountered at TP-6, extending to 8.5 feet bgs at which point the northern portion of TP-1 was consistent with the native soils encountered in the southern portion.					

TEST PIT LOG

PROJECT NAME Four Seasons South						CLIENT Four Seasons Subdivision, LLC		PROJECT NO. 17306		TEST PIT NO. TP-2				
PROJECT LOCATION Vancouver, Washington						CONTRACTOR L&S Contractors		EQUIPMENT Excavator		ENGINEER JFM		DATE 11/3/17		
TEST PIT LOCATION See Figure 2						APPROX. SURFACE ELEVATION 314 ft amsl		GROUNDWATER DEPTH Not encountered		START TIME 0812		FINISH TIME 0915		
Depth (feet)	Sample Field ID	SCS Soil Survey Description	AASHTO Soil Type	USCS Soil Type	Graphic Log	LITHOLOGIC DESCRIPTION AND REMARKS		Moisture Content (%)	Passing No. 200 Sieve (%)	Liquid Limit	Plasticity Index	Infiltration Testing		
0	TP2.1					Approximately 4 to 6 inches of grass and topsoil.		18.7	28.0	34	14	IT-2.1  Depth = 2.0 ft k = 8.8 in/hr		
		Wind River gravelly loam		SC		Dark brown clayey SAND with some gravel, moist, medium dense [Soil Type 2].						IT-2.2  Depth = 6.0 ft k > 250 in/hr		
5			A-2-6(1)				Dark gray poorly-graded SAND with trace of gravel, damp, medium dense [Soil Type 3].							
				A-1	SP		Fines content decreasing with depth.							
10														
15						Bottom of test pit at 14.0 feet. Groundwater not encountered.								
20														

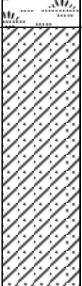
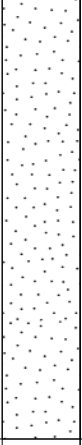
TEST PIT LOG

PROJECT NAME Four Seasons South						CLIENT Four Seasons Subdivision, LLC		PROJECT NO. 17306		TEST PIT NO. TP-3	
PROJECT LOCATION Vancouver, Washington						CONTRACTOR L&S Contractors		EQUIPMENT Excavator		ENGINEER JFM	
TEST PIT LOCATION See Figure 2						APPROX. SURFACE ELEVATION 314 ft amsl		GROUNDWATER DEPTH Not encountered		START TIME 1111	
FINISH TIME 1135											
Depth (feet)	Sample Field ID	SCS Soil Survey Description	AASHTO Soil Type	USCS Soil Type	Graphic Log	LITHOLOGIC DESCRIPTION AND REMARKS	Moisture Content (%)	Passing No. 200 Sieve (%)	Liquid Limit	Plasticity Index	Infiltration Testing
0						Approximately 18 inches of grass and topsoil.					
		Wind River gravelly loam	A-2	SC		Dark brown clayey SAND with some gravel, moist, medium dense [Soil Type 2].					
5			A-1	SP		Dark gray poorly-graded SAND with trace of gravel, damp, medium dense [Soil Type 3]. Fines content decreasing with depth.					
10						Bottom of test pit at 10.0 feet. Groundwater not encountered.					
15											
20											

TEST PIT LOG

PROJECT NAME Four Seasons South						CLIENT Four Seasons Subdivision, LLC		PROJECT NO. 17306		TEST PIT NO. TP-4	
PROJECT LOCATION Vancouver, Washington						CONTRACTOR L&S Contractors		EQUIPMENT Excavator		ENGINEER JFM	
TEST PIT LOCATION See Figure 2						APPROX. SURFACE ELEVATION 305 ft amsl		GROUNDWATER DEPTH Not encountered		START TIME 1030	
FINISH TIME 1105											
Depth (feet)	Sample Field ID	SCS Soil Survey Description	AASHTO Soil Type	USCS Soil Type	Graphic Log	LITHOLOGIC DESCRIPTION AND REMARKS	Moisture Content (%)	Passing No. 200 Sieve (%)	Liquid Limit	Plasticity Index	Infiltration Testing
0	TP4.1					Approximately 6 to 12 inches of grass and topsoil.	9.8	1.0	NP	NP	IT-4.1 Depth = 6.5 ft k = 232 in/hr
		Wind River gravelly loam	A-2	SC		Dark brown clayey SAND with some gravel, moist, medium dense [Soil Type 2].					
5				SP		Dark gray poorly-graded SAND with trace of gravel, damp, medium dense [Soil Type 3].					
			A-1-b(0)			Fines content decreasing with depth.					
10						Bottom of test pit at 10.0 feet. Groundwater not encountered.					
15											
20											

TEST PIT LOG

PROJECT NAME Four Seasons South						CLIENT Four Seasons Subdivision, LLC		PROJECT NO. 17306		TEST PIT NO. TP-5	
PROJECT LOCATION Vancouver, Washington						CONTRACTOR L&S Contractors		EQUIPMENT Excavator		ENGINEER JFM	
TEST PIT LOCATION See Figure 2						APPROX. SURFACE ELEVATION 311 ft amsl		GROUNDWATER DEPTH Not encountered		START TIME 1010	
FINISH TIME 1025											
Depth (feet)	Sample Field ID	SCS Soil Survey Description	AASHTO Soil Type	USCS Soil Type	Graphic Log	LITHOLOGIC DESCRIPTION AND REMARKS	Moisture Content (%)	Passing No. 200 Sieve (%)	Liquid Limit	Plasticity Index	Infiltration Testing
0		Wind River gravelly loam	A-2	SC		Approximately 4 to 6 inches of grass and topsoil. Dark brown clayey SAND with some gravel, moist, medium dense [Soil Type 2].					
5			A-1	SP		Dark gray poorly-graded SAND with trace of gravel, damp, medium dense [Soil Type 3]. Fines content decreasing with depth.					
10						Bottom of test pit at 10.0 feet. Groundwater not encountered.					
15											
20											

TEST PIT LOG

PROJECT NAME Four Seasons South						CLIENT Four Seasons Subdivision, LLC		PROJECT NO. 17306		TEST PIT NO. TP-6	
PROJECT LOCATION Vancouver, Washington						CONTRACTOR L&S Contractors		EQUIPMENT Excavator		ENGINEER JFM	
TEST PIT LOCATION See Figure 2						APPROX. SURFACE ELEVATION 311 ft amsl		GROUNDWATER DEPTH Not encountered		START TIME 0945	
FINISH TIME 1000											
Depth (feet)	Sample Field ID	SCS Soil Survey Description	AASHTO Soil Type	USCS Soil Type	Graphic Log	LITHOLOGIC DESCRIPTION AND REMARKS	Moisture Content (%)	Passing No. 200 Sieve (%)	Liquid Limit	Plasticity Index	Infiltration Testing
0						Approximately 6 to 8 inches of grass and topsoil.					
		Wind River gravelly loam	A-2	SC		Dark brown clayey sand FILL with some gravel, moist, medium dense [Soil Type 1A].					
5			A-1	SP		Dark gray poorly-graded sand FILL with traces of gravel and sandy silt lenses and layers, damp, medium dense [Soil Type 1B]. Fines content decreasing with depth.					
10			A-1	SP		Dark gray poorly-graded SAND with trace of gravel, damp, medium dense [Soil Type 3].					
20						Bottom of test pit at 10.0 feet. Groundwater not encountered.					

APPENDIX C

SOIL CLASSIFICATION INFORMATION

SOIL DESCRIPTION AND CLASSIFICATION GUIDELINES

Particle-Size Classification

COMPONENT	ASTM/USCS		AASHTO	
	size range	sieve size range	size range	sieve size range
Cobbles	> 75 mm	greater than 3 inches	> 75 mm	greater than 3 inches
Gravel	75 mm – 4.75 mm	3 inches to No. 4 sieve	75 mm – 2.00 mm	3 inches to No. 10 sieve
Coarse	75 mm – 19.0 mm	3 inches to 3/4-inch sieve	-	-
Fine	19.0 mm – 4.75 mm	3/4-inch to No. 4 sieve	-	-
Sand	4.75 mm – 0.075 mm	No. 4 to No. 200 sieve	2.00 mm – 0.075 mm	No. 10 to No. 200 sieve
Coarse	4.75 mm – 2.00 mm	No. 4 to No. 10 sieve	2.00 mm – 0.425 mm	No. 10 to No. 40 sieve
Medium	2.00 mm – 0.425 mm	No. 10 to No. 40 sieve	-	-
Fine	0.425 mm – 0.075 mm	No. 40 to No. 200 sieve	0.425 mm – 0.075 mm	No. 40 to No. 200 sieve
Fines (Silt and Clay)	< 0.075 mm	Passing No. 200 sieve	< 0.075 mm	Passing No. 200 sieve

Consistency for Cohesive Soil

CONSISTENCY	SPT N-VALUE (BLOWS PER FOOT)	POCKET PENETROMETER (UNCONFINED COMPRESSIVE STRENGTH, tsf)
Very Soft	2	less than 0.25
Soft	2 to 4	0.25 to 0.50
Medium Stiff	4 to 8	0.50 to 1.0
Stiff	8 to 15	1.0 to 2.0
Very Stiff	15 to 30	2.0 to 4.0
Hard	30 to 60	greater than 4.0
Very Hard	greater than 60	-

Relative Density for Granular Soil

RELATIVE DENSITY	SPT N-VALUE (BLOWS PER FOOT)
Very Loose	0 to 4
Loose	4 to 10
Medium Dense	10 to 30
Dense	30 to 50
Very Dense	more than 50

Moisture Designations

TERM	FIELD IDENTIFICATION
Dry	No moisture. Dusty or dry.
Damp	Some moisture. Cohesive soils are usually below plastic limit and are moldable.
Moist	Grains appear darkened, but no visible water is present. Cohesive soils will clump. Sand will bulk. Soils are often at or near plastic limit.
Wet	Visible water on larger grains. Sand and silt exhibit dilatancy. Cohesive soil can be readily remolded. Soil leaves wetness on the hand when squeezed. Soil is much wetter than optimum moisture content and is above plastic limit.

AASHTO SOIL CLASSIFICATION SYSTEM

TABLE 1. Classification of Soils and Soil-Aggregate Mixtures

General Classification	Granular Materials (35 Percent or Less Passing .075 mm)				Silt-Clay Materials (More than 35 Percent Passing 0.075)		
Group Classification	A-1	A-3	A-2	A-4	A-5	A-6	A-7
Sieve analysis, percent passing:							
2.00 mm (No. 10)	-	-	-	-	-	-	-
0.425 mm (No. 40)	50 max	51 min	-	-	-	-	-
0.075 mm (No. 200)	25 max	10 max	35 max	36 min	36 min	36 min	36 min
<u>Characteristics of fraction passing 0.425 mm (No. 40)</u>							
Liquid limit				40 max	41 min	40 max	41 min
Plasticity index	6 max	N.P.		10 max	10 max	11 min	11 min
General rating as subgrade	Excellent to good				Fair to poor		

Note: The placing of A-3 before A-2 is necessary in the "left to right elimination process" and does not indicate superiority of A-3 over A-2.

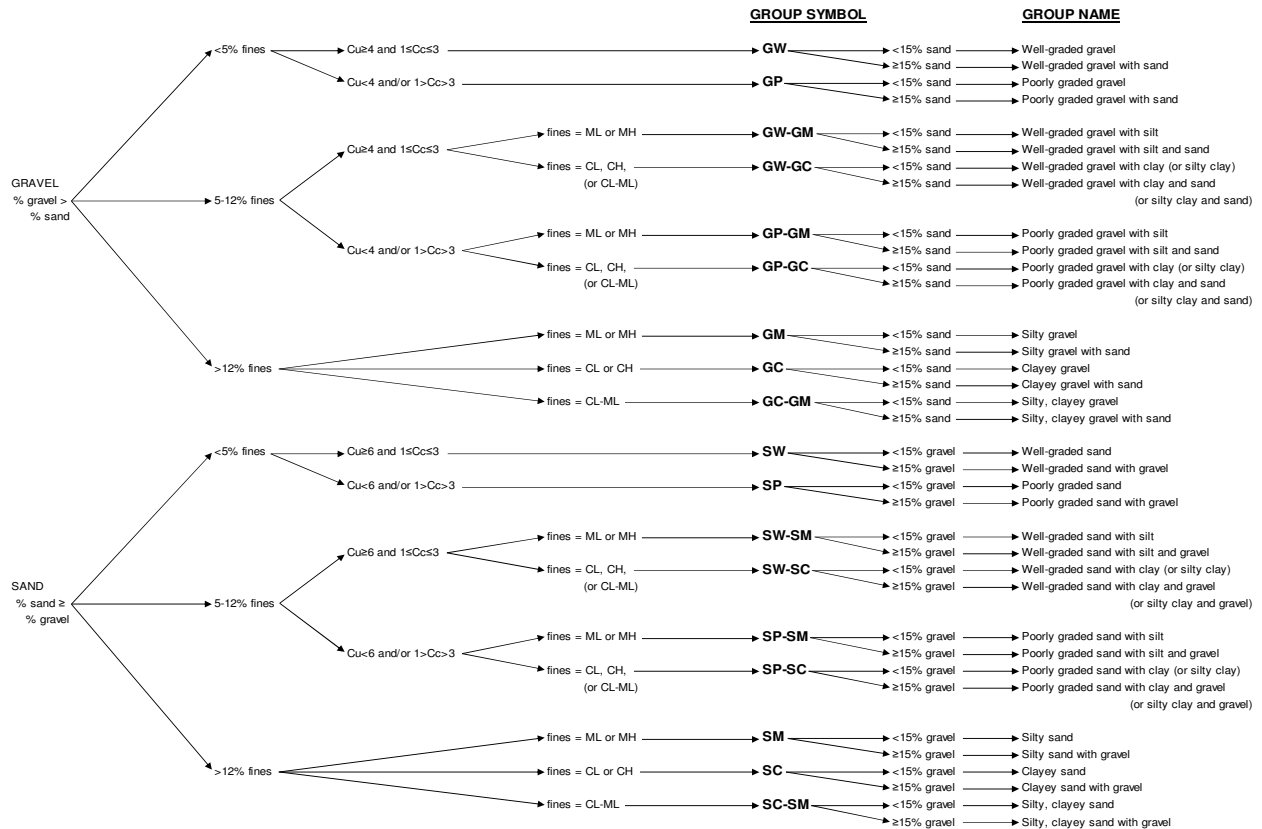
TABLE 2. Classification of Soils and Soil-Aggregate Mixtures

	Granular Materials							Silt-Clay Materials			
General Classification	(35 Percent or Less Passing 0.075 mm)							(More than 35 Percent Passing 0.075 mm)			
	A-1		A-2					A-7			
								A-7-5,			
Group Classification	A-1-a	A-1-b	A-3	A-2-4	A-2-5	A-2-6	A-2-7	A-4	A-5	A-6	A-7-6
<u>Sieve analysis, percent passing:</u>											
2.00 mm (No. 10)	50 max	-	-	-	-	-	-	-	-	-	-
0.425 mm (No. 40)	30 max	50 max	51 min	-	-	-	-	-	-	-	-
0.075 mm (No. 200)	15 max	25 max	10 max	35 max	35 max	35 max	35 max	36 min	36 min	36 min	36 min
<u>Characteristics of fraction passing 0.425 mm (No. 40)</u>											
Liquid limit				40 max	41 min	40 max	41 min	40 max	41 min	40 max	41 min
Plasticity index	6 max		N.P.	10 max	10 max	11 min	11 min	10 max	10 max	11 min	11 min
Usual types of significant constituent materials	Stone fragments, gravel and sand		Fine sand	Silty or clayey gravel and sand				Silty soils		Clayey soils	
General ratings as subgrade	Excellent to Good							Fair to poor			

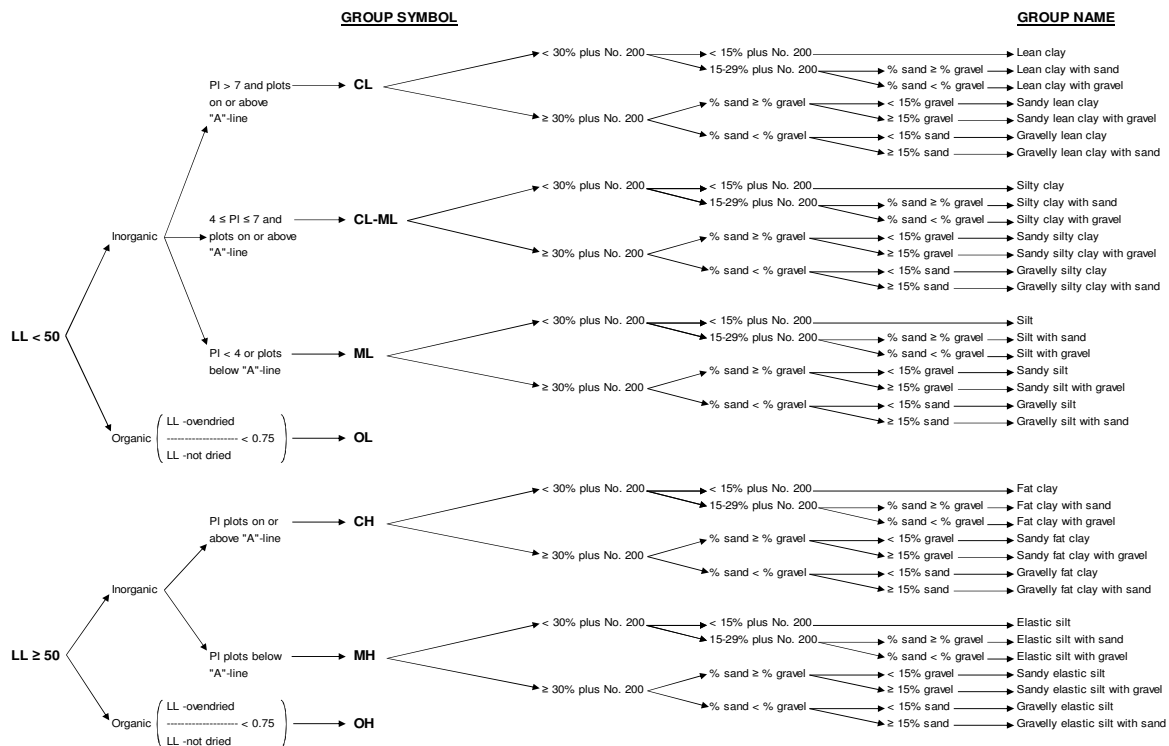
Note: Plasticity index of A-7-5 subgroup is equal to or less than LL minus 30. Plasticity index of A-7-6 subgroup is greater than LL minus 30 (see Figure 2).

AASHTO = American Association of State Highway and Transportation Officials

USCS SOIL CLASSIFICATION SYSTEM



Flow Chart for Classifying Coarse-Grained Soils (More Than 50% Retained on No. 200 Sieve)



Flow Chart for Classifying Fine-Grained Soil (50% or More Passes No. 200 Sieve)

APPENDIX D PHOTO LOG

**FOUR SEASONS SOUTH
VANCOUVER, WASHINGTON
PHOTO LOG**



Site Exploration Activity, TP-5



Typical Test Pit Profile, Test Pit TP-1



**FOUR SEASONS SOUTH
VANCOUVER, WASHINGTON
PHOTO LOG**



Typical Test Pit Profile, Test Pit TP-4



APPENDIX E

REPORT LIMITATIONS AND IMPORTANT INFORMATION

Date: December 4, 2017
Project: Four Seasons South
Vancouver, Washington

Geotechnical and Environmental Report Limitations and Important Information

Report Purpose, Use, and Standard of Care

This report has been prepared in accordance with standard fundamental principles and practices of geotechnical engineering and/or environmental consulting, and in a manner consistent with the level of care and skill typical of currently practicing local engineers and consultants. This report has been prepared to meet the specific needs of specific individuals for the indicated site. It may not be adequate for use by other consultants, contractors, or engineers, or if change in project ownership has occurred. It should not be used for any other reason than its stated purpose without prior consultation with Columbia West Engineering, Inc. (Columbia West). It is a unique report and not applicable for any other site or project. If site conditions are altered, or if modifications to the project description or proposed plans are made after the date of this report, it may not be valid. Columbia West cannot accept responsibility for use of this report by other individuals for unauthorized purposes, or if problems occur resulting from changes in site conditions for which Columbia West was not aware or informed.

Report Conclusions and Preliminary Nature

This geotechnical or environmental report should be considered preliminary and summary in nature. The recommendations contained herein have been established by engineering interpretations of subsurface soils based upon conditions observed during site exploration. The exploration and associated laboratory analysis of collected representative samples identifies soil conditions at specific discreet locations. It is assumed that these conditions are indicative of actual conditions throughout the subject property. However, soil conditions may differ between tested locations at different seasonal times of the year, either by natural causes or human activity. Distinction between soil types may be more abrupt or gradual than indicated on the soil logs. This report is not intended to stand alone without understanding of concomitant instructions, correspondence, communication, or potential supplemental reports that may have been provided to the client.

Because this report is based upon observations obtained at the time of exploration, its adequacy may be compromised with time. This is particularly relevant in the case of natural disasters, earthquakes, floods, or other significant events. Report conclusions or interpretations may also be subject to revision if significant development or other manmade impacts occur within or in proximity to the subject property. Groundwater conditions, if presented in this report, reflect observed conditions at the time of investigation. These conditions may change annually, seasonally or as a result of adjacent development.

Additional Investigation and Construction QA/QC

Columbia West should be consulted prior to construction to assess whether additional investigation above and beyond that presented in this report is necessary. Even slight variations in soil or site conditions may produce impacts to the performance of structural facilities if not adequately addressed. This underscores the importance of diligent QA/QC construction observation and testing to verify soil conditions do not differ materially or significantly from the interpreted conditions utilized for preparation of this report.

Therefore, this report contains several recommendations for field observation and testing by Columbia West personnel during construction activities. Actual subsurface conditions are more readily observed and discerned during the earthwork phase of construction when soils are exposed. Columbia West cannot accept responsibility for deviations from recommendations described in this report or future

performance of structural facilities if another consultant is retained during the construction phase or Columbia West is not engaged to provide construction observation to the full extent recommended.

Collected Samples

Uncontaminated samples of soil or rock collected in connection with this report will be retained for thirty days. Retention of such samples beyond thirty days will occur only at client's request and in return for payment of storage charges incurred. All contaminated or environmentally impacted materials or samples are the sole property of the client. Client maintains responsibility for proper disposal.

Report Contents

This geotechnical or environmental report should not be copied or duplicated unless in full, and even then only under prior written consent by Columbia West, as indicated in further detail in the following text section entitled *Report Ownership*. The recommendations, interpretations, and suggestions presented in this report are only understandable in context of reference to the whole report. Under no circumstances should the soil boring or test pit excavation logs, monitor well logs, or laboratory analytical reports be separated from the remainder of the report. The logs or reports should not be redrawn or summarized by other entities for inclusion in architectural or civil drawings, or other relevant applications.

Report Limitations for Contractors

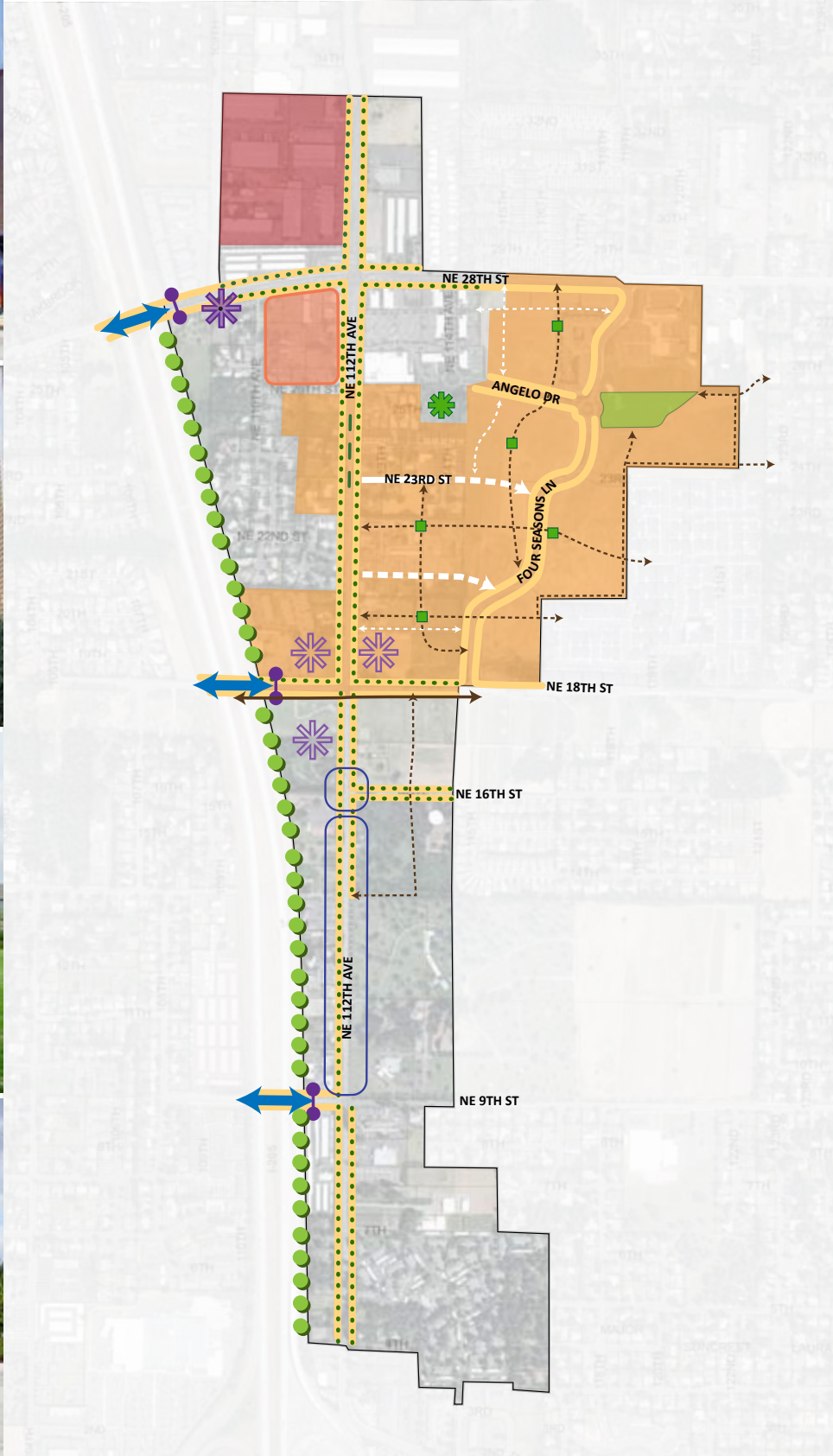
Geotechnical or environmental reports, unless otherwise specifically noted, are not prepared for the purpose of developing cost estimates or bids by contractors. The extent of exploration or investigation conducted as part of this report is usually less than that necessary for contractor's needs. Contractors should be advised of these report limitations, particularly as they relate to development of cost estimates. Contractors may gain valuable information from this report, but should rely upon their own interpretations as to how subsurface conditions may affect cost, feasibility, accessibility and other components of the project work. If believed necessary or relevant, contractors should conduct additional exploratory investigation to obtain satisfactory data for the purposes of developing adequate cost estimates. Clients or developers cannot insulate themselves from attendant liability by disclaiming accuracy for subsurface ground conditions without advising contractors appropriately and providing the best information possible to limit potential for cost overruns, construction problems, or misunderstandings.

Report Ownership

Columbia West retains the ownership and copyright property rights to this entire report and its contents, which may include, but may not be limited to, figures, text, logs, electronic media, drawings, laboratory reports, and appendices. This report was prepared solely for the client, and other relevant approved users or parties, and its distribution must be contingent upon prior express written consent by Columbia West. Furthermore, client or approved users may not use, lend, sell, copy, or distribute this document without express written consent by Columbia West. Client does not own nor have rights to electronic media files that constitute this report, and under no circumstances should said electronic files be distributed or copied. Electronic media is susceptible to unauthorized manipulation or modification, and may not be reliable.

Consultant Responsibility

Geotechnical and environmental engineering and consulting is much less exact than other scientific or engineering disciplines, and relies heavily upon experience, judgment, interpretation, and opinion often based upon media (soils) that are variable, anisotropic, and non-homogenous. This often results in unrealistic expectations, unwarranted claims, and uninformed disputes against a geotechnical or environmental consultant. To reduce potential for these problems and assist relevant parties in better understanding of risk, liability, and responsibility, geotechnical and environmental reports often provide definitive statements or clauses defining and outlining consultant responsibility. The client is encouraged to read these statements carefully and request additional information from Columbia West if necessary.



112th Avenue Corridor Plan

Adopted December 19, 2011



ACKNOWLEDGEMENTS

Vancouver City Council

Tim Leavitt, Mayor
 Larry Smith
 Jeanne Harris
 Jeanne E. Stewart
 Pat Campbell
 Jack Burkman
 Bart Hansen
 Eric Holmes, City Manager

Vancouver Planning Commission

Esther B. Schrader, Chair
 Robert Haverkate, Vice Chair
 John S. Lee
 Mario Raia
 Dave Moriuchi
 Lisa F. Willis
 Erik Paulsen

Vancouver Neighborhood Associations

Fircrest
 Image
 Landover-Sharmel

Project Team

MAKERS Architecture and Urban Design

John Owen
 Bob Bengford
 Sean McCormick

Leland Consulting Group

Chris Zahas

Transpo Group

Mike Swenson

City of Vancouver

Matt Ransom
 Sandra Towne
 Phil Wuest
 Greg Turner
 Alisa Pyszka
 Jean Akers
 Charles Ray
 Tyler Clary

ADDITIONAL THANKS

Fircrest Neighborhood Association
 Image Neighborhood Association
 Landover-Scharmell Neighborhood Association
 Local residents, businesses, and stakeholders

This page intentionally left blank

TABLE OF CONTENTS

INTRODUCTION	5
Plan Area	5
Purpose	5
Planning Process	6
PLAN CONTEXT	7
Surrounding Area Characteristics	7
Plan Area Characteristics	7
MARKET STRATEGY	13
Study Influence Area	13
Market Trends	13
Opportunities	14
SUBAREA CONCEPT	15
Plan Goals	15
Concept Overview	15
Key Features	17
PLAN STRATEGIES	19
Land Use & Zoning	19
Access and Circulation	22
Future Development Conceptual Site Plan	26
Design Guidelines	34
Plan District Approach	34
Land Use Policies	34
Access and Circulation Policies	37
APPENDICES	A-1
Appendix A: Market Strategy	A-1
Appendix B: Traffic Analysis Summary	A-18
Appendix C: Illustrated Site Plan Example & Assumptions	A-24

This page intentionally left blank

INTRODUCTION

PLAN AREA

The 112th Avenue Corridor is a north-south principal arterial just east of Interstate 205 (I-205) in the City of Vancouver. The portion of the corridor that is the subject of this planning effort follows 112th Avenue from NE 4th Street on the south to NE 33rd Street on the north and from I-205 on the west to a varied one to five blocks from 112th Avenue to the east (see Figure 1 below). The planning area encompasses portions of three active neighborhood associations – Fircrest, Image, and Landover-Sharmel and one inactive neighborhood association, Kevanna Park. There is a small residential area west of 112th that is not part of a neighborhood association, but is included in the plan area.

NOTE: Although the names of 112th Avenue and 18th and 28th Streets each begin with northeast (NE), this plan for brevity and ease of reading purposefully leaves off the NE from each street name.

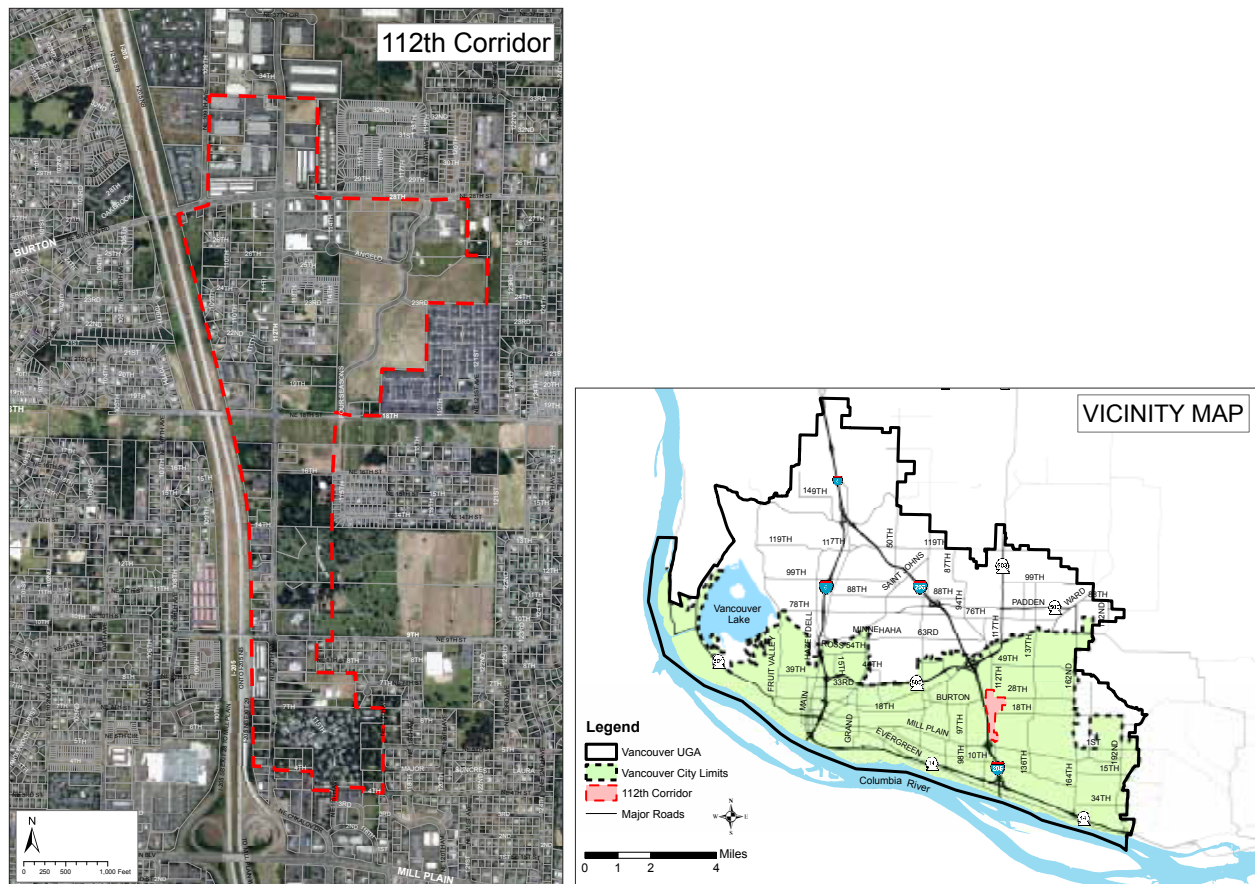


Figure 1. Vicinity Map and Plan Boundary Map

PURPOSE

The City of Vancouver's Comprehensive Plan calls for subarea planning and identifies 112th Avenue Corridor as an area where focused planning for urban growth and services should occur. By initiating the 112th Avenue Corridor Plan the city with input from community residents, businesses and agencies will address the growth and change the area will soon face.

INTRODUCTION

In the near future, the Washington State Department of Transportation's (WSDOT) 18th Street second phase of the split-diamond I-205 interchange project will be constructed. Numerous private development proposals that are on hold with the market slow down will reappear as the market picks up. In the more distant future, proposed projects include 1) WSDOT's Phase III of the I-205 Interchange at 28th Street completing the split-diamond I-205 project and 2) a potential transit station to be located near I-205 in the vicinity of 18th and 28th Streets serving local and bi-state commuters.

This Plan's challenge is to incorporate these major transportation facilities and private developments in a way that supports transit service and enhances the distinctive characteristics and livability of the plan area. It is not too soon to meet this challenge. The WSDOT 18th Street interchange and connector project is slated to begin construction in 2015. The proposed private development on hold because of the national recession and market slow down is expected to revive, possibly modified, as the economy improves. Economists predict that there will be a high demand in the immediate future and over the long term for attached housing such as apartments and town homes.

PLANNING PROCESS

The 112th Avenue Corridor Plan was developed following an extensive planning process. The process included compiling information on existing conditions in the study area to create a "baseline" for future planning, actively engaging property owners, agencies, businesses, and interested citizens, and soliciting advice from urban design professionals.

City staff and consultants held three public workshops to seek input from the 112th Avenue community to identify planning goals, challenges and opportunities, determine a preliminary plan concept, and review and comment on the preferred concept. At the workshops, participants evaluated existing conditions, answered questions, participated in a brainstorming session, identified challenges and opportunities, and took part in a mapping exercise to explore what features and activities would they like to see in the 112th Subarea within the next 10 to 20 years. Later in the summer four additional public open houses were held to review and comment on a draft conceptual site plan, design guidelines, and draft plan text and policy.

Throughout the planning period, information was made available and public comment opportunities were provided through emails, newsletters, and postings to the project website. Neighborhood meeting presentations were made before the Image, Landover-Sharmel, Fircrest Neighborhood Associations and the Vancouver Neighborhood Alliance. City staff attended and displayed planning maps and concepts at the Landover-Sharmel July 16th picnic.

All written comments received regarding the draft Subarea Plan and implementation strategies were provided to the Planning Commission.



112th Avenue Corridor Plan workshops

PLAN CONTEXT

SURROUNDING AREA CHARACTERISTICS

By far the most dominant land use surrounding the plan area is single family residential. These suburban single family neighborhoods located east and west of the plan area were built between 1970 and 1990.

To the north of 28th street is one of the City's more significant industrial employment corridors that includes a wide range of light industrial users from smaller businesses housed within "tech/flex" buildings to the large silicon wafer manufacturer SEH America, Inc. This employment corridor influences the future growth and character of the plan area providing nearby jobs to an urban center population. Additional significant employment can be found to the east of the plan area, Evergreen School District offices and schools, Micropump, US Digital, and public services to name only a few.

To the south of the plan area is the Mill Plain Blvd/Chaklov commercial destination with a diversity of businesses and services provided, and to the north is the Orchards commercial area and Westfield Mall. The plan area incorporates three important east-west connections that pass over or under I-205 – 9th Street, 18th Street, and 28th Street.

PLAN AREA CHARACTERISTICS

Land Use

In the past, 112th Avenue was named N.E. Ellsworth and surrounding it were single family houses on acreage or large lots, small farms, agricultural fields, and open space with large stands of trees. As commonly occurs through the years, urban growth replaced some large residential lots, farms, fields, and stands of trees with subdivisions, businesses, schools and industry. Yet uniquely, this plan area continues to noticeably retain some of these historic characteristics – mature trees, open space at the Evergreen Memorial Gardens, and a successful urban farm, Joe's Place farm.

Although housing remains the dominant land use today, a transition from older single family homes on large lots to newer developments of single-family attached and multifamily housing or office/commercial began several years ago. Specific areas markedly display this transition – South of 18th Street on both the west and east sides of 112th Avenue are several new commercial developments: the Four Seasons mixed-use site includes newly completed commercial and senior housing projects with proposals of future office and multifamily housing projects; and just south of 28th Street adjacent to 112th Avenue is the new 49 home Maxwell Manor townhouse neighborhood.

Nearly all of the property within the plan area is privately owned; the few exceptions include a City of Vancouver water tower, a Clark Public Utility substation and the Bonneville Power Administration's high-voltage transmission line corridor.



Examples of new housing in plan area

There are a couple of land uses along the corridor that give the plan area a special identity – the Evergreen Memorial Gardens and Joe’s Place Farm.

Evergreen Memorial Gardens: In the early 1950s, a Texan named Anderson, began establishing a network of cemeteries in smaller cities of the West. He acquired 40 acres in Clark County and created the Evergreen Memorial Gardens Cemetery. Within a few years the Waterhouse family purchased the cemetery. In 1968, Willard J. Carlson, of Spokane Washington, was hired to promote and further develop the cemetery. Within a few years Mr. Carlson purchased the cemetery from the Waterhouse family. Over the years the Carlson family expanded the cemetery to include a full service funeral chapel and crematory; the only one to this day in Clark County with the combination of cemetery, funeral chapel and crematory. (Source: Evergreen Memorial Gardens Web Page, www.evergreenmemorialgardens.com)



Evergreen Cemetery

Joe’s Place Farm: Joe Beaudoin began planting his first orchard when he was 14 years old. With no equipment he borrowed the neighbor’s horse to cultivate the fields. As a junior in high school, he grew strawberries and sold them to 2 local stores, 2 drive-in restaurants, and at his own roadside stand on NE Ellsworth (now named NE 112th Avenue). In 1957 Joe earned his State Farmers Degree from Washington State University, but didn’t fully apply his farming degree for several years, instead managing a local furniture store.

Returning to farming in 1974, he and his family built their house on 5 acres, and grew corn and tomatoes that they sold by the boxes from their garage. Unable to keep up with the demand, they began to expand by purchasing additional acreage and leasing larger nearby properties. Today, Joe’s farm has expanded to cover nearly 80 acres and Joe and his family continue to sell their locally grown fruits and vegetables from the farm store located just behind their 1974 home. (Source: Interview April 27, 2011 with Joe and Gayle Beaudoin)



Joe's Place Farm



Access and Circulation

Future Significant Transportation Projects

The Washington State Department of Transportation's (WSDOT) I-205 access project was planned many years ago. The first phase (the 112th Avenue connector from I-5 Northbound south of Mill Plain) of this interchange project was completed in 2010. Future phases will add a split diamond interchange at 18th and 28th Streets. The south half of the future split diamond interchange is funded and scheduled for design and construction, but the northern half that includes the collector-distributor roads between 18th and 28th Streets and the I-205 northbound-on and southbound-off ramps are not funded at this time.

In preparation for the future 18th Street interchange, the City of Vancouver is currently upgrading 18th St. at the 112th Avenue intersection with additional vehicle capacity and pedestrian and bicycle facilities. Future phases of the 18th Street corridor improvement will include extension of the corridor to 87th Avenue on the west side of I-205 to provide access to nearby neighborhoods and the Southwest Washington Medical Center/Peacehealth Hospital, and reconstruction and urban upgrade to the 18th Street corridor all the way east to 192nd Avenue. Those future project phases are unfunded at this time.

In the recently completed Regional High Capacity Transit Plan for Clark County, the Southwest Washington Regional Transportation Council (RTC) included a recommendation for a future transit station in the vicinity of 112th Avenue and the planned new split-diamond interchange at 18th and 28th Streets. This facility would likely be designed to serve both nearby residents as well as park and ride traffic. While no detailed planning has been completed, the location of a park and ride is an important consideration for local land use and transportation planning in the 112th Avenue Corridor.

112th Avenue

112th Avenue is partially improved to urban arterial standard. Recent major improvement projects include: the 28th Street and 18th Street intersections completed with frontage improvements (curb, gutter, sidewalks, bike lanes) and the southernmost end of the corridor was upgraded with completion of the I-205 northbound 112th Avenue off-ramp, the first phase of the WSDOT I-205 access improvements described above.



Improved 28th/112th intersection

PLAN CONTEXT

Additionally, development along sections of the corridor, for example the office buildings on the west side of 112th Avenue just north of 9th Street or the commercial development on the southeast corner of 28th Street and 112th Avenue have included frontage improvements along the parcels being developed.



Examples of newer commercial development street frontages

Although portions of 112th Avenue have recently been improved with public projects and private development, much of 112th is built to less than full urban standard. Frontage improvements are spotty or substandard in places and corridor right-of-way width is inconsistent and lacking in several locations. For example, sections of 112th south of 18th Street lack adequate lane width, sidewalks, and bike lanes. The Evergreen Memorial Garden's 112th Avenue frontage does not have any sidewalk and existing right-of-way is between 50 and 60 feet wide.

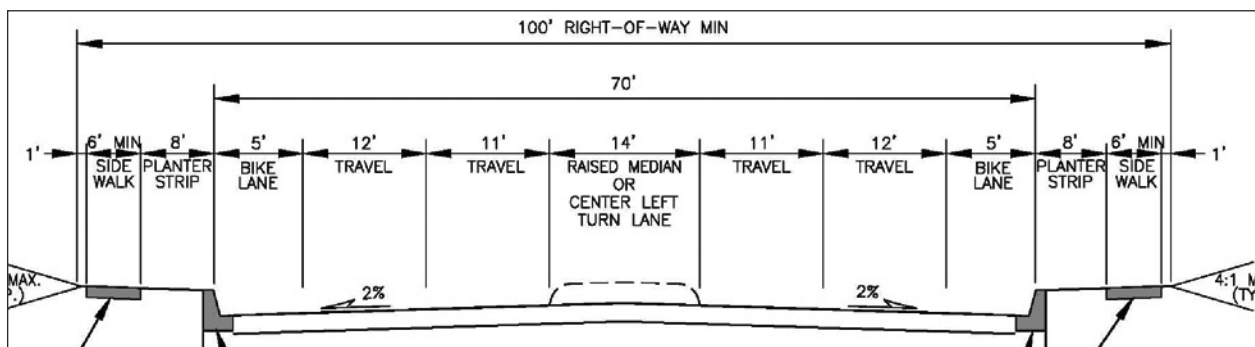


Figure 2. Vancouver's principal arterial standard includes 100 feet of right-of-way, 11 and 12 foot travel lanes, a 14 center turn lane, bike lanes and detached sidewalks.



Areas of 112th Avenue with narrow sidewalk or no sidewalk

112th Avenue Corridor Traffic Safety Project

The Washington State Corridor Safety Program identified 112th Avenue as a corridor safety project in 2009. The Corridor Safety Program works to reduce collisions on roadways using low-cost, near-term solutions through the use of partnerships with engineering, enforcement, education, and emergency services. The program is locally coordinated, which includes invitation to local leadership to chair steering committee meetings, requires local government, interested citizens, businesses, schools and any other agencies that have a vested interest in the safety of their roadways. The Project will come to an end September 2011 and will deliver a summary report that includes:

- Short median installation and I-205 ramp signal installation at Chkalov Drive mid block between NE 2nd Street and I-205 off-ramp;
- Striping of north bound to westbound left-turn striping modified to reduce queue length at Mill Plain Boulevard/Chkalov Drive;
- Left-turn signal upgraded to protected (green arrow) phasing at Chkalov Drive/Fred Meyer traffic signal;
- Radar sign installed between Chkalov Drive and NE 7th Street; and 18th Street intersection widened and upgraded.

Bus Service

Today there is little direct public transit service for the 112th Avenue corridor and plan area. Two local-service routes pass through the plan area on NE 28th Street on one-half hour headways between 6:30 AM and about 9:00 PM.

This page intentionally left blank

MARKET STRATEGY

(Source: The Leland Consulting Group Market Strategy Report Appendix A)

STUDY INFLUENCE AREA

Leland Consulting Group, completed a market strategy report for the 112th Avenue Corridor highlighting several key opportunities and challenges that will shape what is possible in the corridor over the next 10 to 20 years. The report uses a larger study area than the subarea plan boundary in order to provide a broader picture of the influence area. This larger market area encompasses the entirety of 4 neighborhood association boundaries – Kevanna Park, Image, Landover-Sharmel, and Fircrest. (Refer to Appendix A)

MARKET TRENDS

Demographic Shifts

Nationwide, the baby boomer generation is now beginning to enter their retirement years. At the same time, younger generations (namely “Generation Y”) are entering the housing market. Both are expected to drive significant demand for multifamily housing. Further, while growth in the region has slowed due to the economy, growth will return, driven by natural growth as well as renewed in-migration.

New Households

The vast majority of new households being formed during the next decade and beyond will be singles, couples, and seniors according to Harvard University’s Joint Center for Housing Studies. These are the types of households most likely to locate in urban, transit-oriented development, and infill locations - and thus to purchase goods and services, and support retailers in these neighborhoods.

Mixed-use Centers are the Wave of the Future

Demographic and market trends indicate that mixed-use urban centers with good pedestrian and transit access will be the most desirable places for development in the future. Both the baby boomers and Generation Y share a desire for quality over quantity, a sense of community and place, and a desire to live in more urban environments.

“A whopping 88 percent of generation Y wants to live in an urban setting, according to a survey by Robert Charles Lesser & Company. Factor in rising gas prices - which make drivable suburbs more expensive - rising suburban poverty and the difficulty of selling houses on once-exclusive cul-de-sacs, and suburban appeal erodes further.” (Source: New Urban Network)

Combined, these two generations will greatly impact how cities evolve over the next 20 years, driving more demand for infill in urbanized areas and significantly increasing the demand for multifamily housing. Deliberate planning and urban design to make quality places with a sense of community and place will increase the attractiveness and livability of future urban development.

Livability is an Economic Development Draw

The quality of life of a community is a major factor in business location. Whereas, in previous years employees moved to be close to their jobs, a new paradigm is emerging where it is the employers who move in order to be close to the talented workers they need to be successful. More and more, those workers are mobile and choose to live in communities with quality physical environments, outdoor recreation opportunities, cultural amenities, accessible transportation options, good schools, and mixed-use urban centers. Deliberate planning and urban design will help create successful quality urban communities that both employees and employers desire.

OPPORTUNITIES

Future Transit Station

The Southwest Washington Regional Transportation Council (RTC) completed a Clark County High Capacity Transit (HCT) System Study in December 2008. The Study builds from the proposed bi-state Columbia River Crossing Project connecting downtown Vancouver to the Portland MAX system. Four Corridors were evaluated - I-5/Highway 99, Fourth Plain, I-205, and Mill Plain Blvd. The RTC Steering Committee approved the 4 corridor system plan strategy, policies and recommended corridor elements. The study states that HCT in the I-205 corridor will serve both internal Clark County trips and bi-state trips. The study also identifies a future transit station in the plan area along I-205.

Significant nearby Employment

The market area has a significant amount of employment. Based on 2008 numbers, approximately 7,800 people work in the study area. Manufacturing is the strongest employment base with other significant employment in wholesale and retail trade, accommodation and food services, administration and support, waste management and remediation, and health care and social assistance. Several major high-tech manufacturing facilities are located in the market area, including facilities operated by US Digital, Micropump, and SEH America. It is widely known that silicon wafer manufacturer SEH America, Inc. is considering a major expansion of its facility.

Good Access

Well located within the region the planning area has generally good access that will be improved with a new I-205 interchange, is adjacent to a significant employment corridor, and is near many major destinations. With two new planned I-205 interchanges, the plan area's accessibility will make it an increasingly desirable place to be, particularly for housing.

Housing

While national and local economic conditions have largely halted residential development plans over the past couple years, Leland Consulting Group's market analysis indicates strong demand for housing, particularly attached housing such as apartments and townhomes. Housing demand is anticipated to be particularly strong over the long term due to a combination of the area's employment, accessibility, and demographics. Development opportunity sites, especially those along 112th are most likely to redevelop as housing due to these market pressures.

Walkable Mixed-use Urban Center and Corridor

To the extent that the subarea plan accommodates and encourages a transit-oriented walkable mixed-use urban center and corridor, it will be better positioned to thrive and attract investment in the future. In the context of a suburban location such as the 112th Corridor, mixed-use development does not necessarily need to imply vertically mixed uses (multiple uses in a single structure), but could include multiple uses on the same site or on adjacent sites.

New Commercial

Given the strong retail presence along Mill Plain and Fourth Plain Boulevards and at the Four Seasons shopping center, opportunities for new retail are likely to be limited. Some additional retail and services will be needed within the study area to support the anticipated new housing development. Smaller-scale and neighborhood-serving uses could include restaurants, personal services, coffee shops, child care, medical offices, financial services, and general office spaces.

SUBAREA CONCEPT

PLAN GOALS

- Unique neighborhood characteristics and assets such as Evergreen Memorial Gardens, Joe's Place farm, and large canopy trees continue to identify the community.
- Single-family neighborhoods are preserved and enhanced.
- The future I-205 interchange and transit station are carefully integrated into the urban center.
- New developments are coordinated and integrated into a cohesive well-designed walkable urban center.
- Transit-supportive developments are designed to promote a sense of place with a diversity of housing types, a mix of uses, welcoming gathering places, and enhanced pedestrian amenities.
- East-west roadway and trail connections, common open spaces, and coordinated development between 18th and 28th Streets create a pedestrian-friendly neighborhood setting.
- 112th Avenue is enhanced as a safe, pedestrian friendly, multimodal corridor.

CONCEPT OVERVIEW

The concept focuses on design options for the improvement of 112th Avenue corridor and areas that are anticipated for new development, particularly sites between NE 18th and 28th Streets. The concept diagram shown in Figure 3 on page 16 is intended as a design framework that visually depicts the key features for an integrated land use and transportation plan meeting the community's expressed goals listed above.

The 112th Avenue Corridor Subarea is envisioned as a walkable (connected, safe, and comfortable) community. The primary street, 112th Avenue, as well as its adjacent developments will provide for safe pedestrian, bicycle and vehicle travel, allowing connectivity to services, jobs, housing, and amenities along the corridor. To achieve walkability future development will incorporate interconnected streets and trails, diverse housing choices, mix of uses, gathering places, and enhanced pedestrian amenities. The future I-205 interchanges and the potential transit station will also be integrated into the fabric of the area and support walkability.

Walkable neighborhoods provide connectivity, safety, and comfort. Connectivity is how easily residents of all ages and abilities can walk within their neighborhood to community assets. Safety is the provision of a route between walking points that avoids the risk of physical harm. Separation between the pedestrian and or bike and vehicular traffic is an important factor in safety. Comfort is both the physical and aesthetic accommodations that make walking an enjoyable experience. The amount of trees and landscaping, architectural design, public art or other interests are key components in comfortable walkways. Private development frontages along streets also play a key role in comfort and safety by maintaining good visibility between uses and the street and providing visible building entries.

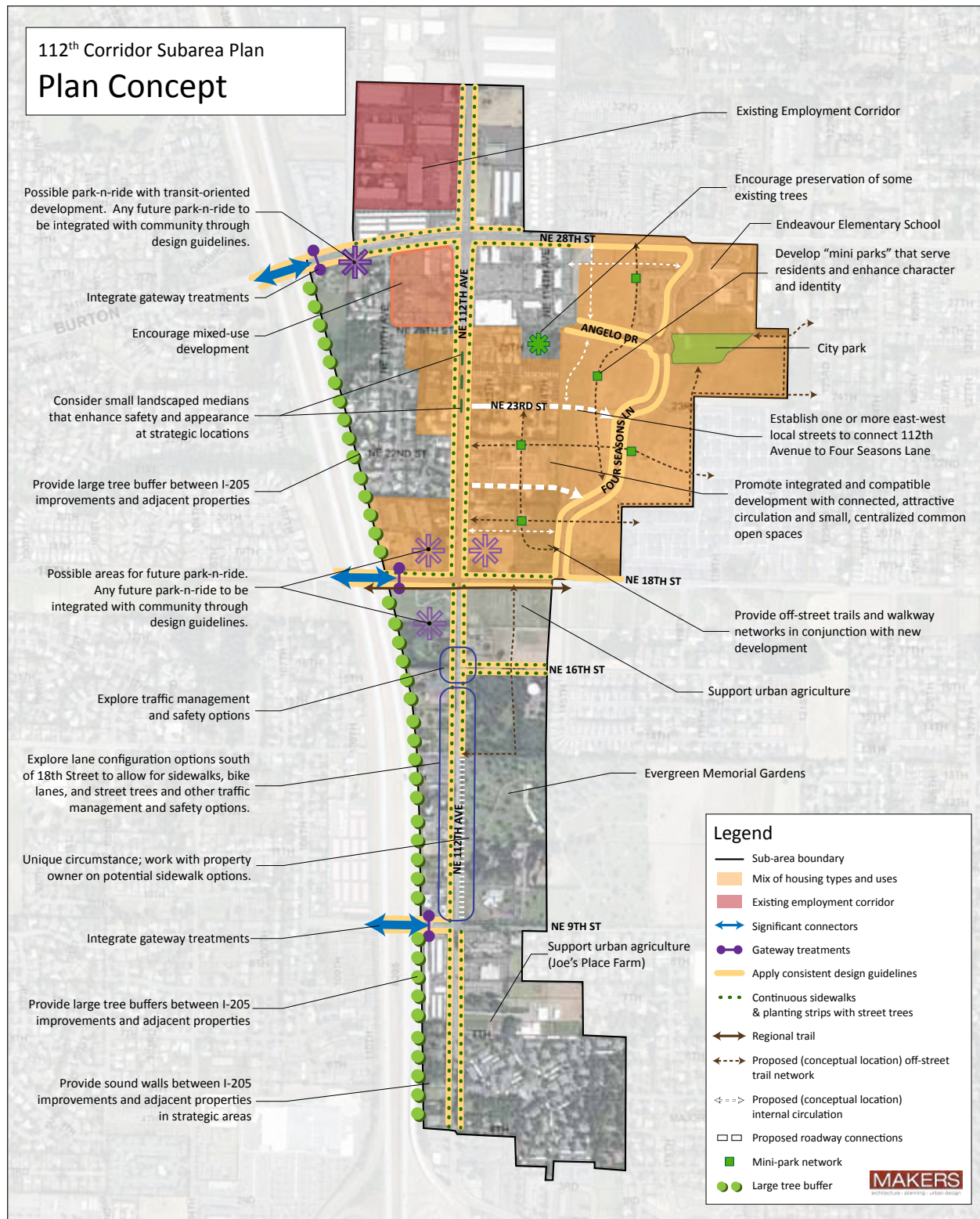


Figure 3. 112th Corridor Subarea Plan Concept

KEY FEATURES

Key Features of the Concept include:

- A network of streets, sidewalks, and off-street trails that connect to current and future developments on adjacent properties to improve both pedestrian and vehicular circulation.
- Small gathering spaces (mini-parks, plazas) incorporated into new development serving as a visual and functional amenity to the immediate surrounding area. The gathering spaces may vary from open lawn, community gardens, natural areas, and hard surface plazas.
- Integrated and compatible development edges. While fenced edges might be appropriate along some property lines, consider more integrated approaches such as a shared pathway or common drive along an internal property line.
- Large tree buffer between I-205 improvements and adjacent properties.
- Any future transit station to be integrated with the community through design guidelines.
- Lane configuration options south of 18th Street on 112th Avenue to allow for bike lanes, sidewalks, street trees, and other traffic management and safety options.
- Consistent design guidelines that provide for pedestrian-friendly façades - both for residential and non-residential uses.
- Gateway features that can be integrated to the streetscape and/or private development at highly visible locations.
- Small landscaped medians along 112th Avenue that enhance safety and appearance at strategic locations.
- A core network of urban arterials for auto and freight access and circulation.

This page intentionally left blank

PLAN STRATEGIES

LAND USE & ZONING

Development of a High Capacity Transit system on I-205 is still easily 10 or more years away, with a number of feasibility and environmental planning studies that would have to be completed before any project moves forward. However, with a strong local employment base and a substantial amount of developable land, the potential for a transit station, brings an opportunity for new, transit-oriented land uses to this area. Success stories from other transit-oriented developments around other cities in the U.S. show that they tend to attract mixed-use development that consists of a mix of retail, office and residential development that takes advantage of convenient transit as well as the large number of people that pass through the area to take the transit.

Transit-oriented development opportunities are most pronounced in areas within 1/4 mile from a transit station. However, for high-capacity transit stations, transit-oriented developments can extend to as much as 1/2 mile from the station, since stations provide high speed and high frequency service. Transit stops also become a “gateway” for the City, since they convey to transit riders an impression about the City. Thus, a future transit station is an opportunity for land owners to take advantage of higher-intensity uses, and an opportunity for the City to create a quality development image.

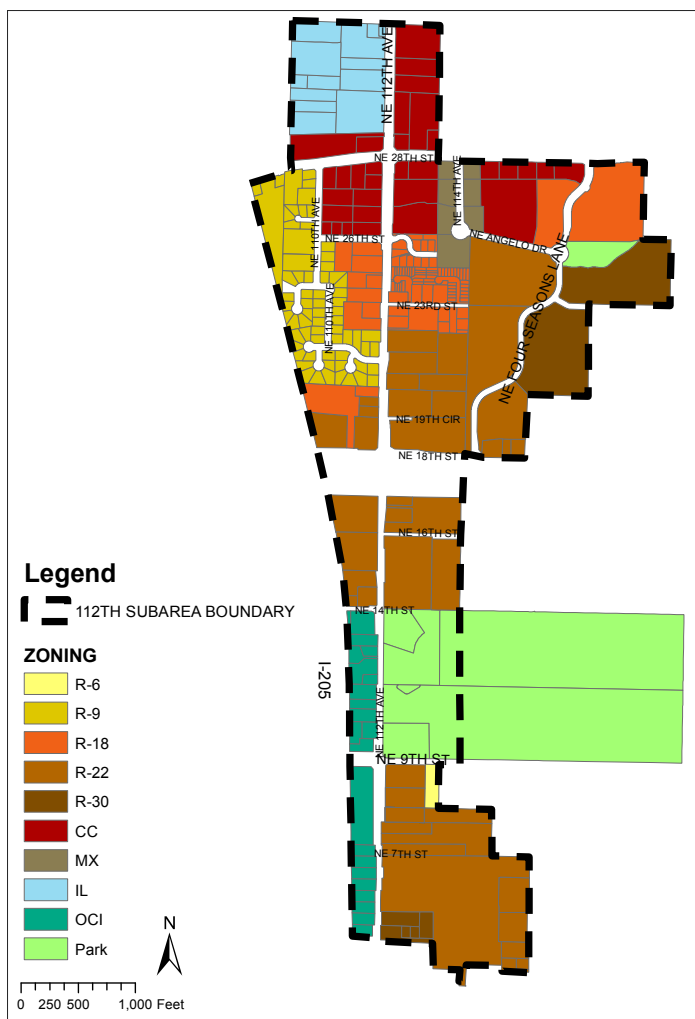


Figure 4. Zoning Map

Single Family Residential

While single family uses and zoning predominate areas surrounding the subarea, there is only one single family zoned area within the subarea. Located between I-205, 112th Avenue, and 18th and 28th Streets (see Figure 4, Zoning Map), the homes within this well established neighborhood were nearly all built in the 1970s and early 80s.

This plan proposes to maintain the existing single family residential zone located in its boundaries, except that the single family R-9 zoning located along 28th Street and east of 112th Avenue may be reconsidered to accommodate a transit station with transit oriented development. Additionally, the plan proposes urban design strategies to help improve the transition between more intense compact development and the single family neighborhoods.

Multi-family Residential

Shifting demographics and market changes favor more housing choices and quality compact development. Economic trends and existing opportunities point to the continuation of primarily residential development with limited retail and office uses. (See Market Study, Appendix A) Currently, multi-family housing is the dominant land use zone in the plan area. However, the current R-18 zone, the most prominent designation in the sub-area, has proven to offer limited mix of housing choices.

To better ensure availability of a mix of housing types to meet expected demand, compact walkable development that supports a transit-oriented urban center and flexibility for those properties with challenging sites to develop, this plan proposes a diverse mixture of R-18, R-22, and R-30 zoning designations.

Additionally, the City of Vancouver Code allows for limited mixed use development pursuant to the design requirements of the Mixed Use code within all of the multifamily zones. This flexibility is beneficial to both property owners wishing to develop and to the community in reaching the plan's goals for an integrated well connected walkable community.

Commercial

A neighborhood retail node named Four Seasons is located at 28th Street and 112th Avenue. Future growth at this intersection is challenged by competition along the Mill and Fourth Plain corridors and the presence of two corner gas stations, an electrical substation and mini-storage warehouses on the north side of 28th Street. These uses limit the ability of the area to achieve a critical mass of commercial development without significant changes of use and/or relocation. Therefore, the type of retail and commercial uses that are likely in this area will continue to be smaller-scale and neighborhood serving.

In either case, the vacant land due east of the Four Seasons shopping center is the most likely to develop as commercial before any redevelopment occurs elsewhere in the vicinity.

Based on the physical constrictions of the commercial properties north of 28th Street, this plan recommends rezoning several parcels zoned Mixed Use within the Four Seasons master plan to the Community Commercial designation. This rezone would extend the existing commercial a bit further east and benefit from the 28th Street access and visibility. It would provide for a few more small scale neighborhood commercial services located within walking distance of the future higher density housing projects and existing single family neighborhoods surrounding the plan area.

Industrial

This plan values the opportunity to enhance the existing employment lands and to provide a choice of housing to be located near the 112th Avenue employment corridor. The plan retains the industrial zoned properties within its boundaries.

Future Transit Station

As discussed under the Market Strategy opportunities, the Southwest Washington Regional Transportation Council's Clark County High Capacity Transit (HCT) System Study identifies a future park and ride facility to be located somewhere in the vicinity of 18th Street and 28th Street and I-205.

The study found that while the design of a good HCT system is critical, it is not enough to ensure successful HCT project implementation. A well designed set of HCT facilities needs to be complimented by transit-supportive densities, a mix of land use, transit-oriented pedestrian environment, parking management strategies, and transit-oriented urban design.

This plan sets the stage for compact transit-oriented development through a proposed mix of land use, housing density, pedestrian amenities and urban design within the larger context of the plan area. However, it will be necessary in the future as C-Tran determines the specific location for the proposed transit station that the criteria to maximize the opportunity to develop as a mixed-use node on adjacent and/or nearby land be employed. Additionally, the zoning of selected property will need to be reconsidered to accommodate a future transit center.

Transit park and ride stations are currently only allowed in commercial and industrial zones. Once a final location is identified, C-TRAN should initiate a zone change request with the City. At that time, the City will have the opportunity to evaluate how a park and ride could best be integrated into the subarea.

Special Uses and Features

Uniquely, this plan area continues to retain some of its historic characteristics – mature trees particularly in the Fircrest neighborhood, open space at the Evergreen Memorial Gardens, and a successful urban farm, Joe's Place farm. These amenities are valued by the community and as the plan area continues to transition to more intense compact development it will be important to protect these amenities.

Evergreen Memorial Gardens, Inc.: The Evergreen Memorial Gardens is a locally owned and independently operated business by both second and third generations of the Willard Carlson family. While the cemetery's historic interest, aesthetic open space and large tree canopy adds significantly to the character of the community, its unique local business plan that provides a cemetery with full service funeral chapel and crematory and employs 27 full-time and 5 part-time employees is a significant amenity to the City of Vancouver.

Joe's Place Farms: Today, Joe's farm has expanded to cover nearly 80 acres, employs 5 full-time, 10 full-time/seasonal, and approximately 30 temporary employees annually. As an urban agriculture business that grows and sells local fruits and vegetables, retention of Joe's Place farm is important to the character of the neighborhood and as an amenity to the City of Vancouver.



(left) Joe's Place Farms, (right) Evergreen Memorial Gardens

Large Canopy Trees: The plan area south of 18th Street is within the boundary of the Fircrest Neighborhood Association. As the Fircrest name proclaims, trees are one of the more important physical characteristics of the neighborhood. The City of Vancouver recognizes the benefits of mature trees. Such benefits include increased property values, improved air quality, and control of rainfall runoff to name only a few. While some trees unfortunately need to be removed because of new urban projects or ill health, the city's goal is to limit removal because of the impacts on the neighborhoods, quality of life, and environment. To help achieve this goal, the City has a Tree Conservation Ordinance that pertains to all land use zones except for single family that meet the exemption requirements. The ordinance protects trees from unnecessary removals and requires replacement.



Preservation of large canopy trees is desired

This plan encourages the preservation of existing trees where appropriate and seeks opportunities for planting new trees. One such opportunity is along the east side of the future I-205 Interchange project. This plan recognizes that properly designed and maintained roadsides complement the functions of the roadway, integrate the roadway facility into the surrounding landscape, and provide social and environmental benefits to vehicle occupants and communities adjacent to roadsides.

Another opportunity is the existing stand of large evergreens located on a property just south of the Four Seasons shopping center (identified on the Concept Plan, Figure 3). Upon future development proposals, the City's Community Development Department and Forester should work collaboratively with the property owners of parcel #162742012 to preserve this stand of trees. The conceptual site plan (see Figure 7 on page 27) shows an example of how a portion of this wooded area could be developed, while setting aside a healthy stand of the trees as permanent open space. The site plan also shows how some of the larger rows of evergreen trees along the perimeter of several properties could be maintained and integrated as an amenity to the development and the larger neighborhood. Such mature trees provide character and identity to the development and provide obvious environmental benefits.

ACCESS AND CIRCULATION

I-205 Split Diamond Interchange

Construction of the 18th/28th Street split diamond interchange will affect the plan area on several levels. It will increase accessibility to residences, retail opportunities, and the 112th Avenue employment corridor north of the plan area. Completion of the interchange will also change traffic patterns in and around the neighborhood. Today, access from the south is provided primarily by 112th Avenue from Mill Plain. In the future that access will be provided at 18th Street and 28th Street. This change in traffic patterns will likely lighten the traffic load on 112th Avenue south of 18th Street.

Future Transit Station

Although this plan does not identify the best location for a potential future transit station, it does identify important considerations for locating one, and provides policies on how it could best be integrated into the neighborhood. Locations around the 18th and 28th Street intersections were evaluated for operational efficiency and as a potential transit-oriented development site. Refer to Figure 3, Concept Plan, for potential transit center locations.

18th Street Locations: The identified locations near the 18th Street Intersection may work with detailed planning, however access and operations would be challenging. And, these locations may be difficult to integrate with the neighborhood and provide little opportunity for a mixed-use transit oriented development. Potentially, a park and ride facility may be a good near-term option in the vicinity of the 18th Street Interchange, provided access challenges can adequately be addressed.

28th Street Location: This location was evaluated as a likely location to integrate a transit center with surrounding land uses. With completion of the north half of the split diamond interchange, a 28th Street transit station would provide easy freeway access to Portland-bound commuters traveling from the north. Looking at the subarea as a whole, the 28th Street area is probably a better location for a transit station with transit oriented development. But the uncertainty of future funding to finish the north half of the split diamond interchange renders investment in a transit station in that area imprudent at this time. However, the long term opportunity for a transit center in the 28th Street vicinity should be considered. As it is likely to be more than a decade before the 28th Street Interchange is completed, the long term market conditions may provide greater opportunity to integrate transit oriented development with structured parking as land values increase over time.

112th Avenue South of 18th Street

The portion of 112th Avenue south of 18th Street presents a significant future transportation challenge for the plan area, because it does not have adequate public right-of-way to accommodate a full urban principal arterial standard roadway. Moreover, frontage improvements such as sidewalks are spotty and pedestrian roadway crossings are few and far between. The plan presents two alternative roadway configurations on the following page that attempt to provide roughly the same functionality as a full-standard principal arterial roadway, but at a slightly lower level of service for each travel mode because of right-of-way constraints.

These configuration concepts on the following page show how a reduced-section roadway could provide mobility and safety within the anticipated available roadway. They are illustrative rather than exclusive and attempt to balance corridor right-of-way constraints with future traffic needs. Strategy 1 widens the roadway to five lanes with reduced lane widths and no planter strip. Strategy 2 includes a reduced roadway to four lanes meeting city arterial lane standards. This includes two northbound lanes, one southbound lane, and one center turn lane. The imbalanced geometry is based on current/future link volumes. Further analysis is needed to confirm operations associated with mid-block connections and merging from the 18th Street improvements.



112th Avenue south of 18th Street presents a significant challenge due to the poor pedestrian facilities and limited right-of-way.

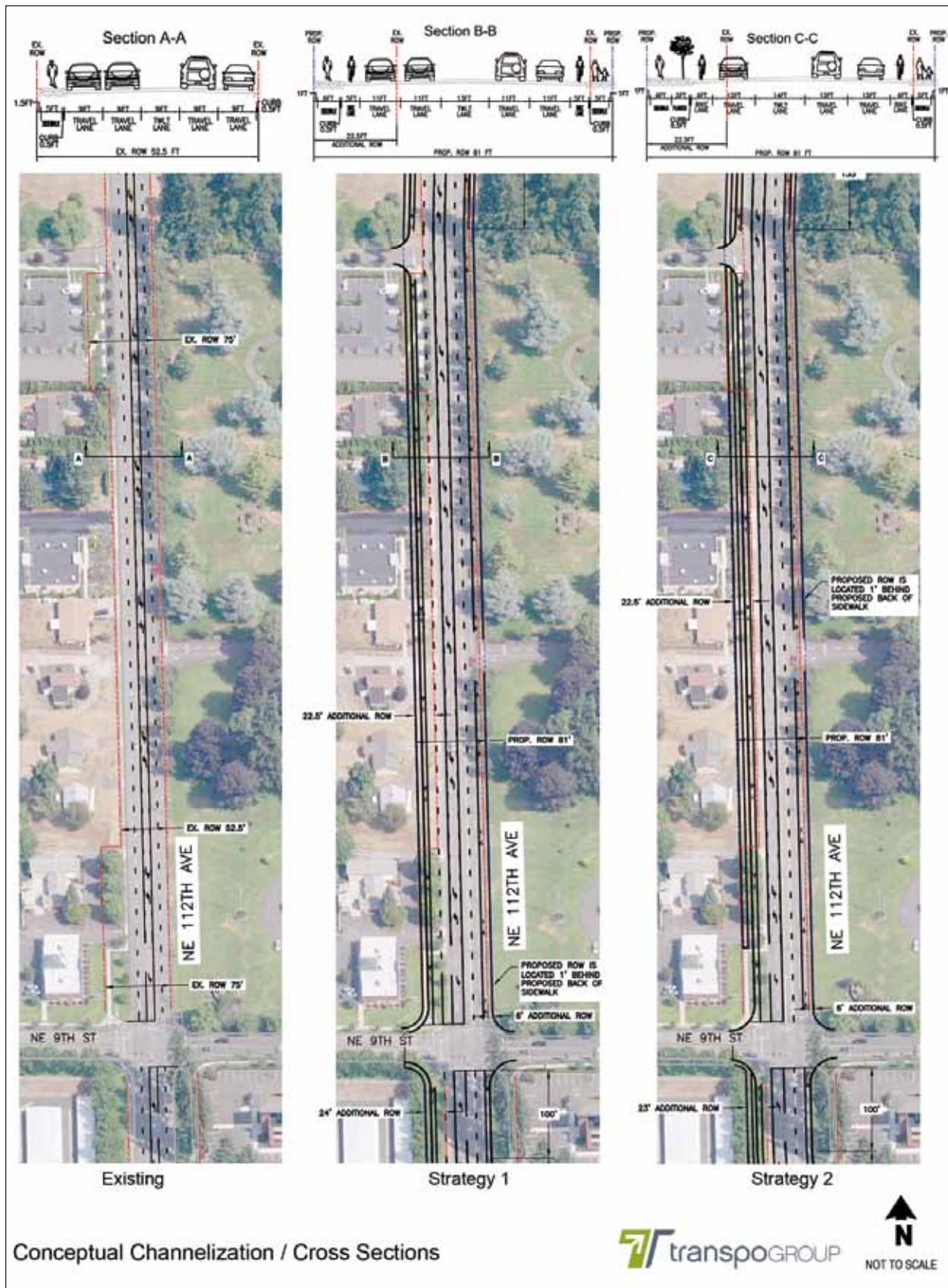


Figure 5. Striping strategy #1 and striping strategy #2

Evergreen Memorial Gardens Frontage

The 112th Avenue frontage at Evergreen Memorial Garden presents a unique challenge. Grave sites begin at approximately 12 feet behind the existing face of curb. Therefore, location of any future sidewalk on that portion of the corridor would be subject to a strict constraint. Any change to the frontage would have to maintain or enhance the existing character of Evergreen Memorial Gardens in order for Evergreen to fulfill its solemn commitment to the deceased and surviving to provide a serene environment. The roadway sections in this plan identify a simple 5 foot attached sidewalk and buffer sufficient to maintain Evergreen Memorial Garden's environment. Specific cross sections provide potential design options to preserve a respectful space between the burials and any future sidewalk.

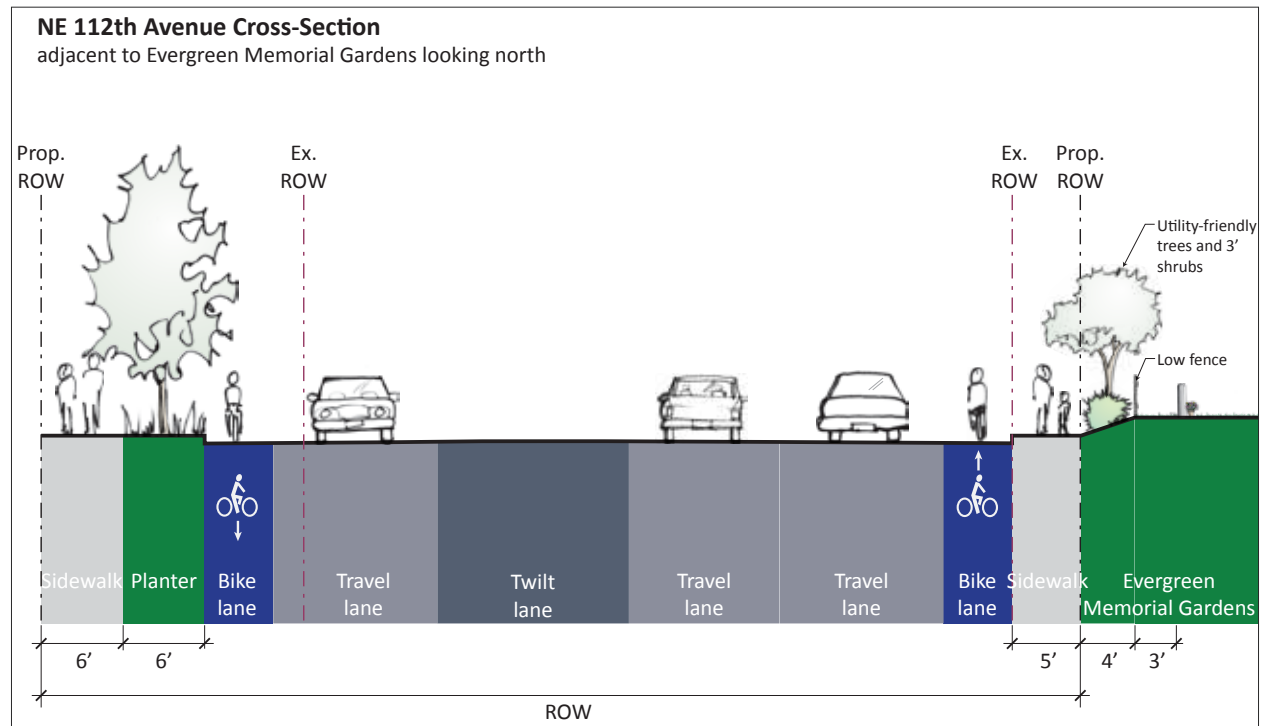


Figure 6. A potential cross-section of future 112th Avenue improvements — measurements to be verified

Needed Improvements

The plan identifies needed street improvements that would provide enhanced safety, connectivity, access and circulation efficiency, and walkability. The following list of improvements if completed would help fulfill the subarea plan's concept, envisioned character, goals and policies.

- Complete 112th Avenue corridor between 18th Street and 28th Street, providing convenient access between the neighborhood on the west to the east side of 112th. This should include pedestrian crossings where appropriate, a continuous sidewalk network, and a continuous bike lane network.
- Construct one signalized intersection on 112th Avenue between 18th and 28th Streets; located to provide access to the areas both east and west of 112th Avenue and to promote efficient traffic operations on 112th.
- Implement context-sensitive design solutions on 112th Avenue south of 18th Street to preserve neighborhood amenities and character while providing principal arterial functionality.
- Create attractive, convenient and safe walkways for pedestrians including roadway crossings, curb ramps, textured crosswalk paving, pedestrian signals and refuges where appropriate, landscaping and intersection median barriers.

- Improve bicycle route safety and connectivity across and along 112th Avenue and through the entire corridor.
- Complete pedestrian and automobile network connections between 112th Avenue and Four Seasons Lane to meet the intent illustrated in the plan concept map.
- Complete planned improvements to the 18th Street corridor east and west of I-205, including the regional trail component on the south side of 18th Street.
- Complete the 28th Street corridor from 142nd to 162nd Avenue.
- Complete the 18th/28th Street split-diamond interchange project, including the collector-distributor roads between 18th and 28th Street and the north ½ of the diamond interchange at 28th Street.
- Explore traffic management options at 16th and 112th.

FUTURE DEVELOPMENT CONCEPTUAL SITE PLAN

With considerable vacant and underutilized land on the east side of 112th Avenue between 18th and 28th Streets, the planning team crafted a site plan and a phasing plan to illustrate how the area could develop over the next twenty years consistent with the goals and policies of this plan.

It is important to note that the site plan and phasing plan illustrations are examples only, and show one of many ways that development could occur consistent with plan policy. Nevertheless, it's critical to communicate how the plan could be carried out over time – particularly showing how the different phases and sites could be integrated with each other, rather than isolated.

While there are vested development applications calling for townhomes and office development on a number of properties, those projects are on hold due to current market conditions. Since there is a very real possibility that owners could submit a revised plan for the sites in the future to accommodate changing market conditions, the site plan illustrates an updated development concept.

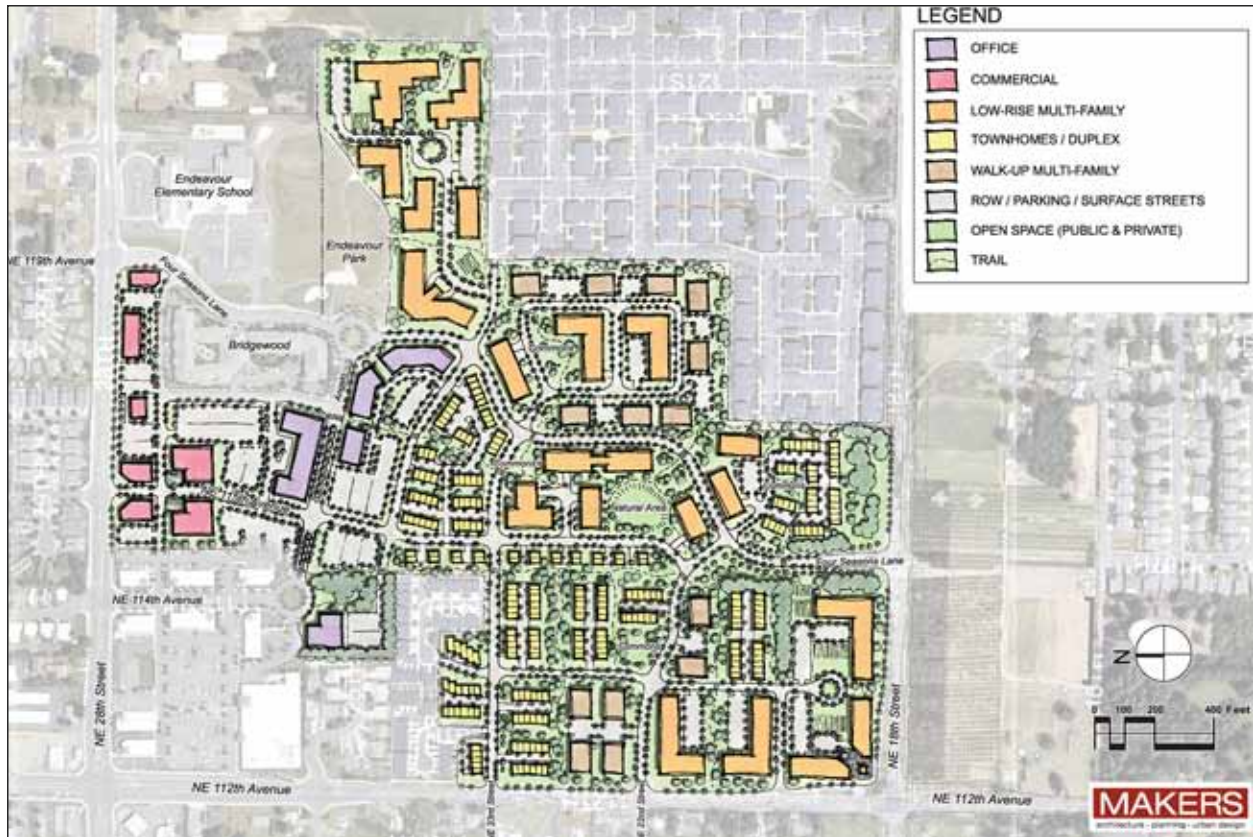


Figure 7. Future development conceptual site plan. This graphic illustrates an example of how the area could be developed over the next twenty years consistent with the community's vision, proposed zoning, and the design guidelines.

Phasing of New Development

Since development is likely to be phased over a period of time, Figure 8 below illustrate examples for first and second phases of development. Depending on market conditions the first phase could be within the next five-ten years, while the second phase could be between five and fifteen years. Figure 7 illustrates full buildout after twenty years.



Figure 8. Example conditions after Phase 1: 0-5 years (left image) and Phase 2: 5-10 years (right image)

Mixture of Housing Types and Uses

The site plan includes a mixture of housing types, office uses, and neighborhood scaled retail developments. Housing types include town homes, walk-up apartments, and senior housing – all of which exist on developed sites within the area now. The proposed mix of housing is expected to accommodate the current and projected market demographics and conditions. With future phased development, the site plan anticipates housing styles that use land efficiently providing a more generous amount of land for open space and trails. One future housing style is low-rise apartments with two or three floors of housing over one floor of parking. Such parking could be built at grade or below grade depending on site conditions and anticipated rents/sales prices. Since most or all of the parking is accommodated within or under the building, more of the site can be used for open space, rather than surface parking.



The site plan assumes a combination of walkup apartments (left), town homes (center), and low-rise apartment buildings.

Commercial uses are integrated in the northern half of the site plan. This includes a continuation of small scale retail, expected to develop in phases along 28th Street and office development centralized along Angelo Drive. In early phases, both uses are expected to be accommodated by surface parking. In later phases, some or most of the parking for office uses might be accommodated within or under buildings. If the market proves weak for office uses, some of these sites may develop as multifamily residential.



Figure 9. Land use and design concept for future development

Connectivity: Street and Internal Drives

Enhancing local connectivity is one of the major objectives of the plan, particularly as this area is developed. The site plan shows a combination of new public streets, private internal drives, and trails that would enhance vehicular, pedestrian, bicycle, and transit access. The site plan shows an extension of 23rd Street eastward to connect with Four Seasons Lane. To the south, 22nd Street also connects 112th Avenue with Four Seasons Lane. Perhaps just as important, private internal streets provide good connectivity, including a north-south roadway east of 112th Avenue and a whole grid of small internal streets on the Four Seasons property. These roadways will reduce vehicular pressure on the arterial streets by providing more options to get around. They will also enhance access to the commercial portion of the Four Seasons site by those future residents north of 18th Street and east of 112th Avenue.



New streets and internal roadways should follow the lead of Four Seasons Drive (left image) and Angelo Lane by providing consistent street trees and planting strips. The image on the right is a good example of an alley providing vehicular access to town homes.

Trails and Open Space

Trails: The vacant and under developed nature of this area provides a tremendous opportunity to create an extensive and connected trail system. While the concept map in Figure 9 on page 29 shows conceptual trail routes, the site plans herein show how a network of trails can actually be integrated with development. Figure 10 highlights a grid of trails that criss-cross the area. Like the uses themselves, these trails would be phased in over time in conjunction with development. Some of the trails are central focal points for developments, while other trails are arranged around the perimeter of developments and expanded over time.

As the photo of Endeavour Park (page 31) shows, a trail separating developments can be a much more attractive option for the neighborhood than simply fencing off each property individually, as has been the pattern in the region over the past few decades. The form and design of these trails could range from 5-foot concrete walkways constructed between buildings, a wider 12-foot asphalt multi-purpose trail (perhaps longer routes connecting park spaces where more bicycle use is anticipated), or gravel/soft-surface where usage is expected to be lighter and/or there is a desire for a nature-type trail.

The context that surrounds these trails are particularly important to their use and safety, thus the site plan aligns these trails in locations that would be visible from nearby residential units or public streets. Over time, such a trail system will be a significant selling point for the area and likely increase demand for housing units and property values.



Figure 10. Illustrating the off-street trail network in the site plan example plus trail design and context examples (right)

Open Space: The site plan shows a variety of ways that open space can be integrated into new development. The existing four acre Endeavour Park provides for large open space recreation, thus newly created open spaces are proposed to be much smaller.



Endeavour Park



These smaller spaces would largely serve the immediate development and could be designed with features and amenities for use by adjacent residents. Some spaces could feature children's play areas, others may include garden plots available to local residents, small sports courts, open lawns for informal recreational activities, or simply enhanced natural areas intended for passive recreation.

The spaces intended for active use are all in central, visible locations – adjacent to streets and/or trails and containing uses that face the space to enhance safety. Some spaces are strategically located to protect existing natural features, such as the heavily wooded area southwest of Angelo Lane, and the hillside area north of 18th Street.



Examples of the types of small open spaces that were envisioned in the site plan example.

Safe and Attractive Streetscapes

The site plan continues the attractive tree-lined streetscape theme from Four Seasons Lane and Angelo Drive to the new street connections and internal roadways and trails throughout the area. The planting strips with trees separate vehicular traffic from pedestrians, provide a consistent visual character, and offer obvious environmental benefits. The site plan extends the street tree concept to internal walkways and drives, as well, which enhances the residential setting.

Public safety was identified as a major concern throughout the process. The design guidelines crafted together with this plan emphasize Crime Prevention through Environmental Design (CPTED) techniques. The CPTED principles emphasize natural surveillance and natural access control, which maximize visibility to public spaces and limits the opportunity for crime by taking steps to clearly differentiate between public space and private space respectively. To enhance natural surveillance, the guidelines promote uses that include entries that are visible from the street, provide a minimum amount of windows on facades, and minimize the extent of blank walls adjacent to streets and trails. For natural access control, the guidelines promote the use of semi-private open space adjacent to ground level units. This is particularly important in buildings where ground level buildings are adjacent to streets and trails.



Illustrating good private development frontage examples. The right image illustrates an example of both natural surveillance and natural access control. The courtyard includes a pathway, but the spaces adjacent to the units are designed as semi-private open space.

Integrated Design

One of the primary goals of the site plan example is to show how individual developments can be integrated with each other, rather than walled-off internalized developments. Road and trail connections discussed above are perhaps the most important features to be integrated. The key to successful integration, particularly where adjacent sites are vacant or under-developed is to plan ahead and assume the adjacent site(s) will be developed at some point. For example, roads and trails would be laid out to allow for their extension in the future. Sometimes, discussions with adjacent property owners can lead to shared facilities for mutual advantages. Examples could include a shared alley along a property line that serves units on both properties. Or it could include a trail along a property line, as mentioned above. Planning these features ahead of time will eventually benefit both developments and the community as a whole.



Figure 11. Illustrating how individual developments could be integrated over time with collaborative site planning. Example phases over twenty years.

DESIGN GUIDELINES

A successful community that incorporates good urban design standards will in turn enhance quality of life for all urban residents and economic benefit to 112th Avenue land owners and businesses.

The most memorable communities that endure as great places to live and centers of commerce have common qualities that can inform new development. These successful communities include:

- A connected network of tree lined streets and internal roadways;
- Welcoming development frontages that add visual interest and safety to streets and sidewalks;
- Buildings of complementary architectural style and scale that lend a sense of cohesiveness;
- Attractive and centralized places for people to meet, congregate, and recreate; and
- The community has a cohesive network of parks, open spaces, and trails.

These qualities and the design goals mentioned herein are incorporated into a set of design standards and guidelines for the 112th Avenue Corridor, which will apply to new commercial, multifamily, and mixed-use development. Design standards and guidelines are perhaps the best tools available to help shape development consistent with the community's vision. They demonstrate a commitment to a design framework that emphasizes walkability; attractive compact development; an integrated open space, trail, street and sidewalk network; health and safety; aesthetics and low impact development techniques. They also provide a higher level of predictability as to what can happen on adjacent properties, which is desirable to potential investors (developers, property owners, and prospective homeowners in new developments).



Attractive density with trail, open space/ low impact development

PLAN DISTRICT APPROACH

The Vancouver Municipal code allows for the creation of a Plan District to meet the unique characteristics and needs of a plan area. The 112th Corridor Plan District will include use and development standard requirements and urban design and interconnectivity design guidelines that implement the goals and policies of the 112th Corridor Plan.

LAND USE POLICIES

General

- LU-1. Provide a unique urban community that offers a diversity of housing choices within a walkable distance of a local commercial center where people can shop, find needed services and entertainment.
- LU-2. Ensure the future success of a transit station by providing shopping opportunities and higher density residential uses within the subarea. Concentrate these uses within walking distance of the transit station.

- LU-3. Provide a variety of housing types within an attractive and integrated compact urban form of development.
- LU-4. Provide opportunities for a limited amount of new commercial development.
- LU-5. Promote pedestrian-oriented retail integrated with office and/or residential.
- LU-6. Recognize existing single family developments and provide for adequate screening from new development where appropriate.
- LU-7. Provide an attractive and integrated open space, sidewalk, and trail network to support health and well being through enhanced recreation, aesthetics and quality pedestrian experiences throughout the 112th Corridor Plan area.
- LU-8. Ensure that all new development provides internal streets, adequate circulation and pedestrian walkways that provide non-motorized connections to adjacent development and that meet the intent of the illustrated street and pedestrian network.
- LU-9. Promote viable transportation alternatives by developing a comprehensive path and trails system to and within the subarea which interconnects neighborhoods with shopping, parks and recreation, work, and schools.
- LU-10. Promote convenient vehicular circulation without negatively impacting the pedestrian environment and visual character of the area.
- LU-11. As development projects are proposed the city shall require coordinated planning to ensure at a minimum adequate access and efficient internal circulation that provides walkable block lengths (eliminates super block development patterns) and is integrated into the city street system, an integrated open space and trail network, and compatible development and appropriate buffers or screening.
- LU-12. Encourage the preservation of mature tree stands located within the plan area and find opportunities to establish new tree plantings.
- LU-13. The City shall partner with WSDOT to provide a consistent, coordinated, proactive approach to the restoration of roadsides along I-205. Coordinate with the WSDOT Regional Landscape Architect and Vancouver's City Forester on the revegetation of buffers using native plants to reflect the regional landscape following the WSDOT Roadside Manual.
- LU-14. The City shall work with WSDOT to ensure provision of sound walls between I-205 improvements and adjacent properties where deemed necessary.
- LU-15. The City shall work with development proposals to secure tree tracts along the east side of I-205 through the means of conservation easements, covenants or otherwise.
- LU-16. When development proposals are submitted for parcel 162742012, the City should work with the applicant to preserve the existing stand of large evergreen trees as noted in the Plan Concept in Figure 3 on page 16.

Future Transit Station

- LU-17. Explore the feasibility of transit-oriented development (TOD) at the transit station. Where it is determined that transit-oriented development is not feasible in the near term, consider designs that might allow for TOD integration in the future within or on adjacent sites.
- LU-18. The City shall work with C-TRAN to ensure that any future transit station site selection criteria include: the ability to maximize the opportunity to develop as an integrated well-connected pedestrian-friendly

mixed-use node (transit center) on adjacent and/or nearby land.

- LU-19. Following a collaborative site selection process with C-TRAN, the City, and public, initiate any necessary zone change request upon the final site selection of the transit park and ride facility.
- LU-20. Ensure any future transit station is integrated into the subarea by developing a comprehensive path and trails system to and within the park and ride which interconnects neighborhoods and shopping and job sites.
- LU-21. Provide landscaping as a key identity element of a future transit station, utilizing large tree canopy and low maintenance plants.
- LU-22. Employ CPTED principles in the design of the transit station.

Urban Design

- LU-23. Design standards and guidelines should be established to direct new development in a way that is consistent with the 112th Corridor Plan Concept.
- LU-24. Provide design guidelines that address façade articulation and architectural scale to reduce the perceived scale of large buildings and add visual interest and promote architectural diversity.
- LU-25. Provide designs that emphasize visible front entries and transparent window areas (to allow for residents to keep an eye on the activity on the street for safety). Avoid layouts where blank fences or walls face the street and layouts where private garages are the dominant visual features along streets.
- LU-26. Locate and design service elements and utility meters to minimize negative aesthetic impacts.
- LU-27. Emphasize human scale, façade articulation, fine detailing, quality building materials, and an inviting appearance in new buildings.
- LU-28. Promote the use of distinctive design treatments at highly visible locations including street corners.
- LU-29. Utilize and maintain landscaping as a key identity element of the development. Also, use landscaping to enhance streetscapes, accommodate natural drainage techniques to the extent possible, soften building edges, and enhance open spaces. Employ a range of plant materials that add multi-season interest, reduce ongoing maintenance costs, and are relatively drought tolerant.
- LU-30. Promote “green” designs and practices that minimize environmental impacts and energy use.
- LU-31. Work cooperatively with WSDOT to include distinctive design treatments for the future pedestrian I-205 over and under passes located at 9th, 18th, and 28th Streets.

Special Features

- LU-32. Encourage the preservation and economic vitality of Joe’s Place Farm.
- LU-33. Encourage the preservation of mature tree stands located within the plan area and find opportunities to establish tree plantings.
- LU-34. Work collaboratively with the owners of the Evergreen Memorial Gardens Cemetery to reach a mutually agreed design solution for a future NE 112th Ave. sidewalk fronting the width of the Cemetery. The sidewalk design shall address at the least the preservation of a private respectful space between the burials and the sidewalk and appropriate tree and shrub plantings.

ACCESS AND CIRCULATION POLICIES

- AC-1. Continue to focus investments on corridor safety enhancements.
- AC-2. Implement context-sensitive design solutions on 112th Avenue to preserve neighborhood amenities and character while providing principal arterial functionality.
- AC-3. Create attractive, convenient and safe walkways for pedestrians including roadway crossings, curb ramps, textured crosswalk paving, pedestrian signals and refuges where appropriate, landscaping and intersection median barriers.
- AC-4. Improve bicycle route safety and connectivity across and along 112th Avenue and through the entire corridor to connect residential, retail, commercial and industrial land uses.
- AC-5. Local and collector streets should be internally connected to allow for off-arterial cross-circulation and to provide multiple local access points to the surrounding arterial roadway network.
- AC-6. Each development proposal should include a local circulation plan demonstrating how the on-site connections and roadways proposed for the underlying development will fit in with the overall network and achieve system connectivity.
- AC-7. Locate off-street parking and auto-oriented land uses behind or on the side of the street face in order to create an interesting urban street front.
- AC-8. Minimize driveway access directly to arterials, encourage shared driveways, and prohibit direct driveway access to arterial roadways where local roadway access is possible.
- AC-9. Minimize industrial truck traffic on residential streets.
- AC-10. Encourage development of compact mixed land uses that can be effectively served by transit and that allow shorter trips by non-auto travel modes to likely urban destinations.
- AC-11. Encourage integration of a future potential park and ride within the neighborhood by providing for multimodal access and with complementary land uses.
- AC-12. C-TRAN should explore direct access to WSDOT's collector-distributor I-205 system for a transit station.
- AC-13. As new development projects are proposed at 16th and 112th, ensure traffic calming design is employed at the western entrance of the existing single family development.
- AC-14. Implement the needed improvements listed under "Needed Improvements" starting on page 25.

This page intentionally left blank



112th Corridor Subarea Plan Project Memorandum

Date 22 March 2011

To Sandra Towne, City of Vancouver

From Chris Zahas, Leland Consulting Group

CC Bob Bengford, Makers

Subject 112th Corridor Subarea Plan Market Strategy

Project No. 5136

Executive Summary

The purpose of this report is to summarize existing market conditions and future opportunities in the 112th Avenue Corridor (the corridor) in order to support the subarea planning process. While a subarea plan is in part an aspirational document, one that articulates how the community would like to grow over time, it must reflect real market conditions and trends if it is to be successfully implemented. The findings discussed in this report will be used to identify what is likely to be achievable from a market perspective and to inform implementation actions that might be needed to shape and achieve the community's desired outcome.

The corridor is a north-south minor arterial in the City of Vancouver, just west of I-205. The portion of the corridor that is the focus of the subarea planning effort roughly follows 112th Avenue from 4th Street to the south and 33rd Street to the north and from I-205 on the west and a varied one to five blocks from 112th to the east (see Figure 1). The planning area encompasses portions of three active neighborhood associations – Fircrest, Image, and Landover-Sharmel and one inactive neighborhood association, Kevanna Park. There is a small residential area west of 112th that is not part of a neighborhood association. Because the corridor itself is somewhat small, this market strategy report uses a study area (the study area) encompassing all four neighborhood association areas (including the area without a neighborhood association) in order to provide a broader picture of the influence area that will shape what is possible. The study area does not include any areas west of I-205 because it is assumed that most people west of I-205 do not typically travel east into the corridor.

People Places Prosperity

Revitalizing Downtowns
Creating Partnerships
Targeting Real Estate Success
Shaping Financial Strategies
Strengthening Community
Enabling Sustainability & Livability
Making Cities Work

610 SW Alder Street Suite 1008
Portland Oregon
97205-3611
p 503.222.1600
f 503.222.5078

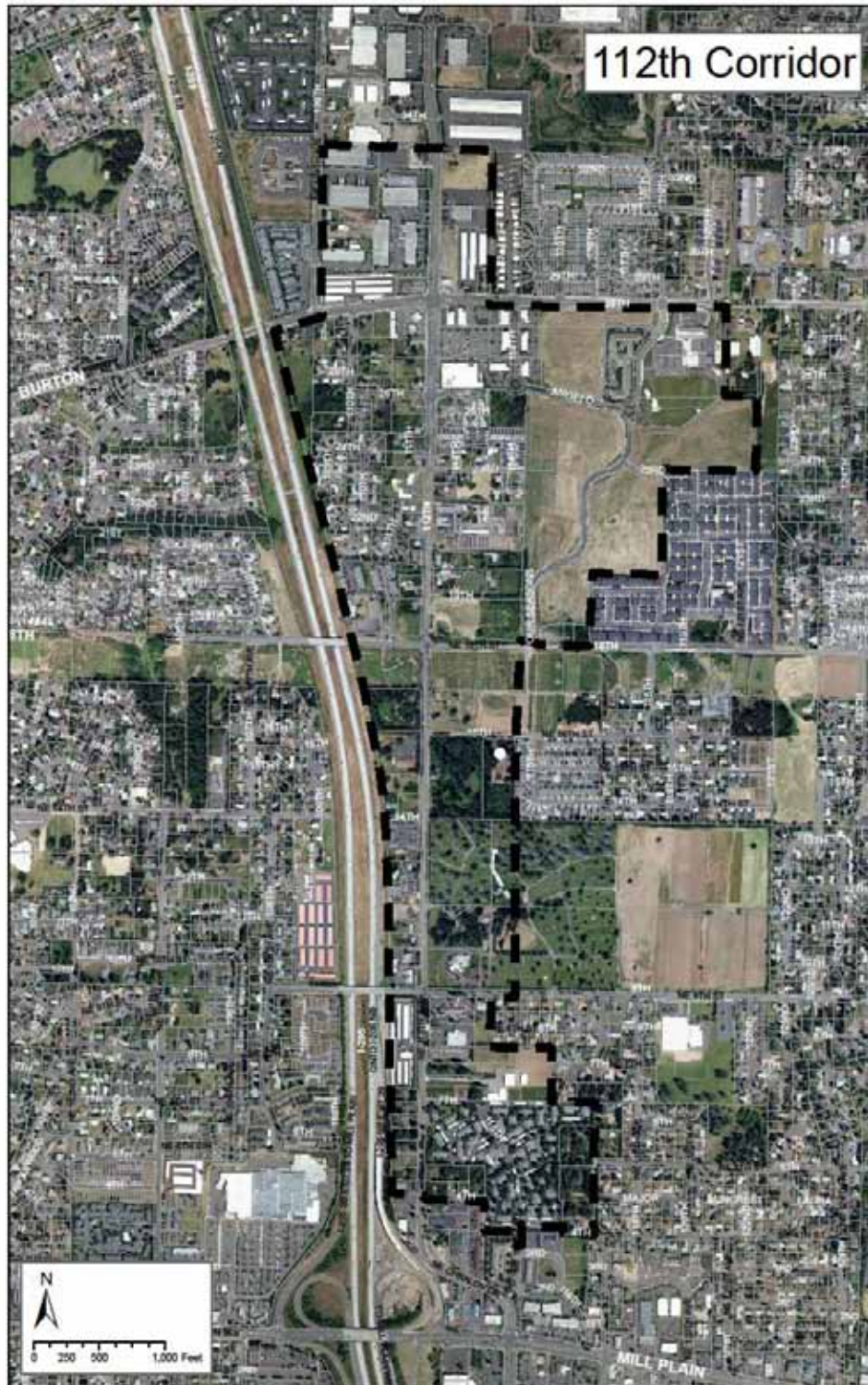
New York New York
Bend Oregon
Abilene Texas
San Miguel de Allende Mexico

www.lelandconsulting.com

LELAND CONSULTING GROUP



Figure 1. 112th Corridor



Source: Makers, City of Vancouver

LELAND CONSULTING GROUP



Figure 2. Study Area Neighborhoods (Highlighted in Blue)



Source: City of Vancouver

The report summarizes existing conditions and key trends in the following areas:

- Demographics
- Employment
- Retail Market
- Residential Market
- Planned Development

KEY FINDINGS

A snapshot of the key findings from the analysis includes:

- **The study area is a family environment:** The study area is characterized by more family-based households (two or more related people living together), a younger median age, and a larger under-20 population than the city as a whole.
- **Incomes are higher:** Median household incomes in the area are slightly higher than those citywide.
- **Demographic shifts are coming:** Nationwide, the baby boomer generation is now beginning to enter their retirement years. At the same time, younger generations (namely “Generation Y”) are entering the housing market. Both are expected to drive significant demand for multifamily housing such as apartments. Further, while growth in the region has slowed due to the economy, growth will return, driven by natural growth as well as renewed in-migration.
- **Senior housing is growing:** While there are only a couple of senior housing developments in place today, proposed projects and overall market trends indicate that there will be much more senior housing in the future.

LELAND CONSULTING GROUP



- **Retail dominates at the edges:** Retail services are dominated by the commercial strips at the north (Fourth Plain) and south (Mill Plain) ends of the corridor. The Four Seasons grocery/shopping center is centrally located between Fourth Plain and Mill Plain. Very few new retail projects in the corridor have been announced.
- **Large employment base:** The corridor and areas just north and east of the study area have a significant amount of employment, particularly high technology and manufacturing.
- **Good access:** The study area is well located within the region, has generally good access, and is near many major destinations. For these reasons, it is likely to continue to be a strong location for housing.

MARKET STRATEGY FOR THE 112TH CORRIDOR

The above snapshot and the detailed findings in this report highlight several key opportunities and challenges that will shape what is possible in the corridor over the next 20 years. The key implications of these conditions and the emerging market strategy for the subarea plan are as follows:

- **Housing in high demand:** The demand for housing, particularly attached housing such as apartments and townhomes will be strong, even in the immediate future, but especially over the long term. Development opportunity sites, especially those along 112th are most likely to redevelop as housing.
- **Limited retail along 112th:** Given the strong retail presence along Mill Plain and Fourth Plain boulevards and at the Four Seasons shopping center, there will only be limited opportunities for new retail along 112th. Since Mill Plain and Fourth Plain are generally close enough to 112th to meet the market demand of residents, most retail needs can be satisfied by existing retail centers.
- **Some new retail and services will still be supportable:** Although new retail development will be limited, some additional retail and services will be needed somewhere in the study area to support the new housing. Locally-serving uses that would serve residents could include restaurants, personal services (hair salons, dry cleaners), coffee shops, child care, medical offices, and financial services. Much of this demand can likely be accommodated in existing commercial centers with current vacancies or on vacant commercially-zoned land. Given the good access, size of parcels, and good visibility, the area around 28th Street and 112th Avenue is the most likely location of new commercial space. Coupled with the mixed-use vision for the Four Seasons development, commercial uses such as medical offices, financial services, and other small-scale commercial uses are also possible. The intersection of 18th and 112th, especially once 18th has direct access to I-205, is another potential location for commercial uses, however the steep slopes of the sites at this intersection will make access difficult.
- **Mixed-use centers are the wave of the future:** Demographic and market trends indicate that mixed-use urban centers with good pedestrian and transit access will be the most desirable places for development in the future. To the extent that the subarea plan accommodates and encourages this type of development, it will be better positioned to thrive and attract investment in the future. The location of any future park

LELAND CONSULTING GROUP



and ride facility should be coordinated to maximize the opportunity to develop a mixed-use node on adjacent and/or nearby land. In the context of a suburban location such as the 112th Corridor, mixed-use development does not necessarily need to imply vertical mixed uses (multiple uses in a single structure), but could include multiple uses on the same site or on adjacent sites.

- **Redevelopment will require an implementation strategy:** Several areas near 112th Avenue and 28th Street are zoned for commercial or mixed uses, but currently have other uses in place today (such as mini-storage and an electrical substation). Other barriers to mixed-use development include the presence of gas stations at key corners and limited pedestrian connectivity. Given the pattern of existing uses and parcelization (multiple ownerships), it is likely that some intervention or incentives will be needed to transition properties to new uses. Implementation actions could include pedestrian and road improvements that enhance connectivity and access to key sites, zoning that provides bonuses or other benefits for mixed-use projects, and the provision of public parking (which reduces development costs).

The remainder of the report provides detailed findings about demographic and market conditions impacting the area that contributed to the identification of the market strategy.

LELAND CONSULTING GROUP



Demographics

NATIONAL TRENDS

Several national trends will impact the future development potential of the corridor. These include:

- The oldest of the baby boomer generation turns 65 this year (2011). Over the next 20 years, America's over-65 population will more than double.
- Generation Y (also known as the echo boomers), which encompasses youth born approximately between 1982 and 2000, is the largest generational group in the United States with approximately 80 million people.
- Both the baby boomers and Generation Y have similar consumer preferences. They both share a desire for quality over quantity, a sense of community and place, and a desire to live in more urban environments. Combined, these two generations will greatly impact how cities evolve over the next 20 years, driving more demand for infill in urbanized areas and significantly increasing the demand for multifamily housing.
- Livability is an economic development draw. Particularly for the technology and knowledge-based industries that will comprise most job growth in the future, the quality of life of a community is a major factor in business location. Whereas in previous years employees moved to be close to their jobs, a new paradigm is emerging where it is the employers who move in order to be close to the talented workers they need to be successful. More and more, those workers are mobile and choose to live in communities with quality physical environments, outdoor recreation opportunities, cultural amenities, accessible transportation options, good schools, mixed-use urban centers, and other amenities.
- The vast majority of new households being formed during the next decade and beyond will be singles, couples, and seniors according to Harvard University's Joint Center for Housing Studies. These are the types of households most likely to locate in urban, transit oriented development, and infill locations—and thus to purchase goods and services, and support retailers in these neighborhoods.

LOCAL TRENDS

An overview of key demographic characteristics in the study area¹ is provided below.

Population and Households

- In 2010, as shown in Table 1, the study area's (four neighborhoods) population was estimated at 14,786, or approximately nine percent of the total population of the City of Vancouver (170,265)².

¹ For the purpose of the analysis of local demographic trends, the corridor market area encompasses all property within the Kevanna Park, Image, Landover-Sharmel and Fircrest neighborhood association boundaries. It also encompasses property north of NE 18th Street, south of NE 28th Street, east of 1-205 and west of 112th Avenue, an area that is currently not served by a neighborhood association (see Figure 2).

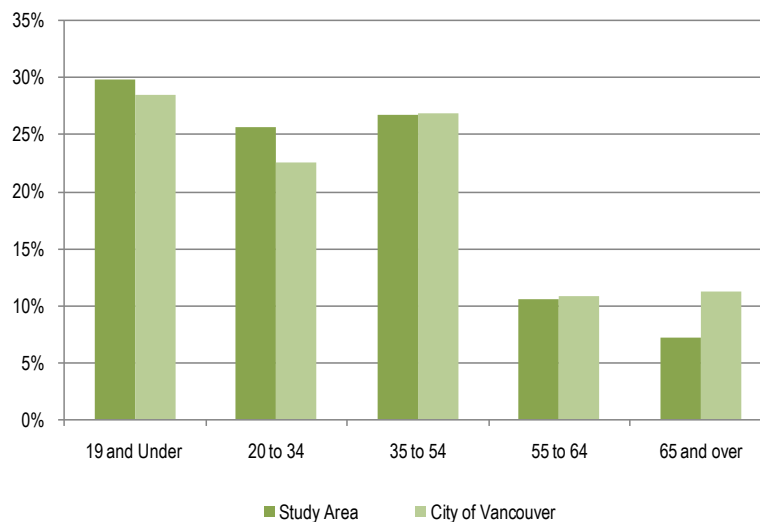
² Data for 2010 are estimates provided by ESRI Business Analyst. Neighborhood-level 2010 Census data will not be available until summer 2011.

LELAND CONSULTING GROUP



- Several population and household characteristics indicate that the study area's population is relatively young and family focused. These include:
 - A median age of 31.7 relative to 34.3 citywide.
 - A high percentage of family households (67 percent). Family households are those with two or more related individuals such as parents with children, a married couple, or a single parent with a child.
 - A slightly higher average household size of 2.7 relative to 2.5 citywide.
 - A relatively high percent of households with related children – 38 percent compared to 35 percent citywide.
 - In 2010, youth ages 19 and under comprised 30 percent of the population. Young adults ages 20 to 34 comprised 26 percent of the population.
 - Retirement age seniors ages 65 and over comprised only seven percent of the study area population in 2010, relative to 11 percent citywide.

Figure 3. Population by Age (2010 estimate)



Source: ESRI Business Analyst, U.S. Census, Leland Consulting Group

- Despite the relatively small senior population in the study area today, as more members of the baby boomer generation enter retirement age in the next decade, seniors are anticipated to comprise a larger share of the population. At the local level, as explained in more detail in the Planned Development section of this report, two large-scale residential developments in the study area are expected to add up to 220 units of housing targeted to seniors, including independent and assisted living facilities and managed care facilities. In addition to projects specifically oriented to seniors, up to 360 units of attached single-family housing (e.g., townhomes, condominiums, etc.) are also planned for the study area. Such projects typically appeal to smaller one- and two-person households, including empty nesters and retirees.

LELAND CONSULTING GROUP



- Estimated at \$61,581, the study area's median household income was more than \$5,000 higher than the median household income citywide (\$56,297) in 2010 (see Table 1). However, the discrepancy between the study area's per capita income (\$26,108) and the City's per capita income (\$25,706) was much smaller, which is explained by the higher percentage of households with children (i.e., non-wage earners) in the study area and by the slightly lower percentage of one- and two-person households.

Table 1. Population and Household Characteristics

Population/Household Characteristic	Study Area	City of Vancouver
Population, 2010 (est)	14,786	170,265
Households, 2010 (est)	5,569	67,052
Average Household Size, 2010 (est)	2.7	2.5
Percent 1 and 2 Person Households, 2000	58%	61%
Percent Family Households, 2010 (est)	66%	63%
Median Age, 2010 (est)	31.7	34.3
Median Household Income, 2010 (est.)	\$61,581	\$56,297
Per Capita Income, 2010 (est.)	\$26,108	\$25,706

Source: ESRI and Leland Consulting Group

Employment Trends

The study area is both a place where workers live (and commute to jobs elsewhere) as well as an employment area in its own right. This section of the report summarizes key findings about the types of jobs that are present in the area and the employment profiles of the residents who live there.

CORRIDOR JOB PROFILE

Key findings about the jobs in the area (irrespective of where the worker lives) include:

- Approximately 7,800 people work in the study area.
- The study area has a strong manufacturing employment base. As shown in Table 2, below, approximately 26 percent of all jobs were in this sector in 2008, the latest year for which data is available.
- Several major high-tech manufacturing facilities are located in the study area, including facilities operated by US Digital, Micropump, and SEH America, the study area's largest employer (see Figure 4).
- Jobs in the retail, accommodation, and food service industries (a single category) are another major source of employment in the study area. A combined 22 percent of all jobs in the area were in this sector in 2008.
- As shown in Figure 4, the study area has two major retail employment concentrations where I-205 intersects with Mill Plain Boulevard and Fourth Plain Boulevard. Due to their high visibility, convenient access to regional transportation routes, and high

LELAND CONSULTING GROUP



volumes of traffic, these locations are ideal for retail and commercial services such as restaurants, lodging, and other uses.

- Other industries with significant employment in the study area include the administration, support, waste management and remediation category, which comprise 11 percent of all jobs in the area and wholesale trade, with eight percent of study area jobs.
- Key drivers for job growth include overall population growth in the region as well as the area's central location and good access to I-205. The area will be even more competitive upon completion of the I-205 access improvements and the potential future construction of a new park and ride facility in the area.

Table 2. Study Area Jobs by Industry, 2008

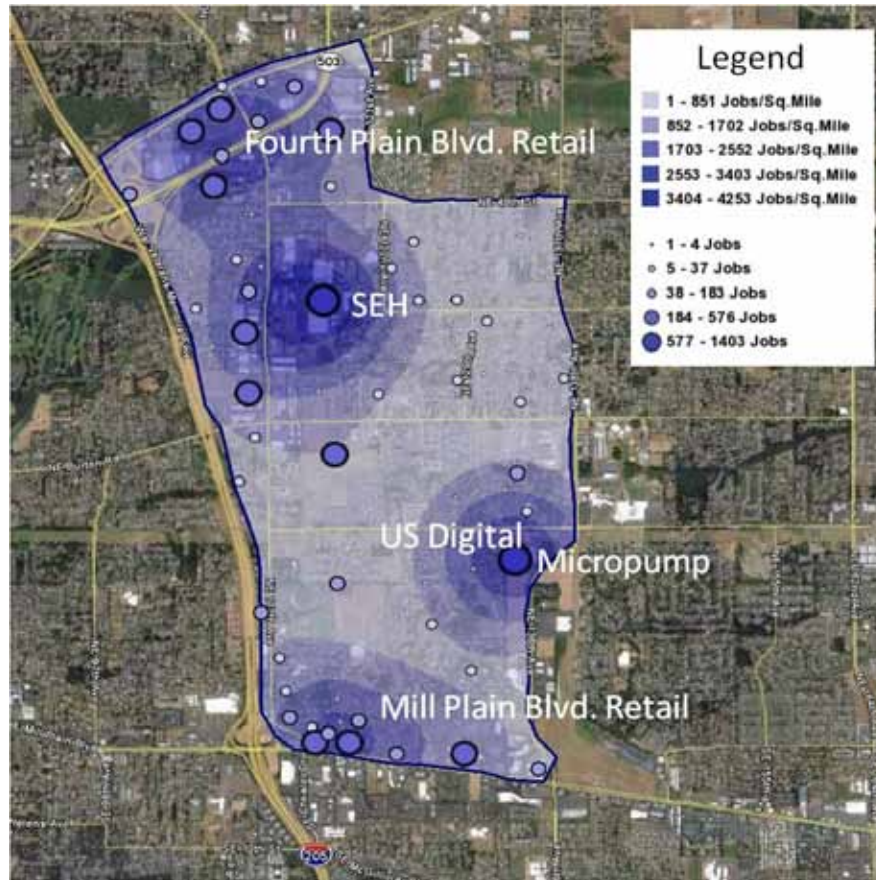
NAICS Industry Sector	Count	Share
Agriculture, Forestry, Fishing and Hunting	6	0%
Mining, Quarrying, and Oil and Gas Extraction	0	0%
Utilities	10	0%
Construction	421	5%
Manufacturing	2,061	26%
Wholesale Trade	652	8%
Retail Trade	713	9%
Transportation and Warehousing	67	1%
Information	21	0%
Finance and Insurance	306	4%
Real Estate and Rental and Leasing	104	1%
Professional, Scientific, and Technical Services	280	4%
Management of Companies and Enterprises	27	0%
Administration & Support, Waste Management and Remediation	877	11%
Educational Services	86	1%
Health Care and Social Assistance	538	7%
Arts, Entertainment, and Recreation	3	0%
Accommodation and Food Services	1,013	13%
Other Services (excluding Public Administration)	269	3%
Public Administration	415	5%
Total	7,869	100%

Source: U.S. Census Bureau – 2008 Local Employment Dynamics Data

LELAND CONSULTING GROUP



Figure 4. Study Area Employment Concentrations, 2008



Source: U.S. Census Bureau, Google Earth

EMPLOYMENT PROFILE OF STUDY AREA RESIDENTS

KEY FINDINGS:

- Many residents in the study area hold retail and service jobs. In 2008, 12 percent of study area residents worked in retail trade while 9 percent (or a combined 18 percent) worked in the educational services and accommodation and food services industries.
- Although 26 percent of all jobs in the study area are manufacturing jobs, only 11 percent of study area residents have manufacturing jobs (which could be located anywhere in the region).
- The health care and social assistance industry, which is anticipated to expand regionally and nationally as the baby boomer generation enters retirement age and the demand for healthcare services increases, employed 11 percent of study area residents in 2008.
- As shown in Table 4, more than half of study area residents (52 percent) work in Clark County. Among residents employed in Clark County, the vast majority (35 percent) worked close to home in Vancouver.

LELAND CONSULTING GROUP



- Approximately 32 percent of study area residents commute to work across the river in the Portland Metro area, excluding Clark County. Of those, 21 percent work in the City of Portland. This commuter population could benefit from improved access to I-205 and enhanced express bus routes (via a park and ride).

Table 3. Study Area Resident Employment by Industry (2008)

NAICS Industry Sector	Count	Share
Agriculture, Forestry, Fishing and Hunting	47	1%
Mining, Quarrying, and Oil and Gas Extraction	8	0%
Utilities	28	1%
Construction	385	7%
Manufacturing	597	11%
Wholesale Trade	338	6%
Retail Trade	635	12%
Transportation and Warehousing	236	5%
Information	103	2%
Finance and Insurance	175	3%
Real Estate and Rental and Leasing	103	2%
Professional, Scientific, and Technical Services	255	5%
Management of Companies and Enterprises	65	1%
Administration & Support, Waste Management and Remediation	321	6%
Educational Services	448	9%
Health Care and Social Assistance	578	11%
Arts, Entertainment, and Recreation	79	2%
Accommodation and Food Services	463	9%
Other Services (excluding Public Administration)	229	4%
Public Administration	167	3%
Total	5,260	100%

Source: U.S. Census Bureau – 2008 Local Employment Dynamics Data

LELAND CONSULTING GROUP



Table 4. Where Study Area Residents Work (2008)

	Count	Share
Vancouver city, WA	1,824	35%
Portland city, OR	1,095	21%
Seattle city, WA	175	3%
Camas city, WA	104	2%
Orchards CDP, WA	95	2%
Gresham city, OR	92	2%
Five Corners CDP, WA	77	2%
Beaverton city, OR	76	1%
Hazel Dell North CDP, WA	70	1%
Hazel Dell South CDP, WA	70	1%
All Other Locations	1,582	30%
Total	5,260	100%
Clark County Subtotal	2,743	52%
Portland Metro Area Subtotal ^{1/}	1,670	32%

^{1/} Includes employment within Multnomah, Washington and Clackamas Counties in Oregon; excludes employment in Clark County, Washington.

Source: U.S. Census Bureau – 2008 Local Employment Dynamics Data

Retail Market Profile

Retail opportunities will be driven by their response to the fundamentals of retail market potential:

- **Visibility.** Thousands of customers must pass and see the site on a daily basis. In urban areas, retailers look for corners and areas with high pedestrian and transit. Along urban arterials and in suburban areas, daily traffic volumes of approximately 20,000 are desirable for national retailers.
- **Accessibility.** The space must be very easy to get to; daily shopping or convenience retail should be on the way home (right) side of the street.
- **Central location vis-a-vis target markets.** The target market will vary depending on the type of retail, but in any case, the location should be central to that market area. For example, grocery anchored centers should be within approximately one mile of 10,000 residents.
- **Manageable competitive environment.** Most retailers will avoid an area if competitors are already located there. The exact opposite can be true, however, when retailers offer complementary products, making the area a destination for comparison shopping.
- **Demographic match.** Retailers choose sites located near their —target market customers.
- **Anchor tenants.** Retail developments are often —anchored by one tenant (for example, a supermarket) who then attracts other tenants.
- **Sense of place, safety, cleanliness.** This is particularly important to encouraging pedestrian activity.

LELAND CONSULTING GROUP



- **Contiguity.** Urban retail must be continuous, or many shoppers will stop and turn back. Empty storefronts, parking lots, and non-retail uses can create breaks in contiguity.
- **Parking capacity.** In an area where on-street parking is unlikely to be feasible, it will be important that retail sites have adequate interior parking.

KEY FINDINGS:

- As shown in Figures 5 to 7, the study area has two main retail concentrations, one at the north end along Fourth Plain Boulevard and the second at the south end along Mill Plain Boulevard. Both locations have convenient access to I-205, high visibility and high volumes of drive-by traffic. They also feature a critical mass of retail and commercial services and comparison shopping opportunities that are attractive to consumers, particularly among value and price conscious shoppers.
- There is a smaller neighborhood retail node at 28th and 112th that is anchored by a Safeway supermarket. Future growth in this area is challenged by the presence of an electrical substation and mini-storage warehouses on the north side of 28th. These uses limit the ability of the area to achieve a critical mass of commercial development without significant changes of use and/or relocation. Therefore, the type of retail and commercial uses that are likely in this area will continue to be smaller-scale and neighborhood serving. In either case, the vacant commercial site due east of the Safeway (at the northern edge of the Four Seasons development) is likely to develop as commercial and mixed-use before any redevelopment occurs elsewhere in the vicinity. In addition to retail, potential uses could include medical offices, financial services, and small flexible office spaces.
- All three retail areas have most retail development on the south side of the street, which is the “going home” side, a positive attribute for retail success.
- Due to several factors, including the study area’s abundant existing retail options, competition from Oregon, a relatively high citywide vacancy rate, and the fact that retail is already concentrated in locations that fulfill the requirements needed for it to succeed, the opportunity for new retail development along 112th is anticipated to be very limited.

LELAND CONSULTING GROUP



Figure 5. Retail Context (Mill Plain Boulevard to 28th Avenue)



Source: Google Earth and Leland Consulting Group

Figure 6. Retail Context (28th Avenue)



Source: Google Earth and Leland Consulting Group

LELAND CONSULTING GROUP



Figure 7. Retail Context (49th Street to Fourth Plain Boulevard)



Source: Google Earth and Leland Consulting Group

Residential Market Profile

As noted earlier, most new development in the corridor over the next 20 years is likely to be in housing. Currently, the study area is characterized by a diverse range of housing types and affordability levels, as described below.

- As shown in Table 5, in 2010, the study area had a similar proportion of homeowners (45 percent) and renters (47 percent) and a slightly lower homeownership rate than the City (49 percent).
- As shown in Table 6, in February 2011, study area median home values, which ranged from \$124,700 in Kevanna Park to as much as \$161,400 in Landover-Sharmel, were lower than the citywide median home value (\$169,000). It should be noted that these values are impacted by the housing market slowdown and could change significantly as the market recovers.
- In addition to families, the study area is anticipated to attract a growing number of seniors with unique needs and housing preferences with respect to form, price, amenities and other characteristics. This trend is supported by the fact that several hundred units of attached senior housing are planned for the study area.

LELAND CONSULTING GROUP

**Table 5. Housing Characteristics**

Housing Characteristic	Study Area	City of Vancouver
Housing Units, 2010 (estimate)	6,057	72,123
Owner Occupied Housing Units	45%	49%
Renter Occupied Housing Units	47%	44%
Vacant Housing Units	8%	7%
Housing Units by Units in Structure, 2000		
1-unit, Detached	55%	56%
1 to 4 units, Attached	10%	17%
5 to 9 units, Attached	13%	8%
10 or more units, Attached	13%	17%
Mobile Home	3%	3%
Other	1%	0%

Source: ESRI and Leland Consulting Group

Table 6. Median Home Value Data - Feb. 2011

Housing Data	Fircrest	Image	Kevanna Park	Landover-Sharmel	Vancouver
Current Median Home Value	\$148,400	\$148,000	\$124,700	\$161,400	\$169,200
Current Median Home Value per Square Foot	\$118	\$115	\$102	\$104	\$119
Change in Median Home Value over Prior Year	-13.4%	-13.4%	-22.2%	-11.0%	-9.4%

Source: Zillow and Leland Consulting Group

Planned Development

This section of the report summarizes the most current information on planned development in the study area identified in the December 2010 Draft 112th Corridor Plan Existing Conditions overview.

- As shown in Table 7, a total of 734 housing units are planned in or within close proximity to the corridor.
- The majority of planned units (584) are associated with developments whose status has been updated relatively recently, in 2009 or later (this includes planned development at the Four Seasons project). However, 150 housing units are associated with planned developments whose status has not been updated for over two years, most likely due to the market slowdown. Thus, there is some uncertainty as to when these projects will be built and, if so, whether they will reflect the most recent proposals or will be something entirely different.
- Attached single-family residences, of which 360 are planned for the study area, comprise the majority of planned housing units.
- A reported 220 units are planned for large senior and assisted living projects. One of these projects, Burton Ridge, is a 172-unit senior Veteran's Housing Administration

LELAND CONSULTING GROUP



project that will include a mix of independent and assisted living units as well as units within a “memory care” facility targeted to individuals with Alzheimer’s and other memory loss conditions.

- While a significant amount of residential development is planned for the study area, planned non-residential development is relatively limited. As shown in Table 8, an estimated 72,000 square feet of non-residential development is planned for the study area, the majority of which has not had a status update since pre-2009.
- While the largest planned non-residential development identified for the study area is a 35,000 square foot expansion of the Salvation Army facility at 1500 NE 112th Avenue, it is widely known that silicon wafer manufacturer SEH America, Inc. is considering a major expansion of its facility. Located in the industrial area east of 112th Avenue, north of 28th Street and south of 49th Street, the facility is adjacent to multiple undeveloped properties with the potential to accommodate an expansion.

Table 7. Planned Residential Development

Housing Types	Status Update Pre-2009 ^{1/}	Status Update 2009 or later ^{2/}
Detached single-family	106	4
Attached single-family	44	360
Senior / Assisted - attached	-	220
<i>Unit subtotals</i>	<i>150</i>	<i>584</i>
Total units		734

^{1/} Includes projects with most recent status update prior to 2009.

^{2/} Includes projects with most recent status update in 2009 or later.

Source: City of Vancouver and Leland Consulting Group

Table 8. Planned Non-Residential Development

Development Type	Status Update Pre-2009 ^{1/}	Status Update 2009 or later ^{2/}
Retail	11,000 ^{3/}	13,000
Other Commercial	35,000	unknown
Industrial	13,250	
<i>Subtotal</i>	<i>59,250</i>	<i>13,000</i>
Total		72,250

^{1/} Includes projects with most recent status update prior to 2009.

^{2/} Includes projects with most recent status update in 2009 or later.

^{3/} Square footage for the proposed Walgreens at 11200 NE 28th Avenue is estimated at 11,000 square feet, the typical retail square footage occupied by Walgreens in a neighborhood setting.

Source: City of Vancouver and Leland Consulting Group

MEMORANDUM

Date:	May 24, 2011	TG:	10220.00
To:	Phil Wuest, City of Vancouver		
From:	Michael Swenson Scott Lee		
cc:	Bob Bengford, Makers		
Subject:	112th Avenue Traffic Analysis Summary		

This memorandum summarizes the traffic analysis and primary findings of the work prepared by Transpo in support of the 112th Avenue Subarea Corridor Plan. The scope of the traffic analysis focused on the following areas:

- Reviewed future transit center locations and opportunities/constraints associated with each
- Reviewed traffic forecast along the 112th Corridor and immediate vicinity.
- Prepared alternative roadway cross sections for 112th, south of 18th Street focusing along the section near the cemetery

Transit Center Siting Summary

In the 2030 High Capacity Transit Plan for Clark County, a transit hub or transit oriented development was identified along the I-205 and 112th Avenue Corridors. The locations evaluated in this review included:

- South side of Burton Road between I-205 and 112th Avenue
- North side of 18th Street between I-205 and 112th Avenue
- Southwest and southeast quadrants of the NE 18th Street/112th Avenue intersection
- West side of 112th Avenue, south of existing BPA easements

Summary graphics were prepared for the February 8, 2011 public workshop (see attached). The following provides a summary of the access and development considerations associated with each location.

Table 1. Transit Oriented Development Siting Summary

Location	Access Considerations	Considerations
South side of Burton Road between I-205 and 112th Avenue	Access is possible from either Burton Road or 112th Avenue could be feasible	Potential for Transit Oriented Development in consideration of adjacent land uses Existing street network that could be utilized for access
Northwest and northeast quadrants of the NE 18th Street/112th Avenue intersection	Access could be from NE 18th Street or NE 112th Avenue. The access points along 112th Avenue would likely be in close proximity to the NE 18th Street/NE 112th Avenue intersection making full access challenging depending on queuing at this intersection. Direct transit access into the transit hub from I-205 frontage roads would be desirable for efficient transit operations, but would require special FHWA approval.	Transit facility is isolated from complementary land uses, limiting TOD potential

Southeast and southwest quadrants of the NE 18th Street/112th Avenue intersection	Access could be from NE 18th Street or NE 112th Avenue. The access points along 112th Avenue would likely be in close proximity to the NE 18th Street/NE 112th Avenue intersection making full access challenging depending on queuing at this intersection. Direct transit access into the transit hub from I-205 frontage roads would be desirable for efficient transit operations, but would require special FHWA approval.	Transit facility is isolated from complementary land uses, limiting TOD potential Development may be limited due to BPA easements and related development restrictions
West side of 112th Avenue, south of existing BPA easements	Transit access may be feasible direct to/from proposed NB off-ramp Access for general purpose would be feasible from 112th Avenue	Transit facility is isolated from complimentary land uses, limiting TOD potential

In addition to the transit center review, the effects of a 400 stall park-and-ride facility located near the intersection of 112th Avenue / 18th Street were reviewed. Consistent with the transit center siting summary, the access points to the park-and-ride may be restricted depending on the location relative to the intersection. Based on a 400 stall facility, the intersection volumes at 112th Avenue / 18th Street would increase traffic volumes by up to three percent. Assuming intersection improvements outlined in the *I-205/Mill Plain Interchange to NE 18th Street Project*, the intersection is anticipated to operate at LOS C and LOS D during future 2030 weekday AM and PM peak hour, respectively. Based on the minimal increase in total entering traffic volumes, intersection operations are not anticipated to degrade below acceptable levels of service during the weekday AM and PM peak hour. The impacts of the intersection are ultimately influenced by the nature of the TOD project, market draw, and site access.

Traffic Forecasting Review

Traffic forecasts from the *I-205/Mill Plain Interchange to NE 18th Street Project* were reviewed to access the impacts from the proposed I-205 northbound off and southbound on ramps at 18th Street, the widening of the 18th Street bridge to a seven-lane cross section, and intersection improvements at the intersection of 18th Street / 112th Avenue.

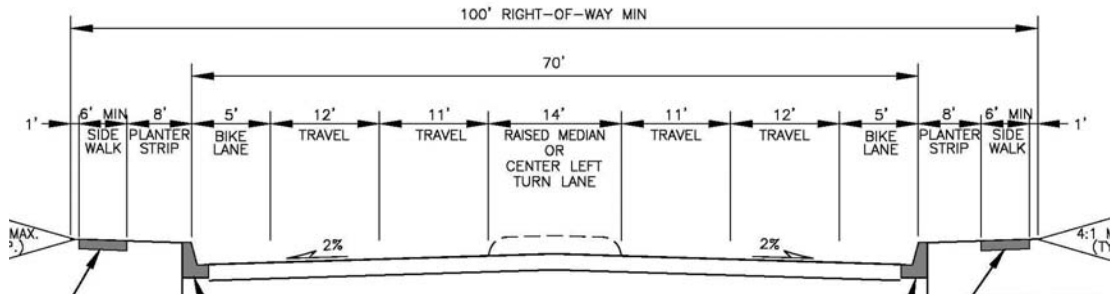
The construction of on/off-ramps to/from NE 18th Street reduces congestion on Mill Plain Road as well as 112th Avenue near Mill Plain Road during both the AM and PM peak hour. North of Mill Plain Road traffic volumes on 112th Avenue are forecasted to decrease both northbound and southbound during the weekday PM peak hour by approximately 350 vehicles northbound and 160 vehicles southbound. During the weekday AM peak hour northbound traffic volumes increase by 55 vehicles and southbound traffic volumes decrease by 440 vehicles.

Intersection volumes at 18th Street / 112th Avenue increase during the weekday AM and PM peak hour by 410 vehicles and 360 vehicles, respectively. South of 18th Street traffic volumes on 112th Avenue are forecasted to decrease both northbound and southbound during the weekday PM peak hour by approximately 305 vehicles northbound and 150 vehicles southbound. During the weekday AM peak hour northbound traffic volumes increase by 115 vehicles and southbound traffic volumes decrease by 445 vehicles.

112th Avenue Street Section Options

The City's principal arterial street standard calls for 100 feet of right-of-way (ROW), as illustrated in the standard street section diagram below. This amount of ROW may not be available along the entire corridor, especially between 9th and 18th Streets. The conceptual striping plans presented in

this report incorporate each of the functions provided for in the City's street standard, but with a reduced footprint.



Conceptual striping plans were developed for the section of 112th Avenue in the vicinity of the Evergreen Memorial Gardens. Right of way in this section is limited on the east side of the road in consideration of the constraints related to burial plots on the cemetery grounds. The purpose of this exercise was to develop conceptual plans that identified street section options that maximized the expansion of the roadway (limited to sidewalks only) on the east and evaluated impacts to properties on the west side of 112th Avenue.

Traffic Volume Considerations

A review of traffic volumes forecasted along 112th Avenue between 18th Street and 9th Street during 2030 build conditions was completed to determine if the number of travel lanes along this stretch of roadway could be reduced. Roadways qualifying for reductions in travel lanes typically have traffic volumes of 20,000 vehicles (~10,000 per direction) or less per day. Based on the projected daily¹ and peak hour volumes along 112th Avenue during 2030 build conditions, the southbound travel lanes would be a candidate for a reduction from two travel lanes to one travel lane.

Operations Assessment

To check the reasonableness of a lane reduction along 112th Avenue, a level of service analysis was completed at 112th Avenue / 9th Street intersection under 2030 build conditions. With the reduction of lanes southbound the approach to 112th Avenue / 9th Street would reduce from two southbound through lanes to one southbound through lane. Analysis using Synchro 7.0 shows 112th / 9th Street is expected to operate at LOS B during the 2030 weekday AM and PM peak hour. This analysis assumes that all channelization improvements identified in the *I-205/Mill Plain Interchange to NE 18th Street Project* have been completed and no lane reductions occur at this location. Additional detailed traffic analysis would have to be conducted by the City Traffic Engineer prior to any potential lane configuration modifications.

Street Section Options

The street section options developed are described below. Both options described below assume a nominal expansion of the ROW on the east to accommodate a sidewalk only.

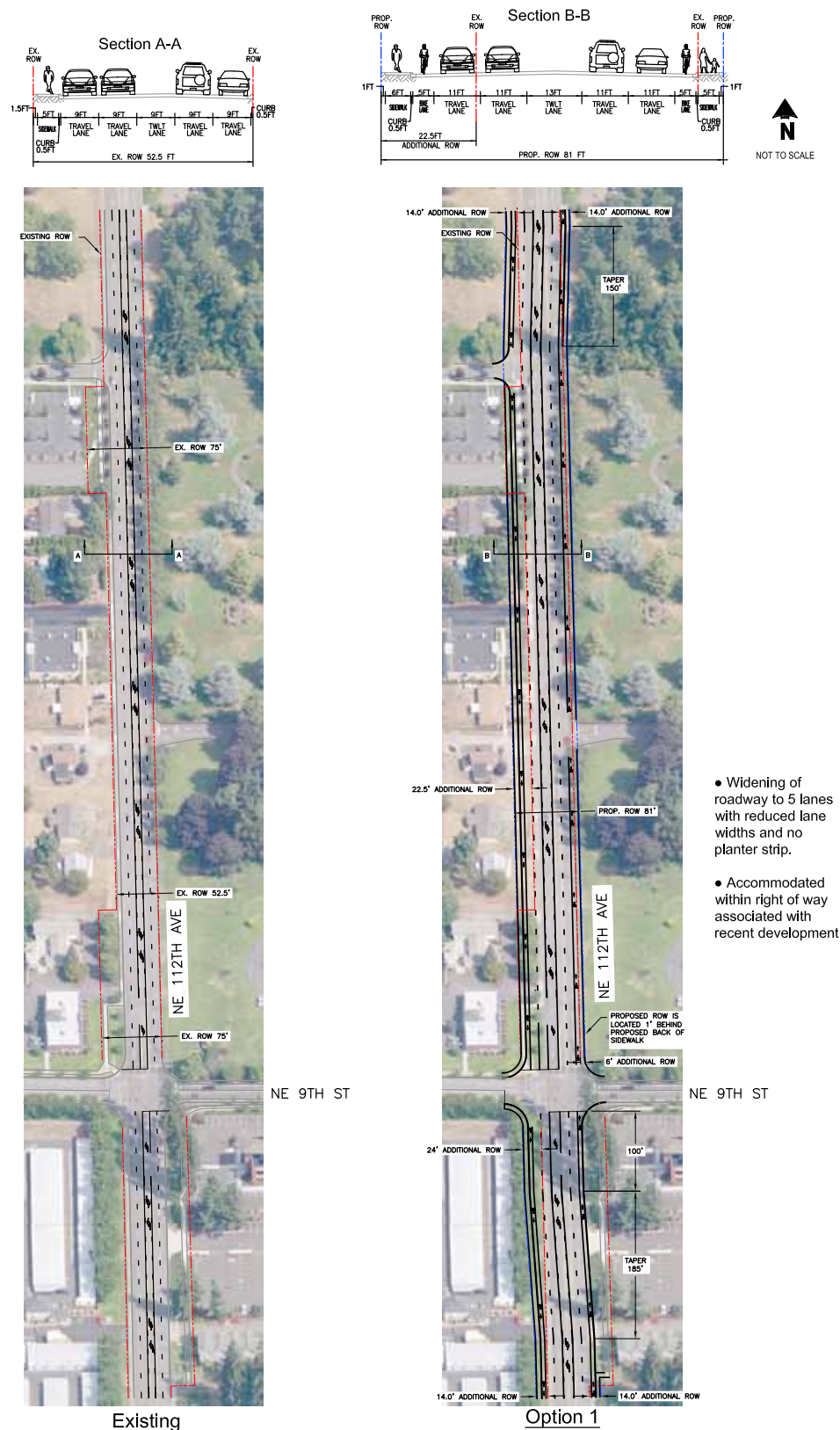
Option 1 – This option includes a 5 lane cross-section on 112th Avenue, assuming recent ROW dedications on the west side of 112th Avenue established the western limit of the ROW dedication

¹ ADT was derived based on the assumption the weekday PM peak hour represents eight percent of the ADT.

for future parcels. Several recent projects have been developed and the likelihood of redevelopment in the near future is minimal. To accommodate the 5 lane section (inclusive of sidewalks), the planter strip was removed and the lane widths reduced in this section.

Option 2 - This option includes a 4 lane cross-section with northbound and southbound bike lanes as well as a planter on the west side of 112th Avenue, resulting in a detached sidewalk. This assumes recent ROW dedications on the west side of 112th Avenue are established from ROW dedication for future parcels. With the detached sidewalk, the pedestrian environment is improved by increasing the distance between the traveled way and pedestrians.

The four lane section includes 2 northbound travel lanes, one southbound travel lane, and a center two-way left-turn lane. While the analysis generally supports the imbalanced geometry, the consistency and lane merging at the NE 18th intersection needs to be reviewed in more operational detail. This geometry is also based on the future conditions with the I-205 18th interchange improvements. The striping plan assumes full City arterial improvements with respect to the section including lane widths.



Conceptual Channelization / Cross Sections

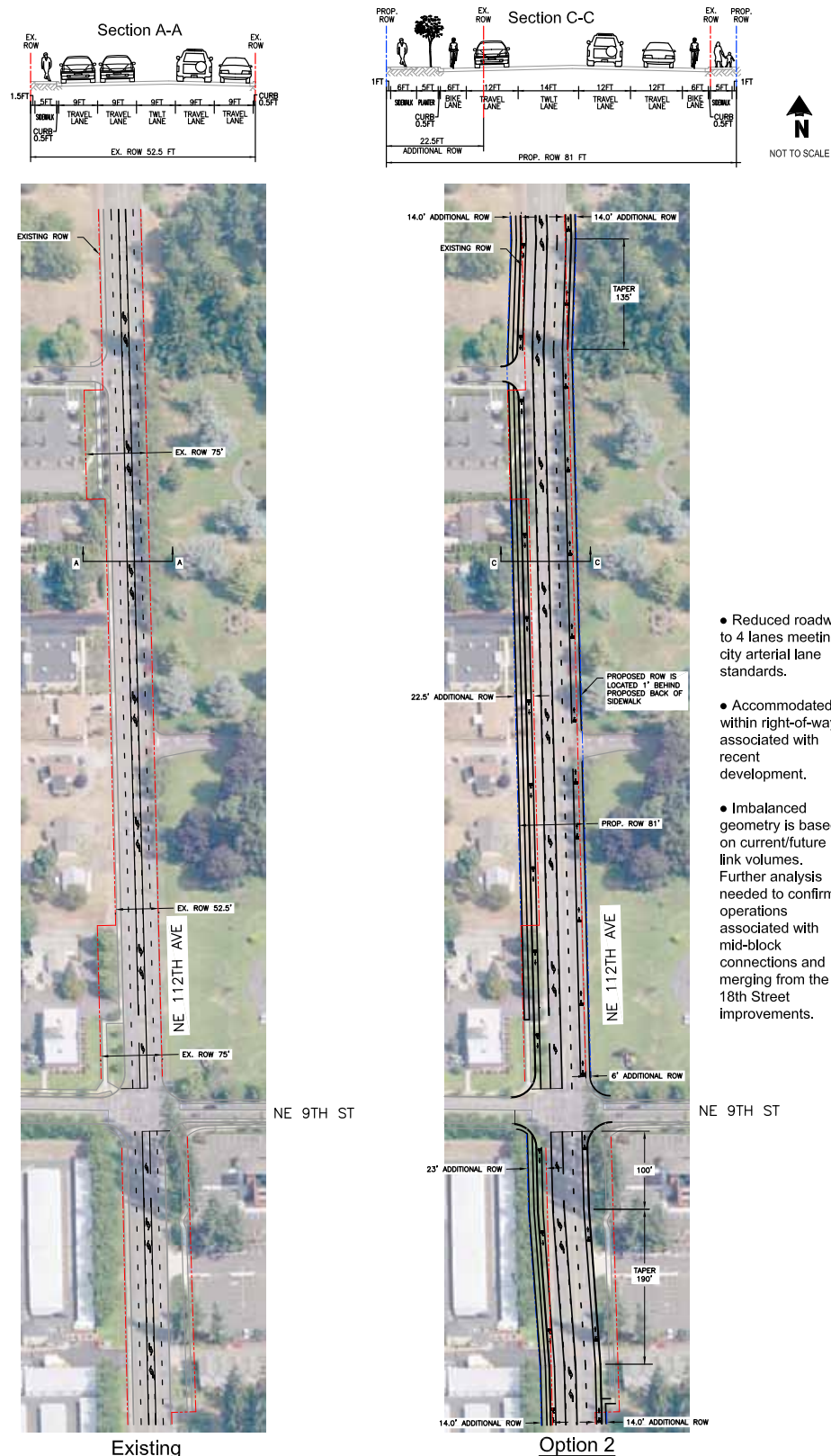
112th Corridor Subarea Plan - Vancouver, WA

M:\10\10220 112th Corridor Subarea Plan\CAD\Conceptual Striping.dwg<P1>Daniel Lai 4/5/2011 2:58 PM

FIGURE

1





Conceptual Channelization / Cross Sections

112th Corridor Subarea Plan - Vancouver, WA

M:\10\10220 112th Corridor Subarea Plan\CAD\Conceptual Striping.dwg<P2>Daniel Lai 5/24/2011 10:37 AM



FIGURE

2

112TH Corridor Subarea Plan

Illustrated Site Plan Example & Assumptions

The 112th Corridor Subarea Planning Team prepared an example site plan illustrating how a key area of the subarea could be developed consistent with the plan’s vision. The site plan is focused on the properties on the east side of NE 112th Avenue between NE 18th and 28th Streets. Areas that are illustrated with new development are either vacant or under developed per current zoning.

The site plan on the following page emphasizes the following overarching concepts and elements:

- Mixture of housing types that accommodates the area’s demographic diversity and responds to predicted future market demand.
- A hierarchy of connected streets that allow for good circulation and reduce pressure on surrounding arterials.
- An integrated and connected trail system that promotes walking and enhances the residential setting.
- A network of usable open spaces that serve the development and add character and identity.
- How to integrate individual developments with surrounding developments to provide a more efficient use of land, share amenities, and enhance the residential setting.
- How to configure buildings, parking areas and open spaces that enhance the character and safety of streets and create focal points of activity.

The following pages include:

Page 2:	Figure 1. Illustrated Site Plan
Page 3.	Figure 2. Site plan sub-areas Site plan land use statistics
Page 4.	Townhouse & Lowrise Apartment assumptions
Page 5	Walkup Apartment & Commercial assumptions
Page 6	Office Buildings, Streets & Internal Roads, and Trail Corridor assumptions

Figure 1. Illustrated Site Plan



Figure 2.

Site plan sub-areas



Site Plan Land Use Statistics

SITE AREA (see Site Area Key map)	NET AREA SF*	NET ACRES*	CURRENT ZONING	PROPOSED ZONING	COM. SF (retail & office)	DWELLING UNITS BY TYPE					TOTAL UNITS	DWELLING UNITS/ ACRE
						CONGREGATE CARE	2 over 1	3 over 1	WALK-UPS	TOWNHOMES		
1	67,022	1.54	R-18	R-18	0	0	0	0	0	19	19	12.35
2	151,806	3.48	R-18	R-22	0	0	0	0	0	46	46	13.20
3	359,142	8.24	R-18	R-22	0	0	0	63	56	32	151	18.31
4	159,398	3.66	R-18	R-22	0	0	46	0	0	20	66	18.04
5	195,031	4.48	R-18	R-22	0	0	92	0	0	0	92	20.55
6	385,519	8.85	R-18/MX	COM	120,350	0	0	0	0	0	0	0.00
7**	457,657	10.51	R-18	R-22	127,575	0	20	132	0	78	230	21.89
8***	185,514	4.26	R-18	R-22	0	0	16	28	0	41	85	19.96
12	410,689	9.43	R-18	R-30	0	85	0	183	0	0	268	28.43
13	433,662	9.96	R-18	R-30	0	0	0	132	96	6	234	23.50
14	78,035	1.79	R-18	MX	23,200	0	0	0	0	0	0	0.00
TOTALS	2,883,476	66.20			271,125	85	174	538	152	242	1,191	
*area calculations exclude existing public rights-of-way												
**area calculations exclude office (195,076sf) and open space areas (70,270sf)												
***area calculations exclude open space area adjacent to NE 18th Street (51,888sf)												

Site Plan Development Assumptions

Townhouses

- Average floorplate 20'x35'
- Average 1,600sf living space,
- Units range from 15-25' wide, average 20' wide
- 1-2 car garage on ground floor with 2 floors above
- 2-3 bedrooms
- Private open space in rear averaging 15x25'
- Typical internal access 20' wide with 5-10' drive/entry
- Planting strip/tree for each unit



Left image – example of townhouses from street; Right image includes townhouses from private internal court; note planting strips in front of each unit.

Lowrise Apartments

- Average floorplate 65' wide and variable length
- In-building parking at grade or partially subgrade
- Two-three floors of apartments over parking
- Some open surface level parking with most buildings
- Average unit size 1,000sf
- Assume actual units vary from 600-1,500sf



Lowrise apartment example. In this example, parking is below grade. It's assumed that parking would occupy the first floor or a floor partially below grade.

Walkup Apartments

- Building size/layout based on Mission Hills complex
- Building floorplates average 65' x 85'
- Buildings are two-three floors
- Units are served by surface parking
- Average unit size 1,000sf
- Assume actual units vary from 600-1,500sf



Walk-up apartment examples – Mission Hills building on the left. Image on the right shows a good example with landscaping.

Commercial

- Building sizes and widths vary from 3,000-10,000 sf
- One drive-through restaurant is included
- All commercial uses are served by surface parking lots
- Building fronting on the new internal street (115th) have pedestrian-friendly facades (see example below)



Left image includes pedestrian-oriented facades along internal street. Right image shows another mixed-retail building.

Office Buildings

- Floorplates are 80-100' wide
- Parking includes some combination of below grade, at-grade in-building, and surface parking
- Two-floor of office uses above one parking level



Office building examples

Streets and Internal Roads

- NE 115th Ave in the commercial area features two lanes and on-street parking between intersections; On-street parking is not included in the office area
- Through streets in the residential areas have on-street parking on one side (NE 115th Ave, NE 22nd & 23rd Streets). Bicycle lanes are on opposite sides of street.
- Other private internal roads generally do not include parallel parking.
- Sidewalks, street trees, and planting strips are included on all public and private internal streets, except townhouse auto courts and surface parking lots feature shared auto/ped space.

Trail Corridors

- Most trails look and function like internal sidewalks, about 5' wide; Some of the longer, centralized trails connecting larger open spaces maybe wider (8-10') to allow for pedestrians and bicycle use.
- Trail corridors between buildings usually have 5-10' of landscaping on each side, then about 10-15' of semi-private open space for individual townhouse/apartment units in the adjacent uses. These spaces are separated from the trails by low level fencing and/or low hedges.



Trail examples



851 SW 6th AVENUE, SUITE 600
PORTLAND, OR 97204
P 503.228.5230 F 503.273.8169

October 23, 2018

Project #: 22152

Eric Hahn, PE
City of Vancouver Public Works
4500 SE Columbia Way
Vancouver, WA 97668-1995

RE: Four Seasons South Subdivision (PRJ-156552/PIR-64574)

Dear Eric,

This letter documents the traffic impacts of the proposed Four Seasons South senior housing development located along NE 16th Street, between NE 112th Avenue and NE 115th Avenue. The proposed development includes opening NE 16th Street to through traffic between NE 112th Avenue and NE 118th Avenue. Site development is expected to commence in 2019 with full build-out and occupancy in 2020.

Based on the traffic analysis, and subject to City of Vancouver direction, the following traffic control improvements are recommended in conjunction with site development in accordance with City of Vancouver standards and the *Manual on Uniform Traffic Control Devices* (MUTCD):

- A stop sign should be installed on the NE 115th Avenue (northbound) approach to NE 16th Street.
- A stop sign should be installed on the NE 118th Avenue (southbound) approach to NE 16th Street.
- Stop signs should be installed on all three of the proposed site access (southbound) approaches to NE 16th Street.
- A stop sign should be installed on the NE 16th Street (westbound) approach to NE 112th Avenue.

In addition, a southbound left-turn lane should be striped on NE 112th Avenue at NE 16th Street in conjunction with site development. Recognizing the back-to-back northbound left-turn lane to the north and subject to City direction, the southbound turn lane should provide at least 50 feet of storage. No other off-site improvement mitigation needs were identified to support the proposed site development.

Finally, it is recommended that above-ground utilities, monuments, fencing, and vegetation be appropriately located and maintained on-site and at the NE 112th Avenue & NE 16th Street intersection to preserve adequate intersection sight lines per City of Vancouver standards.

The methodology of our analysis, pertinent findings, and our recommendations are documented in this report.

FILENAME: ||KITTELSON.COM|FS|H_PROJECTS|22|22152 - FOUR SEASONS SOUTH SUBDIVISION|REPORT|FINAL|SEPTEMBER 2018
TIA|22152_FOURSEASONS_UPDATEDREP_10232018.DOCX

INTRODUCTION

Four Seasons Subdivision, LLC, is proposing development of up to 70 age-restricted residential homes on approximately 9.55 acres located at 1611 NE 112th Avenue in Vancouver, WA. The four existing agricultural-related structures located on the site will be removed. The subdivision site is located north of NE 16th Street and east of NE 112th Avenue. Access to homes within the new subdivision will be via NE 16th Street, to both NE 112th Avenue and NE 118th Avenue. Figure 1 shows the site vicinity map and Figure 2 shows the proposed site plan.

SCOPE OF THE REPORT

This analysis determines the transportation-related impacts associated with the proposed senior housing development. The study intersections and overall study area for this project were determined based on a review of existing travel patterns, the traffic impact analysis requirements pursuant to Vancouver Municipal Code (VMC) Sections 11.80.080 and 11.80.130, the City's Traffic Study Guidelines, and direction provided by City of Vancouver staff during the August 23, 2018 pre-application meeting.

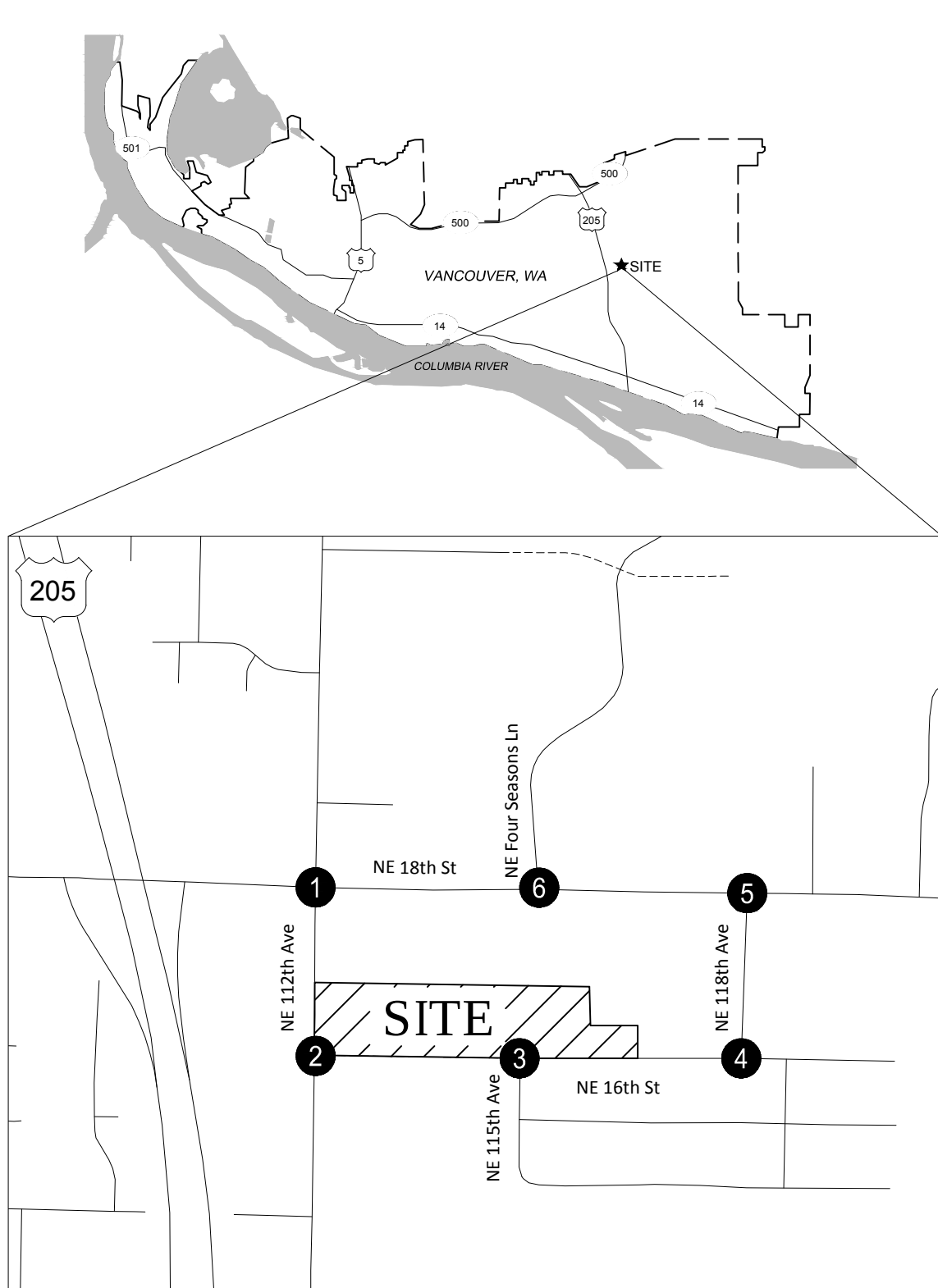
Analysis Periods

Weekday a.m. and p.m. peak hour traffic conditions were modeled at the study intersections. Traffic counts were collected in September 2018. Vehicle counts along NE 18th Street were generally increased to balance with adjacent intersections with no intermediate driveways. *Appendix "A" includes the count data at each of the study intersections. Note that though the Peak Hour Factors calculated at the NE 115th Avenue & NE 16th Street and NE 118th Avenue & NE 16th Street intersections during the p.m. system peak hour were 1.00 and 1.01, respectively, a more reasonable Peak Hour Factor of 0.80 was used for all existing and proposed internal neighborhood intersections during the a.m. and p.m. analysis periods.*

Study Intersections

Six study intersections were identified by City of Vancouver staff as shown in Figure 1 and listed below.

1. NE 18th Street & NE 112th Avenue
2. NE 16th Street & NE 112th Avenue
3. NE 16th Street & NE 115th Avenue
4. NE 16th Street & NE 118th Avenue
5. NE 18th Street & NE 118th Avenue
6. NE 18th Street & NE Four Seasons Lane



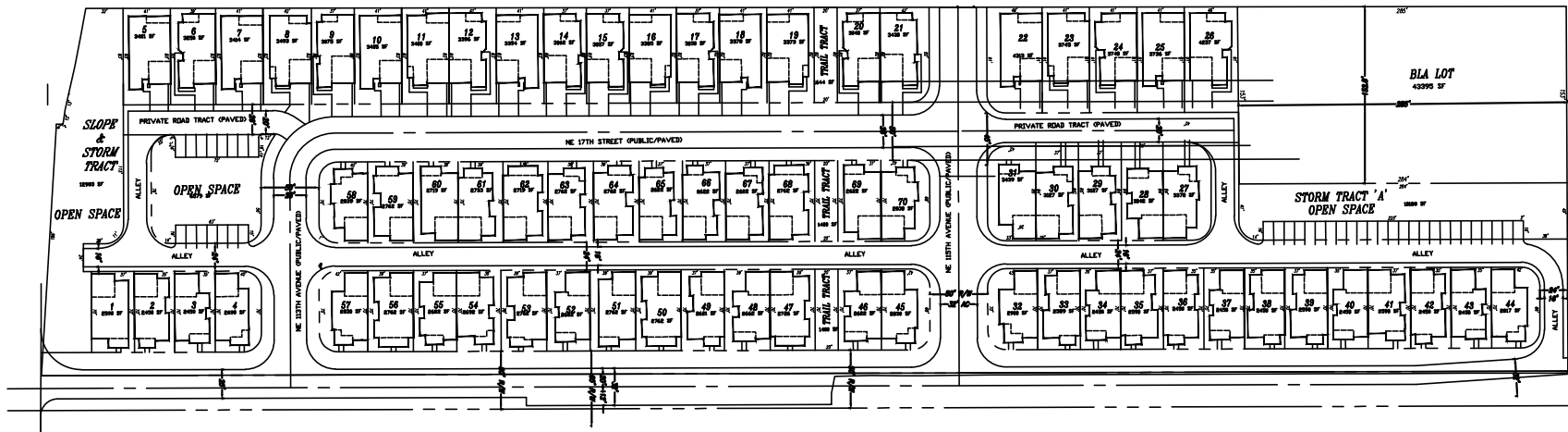
LEGEND

- Study Intersections

Site Vicinity
Vancouver, Washington

Figure
1

H:\12\122152 - Four Seasons South Subdivision\report\figs\122152_2018_Figures.dwg Oct 18, 2018 - 8:05am - clougherty Layout Tab: SitePlan



Note: Site Plan provided by Ginn Development, dated September 13, 2018

**Preliminary Site Plan
Vancouver, Washington**

Figure
2

The remaining sections of this report address the following transportation issues:

- Trip generation and distribution estimates for the proposed senior housing development;
- Concurrency corridor trip assignment;
- Existing land use and transportation system conditions within the site vicinity;
- Forecast year of opening (2020) baseline traffic conditions during the weekday a.m. and p.m. peak hours;
- Forecast year of opening (2020) total traffic conditions with full build-out of the site during the weekday a.m. and p.m. peak hours;
- Five year build out (2025) with site traffic conditions during the weekday a.m. and p.m. peak hours;
- Study intersection crash history review;
- Signal warrant analysis at the NE 16th Street & NE 118th Avenue intersection;
- Forecast year of opening (2020) total traffic conditions with full build-out of the site, assuming alternate site access via the NE 18th Street & NE Four Seasons Lane intersection;
- Five year build out (2025) total traffic conditions with full build-out of the site, assuming alternate site access to the NE 18th Street & NE Four Seasons Lane intersection;
- Intersection sight distance analysis; and,
- Conclusions and recommendations.

ANALYSIS METHODOLOGY

Intersection Levels-of-Service

All level-of-service analyses described in this report were performed in accordance with the procedures stated in the *2000 Highway Capacity Manual* (Reference 1). *A description of level-of-service and the criteria by which they are determined is presented in Appendix "B."* Appendix "B" also indicates how level-of-service is measured and what is generally considered the acceptable range of level-of-service.

Peak 15-minute flow rates were used in the evaluation of all intersection levels of service to provide analyses based on a reasonable worst-case scenario. For this reason, the analyses reflect conditions that are only likely to occur for 15 minutes out of each average peak hour.

Operating Standards

City of Vancouver Municipal Code Section 11.80.130.B states the following:

A proposed development that adds at least five net new peak hour trips to an intersection approach operating at an LOS E or lower within the required traffic impact analysis area may be denied based upon any of the following:

- 1. For signalized intersections, when off-site intersection conditions are at a LOS F, or*
- 2. For signalized intersections, when the LOS E and the volume to capacity ratio is greater than 0.95, or*
- 3. For unsignalized intersections, when the volume to capacity ratio for any lane on any approach is greater than 0.95, and*
- 4. When significant traffic hazards would be caused or materially aggravated by the proposed development.*

All operational analyses were compared to these standards and were prepared using Synchro 10 software.

EXISTING CONDITIONS

The existing conditions analysis identifies site conditions and the current operational and geometric characteristics of roadways within the study area. These conditions will be compared with future conditions later in this report. Kittelson & Associates, Inc. (KAI) staff visited and inventoried the proposed development site and surrounding area in September 2018 to observe site conditions, adjacent land uses, existing traffic operations, and transportation facilities in the study area.

Site Conditions and Adjacent Land Uses

The majority of the study site is currently undeveloped. Four agricultural related buildings are located on the western portion of the site fronting NE 112th Avenue, accessible via a gated driveway connection to NE 112th Avenue, a gated driveway connection via NE 16th Street and an unpaved path to the NE 18th Street & Four Seasons Lane intersection. An existing water utility facility and existing residential development borders the site to the south along NE 16th Street, as well as some existing residential development to the east.

Adjacent Roadway Facilities

Table 1 summarizes the existing transportation facilities and roadways in the study area.

Access between NE 112th Avenue and NE 118th Avenue along NE 16th Street is currently gated approximately 60 feet west of NE 115th Avenue.

Table 1. Existing Transportation Facilities and Roadway Designations

Roadway	Functional Classification ¹	Number of Travel Lanes	Posted Speed (mph)	Sidewalks?	Bicycle Lanes?	Raised Median?	On-Street Parking?
NE 18 th Street	Principal Arterial	4-5	35	Yes	Yes	Portions	No
NE 112 th Avenue	Principal Arterial	4-5	35	Partial ²	Partial ³	No	No
NE 118 th Avenue	Local Collector	2	Not Posted	No	No	No	Yes ⁴
NE Four Seasons Lane	Collector Arterial	2	Not Posted	Yes	No	No	No
NE 16 th Street	Neighborhood Circulator	1-2 ⁵	Not Posted	Partial on South Side	No	No	Yes ⁵
NE 115 th Avenue	Neighborhood Circulator	2	Not Posted	Yes	No	No	Yes ⁴

¹ Source: *City of Vancouver Arterial Street System and Classification Map*, Adopted June 19, 2017

² Sidewalks are complete along both sides of NE 112th Street from NE 18th Street to the south for 350 feet towards NE 16th Street. From there, sidewalk continues to the south only on the west side of NE 112th Street.

³ A bike lane exists on both directions of NE 112th Avenue, beginning approximately 300 feet south of the intersection with NE 18th Street and continues to the north on both directions of NE 112th Avenue.

⁴ Roadway width available for parking but is not striped. Vehicles observed parking on both sides of roadway.

⁵ NE 16th Avenue currently narrows to one through lane and one row of parked cars (south side of roadway) approximately 325 feet west of NE 118th Avenue.

Pedestrian and Bicycle Facilities

As indicated by Table 1, sidewalks and bicycle facilities in the study area are generally intermittent and the available facilities appear to have been completed in conjunction with adjacent development projects as well as the recently completed I-205 interchange with NE 18th Street and NE 18th Street widening. Sidewalk facilities are not provided along the site frontage of NE 16th Street today.

Transit Facilities

C-Tran currently offers four fixed transit routes within the general site vicinity, though none are within a ¼ mile walking distance of the site (Reference 2). Each route is summarized below.

- Route 37 (Mill Plain/Fisher's) route operates between Downtown Vancouver and the Fisher's Landing Transit Center, including service just south of the project vicinity, along SE Mill Plain Boulevard. The service operates on weekdays from approximately 5:00 a.m. to 12:45 a.m., with 15-minute headways for most of the day. On weekends, the route operates with 20-minute headways Saturdays and 30-minute headways on Sundays.
- Route 177 (Evergreen Express) provides bus service between the Evergreen Park & Ride and the downtown Portland Transit Mall, including service along NE 18th Street. Service along this route operates weekdays only, with three morning trips southbound between approximately 6:00 a.m. and 7:00 a.m. and one afternoon southbound bus at 4:45 p.m. The northbound schedule operates one morning bus at 6:30 a.m. and three afternoon trips between approximately 3:50 p.m. and 5:20 p.m.

- Route 30 (Burton) route operates between Downtown Vancouver and the Fisher's Landing Transit Center, including service along NE 28th Street. The service operates on weekdays from approximately 5:30 a.m. to 9:30 p.m., with 30-minute headways for most of the day. On weekends, the route operates with 30-minute headways Saturdays and hourly headways on Sundays.
- Route 80 (Van Mall/Fisher's) provides bus service between the Vancouver Mall Transit Center and the Fisher's Landing Transit Center, including service along NE 28th Street. Service along this route operates weekdays between approximately 5:30 a.m. and 9:00 p.m. with 30-minute headways. The route operates with 45-minute headways on weekends.

The transit stops for Routes 30 and 80 are located approximately 0.75 miles north of the site at the NE 28th Street & NE Four Seasons Lane intersection. The transit stop to access Route 37 is located approximately one mile south of the project site at the NE 112th Ave (NE Chkalov Drive) and SE Mill Plain Boulevard. Additionally, the Evergreen Park and Ride is located approximately 1.25 miles east of the project site, for access to Route 177.

TRIP GENERATION

Trips for the proposed senior housing development were estimated using trip rates obtained from *Trip Generation Manual, 9th Edition* (Reference 3), as shown in Table 2. Overall, the development is estimated to generate a total of 258 net new trips, 42 (15 inbound / 27 outbound) occurring during the a.m. peak hour, and 34 (21 inbound / 13 outbound) during the p.m. peak hour. Note that the weekday a.m. and p.m. peak hour trip rates were calculated using the fitted curve equation in the *Trip Generation Manual*.

Table 2. Trip Generation Estimate

Land Use	ITE Code	Size (units)	Weekday Daily Trips	Weekday AM Peak Hour Trips			Weekday PM Peak Hour Trips		
				Total	In	Out	Total	In	Out
Senior Adult Housing - Detached	251	70	258	42	15	27	34	21	13

TRIP DISTRIBUTION AND ASSIGNMENT

The site-generated trips shown in Table 2 were distributed to the study area roadways based on a trip distribution pattern derived from the Southwest Washington Regional Transportation Council travel demand model (select zone analysis of Transportation Analysis Zone 624) as well as existing travel patterns in the site vicinity.

Figure 3 shows the estimated trip distribution pattern and site-generated traffic volumes assigned to the six study intersections as well as to the new NE 16th Avenue connection from NE 115th Avenue to NE 112th Avenue. The estimated site distribution pattern was determined based on the travel demand model and considering existing traffic patterns, the site location and surrounding transportation system.

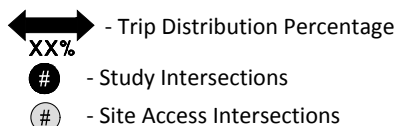


Figure
3

Concurrency Corridor Trip Assignment

Per City of Vancouver requirements, Table 3 summarizes the estimated number of site-generated weekday p.m. peak hour trips entering each of the City's adopted concurrency corridors. Assigned trips were recorded counting trips only once along each of the specified corridors.

Table 3. Concurrency Corridor Weekday PM Peak Hour Trip Assignment

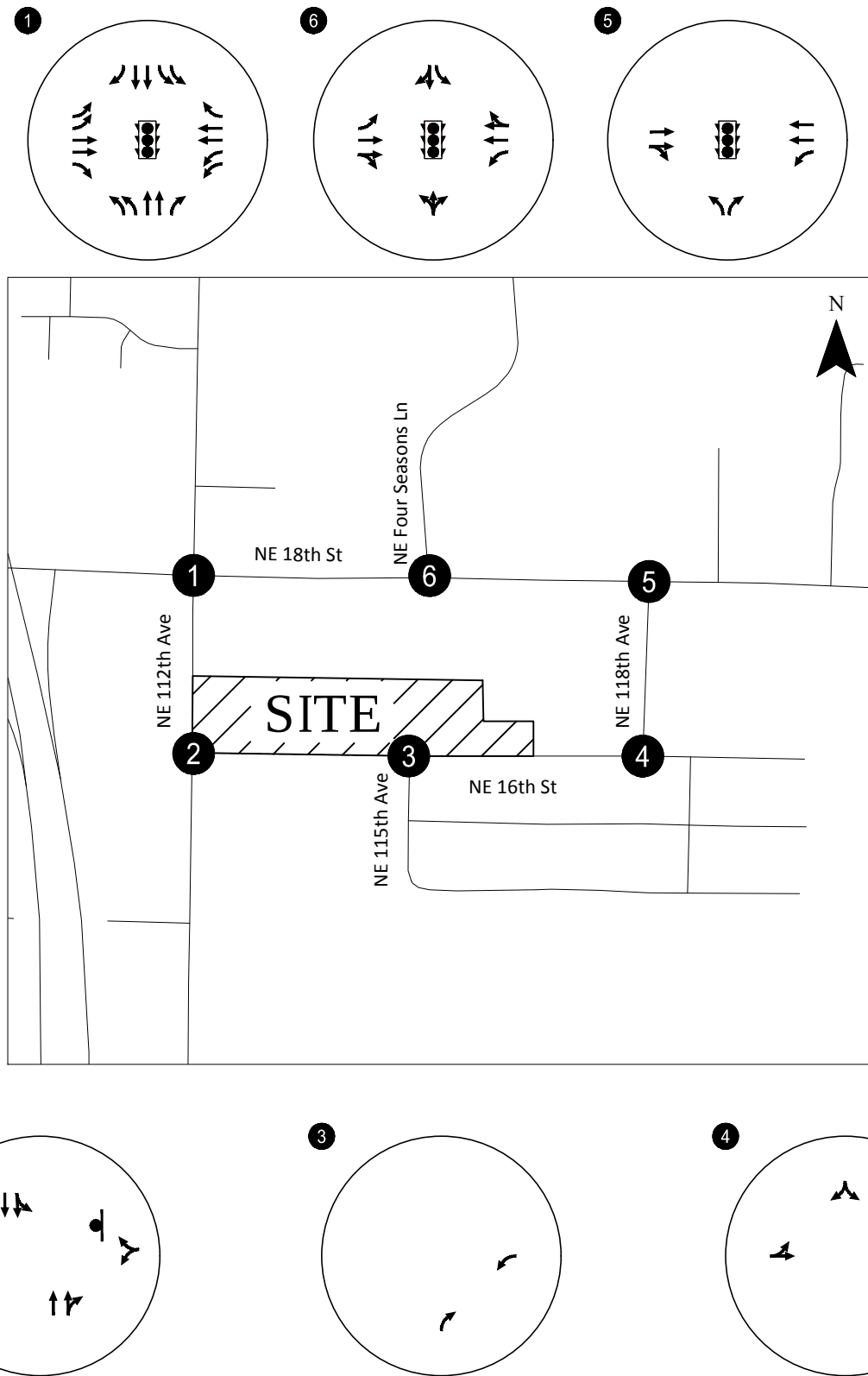
Corridor Name	Corridor Limit	PM Peak Trips to Corridor
Mill Plain Blvd.	Fourth Plain to I-5	-
	I-5 to Andresen	-
	Andresen to I-205	-
	I-205 to 136 th Ave.	-
	136 th Ave. to 164 th Ave.	-
	164 th Ave. to 192 nd Ave.	-
St. Johns / Ft. Van Way	Mill Plain to 63 rd St.	-
Fourth Plain Blvd.	Mill Plain to I-5	-
	I-5 to Andresen	-
	Andresen to I-205	-
	I-205 to 162 nd Ave.	-
Andresen Road	Mill Plain to SR500	-
	SR500 to 78 th St.	-
112 th Avenue	Mill Plain to 28 th St.	27
	28 th St. to 51 st St.	17
164 th /162 nd Avenue	SR14 to SE 1 st St.	-
	SE 1 st St. to Fourth Plain	-
Burton Road / 28 th Street	18 th St. to 112 th Ave.	8
	112 th Ave. to 138 th Ave.	2
	138 th Ave. to 162 nd Ave.	-
18 th Street	112 th Ave. to 138 th Ave.	7
	138 th Ave. to 164 th Ave.	2
136 th /137 th Avenue	Mill Plain to 28 th St.	1
	28 th St. to Fourth Plain	-
192 nd Avenue	SR14 to NE 18 th St.	-

STUDY INTERSECTION OPERATIONS REVIEW

This section provides an overview of operations at the study intersections under existing conditions as well as under future forecast background and total traffic conditions. The analysis determined that the study intersections all operate acceptably today and will continue to do so in the future, during both the weekday a.m. and p.m. peak hours. Figures 5 through 8 illustrate weekday a.m. and p.m. peak hour conditions under existing and future traffic conditions. Derivation of the existing and future conditions analysis at the study intersections is further described below.

Existing 2018 Traffic Conditions

Figure 4 illustrates the existing lane configuration and traffic control devices at each of the study intersections. Figure 5 presents the existing traffic volumes and corresponding intersection operations. All study intersections satisfy City of Vancouver operational thresholds under existing conditions. *Appendix "C" contains the existing operational analysis worksheets.*

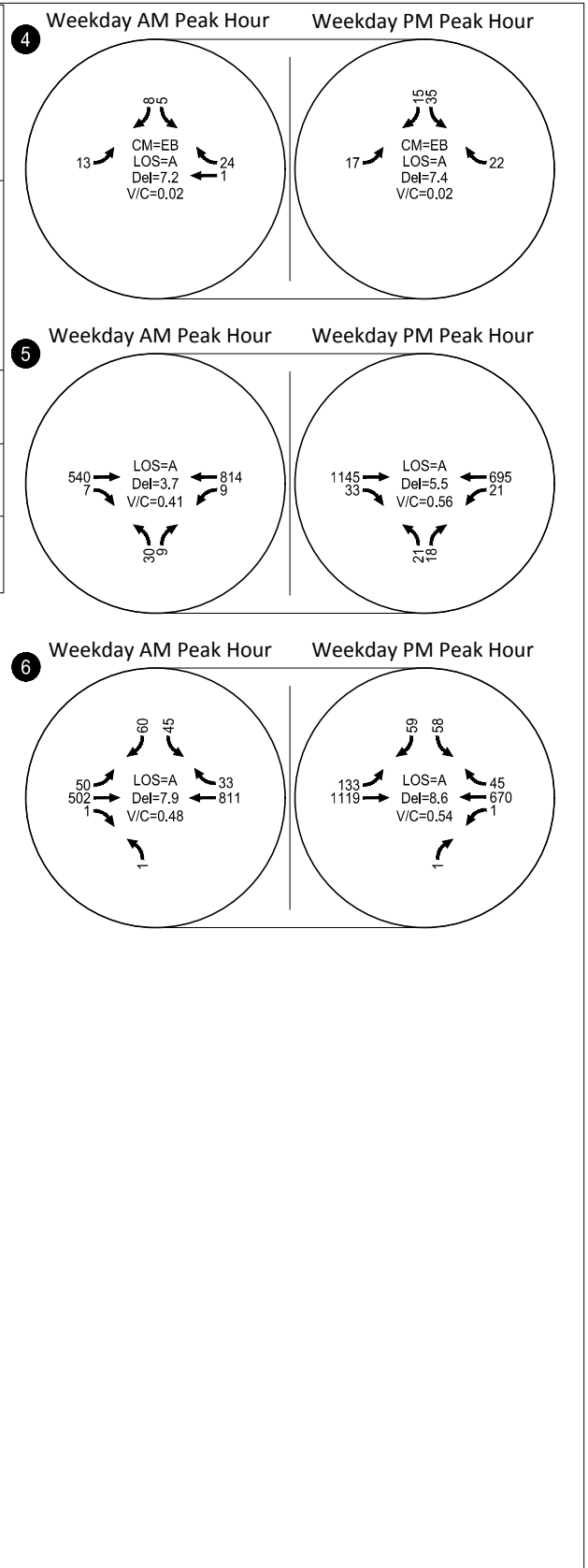
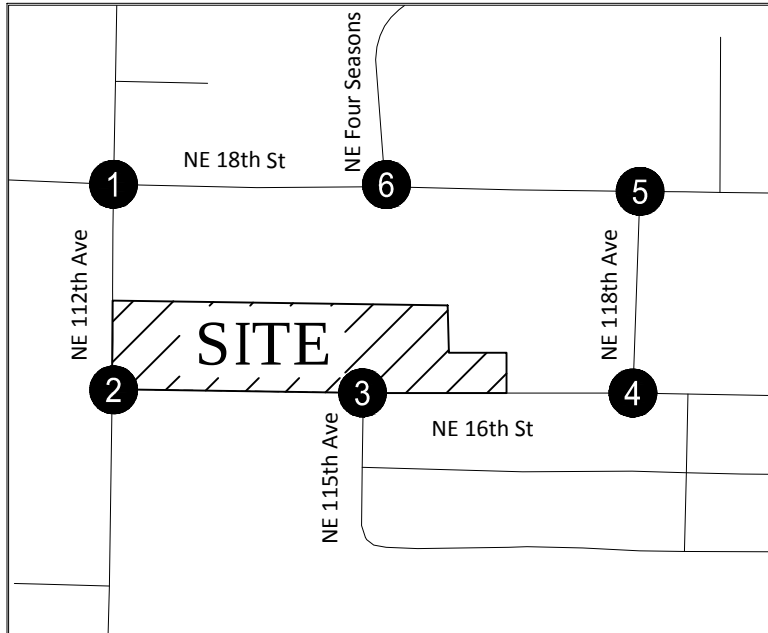


LEGEND

- # - Study Intersections
- - Stop Sign

Existing Lane Configurations and
Traffic Control Devices
Vancouver, Washington

Figure
4



LEGEND

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
 LOS = INTERSECTION LEVEL OF SERVICE
 Del = INTERSECTION AVERAGE CONTROL DELAY
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

**Existing Traffic Conditions
 Weekday AM and PM Peak Hour
 Vancouver, Washington**

**Figure
 5**

Opening Year 2020 Baseline Traffic Conditions

The year 2020 baseline traffic analysis identifies how the study area's transportation system will operate without the proposed development. This analysis includes the addition of estimated trips from general growth in the region (application of a 1.5 percent annual growth) but does not include traffic from the proposed development. In-process trips associated with the following nearby developments were also added to the study intersections:

- Four Seasons Subdivision residential development, currently under construction to the north of this study;
- Block 1618 Apartments, to be developed just west of this study site, across NE 112th Avenue;
- Mountain View Place Apartments, currently under construction to the in the northwest quadrant of the NE 112th Avenue and 18th Street intersection.

As shown in Figure 6, inclusive of regional growth, all of the study intersections continue to operate acceptably under year 2020 baseline conditions. *Appendix "D" contains the 2020 baseline operational analysis worksheets, as well as Figures D-1 through D-3, showing the in-process trip assignments for each development listed above.*

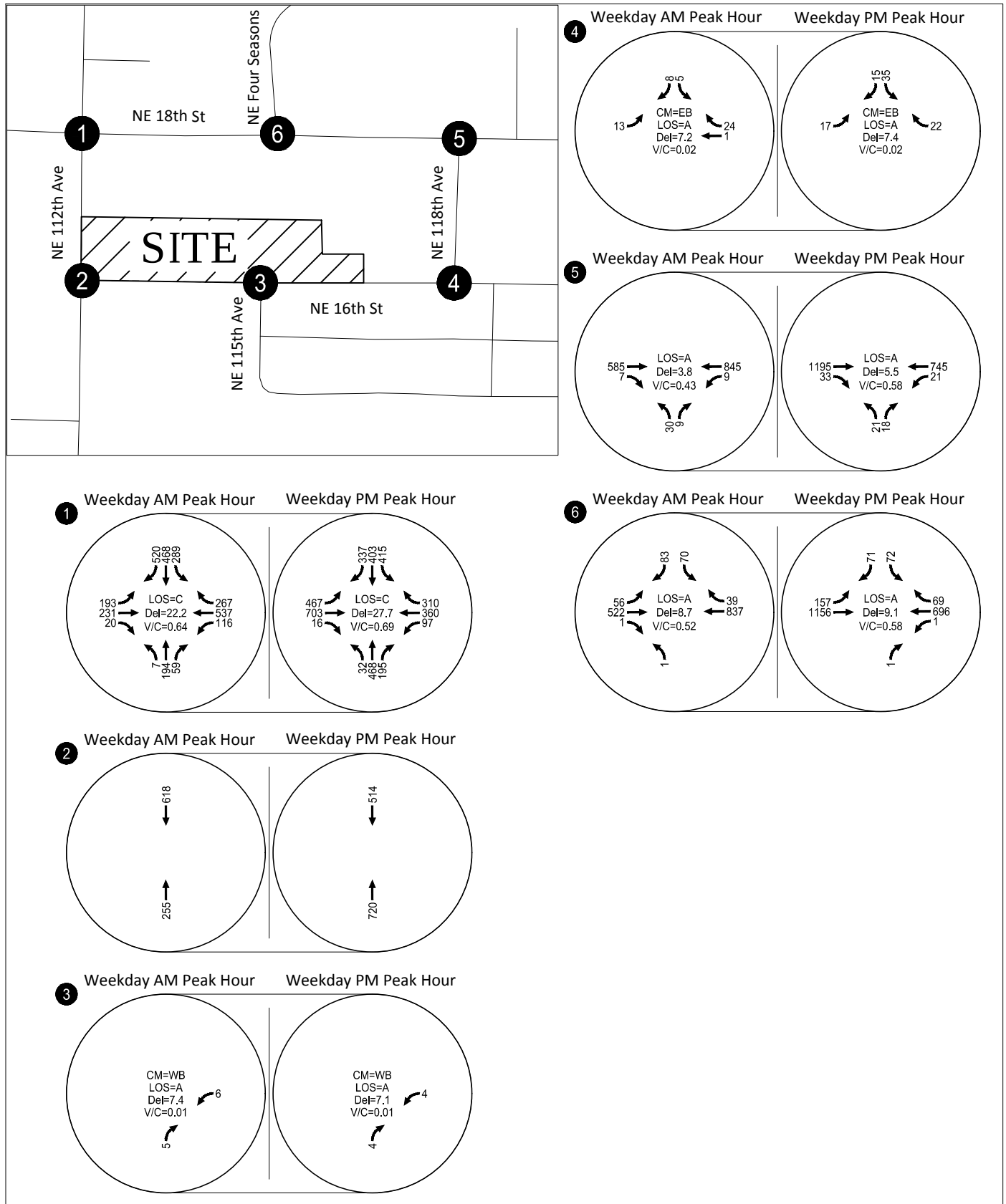
Opening Year 2020 With-Project Conditions

The site-generated trips in Figure 3 were added to the baseline traffic volumes in Figure 6 to produce year 2020 build-out traffic volumes. Also added to each study intersection were redistributed trips, due to existing neighborhood trips that would by 2020 be able to use the extension of NE 16th Street to NE 112th Avenue (provided in conjunction with site development) to enter and exit the existing neighborhood east of the site. It was assumed that the 80% of existing neighborhood trips currently using the NE 118th Street and NE 18th Street intersection for travel north, west or south would instead take the connection of NE 16th Street west to NE 112th Avenue.

Figure 7 illustrates the resultant "with-project" conditions. As shown in Figure 7, all study intersections operate acceptably under build-out year 2020 with-project traffic conditions. *Appendix "E" contains the year 2020 with-project operational analysis worksheets, as well as Figure E-1 showing the redistribution of existing trips.*

Future Five-year (2025) With-Project Conditions

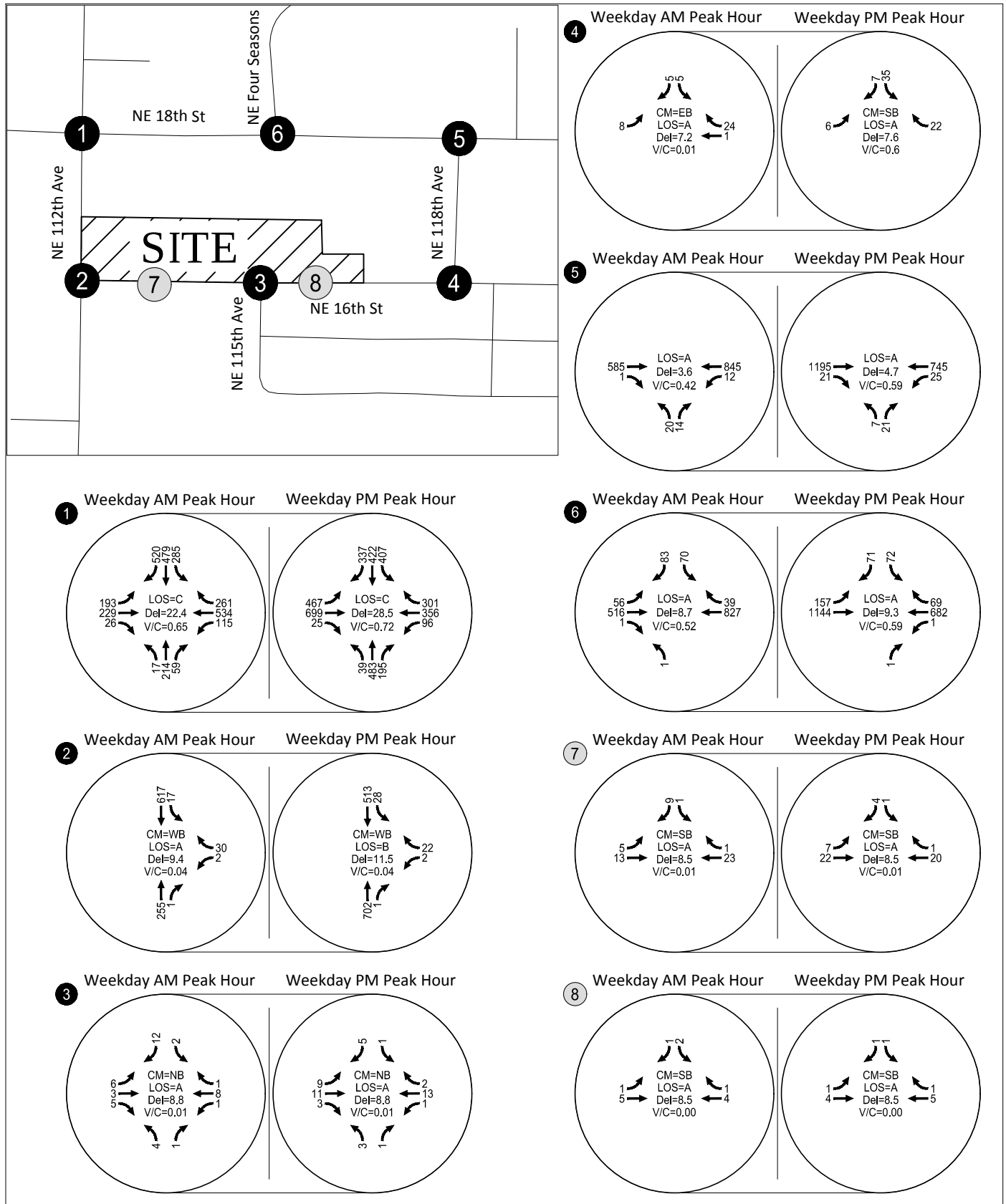
Year 2025 traffic volumes were projected assuming continued 1.5 percent annual growth. In-process trips, site-generated trips estimated in Table 2, and redistributed trips as described above, were then added to each of the study intersections based on the estimated trip distribution pattern shown in Figure 3. Figure 8 illustrates the resultant "with-project" conditions for future year 2025. As shown in Figure 8, all study intersections continue to operate acceptably under future year 2025 traffic conditions. *Appendix "F" contains the year 2025 with project operational analysis worksheets.*

**LEGEND**

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
 LOS = INTERSECTION LEVEL OF SERVICE
 Del = INTERSECTION AVERAGE CONTROL DELAY
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

**Year 2020 Baseline Traffic Conditions
 Weekday AM and PM Peak Hour
 Vancouver, Washington**

Figure
6

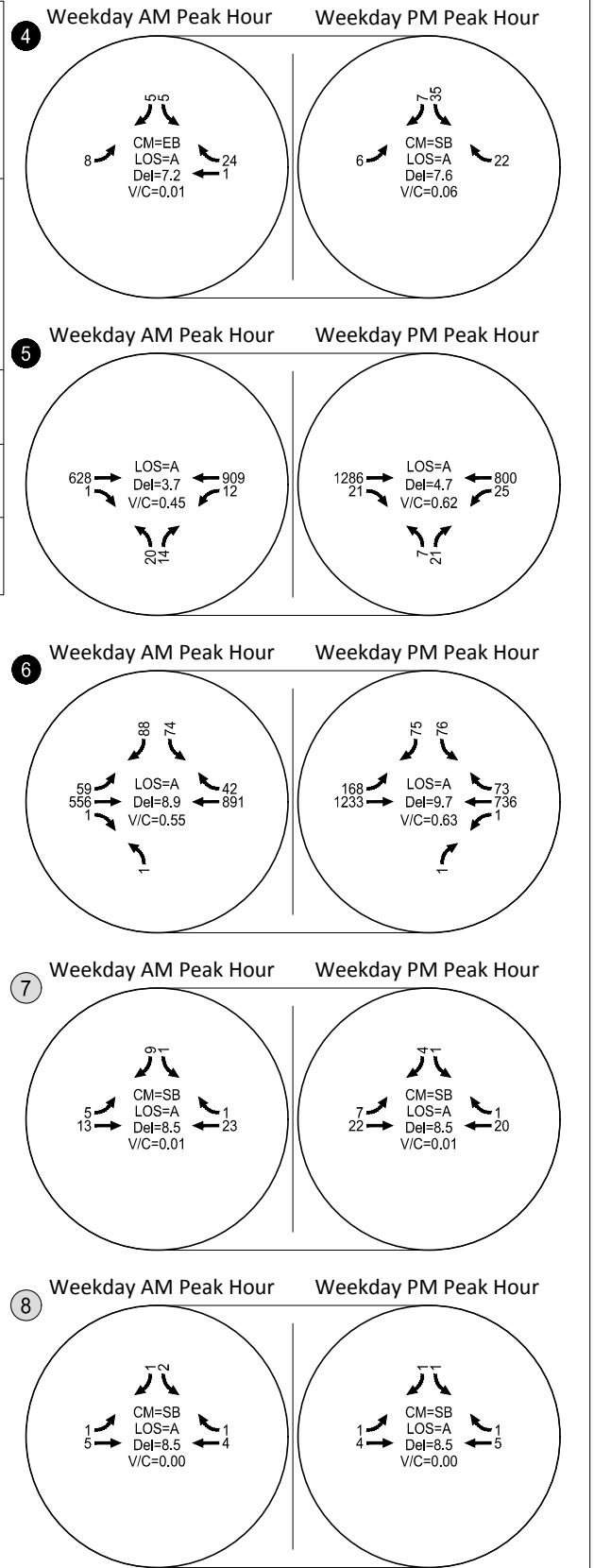
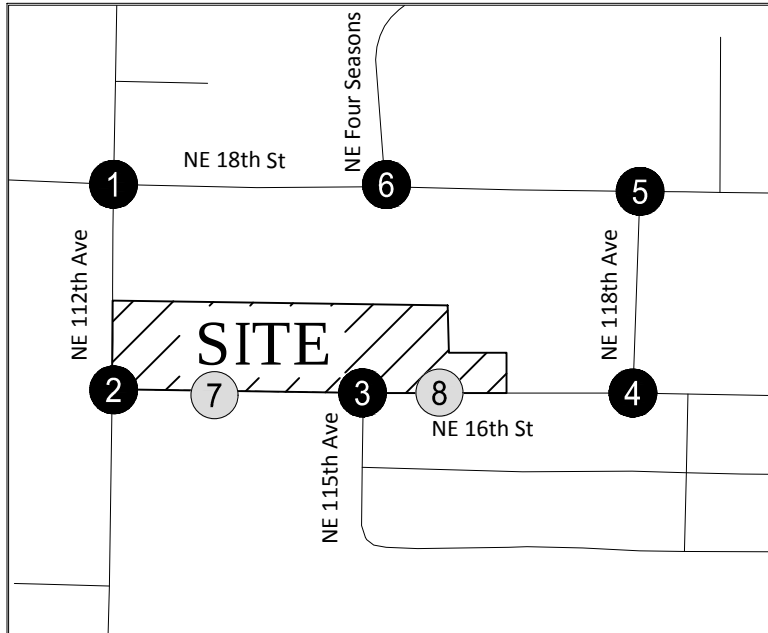


LEGEND

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
 LOS = INTERSECTION LEVEL OF SERVICE
 Del = INTERSECTION AVERAGE CONTROL DELAY
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

**Year 2020 Total Traffic Conditions
 Weekday AM and PM Peak Hour
 Vancouver, Washington**

Figure
7



LEGEND

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
 LOS = INTERSECTION LEVEL OF SERVICE
 Del = INTERSECTION AVERAGE CONTROL DELAY
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

**Year 2025 Total Traffic Conditions
 Weekday AM and PM Peak Hour
 Vancouver, Washington**

**Figure
 8**

Signalized Intersection Queuing Analysis

Queue lengths were evaluated at each of the signalized study intersections to identify potential queue spillback occurring during year 2025 with weekday a.m. and p.m. peak hour project trips. Table 4 summarizes 95th percentile queue lengths estimated by Synchro 10 at the each of the study intersection's respective turn lanes. The 95th percentile queue lengths represent the worst-case queue that occurs 5% of the time during the peak hour.

Table 4. Year 2025 with Project Traffic 95th Percentile Queue Lengths at Signalized Study Intersections

Intersection	Queue Length (feet)	Eastbound		Westbound		Northbound		Southbound	
		Left	Right	Left	Right	Left	Right	Left	Right
NE 112 th Avenue & NE 18 th Street	Storage ¹	150	150	260	150	310	165	310	125
	AM Peak	125	0	100	100	25	25	175	250
	PM Peak	275*	0	75	225	50	125	225	50
NE Four Seasons Lane & NE 18 th Street	Storage ¹	200	-	175	-	-	-	125	-
	AM Peak	50	-	0	-	-	-	75	-
	PM Peak	100	-	25	-	-	-	100	-
NE 118 th Avenue & NE 18 th Street	Storage ¹	-	-	140	-	120	270 ²	-	-
	AM Peak	-	-	25	-	25	25	-	-
	PM Peak	-	-	25	-	25	25	-	-

Notes:

95th percentile queue lengths have been rounded up to the nearest car length, assuming one vehicle equals 25 feet;

Bold and highlighted cells indicate 95th percentile queue lengths greater than the storage length;

¹Storage measured as the length of white gore stripe for turn lane;

²There is approximately 270 feet of storage for the northbound right turn lane before potential blockage of an existing neighborhood driveway;

*95th percentile volume exceeds capacity, queue may be longer.

As shown in Table 4, the southbound right-turn movement at the NE 112th Avenue & NE 18th Street intersection is projected to experience 95th percentile queues that exceed the existing striped storage length during the weekday a.m. peak hour. Additionally, the westbound right-turn movement and the eastbound left-turn movement are projected to experience 95th percentile queues that exceed the existing striped storage length during the weekday p.m. peak hour. No queue storage length changes are recommended at this time recognizing that:

- The intersection was recently reconstructed, and several projects are planned in the area that will result in the continued evolution of traffic patterns at the intersection.
- The existing taper length for each movement can support storage of 3-4 additional vehicles.
- The proposed development adds no trips to the southbound right-turn, eastbound left-turn and westbound right-turn movements.
- Both the westbound and southbound right-turn lanes currently operate overlap right-turn phases and are projected to operate well under capacity.

Unsignalized Intersection Queueing Analysis

A 95th percentile queueing analysis was completed using HCM 2000 analysis at the unsignalized study intersections. All of the 95th percentile stop-controlled approach queues were projected to be one vehicle length or less and can be accommodated within available storage.

TRAFFIC SAFETY AND CIRCULATION

The traffic safety analysis reviewed potential safety and access issues related to the proposed development and includes consideration of reported collision data at study intersections. Intersection sight distance analysis is also provided.

Collision Analysis

The study intersection collision history was obtained from the Washington Department of Transportation for the period from January 1, 2013 to December 31, 2017. The data was reviewed in an effort to identify potential safety issues. Table 5 summarizes the crash frequency at the study intersections. Generally, the City of Vancouver considers a crash rate greater than one crash per million entering vehicles (MEV) to be an indicator that a potential geometric or operational issue may exist and that further evaluation should be considered.

Table 5. Study Intersection Crash Frequency and Severity (January 2013 through December 2017)

Intersection	No. of Crashes	Crash Type					Crash Severity		Crash Rate ¹
		Rear-End	Object	Turning	Angle	Other	Non-Injury	Injury	
112 th Avenue & NE 18 th St.	21	4	5	5	7	-	16	5	0.32
Four Season Ln. & NE 18 th St.	16	-	5	1	10	-	8	8	0.42
118 th Avenue & NE 18 th St.	5	1	-	-	1	3	1	4	0.14
118 th Avenue & NE 16 th St.	-	-	-	-	-	-	-	-	0
115 th Avenue & NE 16 th St.	-	-	-	-	-	-	-	-	0
112 th Avenue & NE 16 th St.	-	-	-	-	-	-	-	-	0

Note: ¹ Crash rate is calculated as the number of crashes per million entering vehicles. Average daily traffic volumes were estimated using p.m. peak hour total entering volume at the intersection.

As shown in Table 5, there were no reported crashes at three of the six study intersections and each of the study intersections has a crash rate less than 1.0 per million entering vehicles. Additionally, there were no reported crashes involving a fatality during the analysis period considered. Of the seventeen reported injury crashes, eight were related to excessive speed or distracted driving. It is further noted that the NE 18th Street & NE 118th Avenue intersection was widened and signalized in the past year.

No safety-based mitigation needs were identified through review of the available crash data. *Appendix "G" includes the crash data provided for each of the study intersections.*

Intersection Turn Lane Needs

The need for a southbound left-turn lane was evaluated at NE 112th Avenue and NE 16th Street. Utilizing the turn lane guidelines presented in the *WSDOT Design Manual*, it was determined that projected 2025 with-project traffic volumes satisfy the minimum WSDOT volume threshold for providing a southbound left-turn lane. Recognizing the back-to-back northbound left-turn lane to the north and subject to City direction, the existing striped median may be restriped to provide a southbound left-turn lane with at least 50 feet of storage. *Appendix "H" contains the turn lane warrant worksheets.*

Intersection Sight Distance Review

The location of the NE 16th Street connection to NE 112th Avenue was reviewed in the field and appears to offer adequate intersection sight distance. The final site plan design should ensure intersection sight clear areas are provided at each intersection in accordance with City of Vancouver standards. It is recommended that above-ground utilities, monuments, fencing, and vegetation be appropriately located and maintained on-site and at the NE 112th Avenue & NE 16th Street intersection to preserve adequate intersection sight lines per City of Vancouver standards.

Study Intersection Traffic Control Needs

Based on the traffic analysis, and subject to City of Vancouver direction, the following traffic control improvements are recommended in conjunction with site development in accordance with City of Vancouver standards and the *Manual on Uniform Traffic Control Devices* (MUTCD):

- A stop sign should be installed on the NE 115th Avenue (northbound) approach to NE 16th Street.
- A stop sign should be installed on the NE 118th Avenue (southbound) approach to NE 16th Street.
- Stop signs should be installed on all three of the proposed site access (southbound) approaches to NE 16th Street.
- A stop sign should be installed on the NE 16th Street (westbound) approach to NE 112th Avenue.

Intersection Signal Warrant Analysis

Per City of Vancouver request, a signal warrant analysis was completed for NE 16th Street & NE 112th Avenue intersection, in accordance with the *Manual on Uniform Traffic Control Devices*. Signal warrants are not met in the future five-year (2025) with-projection conditions at the NE 16th Street & NE 112th Avenue intersection. *Appendix "I" contains the signal warrant analysis worksheets.*

STUDY INTERSECTION OPERATIONS REVIEW – NORTH ACCESS SCENERIO

This section provides an overview of operations at the study intersections under future forecast total traffic conditions, assuming that the study site will have access to the signalized intersection of NE 18th Street & Four Seasons Lane. The analysis determined that the study intersections will continue to operate acceptably in the future under the alternative access.

Opening Year 2020 With-Project Conditions – North Access Scenario

The site-generated trips in Table 2 were re-distributed to the study intersections, assuming access to the site via the NE 18th Street & NE Four Seasons Lane signalized intersection. Figure 9 presents the site trip

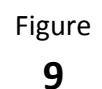
distribution for the north access scenario which were then added to the baseline traffic volumes in Figure 6 to produce the year 2020 North Access build-out traffic volumes shown in Figure 10. Also included at each study intersection were redistributed trips, due to existing neighborhood trips that would use the extension of NE 16th Street to NE 112th Avenue and also access the NE 18th Street & NE Four Seasons Lane signalized intersection.

For the future scenario analysis purposes, it was assumed that the lane configuration and signal timing parameters for the northbound approach to the NE 18th Street & NE Four Seasons Lane intersection would match the existing southbound approach.

Figure 10 summarizes the resultant north access scenario “with-project” conditions. As shown in Figure 10, all study intersections operate acceptably under build-out year 2020 with-project traffic conditions. *Appendix “J” contains the year 2020 with-project – north access scenario operational analysis worksheets, as well as Figure J-1 showing the redistribution of existing neighborhood trips.*

Future Five-year (2025) With-Project Conditions – North Access Scenario

Year 2025 traffic volumes were projected assuming continued 1.5 percent annual growth. In-process trips, site-generated trips shown in Figure 9, and redistributed trips as described above, were then added to each of the study intersections based on the estimated trip distribution pattern shown in Figure 9. Figure 11 illustrates the resultant north access scenario “with-project” conditions for future year 2025. As shown in Figure 11, all study intersections continue to operate acceptably under future year 2025 traffic conditions. *Appendix “K” contains the year 2025 with project – north access scenario operational analysis worksheets.*



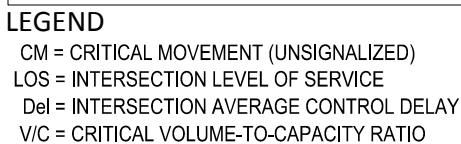
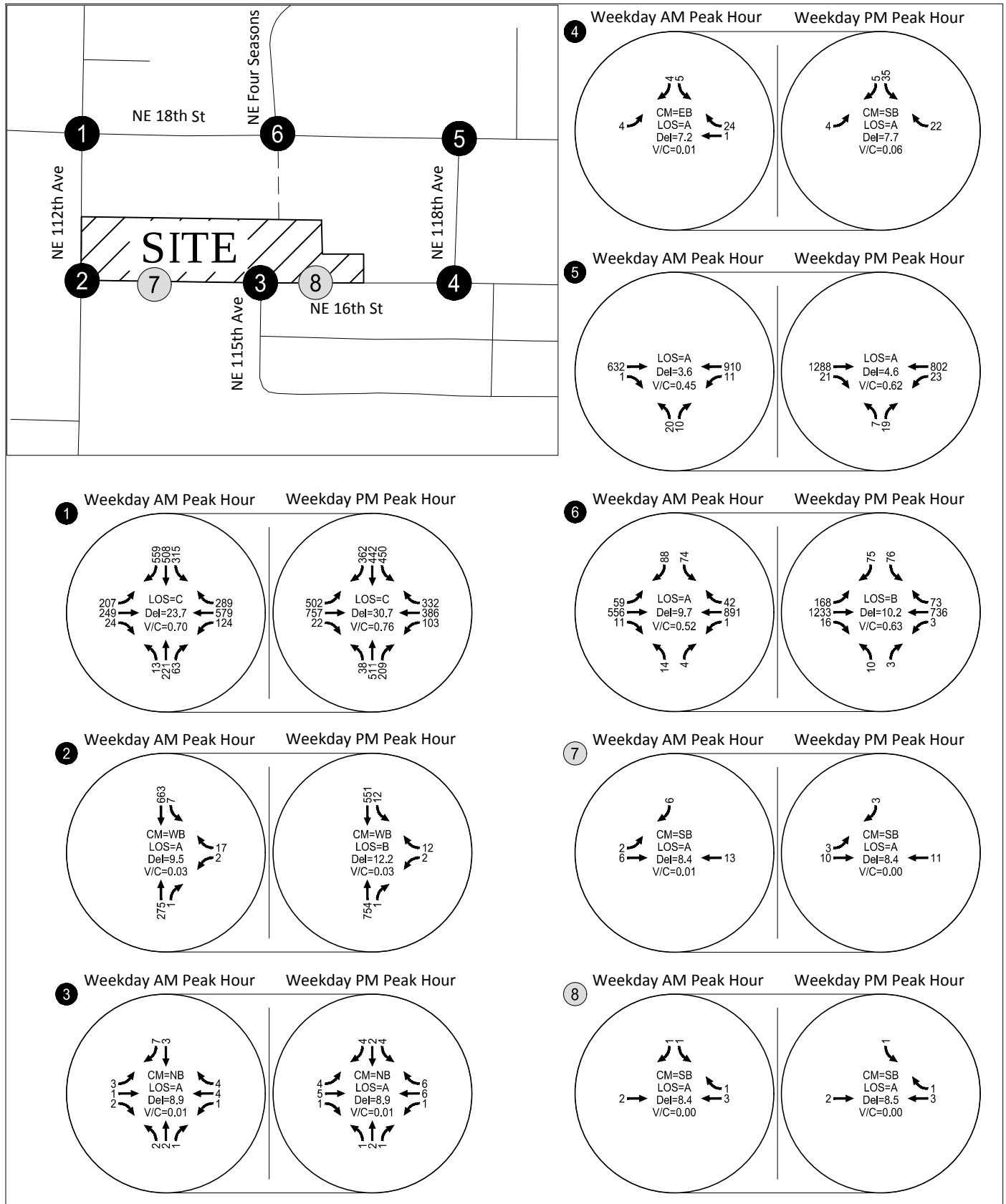


Figure
10

**LEGEND**

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
 LOS = INTERSECTION LEVEL OF SERVICE
 Del = INTERSECTION AVERAGE CONTROL DELAY
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

**North Access Scenario - Year 2025 Total
 Traffic Conditions
 Vancouver, Washington**

Figure
11

Signalized Intersection Queuing Analysis – North Access Scenario

Queue lengths were re-evaluated at each of the signalized study intersections to identify potential queue spillback occurring during year 2025 with weekday a.m. and p.m. peak hour project trips. Table 6 summarizes 95th percentile queue lengths estimated by Synchro 10 at the each of the study intersection's respective turn lanes.

Table 6. Year 2025 with Project Traffic 95th Percentile Queue Lengths at Signalized Study Intersections

Intersection	Queue Length (feet)	Eastbound		Westbound		Northbound		Southbound	
		Left	Right	Left	Right	Left	Right	Left	Right
NE 112 th Avenue & NE 18 th Street	Storage ¹	150	150	260	150	310	165	310	125
	AM Peak	125	0	100	100	25	25	175	225
	PM Peak	275*	0	75	225	50	125	225	50
NE Four Seasons Lane & NE 18 th Street	Storage ¹	200	-	175	-	125 ²	-	125	-
	AM Peak	50	-	25	-	25	-	75	-
	PM Peak	100	-	25	-	25	-	100	-
NE 118 th Avenue & NE 18 th Street	Storage ¹	-	-	175	-	175	270 ³	-	-
	AM Peak	-	-	25	-	25	25	-	-
	PM Peak	-	-	25	-	25	25	-	-

Notes:

95th percentile queue lengths have been rounded up to the nearest car length, assuming one vehicle equals 25 feet;

Bold and highlighted cells indicate 95th percentile queue lengths greater than the storage length;

¹Storage measured as the length of white gore stripe for turn lane;

²For North Access Scenario analysis, it was assumed that the northbound approach to the NE Four Seasons Lane & NE 18th Street intersection would be striped to include 125 feet of left turn storage, similar to the existing southbound approach;

³There is approximately 270 feet of storage for the northbound right turn lane before potential blockage of an existing neighborhood driveway;

*95th percentile volume exceeds capacity, queue may be longer.

As shown in Table 6, in the north access scenario, the southbound right-turn movement at the NE 112th Avenue & NE 18th Street intersection is projected to experience 95th percentile queues that exceed the existing striped storage length during the weekday a.m. peak hour. Additionally, the westbound right-turn movement and the eastbound left-turn movement are projected to experience 95th percentile queues that exceed the existing striped storage length during the weekday p.m. peak hour. No queue storage length changes are recommended at this time recognizing that:

- The intersection was recently reconstructed, and several projects are planned in the area that will result in the continued evolution of traffic patterns at the intersection.
- The existing taper length for each movement can support storage of 3-4 additional vehicles.
- The proposed development adds no trips to the southbound right-turn, eastbound left-turn and westbound right-turn movements.
- Both the westbound and southbound right-turn lanes currently operate overlap right-turn phases and are projected to operate well under capacity.

Unsignalized Intersection Queueing Analysis – North Access Scenario

All of the 95th percentile stop-controlled study intersection approach queues were projected to be one vehicle length or less and can be accommodated within available storage.

FINDINGS AND RECOMMENDATIONS

Based on the results of this Traffic Impact Analysis, the proposed Four Seasons South Subdivision can be developed while maintaining acceptable study intersection operations. The analysis developed the findings and recommendations listed below.

Findings

- The 70-unit senior housing development is estimated to generate a total of 258 net new trips, with 42 trips (15 inbound / 27 outbound) occurring during the a.m. peak hour, and 34 trips (21 inbound / 13 outbound) during the p.m. peak hour.
- All of the study intersections were found to operate acceptably under existing and future conditions with full build-out of the proposed development.
- No safety-based mitigation needs were identified based on review of historic crash data at the study intersections.
- Analysis of future year 2025 traffic volumes show that signal warrants are not met at the NE 112th Avenue & NE 16th Street intersection.
- All of the study intersections were found to also operate acceptably under future conditions with full build-out of the proposed development in the north access scenario.

Recommendations

- Subject to City of Vancouver direction, installation of the following traffic control improvements are recommended in conjunction with site development in accordance with City of Vancouver standards and the *Manual on Uniform Traffic Control Devices* (MUTCD):
 - A stop sign should be installed on the NE 115th Avenue (northbound) approach to NE 16th Street.
 - A stop sign should be installed on the NE 118th Avenue (southbound) approach to NE 16th Street.
 - Stop signs should be installed on all three of the proposed site access (southbound) approaches to NE 16th Street.
 - A stop sign should be installed on the NE 16th Street (westbound) approach to NE 112th Avenue.
- Above-ground utilities, monuments, fencing, and vegetation should be appropriately located and maintained on-site and at the NE 112th Avenue & NE 16th Street intersection to preserve adequate intersection sight lines per City of Vancouver standards.

- A southbound left-turn lane should be provided on NE 112th Avenue at NE 16th Street. Recognizing the back-to-back northbound left-turn lane to the north and subject to City direction, the southbound turn lane should provide at least 50 feet of storage.

We trust this memorandum adequately addresses the traffic impacts associated with the proposed senior housing development. Please contact us if you have any questions or comments regarding the contents of this analysis.

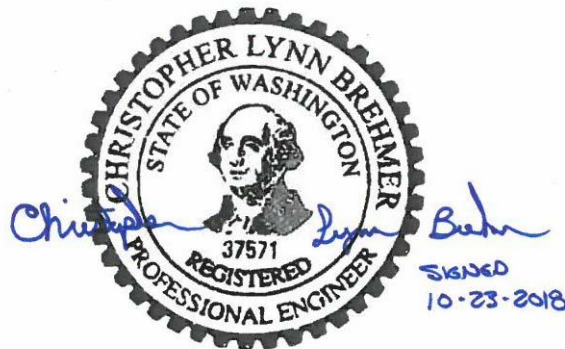
Sincerely,
KITTELSON & ASSOCIATES, INC.

Chris Brehmer

Chris Brehmer, P.E.
Senior Principal Engineer

Kristine Connolly

Kristine Connolly, P.E.
Senior Engineer



REFERENCES

- 1) Transportation Research Board. *Highway Capacity Manual 2000*.
- 2) C-Tran. <http://www.c-tran.com>. Accessed October 2018.
- 3) Institute of Transportation Engineers. *Trip Generation Manual, 9th Edition*. 2012.
- 4) U.S. Department of Transportation. *Manual on Uniform Traffic Control Devices*. 2009.

ATTACHMENTS

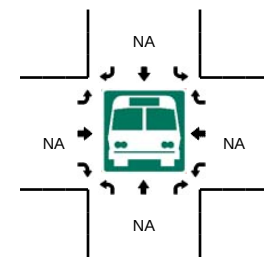
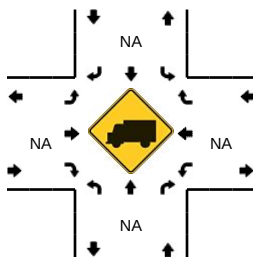
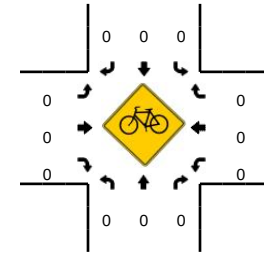
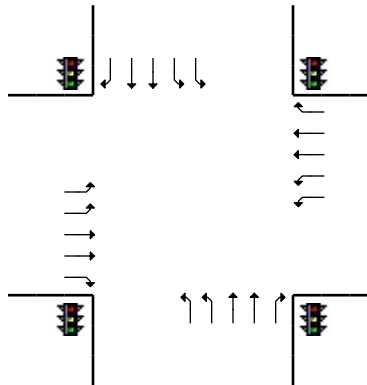
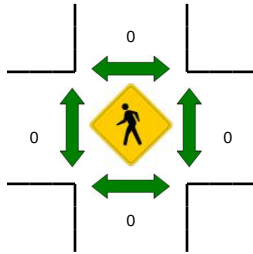
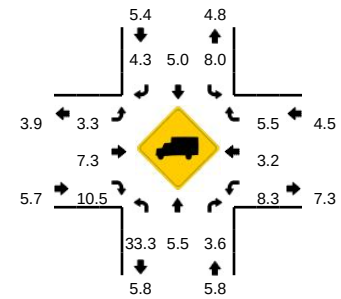
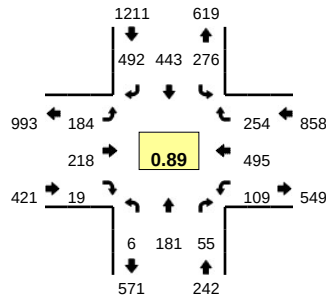
- Appendix A: Traffic Count Data
- Appendix B: Description of Level-of-Service Methods and Criteria
- Appendix C: 2018 Existing Operations Worksheets
- Appendix D: 2020 Baseline Operations Worksheets
- Appendix E: 2020 With Site Operations Worksheets
- Appendix F: 2025 With Site Operations Worksheets
- Appendix G: WSDOT Crash Data
- Appendix H: Left-turn Lane Warrant
- Appendix I: Signal Warrant Analysis Worksheets
- Appendix J: 2020 With Site Operations Worksheets – North Access Scenario
- Appendix K: 2025 With Site Operations Worksheets – North Access Scenario

Appendix A Traffic Count Data

LOCATION: NE 112th Ave -- NE 18th St
CITY/STATE: Vancouver, WA

QC JOB #: 14784701
DATE: Thu, Sep 13 2018

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



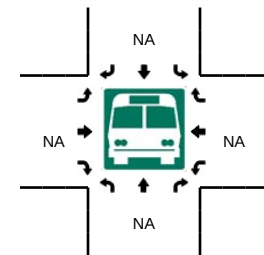
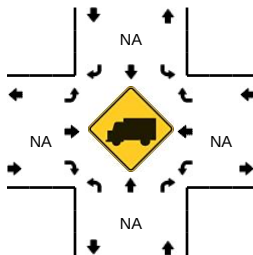
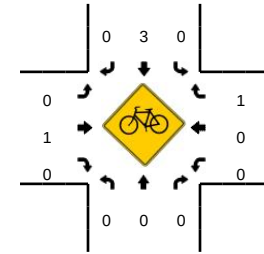
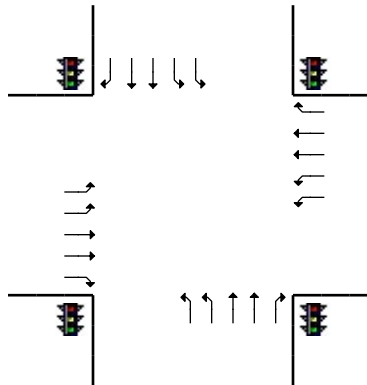
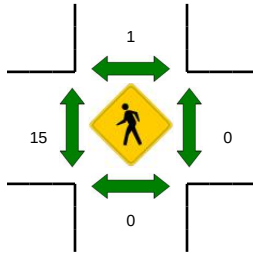
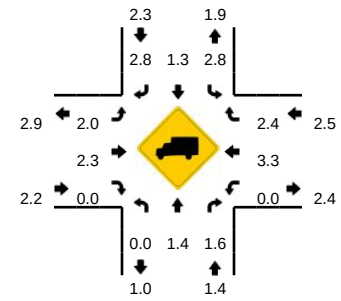
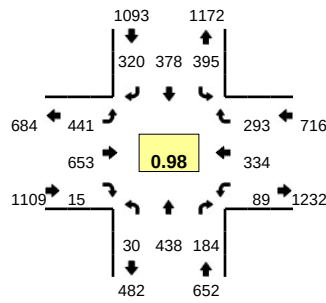
5-Min Count Period Beginning At	NE 112th Ave (Northbound)				NE 112th Ave (Southbound)				NE 18th St (Eastbound)				NE 18th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	11	7	0	12	23	44	0	17	11	1	0	5	42	18	0	191	
7:05 AM	0	14	4	0	18	31	42	0	7	12	0	0	1	39	10	0	178	
7:10 AM	1	6	5	0	12	19	53	0	15	11	1	0	5	48	15	0	191	
7:15 AM	0	16	3	0	24	17	43	0	18	24	0	0	11	50	25	0	231	
7:20 AM	0	18	3	0	17	29	51	0	14	15	3	0	12	43	16	0	221	
7:25 AM	3	21	2	0	17	40	46	0	14	15	6	0	5	46	16	0	231	
7:30 AM	1	8	6	0	23	33	32	0	14	18	1	0	11	49	18	0	214	
7:35 AM	0	15	5	0	31	39	37	0	16	14	3	0	10	37	20	0	227	
7:40 AM	0	14	3	0	20	39	34	0	13	16	2	0	7	38	22	0	208	
7:45 AM	0	9	6	0	41	57	63	0	13	18	2	0	13	31	23	0	276	
7:50 AM	0	22	6	0	19	50	43	0	14	18	0	0	16	38	29	0	255	
7:55 AM	0	16	4	0	20	49	38	0	16	26	0	0	5	40	24	0	238	2661
8:00 AM	2	15	3	0	31	23	42	0	16	14	0	0	9	39	16	0	210	2680
8:05 AM	0	12	10	0	19	33	34	0	17	21	2	0	5	44	20	0	217	2719
8:10 AM	0	15	4	0	14	34	29	0	19	19	0	0	5	40	25	0	204	2732
8:15 AM	0	18	10	0	20	31	45	0	20	17	1	0	10	36	16	0	224	2725
8:20 AM	0	14	3	0	20	31	37	0	14	22	2	0	6	40	17	0	206	2710
8:25 AM	1	18	4	0	26	23	41	0	22	16	0	0	5	50	16	0	222	2701
8:30 AM	1	12	8	0	23	25	46	0	11	11	4	0	7	35	18	0	201	2688
8:35 AM	0	12	11	0	19	25	39	0	17	9	2	0	2	32	26	0	194	2655
8:40 AM	0	17	5	0	25	21	40	0	18	18	3	0	2	27	19	0	195	2642
8:45 AM	0	17	6	0	18	23	34	0	10	12	0	0	8	31	13	0	172	2538
8:50 AM	5	17	4	0	18	15	25	0	21	11	1	0	6	21	19	0	163	2446
8:55 AM	2	16	4	0	13	27	34	0	13	11	1	0	5	35	18	0	179	2387
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	188	64	0	320	624	576	0	172	248	8	0	136	436	304	0	3076	
Heavy Trucks	0	4	0	0	12	48	28	0	0	8	4	0	0	12	20	0	136	
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: NE 112th Ave -- NE 18th St
CITY/STATE: Vancouver, WA

QC JOB #: 14784702
DATE: Thu, Sep 13 2018

Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 5:15 PM -- 5:30 PM

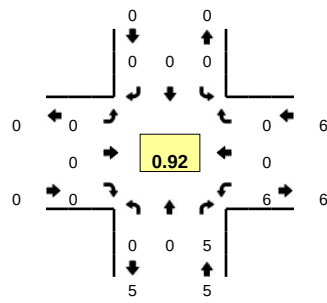


5-Min Count Period Beginning At	NE 112th Ave (Northbound)				NE 112th Ave (Southbound)				NE 18th St (Eastbound)				NE 18th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	38	17	0	31	23	22	0	33	39	1	0	13	16	32	0	265	
4:05 PM	1	30	11	0	17	24	24	0	28	51	4	0	7	28	15	0	240	
4:10 PM	2	30	23	0	18	39	24	0	34	53	1	0	2	26	21	0	273	
4:15 PM	2	25	7	0	35	34	42	0	32	47	2	0	9	29	25	0	289	
4:20 PM	4	39	10	0	14	17	26	0	50	76	2	0	9	27	27	0	301	
4:25 PM	1	43	13	0	36	25	23	0	43	58	3	0	9	29	19	0	302	
4:30 PM	2	42	13	0	31	29	25	0	27	54	2	0	2	30	21	0	278	
4:35 PM	1	42	18	0	24	22	23	0	47	47	2	0	9	23	33	0	291	
4:40 PM	2	18	11	0	44	39	33	0	40	58	0	0	8	33	26	0	312	
4:45 PM	3	51	13	0	19	36	24	0	28	49	0	0	4	24	27	0	278	
4:50 PM	1	35	25	0	34	38	24	0	35	67	2	0	9	23	19	0	312	
4:55 PM	3	31	14	0	22	26	24	0	45	47	1	0	9	31	13	0	266	3407
5:00 PM	5	33	16	0	40	40	27	0	28	48	0	0	6	33	22	0	298	3440
5:05 PM	4	47	11	0	34	28	35	0	37	49	1	0	10	26	24	0	306	3506
5:10 PM	2	29	14	0	36	35	29	0	38	51	2	0	7	34	23	0	300	3533
5:15 PM	1	48	23	0	37	26	21	0	28	38	4	0	7	31	21	0	285	3529
5:20 PM	3	39	13	0	35	31	28	0	33	69	1	0	10	19	28	0	309	3537
5:25 PM	4	34	11	0	37	28	26	0	49	74	2	0	6	22	21	0	314	3549
5:30 PM	1	31	15	0	33	29	26	0	33	56	0	0	4	35	36	0	299	3570
5:35 PM	4	33	11	0	21	22	32	0	49	67	1	0	7	20	36	0	303	3582
5:40 PM	1	46	15	0	32	30	26	0	30	49	0	0	4	24	25	0	282	3552
5:45 PM	2	19	16	0	14	23	18	0	40	52	1	0	9	38	27	0	259	3533
5:50 PM	2	32	12	0	41	32	30	0	26	48	2	0	5	30	22	0	282	3503
5:55 PM	3	27	9	0	18	22	25	0	33	66	1	0	3	26	22	0	255	3492
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	32	484	188	0	436	340	300	0	440	724	28	0	92	288	280	0	3632	
Heavy Trucks	0	8	4		0	12	8		4	20	0		0	12	0		68	
Pedestrians		0				0				4				0			4	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	1		1	
Railroad																		
Stopped Buses																		

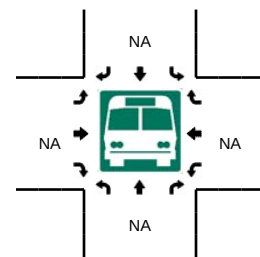
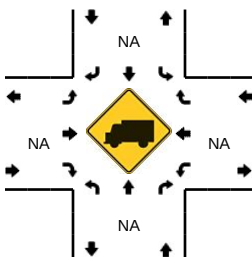
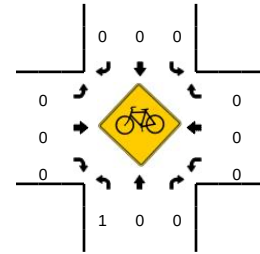
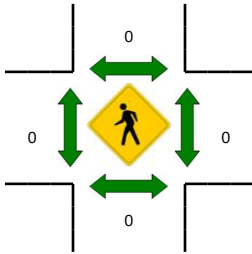
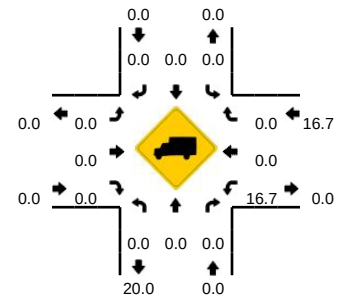
Comments:

LOCATION: NE 115th Ave -- NE 16th St
CITY/STATE: Vancouver, WA

QC JOB #: 14784703
DATE: Thu, Sep 13 2018



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

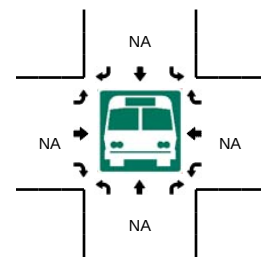
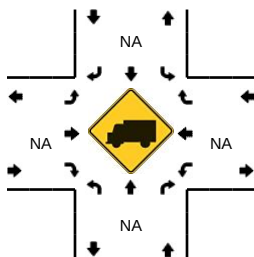
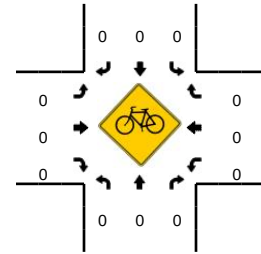
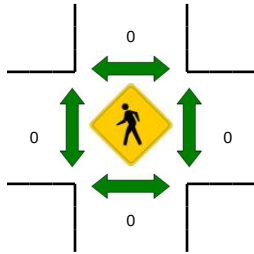
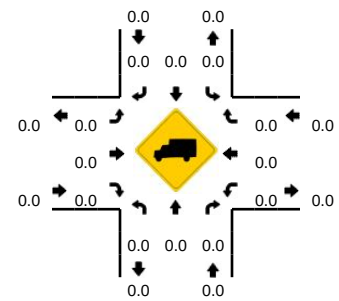
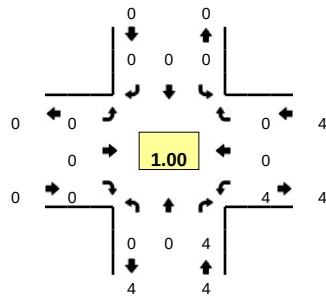
[illegible]

Comments:

LOCATION: NE 115th Ave -- NE 16th St
CITY/STATE: Vancouver, WA

QC JOB #: 14784704
DATE: Thu, Sep 13 2018

Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 5:15 PM -- 5:30 PM



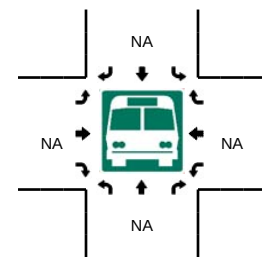
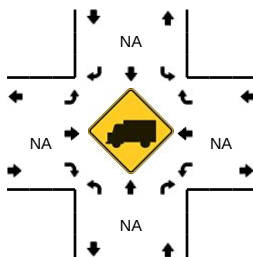
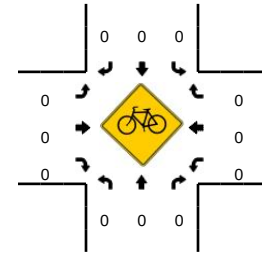
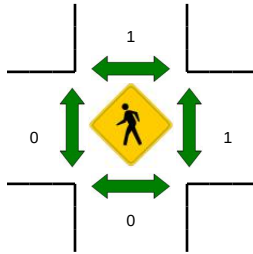
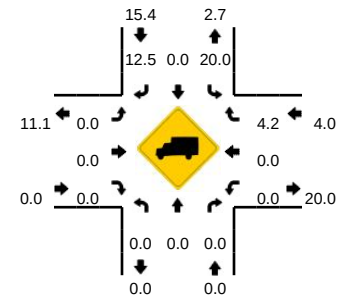
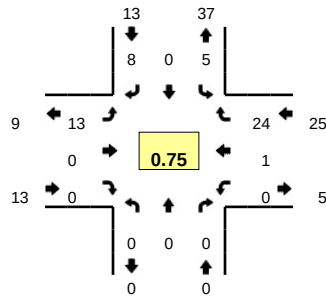
5-Min Count Period Beginning At	NE 115th Ave (Northbound)				NE 115th Ave (Southbound)				NE 16th St (Eastbound)				NE 16th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	2	
4:05 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
4:10 PM	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	3	
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	
4:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	
4:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	
4:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	13
5:00 PM	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3	14
5:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13
5:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	11
5:15 PM	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	2	13
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
5:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
5:35 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	9
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
5:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	11
5:55 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	11
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	4	0	0	0	0	0	0	0	0	0	4	0	0	0	8	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
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: NE 118th Ave -- NE 16th St
CITY/STATE: Vancouver, WA

QC JOB #: 14784705
DATE: Thu, Sep 13 2018

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

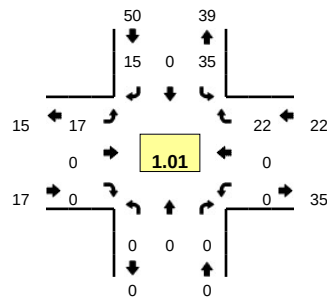


5-Min Count Period Beginning At	NE 118th Ave (Northbound)				NE 118th Ave (Southbound)				NE 16th St (Eastbound)				NE 16th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	1	0	2	0	0	0	0	0	0	0	2	0	5	
7:05 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	5	0	6	
7:10 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0	3	
7:15 AM	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	0	4	
7:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:25 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	3	
7:30 AM	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	2	
7:35 AM	0	0	0	0	0	0	1	0	1	0	0	0	0	0	3	0	5	
7:40 AM	0	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	3	
7:45 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3	0	4	
7:50 AM	0	0	0	0	1	0	2	0	0	0	0	0	0	0	2	0	5	
7:55 AM	0	0	0	0	1	0	0	0	4	0	0	0	0	0	3	0	8	48
8:00 AM	0	0	0	0	2	0	1	0	1	0	0	0	0	0	3	0	7	50
8:05 AM	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	3	47
8:10 AM	0	0	0	0	0	0	2	0	0	0	0	0	0	1	4	0	7	51
8:15 AM	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3	50
8:20 AM	0	0	0	0	3	0	1	0	1	0	0	0	0	0	6	0	11	61
8:25 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	3	0	4	62
8:30 AM	0	0	0	0	1	0	0	0	1	0	0	0	0	0	3	0	5	65
8:35 AM	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	0	4	64
8:40 AM	0	0	0	0	1	0	1	0	0	0	0	0	0	0	2	0	4	65
8:45 AM	0	0	0	0	2	0	1	0	3	0	0	0	0	0	0	0	6	67
8:50 AM	0	0	0	0	2	0	0	0	2	0	0	0	0	1	2	0	7	69
8:55 AM	0	0	0	0	2	0	0	0	1	0	0	0	0	0	2	0	5	66
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
All Vehicles	0	0	0	0	8	0	8	0	20	0	0	0	0	0	32	0	68	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

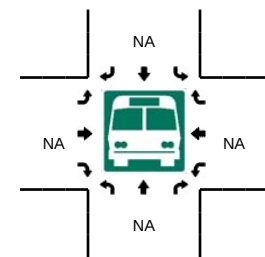
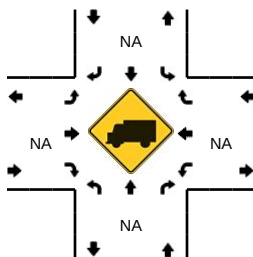
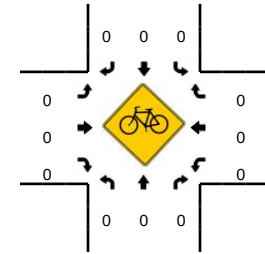
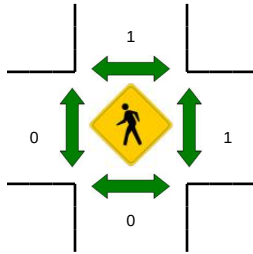
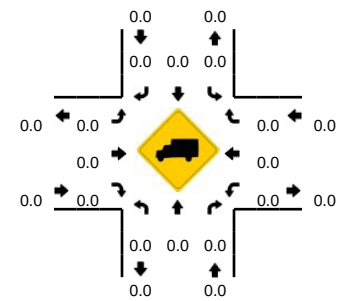
Comments:

LOCATION: NE 118th Ave -- NE 16th St
CITY/STATE: Vancouver, WA

QC JOB #: 14784706
DATE: Thu, Sep 13 2018



Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 5:15 PM -- 5:30 PM

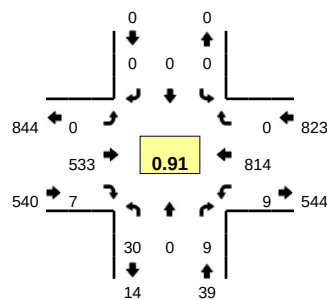


5-Min Count Period Beginning At	NE 118th Ave (Northbound)				NE 118th Ave (Southbound)				NE 16th St (Eastbound)				NE 16th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	6	0	1	0	1	0	0	0	0	0	0	0	8	
4:05 PM	0	0	0	0	1	0	0	0	1	0	0	0	0	0	5	0	7	
4:10 PM	0	0	0	0	3	0	1	0	2	0	0	0	0	0	2	0	8	
4:15 PM	0	0	0	0	0	0	3	0	0	0	0	0	0	0	2	0	5	
4:20 PM	0	0	0	0	4	0	0	0	1	0	0	0	0	0	2	0	7	
4:25 PM	0	0	0	0	3	0	2	1	0	0	0	0	0	0	2	0	8	
4:30 PM	0	0	0	0	1	0	3	0	1	0	0	0	0	0	0	0	5	
4:35 PM	0	0	0	0	6	0	0	0	0	0	0	0	0	0	1	0	7	
4:40 PM	0	0	0	0	3	0	2	0	1	0	0	0	0	0	3	0	9	
4:45 PM	0	0	0	0	2	0	3	0	2	0	0	0	0	0	3	0	10	
4:50 PM	0	0	0	0	3	0	0	0	3	0	0	0	0	0	2	0	8	
4:55 PM	0	0	0	0	4	0	1	0	1	0	0	0	0	0	0	0	6	88
5:00 PM	0	0	0	0	2	0	2	0	4	0	0	0	0	0	2	0	10	90
5:05 PM	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0	3	86
5:10 PM	0	0	0	0	2	0	4	0	0	0	0	0	0	0	1	0	7	85
5:15 PM	0	0	0	0	3	0	1	0	1	0	0	0	0	0	2	0	7	87
5:20 PM	0	0	0	0	3	0	0	0	1	0	0	0	0	0	1	0	5	85
5:25 PM	0	0	0	0	3	0	2	0	2	0	0	0	0	0	3	0	10	87
5:30 PM	0	0	0	0	3	0	0	0	1	0	0	0	0	0	3	0	7	89
5:35 PM	0	0	0	0	2	0	2	0	1	0	0	0	0	0	0	0	5	87
5:40 PM	0	0	0	0	4	0	1	0	0	0	0	0	0	0	1	0	6	84
5:45 PM	0	0	0	0	5	0	2	0	0	1	0	0	0	0	0	0	8	82
5:50 PM	0	0	0	0	3	0	3	0	1	0	0	0	0	0	0	0	7	81
5:55 PM	0	0	0	0	4	0	1	0	1	0	0	0	0	0	1	0	7	82
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	36	0	12	0	16	0	0	0	0	0	24	0	88	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
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																		

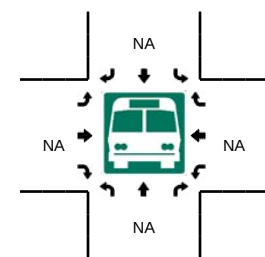
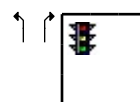
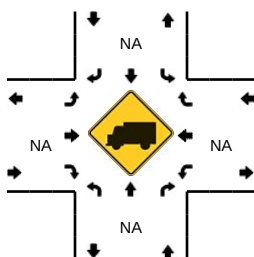
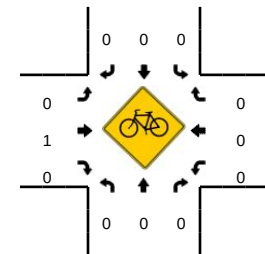
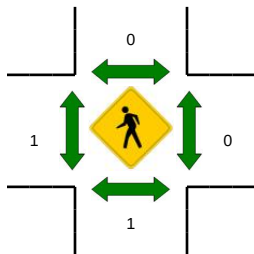
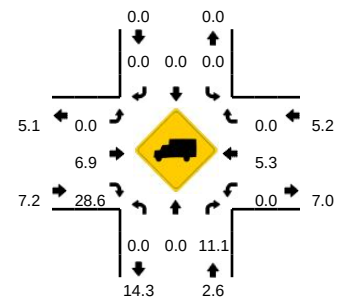
Comments:

LOCATION: NE 118th St -- NE 18th St
CITY/STATE: Vancouver, WA

QC JOB #: 14784707
DATE: Thu, Sep 13 2018



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

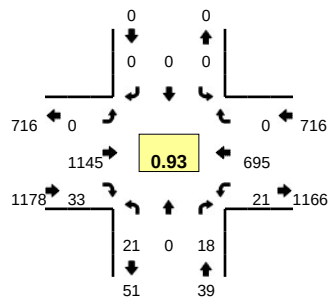


5-Min Count Period Beginning At	NE 118th St (Northbound)				NE 118th St (Southbound)				NE 18th St (Eastbound)				NE 18th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	2	0	0	0	0	0	0	0	0	29	2	0	2	54	0	0	89	
7:05 AM	4	0	1	0	0	0	0	0	0	28	0	0	1	45	0	0	79	
7:10 AM	2	0	3	0	0	0	0	0	0	30	0	0	0	56	0	0	91	
7:15 AM	2	0	0	0	0	0	0	0	0	46	0	0	0	84	0	0	132	
7:20 AM	1	0	1	0	0	0	0	0	0	37	0	0	0	67	0	1	107	
7:25 AM	2	0	0	0	0	0	0	0	0	35	0	0	1	71	0	0	109	
7:30 AM	2	0	0	0	0	0	0	0	0	42	1	0	1	70	0	0	116	
7:35 AM	1	0	2	0	0	0	0	0	0	52	0	0	1	63	0	0	119	
7:40 AM	5	0	0	0	0	0	0	0	0	41	0	0	0	64	0	0	110	
7:45 AM	2	0	2	0	0	0	0	0	0	62	0	0	0	58	0	0	124	
7:50 AM	1	0	0	0	0	0	0	0	0	46	1	0	2	85	0	0	135	
7:55 AM	5	0	3	0	0	0	0	0	0	44	1	0	0	74	0	1	128	1339
8:00 AM	4	0	0	0	0	0	0	0	0	33	2	0	1	48	0	0	88	1338
8:05 AM	2	0	0	0	0	0	0	0	0	55	0	0	1	64	0	0	122	1381
8:10 AM	3	0	1	0	0	0	0	0	0	40	2	0	0	66	0	0	112	1402
8:15 AM	2	0	0	0	0	0	0	0	0	46	0	0	0	56	0	0	104	1374
8:20 AM	2	0	5	0	0	0	0	0	0	37	3	0	2	59	0	0	108	1375
8:25 AM	3	0	1	0	0	0	0	0	0	53	1	0	0	58	0	1	117	1383
8:30 AM	2	0	1	0	0	0	0	0	0	33	0	0	1	60	0	0	97	1364
8:35 AM	2	0	3	0	0	0	0	0	0	41	0	0	0	56	0	0	102	1347
8:40 AM	2	0	0	0	0	0	0	0	0	46	1	0	1	55	0	0	105	1342
8:45 AM	2	0	1	0	0	0	0	0	0	34	3	0	1	52	0	1	94	1312
8:50 AM	2	0	0	0	0	0	0	0	0	37	1	0	0	44	0	0	84	1261
8:55 AM	6	0	0	0	0	0	0	0	0	28	2	1	0	46	0	0	83	1216
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
All Vehicles	32	0	20	0	0	0	0	0	0	608	8	0	8	868	0	4	1548	
Heavy Trucks	0	0	0	0	0	0	0	0	0	20	0	0	0	36	0	0	56	
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																		

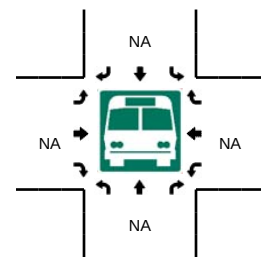
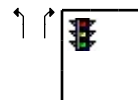
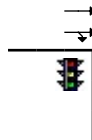
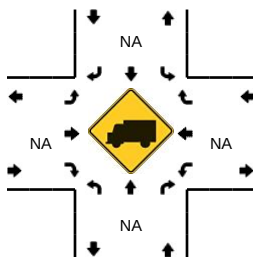
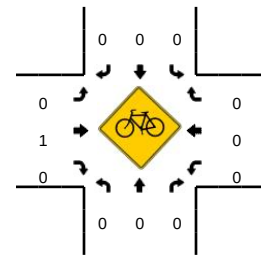
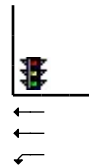
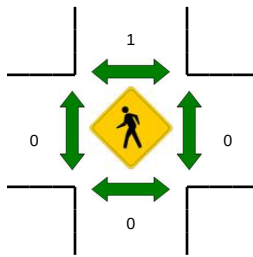
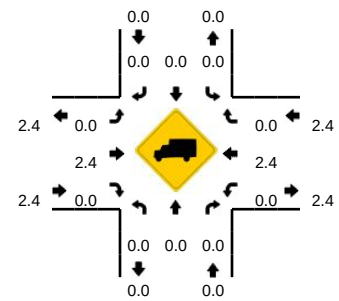
Comments:

LOCATION: NE 118th St -- NE 18th St
CITY/STATE: Vancouver, WA

QC JOB #: 14784708
DATE: Thu, Sep 13 2018



Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 5:15 PM -- 5:30 PM

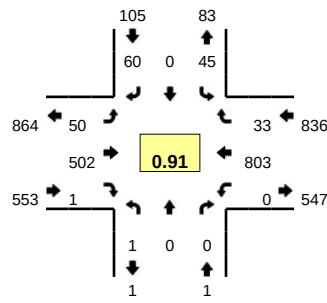


5-Min Count Period Beginning At	NE 118th St (Northbound)				NE 118th St (Southbound)				NE 18th St (Eastbound)				NE 18th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	1	0	0	0	0	0	0	81	5	0	0	60	0	1	148	
4:05 PM	5	0	0	0	0	0	0	0	0	76	0	0	2	41	0	1	125	
4:10 PM	4	0	1	0	0	0	0	0	0	78	5	0	1	59	0	1	149	
4:15 PM	2	0	1	0	0	0	0	0	0	81	2	0	1	65	0	0	152	
4:20 PM	3	0	0	0	0	0	0	0	0	78	6	0	0	61	0	0	148	
4:25 PM	1	0	2	0	0	0	0	0	0	94	4	0	2	47	0	0	150	
4:30 PM	1	0	0	0	0	0	0	0	0	82	3	0	0	52	0	0	138	
4:35 PM	0	0	1	0	0	0	0	0	0	98	4	0	2	78	0	0	183	
4:40 PM	1	0	3	0	0	0	0	0	0	94	4	0	1	59	0	0	162	
4:45 PM	4	0	1	0	0	0	0	0	0	91	4	0	1	53	0	0	154	
4:50 PM	1	0	2	0	0	0	0	0	0	99	3	0	1	41	0	0	147	
4:55 PM	2	0	2	0	0	0	0	0	0	76	1	0	4	51	0	0	136	1792
5:00 PM	3	0	3	0	0	0	0	0	0	82	3	0	1	54	0	0	146	1790
5:05 PM	1	0	1	0	0	0	0	0	0	109	2	0	0	71	0	0	184	1849
5:10 PM	0	0	1	0	0	0	0	0	0	87	1	0	4	56	0	0	149	1849
5:15 PM	0	0	2	0	0	0	0	0	0	100	3	0	1	65	0	0	171	1868
5:20 PM	2	0	1	0	0	0	0	0	0	108	3	0	1	58	0	1	174	1894
5:25 PM	2	0	1	0	0	0	0	0	0	115	4	0	0	53	0	2	177	1921
5:30 PM	5	0	0	0	0	0	0	0	0	86	1	0	2	56	0	0	150	1933
5:35 PM	0	0	1	0	0	0	0	0	0	81	4	0	0	55	0	1	142	1892
5:40 PM	1	0	0	0	0	0	0	0	0	94	4	0	2	66	0	0	167	1897
5:45 PM	0	0	0	0	0	0	0	0	0	82	7	0	1	56	0	0	146	1889
5:50 PM	1	0	1	0	0	0	0	0	0	96	3	0	3	53	0	0	157	1899
5:55 PM	0	0	1	0	0	0	0	0	0	72	4	0	0	47	0	1	125	1888
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
All Vehicles	16	0	16	0	0	0	0	0	0	1292	40	0	8	704	0	12	2088	
Heavy Trucks	0	0	0	0	0	0	0	0	0	36	0	0	0	12	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	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

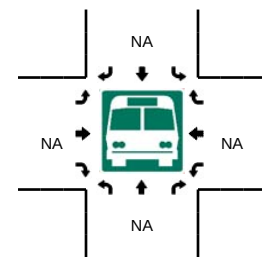
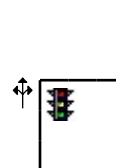
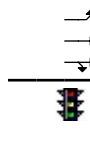
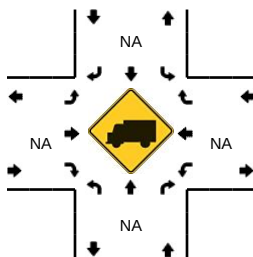
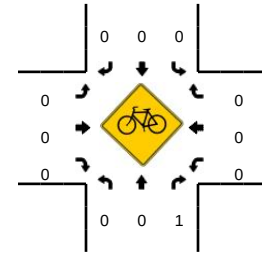
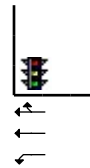
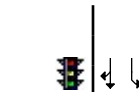
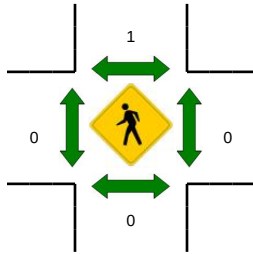
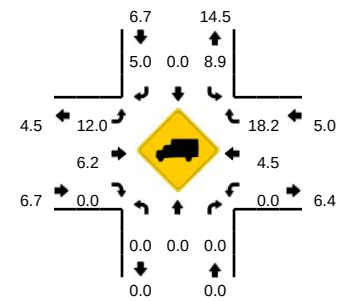
Comments:

LOCATION: NE 4 Seasons Ln -- NE 18th St
CITY/STATE: Vancouver, WA

QC JOB #: 14784709
DATE: Thu, Sep 13 2018



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

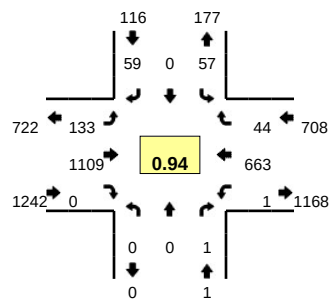


5-Min Count Period Beginning At	NE 4 Seasons Ln (Northbound)				NE 4 Seasons Ln (Southbound)				NE 18th St (Eastbound)				NE 18th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	2	0	3	0	1	26	0	0	0	55	2	0	89	
7:05 AM	0	0	0	0	1	0	8	0	3	27	1	0	0	49	0	0	89	
7:10 AM	0	0	0	0	1	0	5	0	0	28	0	0	0	60	1	0	95	
7:15 AM	0	0	0	0	4	0	6	0	5	48	0	0	0	81	1	0	145	
7:20 AM	0	0	0	0	3	0	6	0	5	30	0	0	0	69	0	0	113	
7:25 AM	0	0	0	0	2	0	9	0	3	32	0	0	0	67	2	0	115	
7:30 AM	0	0	0	0	0	0	4	0	2	44	0	0	0	65	2	0	117	
7:35 AM	0	0	0	0	6	0	5	0	4	46	0	0	0	65	3	0	129	
7:40 AM	0	0	0	0	5	0	4	0	3	36	0	0	0	62	2	0	112	
7:45 AM	0	0	0	0	3	0	4	0	5	62	0	0	0	60	3	0	137	
7:50 AM	0	0	0	0	5	0	4	0	3	39	0	0	0	84	2	0	137	
7:55 AM	0	0	0	0	3	0	5	0	6	44	0	0	0	72	5	0	135	1413
8:00 AM	1	0	0	0	3	0	6	0	2	42	0	0	0	51	6	0	111	1435
8:05 AM	0	0	0	0	6	0	1	0	7	40	1	0	0	61	4	0	120	1466
8:10 AM	0	0	0	0	5	0	6	0	5	39	0	0	0	66	3	0	124	1495
8:15 AM	0	0	0	0	4	0	7	0	6	42	0	0	0	50	2	0	111	1461
8:20 AM	0	0	0	0	3	0	4	0	4	37	0	0	0	61	1	1	111	1459
8:25 AM	0	0	0	0	3	0	8	0	2	50	0	0	0	61	3	0	127	1471
8:30 AM	0	0	0	0	2	0	9	0	6	32	0	0	0	55	5	0	109	1463
8:35 AM	0	0	0	0	1	0	1	0	2	41	0	0	0	59	2	0	106	1440
8:40 AM	0	0	0	0	1	0	6	0	6	44	0	0	0	45	7	0	109	1437
8:45 AM	0	0	0	0	6	0	3	0	2	35	0	0	0	51	1	0	98	1398
8:50 AM	0	0	1	0	3	0	4	0	3	34	0	0	1	42	2	0	90	1351
8:55 AM	0	0	1	0	3	0	3	0	4	25	0	0	1	59	2	0	98	1314
Peak 15-Min Flowrates																		
	Northbound				Southbound				Eastbound				Westbound				Total	
All Vehicles	0	0	0	0	44	0	52	0	56	580	0	0	0	864	40	0	1636	
Heavy Trucks	0	0	0	0	0	0	4	0	0	16	0	0	0	28	8	0	56	
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																		

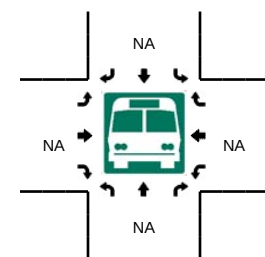
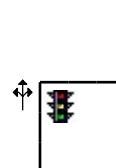
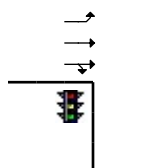
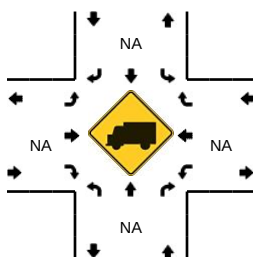
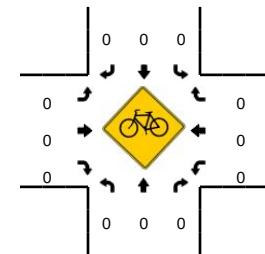
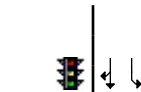
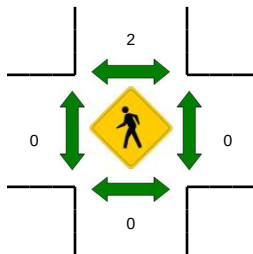
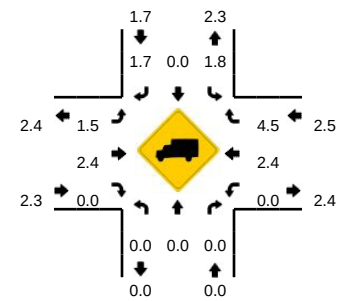
Comments:

LOCATION: NE 4 Seasons Ln -- NE 18th St
CITY/STATE: Vancouver, WA

QC JOB #: 14784710
DATE: Thu, Sep 13 2018



Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 5:15 PM -- 5:30 PM



5-Min Count Period Beginning At	NE 4 Seasons Ln (Northbound)				NE 4 Seasons Ln (Southbound)				NE 18th St (Eastbound)				NE 18th St (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	7	0	8	0	11	74	0	0	0	55	7	0	162	
4:05 PM	0	0	0	0	10	0	6	0	10	77	0	0	0	43	3	0	149	
4:10 PM	0	0	0	0	1	0	5	0	10	72	0	0	0	61	3	0	152	
4:15 PM	0	0	0	0	4	0	3	0	10	82	0	0	0	58	6	0	163	
4:20 PM	0	0	0	0	6	0	5	0	10	89	0	0	0	57	5	0	172	
4:25 PM	0	0	0	0	4	0	9	0	20	78	0	0	0	53	1	0	165	
4:30 PM	0	0	0	0	9	0	4	0	13	83	0	0	0	44	5	0	158	
4:35 PM	0	0	0	0	4	0	4	0	10	90	0	0	0	70	4	1	183	
4:40 PM	0	0	0	0	5	0	2	0	8	98	0	0	0	59	2	0	174	
4:45 PM	0	0	1	0	3	0	8	0	7	83	0	0	0	48	9	0	159	
4:50 PM	0	0	0	0	5	0	0	0	17	104	0	0	0	44	1	0	171	
4:55 PM	0	0	0	0	8	0	7	0	11	67	0	0	0	47	2	0	142	1950
5:00 PM	0	0	0	0	6	0	6	0	11	90	0	0	0	54	5	0	172	1960
5:05 PM	0	0	0	0	3	0	7	0	12	93	0	0	0	63	6	0	184	1995
5:10 PM	0	0	0	0	9	0	8	0	7	85	0	0	0	50	5	0	164	2007
5:15 PM	0	0	0	0	5	0	5	0	12	95	0	0	0	62	3	0	182	2026
5:20 PM	0	0	0	0	3	0	0	0	16	105	0	0	0	49	1	0	174	2028
5:25 PM	0	0	0	0	4	0	5	0	11	110	0	0	0	60	3	0	193	2056
5:30 PM	0	0	0	0	2	0	7	0	11	89	0	0	0	57	3	0	169	2067
5:35 PM	0	0	0	0	8	0	4	0	7	84	0	0	0	59	2	0	164	2048
5:40 PM	1	0	0	0	5	0	2	0	12	92	1	0	0	62	3	0	178	2052
5:45 PM	0	0	0	0	7	0	2	0	7	75	0	0	0	44	5	0	140	2033
5:50 PM	0	0	0	0	7	0	5	0	8	89	0	0	0	56	3	0	168	2030
5:55 PM	0	0	0	0	2	0	6	0	13	74	0	0	0	46	3	0	144	2032
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	48	0	40	0	156	1240	0	0	0	684	28	0	2196	
Heavy Trucks	0	0	0	0	0	0	4	0	0	32	0	0	0	12	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	0	0	0	0	0	0	0	0	
Railroad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Comments:

Appendix B Description of Level-of-Service Methods and Criteria

DESCRIPTION OF LEVEL-OF-SERVICE METHODS AND CRITERIA

Level of service (LOS) is a concept developed to quantify the degree of comfort (including such elements as travel time, number of stops, total amount of stopped delay, and impediments caused by other vehicles) afforded to drivers as they travel through an intersection or roadway segment. Six grades are used to denote the various level of service from “A” to “F”.¹

Signalized Intersections

The six level-of-service grades are described qualitatively for signalized intersections in Table B1. Additionally, Table B2 identifies the relationship between level of service and average control delay per vehicle. Control delay is defined to include initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Using this definition, Level of Service “D” is generally considered to represent the minimum acceptable design standard.

Table B1 Level-of-Service Definitions (Signalized Intersections)

Level of Service	Average Delay per Vehicle
A	Very low average control delay, less than 10 seconds per vehicle. This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	Average control delay is greater than 10 seconds per vehicle and less than or equal to 20 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for a level of service A, causing higher levels of average delay.
C	Average control delay is greater than 20 seconds per vehicle and less than or equal to 35 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
D	Average control delay is greater than 35 seconds per vehicle and less than or equal to 55 seconds per vehicle. The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle length, or high volume/capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Average control delay is greater than 55 seconds per vehicle and less than or equal to 80 seconds per vehicle. This is usually considered to be the limit of acceptable delay. These high delay values generally (but not always) indicate poor progression, long cycle lengths, and high volume/capacity ratios. Individual cycle failures are frequent occurrences.
F	Average control delay is in excess of 80 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with oversaturation. It may also occur at high volume/capacity ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also contribute to such high delay values.

¹Most of the material in this attachment is adapted from the Transportation Research Board, Highway Capacity Manual, (2000).

Table B2 Level-of-Service Criteria for Signalized Intersections

Level of Service	Average Control Delay per Vehicle (Seconds)
A	<10.0
B	>10 and ≤20
C	>20 and ≤35
D	>35 and ≤55
E	>55 and ≤80
F	>80

Unsignalized Intersections

Unsignalized intersections include two-way stop-controlled (TWSC) and all-way stop-controlled (AWSC) intersections. The 2000 Highway Capacity Manual (HCM) provides models for estimating control delay at both TWSC and AWSC intersections. A qualitative description of the various service levels associated with an unsignalized intersection is presented in Table B3. A quantitative definition of level of service for unsignalized intersections is presented in Table B4. Using this definition, Level of Service “E” is generally considered to represent the minimum acceptable design standard.

Table B3 Level-of-Service Criteria for Unsignalized Intersections

Level of Service	Average Delay per Vehicle to Minor Street
A	- Nearly all drivers find freedom of operation. - Very seldom is there more than one vehicle in queue.
B	- Some drivers begin to consider the delay an inconvenience. - Occasionally there is more than one vehicle in queue.
C	- Many times there is more than one vehicle in queue. - Most drivers feel restricted, but not objectionably so.
D	- Often there is more than one vehicle in queue. - Drivers feel quite restricted.
E	- Represents a condition in which the demand is near or equal to the probable maximum number of vehicles that can be accommodated by the movement. - There is almost always more than one vehicle in queue. - Drivers find the delays approaching intolerable levels.
F	- Forced flow. - Represents an intersection failure condition that is caused by geometric and/or operational constraints external to the intersection.

Table B4 Level-of-Service Criteria for Unsignalized Intersections

Level of Service	Average Control Delay per Vehicle (Seconds)
A	<10.0
B	>10.0 and ≤ 15.0
C	>15.0 and ≤ 25.0
D	>25.0 and ≤ 35.0
E	>35.0 and ≤ 50.0
F	>50.0

It should be noted that the level-of-service criteria for unsignalized intersections are somewhat different than the criteria used for signalized intersections. The primary reason for this difference is that drivers expect different levels of performance from different kinds of transportation facilities. The expectation is that a signalized intersection is designed to carry higher traffic volumes than an unsignalized intersection. Additionally, there are a number of driver behavior considerations that combine to make delays at signalized intersections less galling than at unsignalized intersections. For example, drivers at signalized intersections are able to relax during the red interval, while drivers on the minor street approaches to TWSC intersections must remain attentive to the task of identifying acceptable gaps and vehicle conflicts. Also, there is often much more variability in the amount of delay experienced by individual drivers at unsignalized intersections than signalized intersections. For these reasons, it is considered that the control delay threshold for any given level of service is less for an unsignalized intersection than for a signalized intersection. While overall intersection level of service is calculated for AWSC intersections, level of service is only calculated for the minor approaches and the major street left turn movements at TWSC intersections. No delay is assumed to the major street through movements. For TWSC intersections, the overall intersection level of service remains undefined: level of service is only calculated for each minor street lane.

In the performance evaluation of TWSC intersections, it is important to consider other measures of effectiveness (MOEs) in addition to delay, such as v/c ratios for individual movements, average queue lengths, and 95th percentile queue lengths. By focusing on a single MOE for the worst movement only, such as delay for the minor-street left turn, users may make inappropriate traffic control decisions. The potential for making such inappropriate decisions is likely to be particularly pronounced when the HCM level-of-service thresholds are adopted as legal standards, as is the case in many public agencies.

Appendix C 2018 Existing Operations Worksheets

Queues

1: NE 112th Ave & NE 18th St

Four Seasons South Subdivision

Year 2018 Existing AM Peak Hour Conditions

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	207	247	21	124	566	290	7	203	62	312	498	553
v/c Ratio	0.47	0.29	0.03	0.35	0.69	0.33	0.03	0.39	0.10	0.57	0.42	0.53
Control Delay	34.3	22.5	0.1	35.6	29.8	2.9	37.3	29.4	2.1	32.7	20.0	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.3	22.5	0.1	35.6	29.8	2.9	37.3	29.4	2.1	32.7	20.0	5.3
Queue Length 50th (ft)	38	38	0	23	102	0	1	38	0	56	69	22
Queue Length 95th (ft)	99	97	0	67	227	42	9	85	12	138	166	117
Internal Link Dist (ft)		626			696			637			768	
Turn Bay Length (ft)	250		200	350		175	350		180	380		150
Base Capacity (vph)	1070	1858	977	1020	1931	1259	829	1876	891	1530	2435	1254
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.13	0.02	0.12	0.29	0.23	0.01	0.11	0.07	0.20	0.20	0.44
Intersection Summary												

HCM Signalized Intersection Capacity Analysis

1: NE 112th Ave & NE 18th St

Four Seasons South Subdivision

Year 2018 Existing AM Peak Hour Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	184	220	19	110	504	258	6	181	55	278	443	492
Future Volume (vph)	184	220	19	110	504	258	6	181	55	278	443	492
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3400	3374	1455	3242	3505	1524	2633	3406	1553	3242	3438	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3400	3374	1455	3242	3505	1524	2633	3406	1553	3242	3438	1553
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	207	247	21	124	566	290	7	203	62	312	498	553
RTOR Reduction (vph)	0	0	15	0	0	177	0	0	43	0	0	220
Lane Group Flow (vph)	207	247	6	124	566	113	7	203	19	312	498	333
Heavy Vehicles (%)	3%	7%	11%	8%	3%	6%	33%	6%	4%	8%	5%	4%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	7	1	6	3	7	4	1	3	8	5
Permitted Phases			2			6			4			8
Actuated Green, G (s)	8.7	17.3	19.3	7.3	15.9	27.2	2.0	14.1	21.4	11.3	23.4	32.1
Effective Green, g (s)	8.7	17.3	19.3	7.3	15.9	27.2	2.0	14.1	21.4	11.3	23.4	32.1
Actuated g/C Ratio	0.12	0.25	0.28	0.10	0.23	0.39	0.03	0.20	0.31	0.16	0.33	0.46
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	422	833	505	338	796	701	75	686	585	523	1149	823
v/s Ratio Prot	0.06	0.07	0.00	0.04	c0.16	0.03	0.00	0.06	0.00	c0.10	0.14	c0.05
v/s Ratio Perm			0.00			0.05			0.01			0.16
v/c Ratio	0.49	0.30	0.01	0.37	0.71	0.16	0.09	0.30	0.03	0.60	0.43	0.40
Uniform Delay, d1	28.6	21.4	18.4	29.2	24.9	14.0	33.1	23.7	17.0	27.2	18.1	12.6
Progression Factor	1.00	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	0.1	0.0	0.2	2.5	0.0	0.2	0.1	0.0	1.2	0.1	0.1
Delay (s)	28.9	21.5	18.4	29.4	27.4	14.0	33.3	23.8	17.0	28.5	18.2	12.7
Level of Service	C	C	B	C	C	B	C	C	B	C	B	B
Approach Delay (s)	24.6					23.7		22.5		18.3		
Approach LOS	C					C		C		B		
Intersection Summary												
HCM 2000 Control Delay			21.4		HCM 2000 Level of Service				C			
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			70.0		Sum of lost time (s)				20.0			
Intersection Capacity Utilization			61.9%		ICU Level of Service				B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 3: NE 115th Ave & NE 16th St

Four Seasons South Subdivision
Year 2018 Existing AM Peak Hour Conditions

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations			↘			↗
Sign Control	Yield			Yield	Yield	
Traffic Volume (vph)	0	0	6	0	0	5
Future Volume (vph)	0	0	6	0	0	5
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	0	0	8	0	0	6
Direction, Lane #	WB 1	NB 1				
Volume Total (vph)	8	6				
Volume Left (vph)	8	0				
Volume Right (vph)	0	6				
Hadj (s)	0.49	-0.60				
Departure Headway (s)	4.4	3.3				
Degree Utilization, x	0.01	0.01				
Capacity (veh/h)	811	1078				
Control Delay (s)	7.4	6.3				
Approach Delay (s)	7.4	6.3				
Approach LOS	A	A				
Intersection Summary						
Delay			7.0			
Level of Service			A			
Intersection Capacity Utilization			6.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 4: NE 16th St & NE 118th Ave

Four Seasons South Subdivision
Year 2018 Existing AM Peak Hour Conditions

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Yield	Yield		Yield	
Traffic Volume (vph)	13	0	1	24	5	8
Future Volume (vph)	13	0	1	24	5	8
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	16	0	1	30	6	10
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total (vph)	16	31	16			
Volume Left (vph)	16	0	6			
Volume Right (vph)	0	30	10			
Hadj (s)	0.20	-0.51	-0.04			
Departure Headway (s)	4.2	3.4	3.9			
Degree Utilization, x	0.02	0.03	0.02			
Capacity (veh/h)	855	1036	889			
Control Delay (s)	7.2	6.5	7.0			
Approach Delay (s)	7.2	6.5	7.0			
Approach LOS	A	A	A			
Intersection Summary						
Delay			6.8			
Level of Service			A			
Intersection Capacity Utilization			17.4%	ICU Level of Service	A	
Analysis Period (min)			15			

Queues
5: NE 118th St & NE 18th St

Four Seasons South Subdivision
Year 2018 Existing AM Peak Hour Conditions

	→	↙	←	↘	↗
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	601	10	895	33	10
v/c Ratio	0.22	0.01	0.31	0.11	0.04
Control Delay	4.3	2.2	2.8	16.5	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	4.3	2.2	2.8	16.5	10.8
Queue Length 50th (ft)	0	0	0	5	0
Queue Length 95th (ft)	88	4	75	27	10
Internal Link Dist (ft)	835		335	583	
Turn Bay Length (ft)		175		175	
Base Capacity (vph)	3357	932	3438	1729	1394
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.18	0.01	0.26	0.02	0.01
Intersection Summary					

HCM Signalized Intersection Capacity Analysis

5: NE 118th St & NE 18th St

Four Seasons South Subdivision
Year 2018 Existing AM Peak Hour Conditions

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↘	↑↑	↘	↗
Traffic Volume (vph)	540	7	9	814	30	9
Future Volume (vph)	540	7	9	814	30	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0	5.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3357		1805	3438	1805	1455
Flt Permitted	1.00		0.42	1.00	0.95	1.00
Satd. Flow (perm)	3357		807	3438	1805	1455
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	593	8	10	895	33	10
RTOR Reduction (vph)	0	0	0	0	0	9
Lane Group Flow (vph)	601	0	10	895	33	1
Confl. Peds. (#/hr)		1	1		1	
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	7%	29%	0%	5%	0%	11%
Turn Type	NA		pm+pt	NA	Prot	Prot
Protected Phases	2		1	6	4	4
Permitted Phases			6			
Actuated Green, G (s)	27.5		33.3	33.3	2.5	2.5
Effective Green, g (s)	27.5		33.3	33.3	2.5	2.5
Actuated g/C Ratio	0.60		0.73	0.73	0.05	0.05
Clearance Time (s)	5.0		5.0	5.0	5.0	5.0
Vehicle Extension (s)	1.0		1.0	1.0	3.0	3.0
Lane Grp Cap (vph)	2015		604	2499	98	79
v/s Ratio Prot	0.18		0.00	c0.26	c0.02	0.00
v/s Ratio Perm			0.01			
v/c Ratio	0.30		0.02	0.36	0.34	0.01
Uniform Delay, d1	4.5		1.7	2.3	20.9	20.5
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0		0.0	0.0	2.0	0.0
Delay (s)	4.5		1.7	2.3	22.9	20.5
Level of Service	A		A	A	C	C
Approach Delay (s)	4.5			2.3	22.3	
Approach LOS	A			A	C	
Intersection Summary						
HCM 2000 Control Delay			3.7		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.41			
Actuated Cycle Length (s)			45.8		Sum of lost time (s)	15.0
Intersection Capacity Utilization			35.0%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Queues

6: NE 4 Seasons Ln & NE 18th St

Four Seasons South Subdivision

Year 2018 Existing AM Peak Hour Conditions

						
Lane Group	EBL	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	55	553	927	1	49	66
v/c Ratio	0.14	0.24	0.50	0.00	0.20	0.12
Control Delay	6.7	5.8	13.3	17.0	19.5	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.7	5.8	13.3	17.0	19.5	0.5
Queue Length 50th (ft)	4	23	90	0	10	0
Queue Length 95th (ft)	30	111	284	4	42	0
Internal Link Dist (ft)		696	835	313		373
Turn Bay Length (ft)	200				125	
Base Capacity (vph)	813	3174	3114	986	959	1204
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.17	0.30	0.00	0.05	0.05
Intersection Summary						

HCM Signalized Intersection Capacity Analysis

6: NE 4 Seasons Ln & NE 18th St

Four Seasons South Subdivision
Year 2018 Existing AM Peak Hour Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	502	1	0	811	33	1	0	0	45	0	60
Future Volume (vph)	50	502	1	0	811	33	1	0	0	45	0	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0			5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95			0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00			1.00			1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00			1.00		1.00	1.00	
Frt	1.00	1.00			0.99			1.00		1.00	0.85	
Flt Protected	0.95	1.00			1.00			0.95		0.95	1.00	
Satd. Flow (prot)	1612	3405			3430			1805		1656	1538	
Flt Permitted	0.21	1.00			1.00			0.71		0.76	1.00	
Satd. Flow (perm)	352	3405			3430			1357		1320	1538	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	55	552	1	0	891	36	1	0	0	49	0	66
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	56	0
Lane Group Flow (vph)	55	553	0	0	925	0	0	1	0	49	10	0
Confl. Peds. (#/hr)	1					1						
Heavy Vehicles (%)	12%	6%	0%	0%	4%	18%	0%	0%	0%	9%	0%	5%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	32.8	32.8			24.4			7.4		7.4	7.4	
Effective Green, g (s)	32.8	32.8			24.4			7.4		7.4	7.4	
Actuated g/C Ratio	0.65	0.65			0.49			0.15		0.15	0.15	
Clearance Time (s)	5.0	5.0			5.0			5.0		5.0	5.0	
Vehicle Extension (s)	1.0	1.0			1.0			1.0		1.0	1.0	
Lane Grp Cap (vph)	315	2224			1667			200		194	226	
v/s Ratio Prot	0.01	c0.16			c0.27						0.01	
v/s Ratio Perm	0.10							0.00		c0.04		
v/c Ratio	0.17	0.25			0.55			0.01		0.25	0.04	
Uniform Delay, d1	4.1	3.6			9.1			18.3		19.0	18.4	
Progression Factor	1.00	1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.0			0.2			0.0		0.3	0.0	
Delay (s)	4.2	3.6			9.3			18.3		19.2	18.4	
Level of Service	A	A			A			B		B	B	
Approach Delay (s)		3.7			9.3			18.3			18.7	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			7.9				HCM 2000 Level of Service			A		
HCM 2000 Volume to Capacity ratio			0.48									
Actuated Cycle Length (s)			50.2				Sum of lost time (s)			15.0		
Intersection Capacity Utilization			44.3%				ICU Level of Service			A		
Analysis Period (min)			15									

c Critical Lane Group

Queues

1: NE 112th Ave & NE 18th St

Four Seasons South Subdivision

Year 2018 Existing PM Peak Hour Conditions

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	450	679	15	92	348	304	31	447	190	409	386	327
v/c Ratio	0.64	0.68	0.02	0.31	0.61	0.52	0.11	0.65	0.32	0.68	0.30	0.33
Control Delay	35.8	29.7	0.1	42.4	37.2	17.3	42.0	35.9	13.0	38.5	21.1	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.8	29.7	0.1	42.4	37.2	17.3	42.0	35.9	13.0	38.5	21.1	2.0
Queue Length 50th (ft)	101	148	0	22	83	77	7	106	33	95	77	0
Queue Length 95th (ft)	206	269	0	57	158	177	26	194	100	187	136	34
Internal Link Dist (ft)		626			696			637			768	
Turn Bay Length (ft)	250		200	350		175	350		180	380		150
Base Capacity (vph)	900	1623	918	918	1608	909	918	1639	867	1337	2108	1078
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.42	0.02	0.10	0.22	0.33	0.03	0.27	0.22	0.31	0.18	0.30

Intersection Summary

HCM Signalized Intersection Capacity Analysis

1: NE 112th Ave & NE 18th St

Four Seasons South Subdivision

Year 2018 Existing PM Peak Hour Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	441	665	15	90	341	298	30	438	186	401	378	320
Future Volume (vph)	441	665	15	90	341	298	30	438	186	401	378	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1597	3502	3505	1573	3502	3574	1583	3400	3574	1540
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1597	3502	3505	1573	3502	3574	1583	3400	3574	1540
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	450	679	15	92	348	304	31	447	190	409	386	327
RTOR Reduction (vph)	0	0	10	0	0	46	0	0	66	0	0	146
Lane Group Flow (vph)	450	679	5	92	348	258	31	447	124	409	386	181
Confl. Peds. (#/hr)	1						1	15				15
Confl. Bikes (#/hr)			1									3
Heavy Vehicles (%)	2%	2%	0%	0%	3%	2%	0%	1%	2%	3%	1%	3%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	7	1	6	3	7	4	1	3	8	5
Permitted Phases			2			6			4			8
Actuated Green, G (s)	16.2	22.6	25.8	6.7	13.1	27.3	3.2	17.7	24.4	14.2	28.7	44.9
Effective Green, g (s)	16.2	22.6	25.8	6.7	13.1	27.3	3.2	17.7	24.4	14.2	28.7	44.9
Actuated g/C Ratio	0.20	0.28	0.32	0.08	0.16	0.34	0.04	0.22	0.30	0.17	0.35	0.55
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	684	984	605	288	565	625	138	779	573	594	1263	946
v/s Ratio Prot	c0.13	c0.19	0.00	0.03	0.10	0.07	0.01	c0.13	0.02	c0.12	0.11	0.04
v/s Ratio Perm			0.00			0.09			0.06			0.08
v/c Ratio	0.66	0.69	0.01	0.32	0.62	0.41	0.22	0.57	0.22	0.69	0.31	0.19
Uniform Delay, d1	29.9	26.2	18.9	35.1	31.7	20.8	37.8	28.4	21.3	31.4	19.0	9.1
Progression Factor	1.00	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	1.8	1.7	0.0	0.2	1.4	0.2	0.3	0.6	0.1	2.7	0.1	0.0
Delay (s)	31.7	27.9	18.9	35.3	33.1	20.9	38.1	29.0	21.3	34.1	19.1	9.1
Level of Service	C	C	B	D	C	C	D	C	C	C	B	A
Approach Delay (s)		29.3			28.4			27.2			21.6	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			26.4				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			81.2				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			63.6%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 3: NE 115th Ave & NE 16th St

Four Seasons South Subdivision
Year 2018 Existing PM Peak Hour Conditions

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations			↘			↗
Sign Control	Yield			Yield	Yield	
Traffic Volume (vph)	0	0	4	0	0	4
Future Volume (vph)	0	0	4	0	0	4
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	0	0	5	0	0	5
Direction, Lane #	WB 1	NB 1				
Volume Total (vph)	5	5				
Volume Left (vph)	5	0				
Volume Right (vph)	0	5				
Hadj (s)	0.20	-0.60				
Departure Headway (s)	4.1	3.3				
Degree Utilization, x	0.01	0.00				
Capacity (veh/h)	868	1081				
Control Delay (s)	7.1	6.3				
Approach Delay (s)	7.1	6.3				
Approach LOS	A	A				
Intersection Summary						
Delay			6.7			
Level of Service			A			
Intersection Capacity Utilization			6.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 4: NE 16th St & NE 118th Ave

Four Seasons South Subdivision
Year 2018 Existing PM Peak Hour Conditions

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Yield	Yield		Yield	
Traffic Volume (vph)	17	0	0	22	35	15
Future Volume (vph)	17	0	0	22	35	15
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	21	0	0	28	44	19
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total (vph)	21	28	63			
Volume Left (vph)	21	0	44			
Volume Right (vph)	0	28	19			
Hadj (s)	0.20	-0.60	-0.04			
Departure Headway (s)	4.3	3.5	4.0			
Degree Utilization, x	0.02	0.03	0.07			
Capacity (veh/h)	827	1017	887			
Control Delay (s)	7.4	6.6	7.3			
Approach Delay (s)	7.4	6.6	7.3			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.1			
Level of Service			A			
Intersection Capacity Utilization			17.6%	ICU Level of Service	A	
Analysis Period (min)			15			

Queues
5: NE 118th St & NE 18th St

Four Seasons South Subdivision
Year 2018 Existing PM Peak Hour Conditions

	→	↙	←	↘	↗
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1266	23	747	23	19
v/c Ratio	0.49	0.05	0.26	0.09	0.08
Control Delay	7.5	3.2	2.9	21.3	11.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.5	3.2	2.9	21.3	11.7
Queue Length 50th (ft)	75	1	35	6	0
Queue Length 95th (ft)	223	7	60	24	15
Internal Link Dist (ft)	835		335	583	
Turn Bay Length (ft)		175		175	
Base Capacity (vph)	3459	614	3539	1539	1380
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.37	0.04	0.21	0.01	0.01
Intersection Summary					

HCM Signalized Intersection Capacity Analysis

5: NE 118th St & NE 18th St

Four Seasons South Subdivision
Year 2018 Existing PM Peak Hour Conditions

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↘	↑↑	↘	↗
Traffic Volume (vph)	1145	33	21	695	21	18
Future Volume (vph)	1145	33	21	695	21	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0	5.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3524		1805	3539	1805	1615
Flt Permitted	1.00		0.18	1.00	0.95	1.00
Satd. Flow (perm)	3524		335	3539	1805	1615
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	1231	35	23	747	23	19
RTOR Reduction (vph)	1	0	0	0	0	18
Lane Group Flow (vph)	1265	0	23	747	23	1
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	2%	0%	0%	2%	0%	0%
Turn Type	NA		pm+pt	NA	Prot	Prot
Protected Phases	2		1	6	4	4
Permitted Phases			6			
Actuated Green, G (s)	30.3		37.0	37.0	3.7	3.7
Effective Green, g (s)	30.3		37.0	37.0	3.7	3.7
Actuated g/C Ratio	0.60		0.73	0.73	0.07	0.07
Clearance Time (s)	5.0		5.0	5.0	5.0	5.0
Vehicle Extension (s)	1.0		1.0	1.0	3.0	3.0
Lane Grp Cap (vph)	2106		293	2582	131	117
v/s Ratio Prot	c0.36		0.00	c0.21	c0.01	0.00
v/s Ratio Perm			0.05			
v/c Ratio	0.60		0.08	0.29	0.18	0.01
Uniform Delay, d1	6.4		4.5	2.3	22.1	21.8
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3		0.0	0.0	0.6	0.0
Delay (s)	6.7		4.5	2.4	22.7	21.8
Level of Service	A		A	A	C	C
Approach Delay (s)	6.7			2.4	22.3	
Approach LOS	A			A	C	
Intersection Summary						
HCM 2000 Control Delay			5.5	HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio			0.56			
Actuated Cycle Length (s)			50.7	Sum of lost time (s)		15.0
Intersection Capacity Utilization			45.2%	ICU Level of Service		A
Analysis Period (min)			15			

c Critical Lane Group

Queues
6: NE 4 Seasons Ln & NE 18th St

Four Seasons South Subdivision
Year 2018 Existing PM Peak Hour Conditions

							
Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	141	1190	1	761	1	62	63
v/c Ratio	0.27	0.50	0.00	0.44	0.00	0.25	0.11
Control Delay	6.9	9.3	7.0	13.8	0.0	21.6	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.9	9.3	7.0	13.8	0.0	21.6	0.4
Queue Length 50th (ft)	10	63	0	74	0	14	0
Queue Length 95th (ft)	63	362	2	223	0	55	0
Internal Link Dist (ft)		696		835	313		373
Turn Bay Length (ft)	200		175			125	
Base Capacity (vph)	893	3264	568	3147	1204	975	1203
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.36	0.00	0.24	0.00	0.06	0.05
Intersection Summary							

HCM Signalized Intersection Capacity Analysis

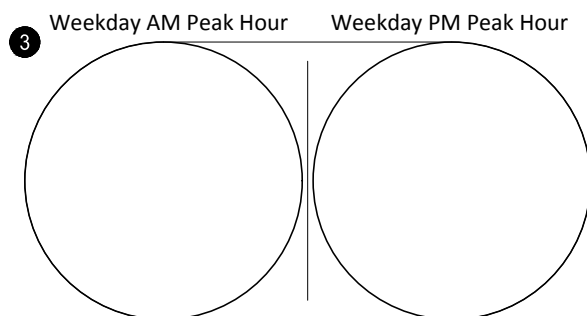
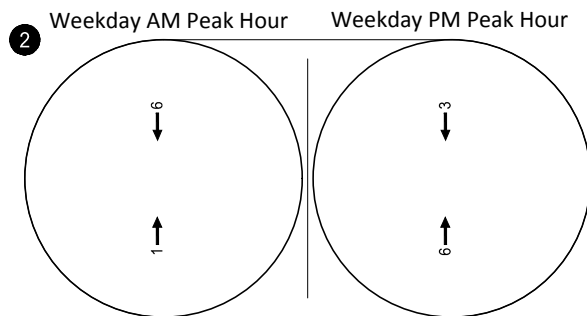
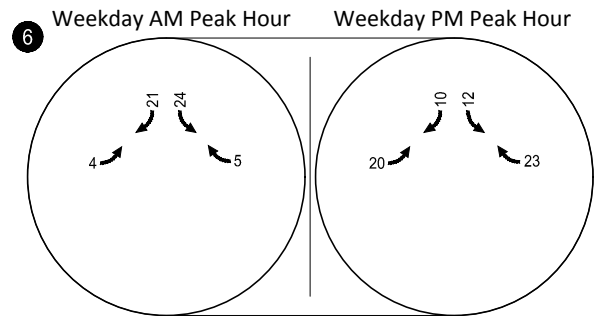
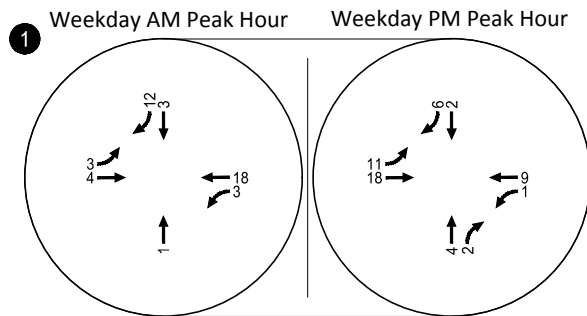
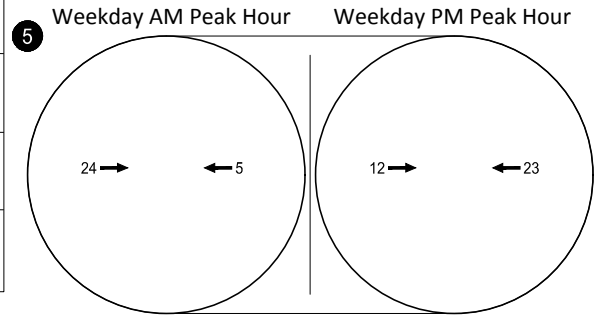
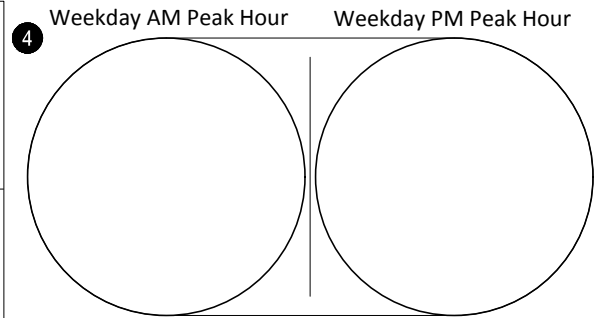
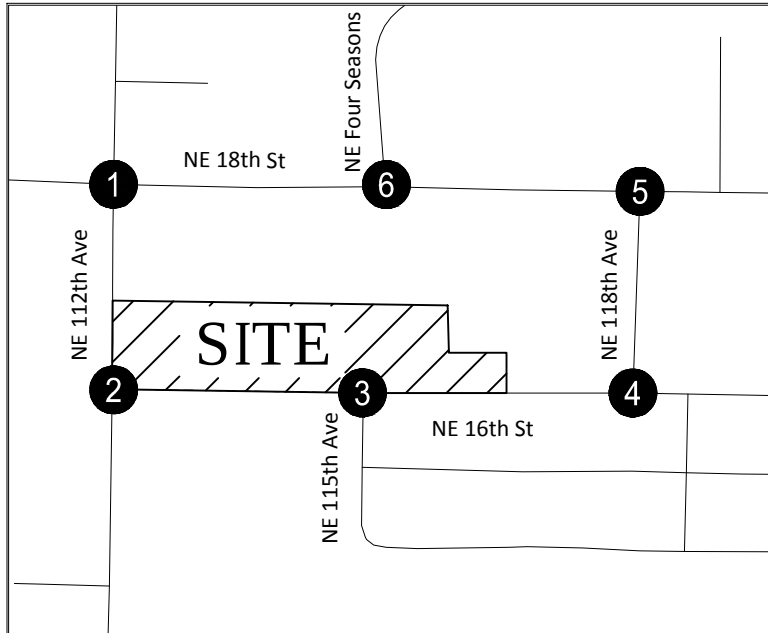
6: NE 4 Seasons Ln & NE 18th St

Four Seasons South Subdivision
Year 2018 Existing PM Peak Hour Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	133	1119	0	1	670	45	0	0	1	58	0	59
Future Volume (vph)	133	1119	0	1	670	45	0	0	1	58	0	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	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	
Frt	1.00	1.00		1.00	0.99			0.86		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1769	3539		1805	3494			1644		1770	1583	
Flt Permitted	0.27	1.00		0.22	1.00			1.00		0.76	1.00	
Satd. Flow (perm)	506	3539		416	3494			1644		1410	1583	
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)	141	1190	0	1	713	48	0	0	1	62	0	63
RTOR Reduction (vph)	0	0	0	0	4	0	0	1	0	0	55	0
Lane Group Flow (vph)	141	1190	0	1	757	0	0	0	0	62	8	0
Confl. Peds. (#/hr)	2					2						
Heavy Vehicles (%)	2%	2%	0%	0%	2%	5%	0%	0%	0%	2%	0%	2%
Turn Type	pm+pt	NA		pm+pt	NA			NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	37.8	32.2		27.6	27.0			7.4		7.4	7.4	
Effective Green, g (s)	37.8	32.2		27.6	27.0			7.4		7.4	7.4	
Actuated g/C Ratio	0.68	0.58		0.50	0.49			0.13		0.13	0.13	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Vehicle Extension (s)	1.0	1.0		1.0	1.0			1.0		1.0	1.0	
Lane Grp Cap (vph)	479	2064		223	1709			220		189	212	
v/s Ratio Prot	c0.03	c0.34		0.00	0.22			0.00			0.01	
v/s Ratio Perm	0.17			0.00						c0.04		
v/c Ratio	0.29	0.58		0.00	0.44			0.00		0.33	0.04	
Uniform Delay, d1	3.7	7.2		6.9	9.2			20.7		21.6	20.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.2		0.0	0.1			0.0		0.4	0.0	
Delay (s)	3.9	7.5		6.9	9.3			20.7		22.0	20.8	
Level of Service	A	A		A	A			C		C	C	
Approach Delay (s)		7.1			9.3			20.7			21.4	
Approach LOS		A			A			C			C	
Intersection Summary												
HCM 2000 Control Delay			8.6			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			55.2			Sum of lost time (s)				15.0		
Intersection Capacity Utilization			57.5%			ICU Level of Service				B		
Analysis Period (min)			15									

c Critical Lane Group

Appendix D 2020 Baseline Operations Worksheets

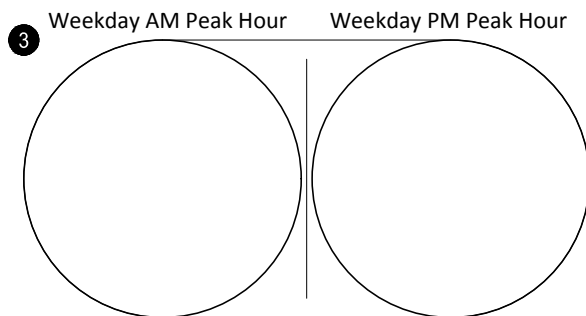
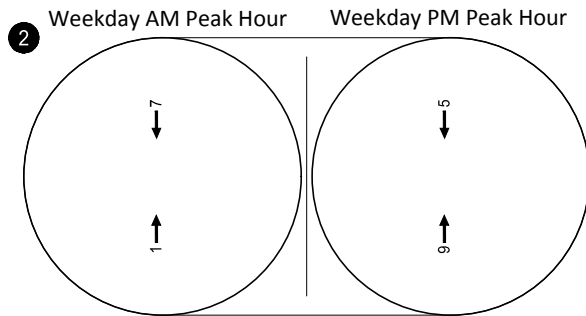
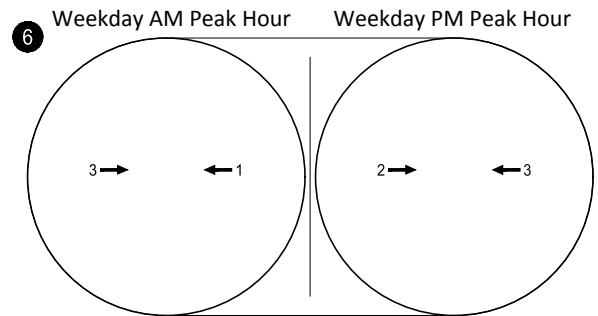
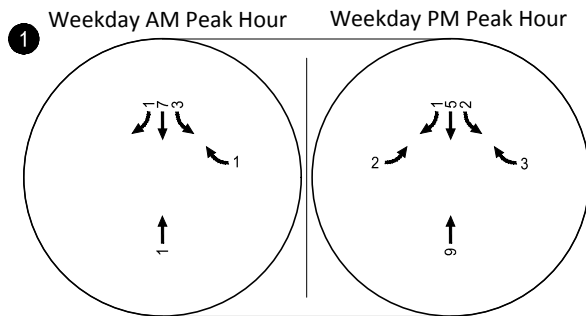
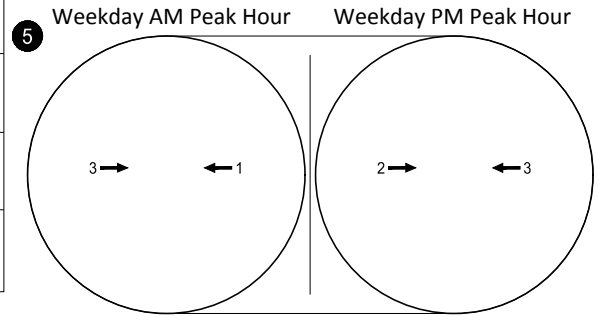
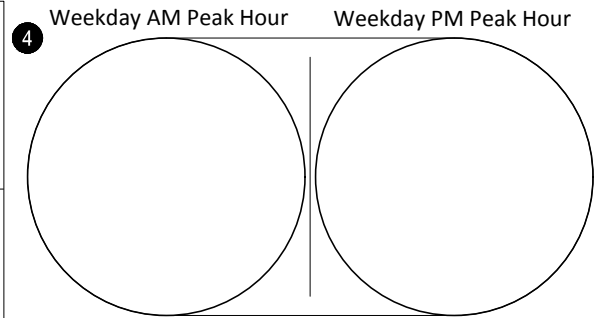
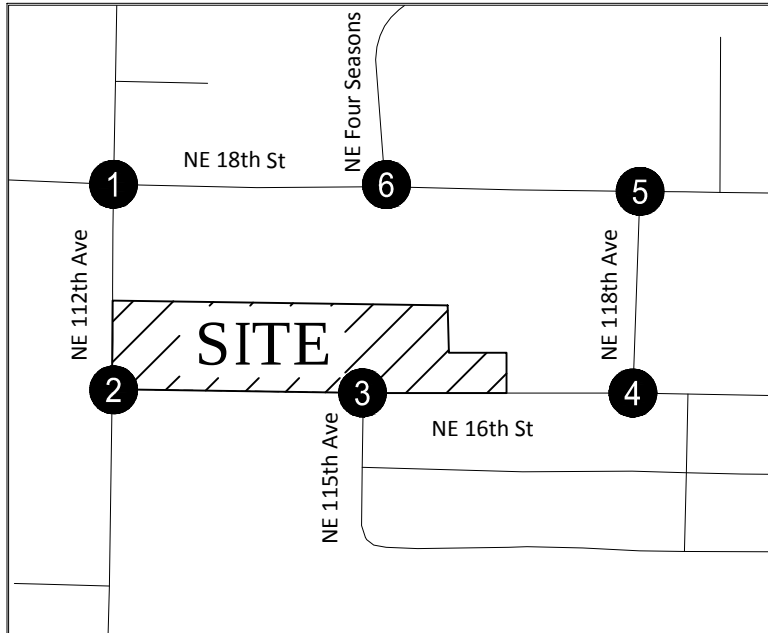


LEGEND

- # - Study Intersections
- # - Site Access Intersections

**In-Process Trips - Four Seasons Subdivision
Weekday AM and PM Peak Hour
Vancouver, Washington**

Figure
D-1

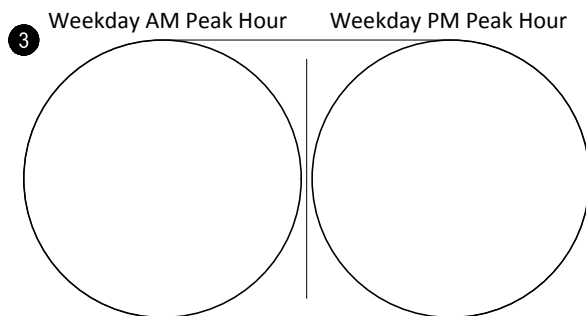
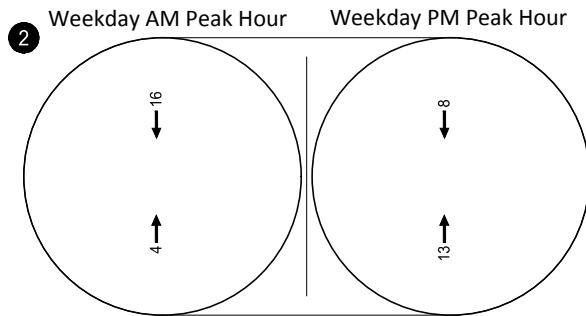
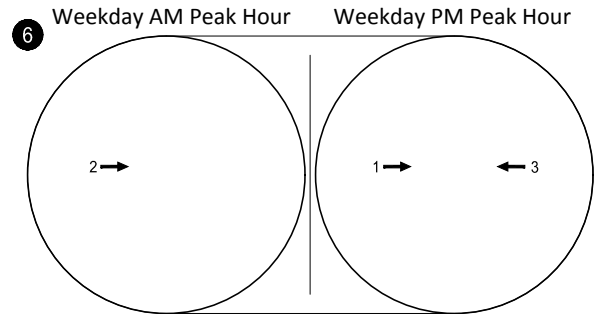
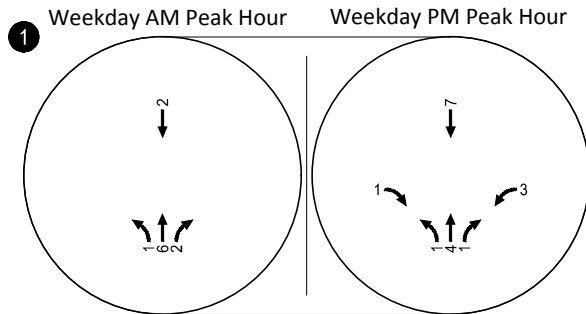
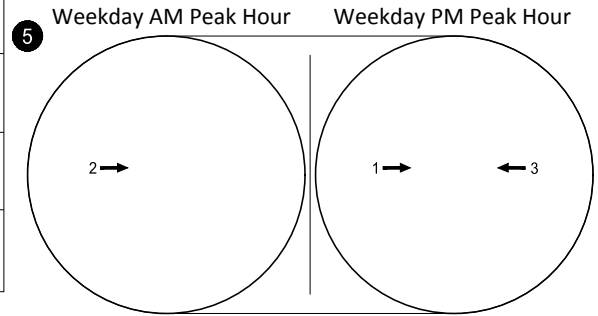
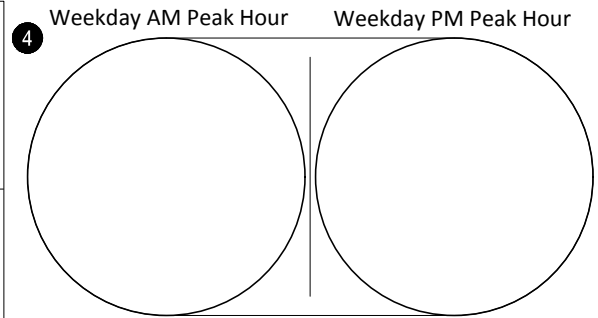
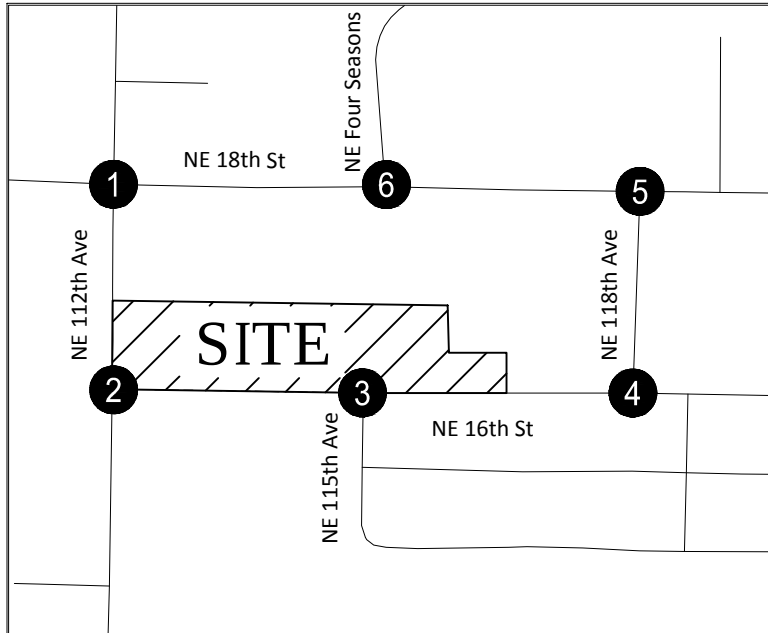


LEGEND

- # - Study Intersections
- # - Site Access Intersections

**In-Process Trips - Mountain View Apartments
Weekday AM and PM Peak Hour
Vancouver, Washington**

Figure
D-2



LEGEND

- #** - Study Intersections
- #** - Site Access Intersections

**In-Process Trips - Block 1618 Apartments
Weekday AM and PM Peak Hour
Vancouver, Washington**

**Figure
D-3**

Queues

1: NE 112th Ave & NE 18th St

Four Seasons South Subdivision

Year 2020 Baseline AM Peak Hour Conditions

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	217	260	22	130	603	300	8	218	66	325	526	584
v/c Ratio	0.49	0.29	0.03	0.37	0.70	0.34	0.03	0.42	0.11	0.59	0.44	0.56
Control Delay	35.7	22.7	0.1	37.2	30.6	3.4	39.1	31.1	2.6	33.9	21.0	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.7	22.7	0.1	37.2	30.6	3.4	39.1	31.1	2.6	33.9	21.0	6.3
Queue Length 50th (ft)	42	42	0	25	114	4	1	43	0	61	77	30
Queue Length 95th (ft)	107	103	0	72	248	50	10	95	14	146	183	150
Internal Link Dist (ft)		626			696			637			768	
Turn Bay Length (ft)	250		200	350		175	350		180	380		150
Base Capacity (vph)	1030	1789	972	982	1858	1243	797	1806	868	1473	2412	1236
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.15	0.02	0.13	0.32	0.24	0.01	0.12	0.08	0.22	0.22	0.47

Intersection Summary

HCM Signalized Intersection Capacity Analysis

1: NE 112th Ave & NE 18th St

Four Seasons South Subdivision
Year 2020 Baseline AM Peak Hour Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	193	231	20	116	537	267	7	194	59	289	468	520
Future Volume (vph)	193	231	20	116	537	267	7	194	59	289	468	520
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3400	3374	1455	3242	3505	1524	2633	3406	1553	3242	3438	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3400	3374	1455	3242	3505	1524	2633	3406	1553	3242	3438	1553
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	217	260	22	130	603	300	8	218	66	325	526	584
RTOR Reduction (vph)	0	0	16	0	0	166	0	0	46	0	0	214
Lane Group Flow (vph)	217	260	6	130	603	134	8	218	20	325	526	370
Heavy Vehicles (%)	3%	7%	11%	8%	3%	6%	33%	6%	4%	8%	5%	4%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	7	1	6	3	7	4	1	3	8	5
Permitted Phases			2			6			4			8
Actuated Green, G (s)	9.1	18.8	20.8	7.5	17.2	29.2	2.0	14.4	21.9	12.0	24.4	33.5
Effective Green, g (s)	9.1	18.8	20.8	7.5	17.2	29.2	2.0	14.4	21.9	12.0	24.4	33.5
Actuated g/C Ratio	0.13	0.26	0.29	0.10	0.24	0.40	0.03	0.20	0.30	0.17	0.34	0.46
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	425	872	516	334	829	716	72	674	574	535	1153	822
v/s Ratio Prot	0.06	0.08	0.00	0.04	c0.17	0.03	0.00	0.06	0.00	c0.10	0.15	c0.06
v/s Ratio Perm			0.00			0.06			0.01			0.18
v/c Ratio	0.51	0.30	0.01	0.39	0.73	0.19	0.11	0.32	0.03	0.61	0.46	0.45
Uniform Delay, d1	29.7	21.7	18.6	30.5	25.6	14.1	34.5	25.0	17.9	28.2	18.9	13.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.1	0.0	0.3	2.7	0.0	0.2	0.1	0.0	1.3	0.1	0.1
Delay (s)	30.2	21.7	18.6	30.7	28.3	14.1	34.7	25.1	17.9	29.5	19.1	13.5
Level of Service	C	C	B	C	C	B	C	C	B	C	B	B
Approach Delay (s)	25.2		24.5			23.7			19.2			
Approach LOS	C		C			C			B			
Intersection Summary												
HCM 2000 Control Delay			22.2		HCM 2000 Level of Service				C			
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			72.7		Sum of lost time (s)				20.0			
Intersection Capacity Utilization			64.5%		ICU Level of Service				C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 3: NE 115th Ave & NE 16th St

Four Seasons South Subdivision
Year 2020 Baseline AM Peak Hour Conditions

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations			↘			↗
Sign Control	Yield			Yield	Yield	
Traffic Volume (vph)	0	0	6	0	0	5
Future Volume (vph)	0	0	6	0	0	5
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	0	0	8	0	0	6
Direction, Lane #	WB 1	NB 1				
Volume Total (vph)	8	6				
Volume Left (vph)	8	0				
Volume Right (vph)	0	6				
Hadj (s)	0.49	-0.60				
Departure Headway (s)	4.4	3.3				
Degree Utilization, x	0.01	0.01				
Capacity (veh/h)	811	1078				
Control Delay (s)	7.4	6.3				
Approach Delay (s)	7.4	6.3				
Approach LOS	A	A				
Intersection Summary						
Delay			7.0			
Level of Service			A			
Intersection Capacity Utilization			6.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 4: NE 16th St & NE 118th Ave

Four Seasons South Subdivision
Year 2020 Baseline AM Peak Hour Conditions

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Yield	Yield		Yield	
Traffic Volume (vph)	13	0	1	24	5	8
Future Volume (vph)	13	0	1	24	5	8
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	16	0	1	30	6	10
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total (vph)	16	31	16			
Volume Left (vph)	16	0	6			
Volume Right (vph)	0	30	10			
Hadj (s)	0.20	-0.51	-0.04			
Departure Headway (s)	4.2	3.4	3.9			
Degree Utilization, x	0.02	0.03	0.02			
Capacity (veh/h)	855	1036	889			
Control Delay (s)	7.2	6.5	7.0			
Approach Delay (s)	7.2	6.5	7.0			
Approach LOS	A	A	A			
Intersection Summary						
Delay			6.8			
Level of Service			A			
Intersection Capacity Utilization			17.4%	ICU Level of Service	A	
Analysis Period (min)			15			

Queues
5: NE 118th St & NE 18th St

Four Seasons South Subdivision
Year 2020 Baseline AM Peak Hour Conditions

	→	↙	←	↘	↗
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	651	10	929	33	10
v/c Ratio	0.24	0.01	0.32	0.11	0.04
Control Delay	4.4	2.2	2.9	16.4	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	4.4	2.2	2.9	16.4	10.8
Queue Length 50th (ft)	0	0	0	5	0
Queue Length 95th (ft)	97	4	80	27	10
Internal Link Dist (ft)	835		335	583	
Turn Bay Length (ft)		175		175	
Base Capacity (vph)	3358	909	3438	1728	1394
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.19	0.01	0.27	0.02	0.01
Intersection Summary					

HCM Signalized Intersection Capacity Analysis

5: NE 118th St & NE 18th St

Four Seasons South Subdivision
Year 2020 Baseline AM Peak Hour Conditions

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↘	↑↑	↘	↗
Traffic Volume (vph)	585	7	9	845	30	9
Future Volume (vph)	585	7	9	845	30	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0	5.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3358		1805	3438	1805	1455
Flt Permitted	1.00		0.40	1.00	0.95	1.00
Satd. Flow (perm)	3358		768	3438	1805	1455
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	643	8	10	929	33	10
RTOR Reduction (vph)	0	0	0	0	0	9
Lane Group Flow (vph)	651	0	10	929	33	1
Confl. Peds. (#/hr)		1	1		1	
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	7%	29%	0%	5%	0%	11%
Turn Type	NA		pm+pt	NA	Prot	Prot
Protected Phases	2		1	6	4	4
Permitted Phases			6			
Actuated Green, G (s)	27.5		33.3	33.3	2.5	2.5
Effective Green, g (s)	27.5		33.3	33.3	2.5	2.5
Actuated g/C Ratio	0.60		0.73	0.73	0.05	0.05
Clearance Time (s)	5.0		5.0	5.0	5.0	5.0
Vehicle Extension (s)	1.0		1.0	1.0	3.0	3.0
Lane Grp Cap (vph)	2016		576	2499	98	79
v/s Ratio Prot	0.19		0.00	c0.27	c0.02	0.00
v/s Ratio Perm			0.01			
v/c Ratio	0.32		0.02	0.37	0.34	0.01
Uniform Delay, d1	4.5		1.7	2.3	20.9	20.5
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0		0.0	0.0	2.0	0.0
Delay (s)	4.6		1.7	2.4	22.9	20.5
Level of Service	A		A	A	C	C
Approach Delay (s)	4.6			2.4	22.3	
Approach LOS	A			A	C	
Intersection Summary						
HCM 2000 Control Delay			3.8		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.43			
Actuated Cycle Length (s)			45.8		Sum of lost time (s)	15.0
Intersection Capacity Utilization			35.9%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Queues
6: NE 4 Seasons Ln & NE 18th St

Four Seasons South Subdivision
Year 2020 Baseline AM Peak Hour Conditions

						
Lane Group	EBL	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	62	575	963	1	77	91
v/c Ratio	0.17	0.26	0.53	0.00	0.30	0.16
Control Delay	7.0	6.1	14.1	18.0	21.3	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	6.1	14.1	18.0	21.3	0.6
Queue Length 50th (ft)	5	27	102	0	18	0
Queue Length 95th (ft)	33	115	302	4	61	0
Internal Link Dist (ft)		696	835	313		373
Turn Bay Length (ft)	200				125	
Base Capacity (vph)	813	3162	3042	963	959	1203
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.18	0.32	0.00	0.08	0.08
Intersection Summary						

HCM Signalized Intersection Capacity Analysis

6: NE 4 Seasons Ln & NE 18th St

Four Seasons South Subdivision
Year 2020 Baseline AM Peak Hour Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	522	1	0	837	39	1	0	0	70	0	83
Future Volume (vph)	56	522	1	0	837	39	1	0	0	70	0	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0			5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95			0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00			1.00			1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00			1.00		1.00	1.00	
Frt	1.00	1.00			0.99			1.00		1.00	0.85	
Flt Protected	0.95	1.00			1.00			0.95		0.95	1.00	
Satd. Flow (prot)	1612	3405			3424			1805		1656	1538	
Flt Permitted	0.19	1.00			1.00			0.70		0.76	1.00	
Satd. Flow (perm)	326	3405			3424			1326		1320	1538	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	62	574	1	0	920	43	1	0	0	77	0	91
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	76	0
Lane Group Flow (vph)	62	575	0	0	960	0	0	1	0	77	15	0
Confl. Peds. (#/hr)	1					1						
Heavy Vehicles (%)	12%	6%	0%	0%	4%	18%	0%	0%	0%	9%	0%	5%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	32.8	32.8			24.4			8.2		8.2	8.2	
Effective Green, g (s)	32.8	32.8			24.4			8.2		8.2	8.2	
Actuated g/C Ratio	0.64	0.64			0.48			0.16		0.16	0.16	
Clearance Time (s)	5.0	5.0			5.0			5.0		5.0	5.0	
Vehicle Extension (s)	1.0	1.0			1.0			1.0		1.0	1.0	
Lane Grp Cap (vph)	295	2189			1638			213		212	247	
v/s Ratio Prot	0.01	c0.17			c0.28						0.01	
v/s Ratio Perm	0.12							0.00		c0.06		
v/c Ratio	0.21	0.26			0.59			0.00		0.36	0.06	
Uniform Delay, d1	4.6	3.9			9.6			18.0		19.1	18.1	
Progression Factor	1.00	1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.0			0.3			0.0		0.4	0.0	
Delay (s)	4.7	3.9			10.0			18.0		19.5	18.2	
Level of Service	A	A			A			B		B	B	
Approach Delay (s)		4.0			10.0			18.0			18.8	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			8.7			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			51.0			Sum of lost time (s)				15.0		
Intersection Capacity Utilization			46.2%			ICU Level of Service				A		
Analysis Period (min)			15									

c Critical Lane Group

Queues

1: NE 112th Ave & NE 18th St

Four Seasons South Subdivision

Year 2020 Baseline PM Peak Hour Conditions

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	477	717	16	99	367	316	33	478	199	423	411	344
v/c Ratio	0.64	0.67	0.02	0.35	0.64	0.55	0.13	0.69	0.33	0.70	0.32	0.33
Control Delay	36.2	30.2	0.1	44.2	39.5	19.4	43.6	38.3	13.9	40.6	21.8	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.2	30.2	0.1	44.2	39.5	19.4	43.6	38.3	13.9	40.6	21.8	2.0
Queue Length 50th (ft)	112	164	0	25	94	94	8	122	38	106	87	0
Queue Length 95th (ft)	220	292	0	61	168	192	27	210	107	192	145	35
Internal Link Dist (ft)		626			696			637			768	
Turn Bay Length (ft)	250		200	350		175	350		180	380		150
Base Capacity (vph)	849	1532	921	866	1517	870	866	1547	842	1261	1989	1066
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.47	0.02	0.11	0.24	0.36	0.04	0.31	0.24	0.34	0.21	0.32
Intersection Summary												

HCM Signalized Intersection Capacity Analysis

1: NE 112th Ave & NE 18th St

Four Seasons South Subdivision

Year 2020 Baseline PM Peak Hour Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	467	703	16	97	360	310	32	468	195	415	403	337
Future Volume (vph)	467	703	16	97	360	310	32	468	195	415	403	337
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1597	3502	3505	1573	3502	3574	1583	3400	3574	1540
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1597	3502	3505	1573	3502	3574	1583	3400	3574	1540
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	477	717	16	99	367	316	33	478	199	423	411	344
RTOR Reduction (vph)	0	0	11	0	0	39	0	0	66	0	0	149
Lane Group Flow (vph)	477	717	5	99	367	277	33	478	133	423	411	195
Confl. Peds. (#/hr)	1					1	15					15
Confl. Bikes (#/hr)			1									3
Heavy Vehicles (%)	2%	2%	0%	0%	3%	2%	0%	1%	2%	3%	1%	3%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	7	1	6	3	7	4	1	3	8	5
Permitted Phases			2			6			4			8
Actuated Green, G (s)	18.3	25.2	28.5	6.8	13.7	28.5	3.3	18.6	25.4	14.8	30.1	48.4
Effective Green, g (s)	18.3	25.2	28.5	6.8	13.7	28.5	3.3	18.6	25.4	14.8	30.1	48.4
Actuated g/C Ratio	0.21	0.30	0.33	0.08	0.16	0.33	0.04	0.22	0.30	0.17	0.35	0.57
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	735	1044	626	278	562	617	135	778	563	589	1259	962
v/s Ratio Prot	c0.14	c0.20	0.00	0.03	0.10	0.08	0.01	c0.13	0.02	c0.12	0.11	0.04
v/s Ratio Perm			0.00			0.10			0.07			0.08
v/c Ratio	0.65	0.69	0.01	0.36	0.65	0.45	0.24	0.61	0.24	0.72	0.33	0.20
Uniform Delay, d1	30.6	26.6	19.0	37.2	33.6	22.3	39.8	30.2	22.7	33.3	20.2	9.1
Progression Factor	1.00	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	1.5	1.5	0.0	0.3	2.1	0.2	0.3	1.0	0.1	3.5	0.1	0.0
Delay (s)	32.1	28.1	19.0	37.5	35.7	22.5	40.2	31.2	22.7	36.8	20.3	9.1
Level of Service	C	C	B	D	D	C	D	C	C	D	C	A
Approach Delay (s)		29.6			30.6			29.2			23.0	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			27.7				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			85.4				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			65.9%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 3: NE 115th Ave & NE 16th St

Four Seasons South Subdivision
Year 2020 Baseline PM Peak Hour Conditions

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations			↘			↗
Sign Control	Yield			Yield	Yield	
Traffic Volume (vph)	0	0	4	0	0	4
Future Volume (vph)	0	0	4	0	0	4
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	0	0	5	0	0	5
Direction, Lane #	WB 1	NB 1				
Volume Total (vph)	5	5				
Volume Left (vph)	5	0				
Volume Right (vph)	0	5				
Hadj (s)	0.20	-0.60				
Departure Headway (s)	4.1	3.3				
Degree Utilization, x	0.01	0.00				
Capacity (veh/h)	868	1081				
Control Delay (s)	7.1	6.3				
Approach Delay (s)	7.1	6.3				
Approach LOS	A	A				
Intersection Summary						
Delay			6.7			
Level of Service			A			
Intersection Capacity Utilization			6.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

4: NE 16th St & NE 118th Ave

Four Seasons South Subdivision
Year 2020 Baseline PM Peak Hour Conditions

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Yield	Yield		Yield	
Traffic Volume (vph)	17	0	0	22	35	15
Future Volume (vph)	17	0	0	22	35	15
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	21	0	0	28	44	19
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total (vph)	21	28	63			
Volume Left (vph)	21	0	44			
Volume Right (vph)	0	28	19			
Hadj (s)	0.20	-0.60	-0.04			
Departure Headway (s)	4.3	3.5	4.0			
Degree Utilization, x	0.02	0.03	0.07			
Capacity (veh/h)	827	1017	887			
Control Delay (s)	7.4	6.6	7.3			
Approach Delay (s)	7.4	6.6	7.3			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.1			
Level of Service			A			
Intersection Capacity Utilization			17.6%	ICU Level of Service	A	
Analysis Period (min)			15			

Queues
5: NE 118th St & NE 18th St

Four Seasons South Subdivision
Year 2020 Baseline PM Peak Hour Conditions

	→	↙	←	↘	↗
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1320	23	801	23	19
v/c Ratio	0.51	0.06	0.28	0.09	0.08
Control Delay	7.6	3.2	2.9	22.0	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.6	3.2	2.9	22.0	12.1
Queue Length 50th (ft)	79	1	39	6	0
Queue Length 95th (ft)	236	7	64	25	16
Internal Link Dist (ft)	835		335	583	
Turn Bay Length (ft)		175		175	
Base Capacity (vph)	3433	596	3539	1520	1363
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.38	0.04	0.23	0.02	0.01
Intersection Summary					

HCM Signalized Intersection Capacity Analysis

5: NE 118th St & NE 18th St

Four Seasons South Subdivision
Year 2020 Baseline PM Peak Hour Conditions

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↘	↑↑	↘	↗
Traffic Volume (vph)	1195	33	21	745	21	18
Future Volume (vph)	1195	33	21	745	21	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0	5.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3525		1805	3539	1805	1615
Flt Permitted	1.00		0.16	1.00	0.95	1.00
Satd. Flow (perm)	3525		310	3539	1805	1615
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	1285	35	23	801	23	19
RTOR Reduction (vph)	1	0	0	0	0	18
Lane Group Flow (vph)	1319	0	23	801	23	1
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	2%	0%	0%	2%	0%	0%
Turn Type	NA		pm+pt	NA	Prot	Prot
Protected Phases	2		1	6	4	4
Permitted Phases			6			
Actuated Green, G (s)	31.1		37.8	37.8	3.7	3.7
Effective Green, g (s)	31.1		37.8	37.8	3.7	3.7
Actuated g/C Ratio	0.60		0.73	0.73	0.07	0.07
Clearance Time (s)	5.0		5.0	5.0	5.0	5.0
Vehicle Extension (s)	1.0		1.0	1.0	3.0	3.0
Lane Grp Cap (vph)	2128		276	2597	129	116
v/s Ratio Prot	c0.37		0.00	c0.23	c0.01	0.00
v/s Ratio Perm			0.06			
v/c Ratio	0.62		0.08	0.31	0.18	0.01
Uniform Delay, d1	6.5		4.8	2.4	22.5	22.2
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4		0.0	0.0	0.7	0.0
Delay (s)	6.8		4.8	2.4	23.1	22.2
Level of Service	A		A	A	C	C
Approach Delay (s)	6.8			2.4	22.7	
Approach LOS	A			A	C	
Intersection Summary						
HCM 2000 Control Delay			5.5	HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio			0.58			
Actuated Cycle Length (s)			51.5	Sum of lost time (s)		15.0
Intersection Capacity Utilization			46.6%	ICU Level of Service		A
Analysis Period (min)			15			

c Critical Lane Group

Queues
6: NE 4 Seasons Ln & NE 18th St

Four Seasons South Subdivision
Year 2020 Baseline PM Peak Hour Conditions

							
Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	167	1230	1	813	1	77	76
v/c Ratio	0.33	0.52	0.00	0.47	0.00	0.30	0.13
Control Delay	7.3	9.4	7.0	14.6	0.0	23.2	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.3	9.4	7.0	14.6	0.0	23.2	0.5
Queue Length 50th (ft)	13	71	0	86	0	18	0
Queue Length 95th (ft)	73	378	2	246	0	66	0
Internal Link Dist (ft)		696		835	313		373
Turn Bay Length (ft)	200		175			125	
Base Capacity (vph)	891	3255	559	3071	1175	947	1177
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.38	0.00	0.26	0.00	0.08	0.06
Intersection Summary							

HCM Signalized Intersection Capacity Analysis

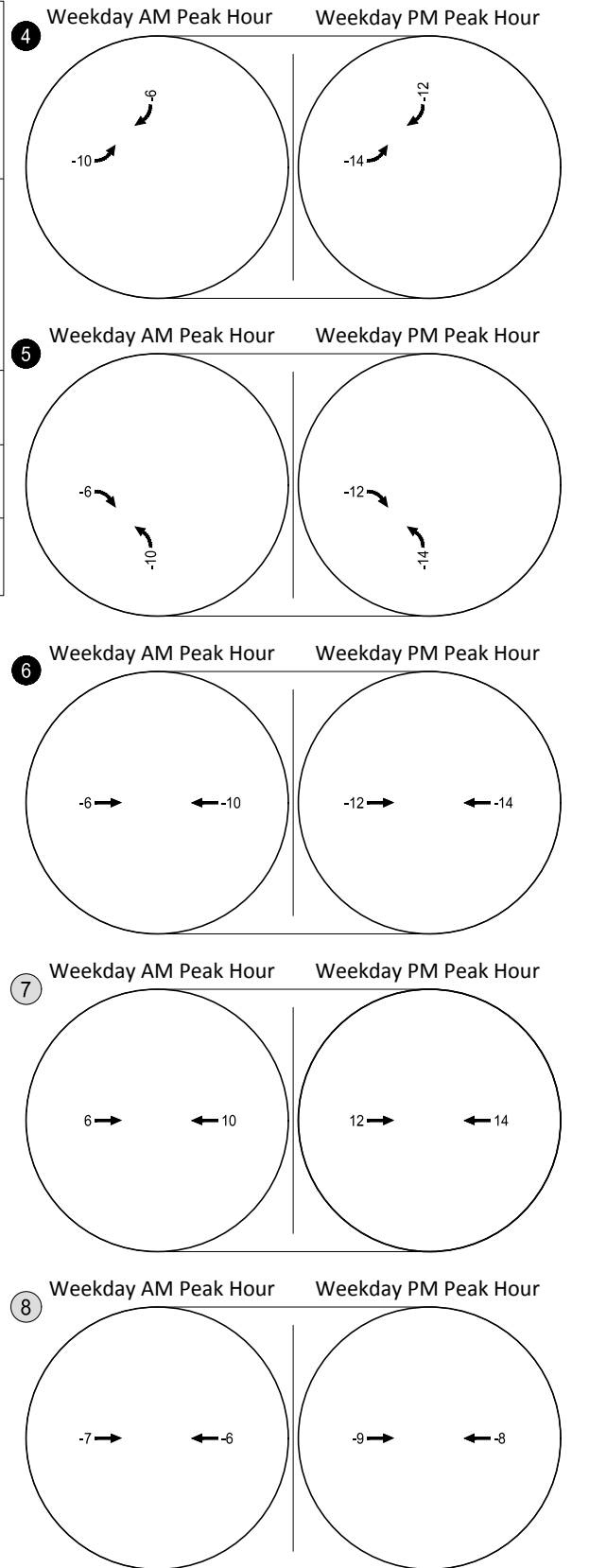
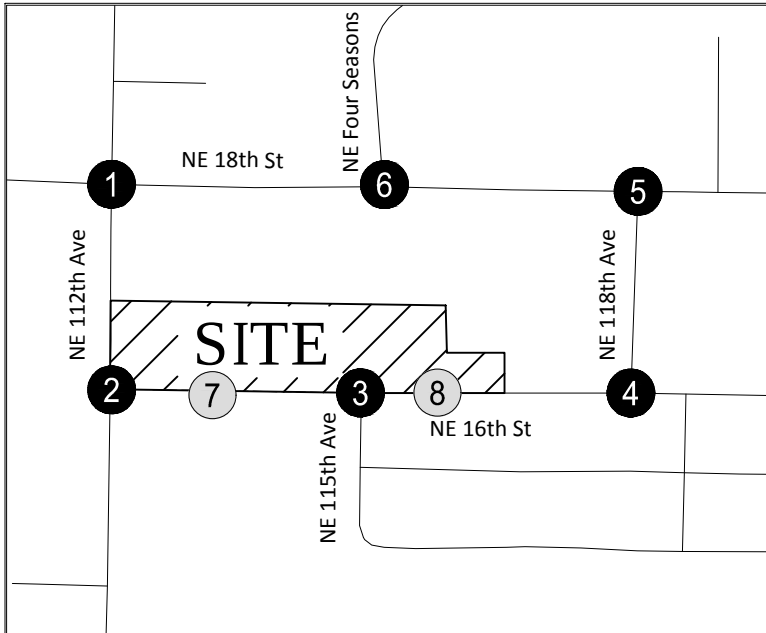
6: NE 4 Seasons Ln & NE 18th St

Four Seasons South Subdivision
Year 2020 Baseline PM Peak Hour Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	157	1156	0	1	696	69	0	0	1	72	0	71
Future Volume (vph)	157	1156	0	1	696	69	0	0	1	72	0	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	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	
Frt	1.00	1.00		1.00	0.99			0.86		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1769	3539		1805	3475			1644		1770	1583	
Flt Permitted	0.25	1.00		0.21	1.00			1.00		0.76	1.00	
Satd. Flow (perm)	460	3539		397	3475			1644		1410	1583	
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)	167	1230	0	1	740	73	0	0	1	77	0	76
RTOR Reduction (vph)	0	0	0	0	6	0	0	1	0	0	66	0
Lane Group Flow (vph)	167	1230	0	1	807	0	0	0	0	77	10	0
Confl. Peds. (#/hr)	2					2						
Heavy Vehicles (%)	2%	2%	0%	0%	2%	5%	0%	0%	0%	2%	0%	2%
Turn Type	pm+pt	NA		pm+pt	NA			NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	38.2	32.6		27.4	26.8			7.6		7.6	7.6	
Effective Green, g (s)	38.2	32.6		27.4	26.8			7.6		7.6	7.6	
Actuated g/C Ratio	0.68	0.58		0.49	0.48			0.14		0.14	0.14	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Vehicle Extension (s)	1.0	1.0		1.0	1.0			1.0		1.0	1.0	
Lane Grp Cap (vph)	465	2067		210	1668			223		192	215	
v/s Ratio Prot	c0.04	c0.35		0.00	0.23			0.00			0.01	
v/s Ratio Perm	0.20			0.00						c0.05		
v/c Ratio	0.36	0.60		0.00	0.48			0.00		0.40	0.05	
Uniform Delay, d1	4.1	7.4		7.3	9.8			20.8		22.0	21.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.3		0.0	0.1			0.0		0.5	0.0	
Delay (s)	4.2	7.7		7.3	9.9			20.8		22.5	21.0	
Level of Service	A	A		A	A			C		C	C	
Approach Delay (s)		7.3			9.9			20.8			21.8	
Approach LOS		A			A			C			C	
Intersection Summary												
HCM 2000 Control Delay			9.1			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			55.8			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			59.3%			ICU Level of Service			B			
Analysis Period (min)			15									

c Critical Lane Group

Appendix E 2020 With Site Operations Worksheets



LEGEND

- # - Study Intersections
- # - Site Access Intersections

**Redistributed Trips
Weekday AM and PM Peak Hour
Vancouver, Washington**

**Figure
E-1**

Queues
1: NE 112th Ave & NE 18th St

Four Seasons South Subdivision
Year 2020 Total Traffic AM Peak Hour Conditions

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	217	257	29	129	600	293	19	240	66	320	538	584
v/c Ratio	0.50	0.29	0.04	0.38	0.70	0.34	0.08	0.45	0.11	0.59	0.49	0.59
Control Delay	36.0	22.9	0.1	37.5	30.8	3.9	39.1	31.1	2.5	34.2	23.3	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.0	22.9	0.1	37.5	30.8	3.9	39.1	31.1	2.5	34.2	23.3	7.9
Queue Length 50th (ft)	43	43	0	26	117	8	3	47	0	62	105	57
Queue Length 95th (ft)	106	102	0	71	246	58	18	103	14	144	186	172
Internal Link Dist (ft)		626			696			600			768	
Turn Bay Length (ft)	250		200	350		175	350		180	380		150
Base Capacity (vph)	1019	1771	967	972	1840	1230	789	1788	872	1459	2320	1187
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.15	0.03	0.13	0.33	0.24	0.02	0.13	0.08	0.22	0.23	0.49
Intersection Summary												

HCM Signalized Intersection Capacity Analysis

1: NE 112th Ave & NE 18th St

Four Seasons South Subdivision
Year 2020 Total Traffic AM Peak Hour Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	193	229	26	115	534	261	17	214	59	285	479	520
Future Volume (vph)	193	229	26	115	534	261	17	214	59	285	479	520
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3400	3374	1455	3242	3505	1524	2633	3406	1553	3242	3438	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3400	3374	1455	3242	3505	1524	2633	3406	1553	3242	3438	1553
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	217	257	29	129	600	293	19	240	66	320	538	584
RTOR Reduction (vph)	0	0	20	0	0	151	0	0	47	0	0	204
Lane Group Flow (vph)	217	257	9	129	600	142	19	240	19	320	538	380
Heavy Vehicles (%)	3%	7%	11%	8%	3%	6%	33%	6%	4%	8%	5%	4%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	7	1	6	3	7	4	1	3	8	5
Permitted Phases			2			6			4			8
Actuated Green, G (s)	9.1	18.9	22.1	7.5	17.3	29.2	3.2	13.8	21.3	11.9	22.5	31.6
Effective Green, g (s)	9.1	18.9	22.1	7.5	17.3	29.2	3.2	13.8	21.3	11.9	22.5	31.6
Actuated g/C Ratio	0.13	0.26	0.31	0.10	0.24	0.40	0.04	0.19	0.30	0.17	0.31	0.44
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	429	884	546	337	841	722	116	651	566	535	1072	788
v/s Ratio Prot	0.06	0.08	0.00	0.04	c0.17	0.03	0.01	0.07	0.00	c0.10	0.16	c0.06
v/s Ratio Perm			0.01			0.06			0.01			0.18
v/c Ratio	0.51	0.29	0.02	0.38	0.71	0.20	0.16	0.37	0.03	0.60	0.50	0.48
Uniform Delay, d1	29.4	21.2	17.4	30.1	25.1	13.9	33.2	25.4	18.1	27.9	20.2	14.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.1	0.0	0.3	2.4	0.0	0.2	0.1	0.0	1.2	0.1	0.2
Delay (s)	29.7	21.3	17.4	30.4	27.5	13.9	33.4	25.5	18.1	29.1	20.4	14.6
Level of Service	C	C	B	C	C	B	C	C	B	C	C	B
Approach Delay (s)		24.7			24.0			24.4			20.0	
Approach LOS		C			C			C			B	
Intersection Summary												
HCM 2000 Control Delay			22.4				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			72.1				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			64.5%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: NE 112th Ave & NE 16th St

Four Seasons South Subdivision
Year 2020 Total Traffic AM Peak Hour Conditions

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	30	255	1	17	617
Future Volume (Veh/h)	2	30	255	1	17	617
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	2	34	287	1	19	693
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (ft)						680
pX, platoon unblocked	0.89					
vC, conflicting volume	672	144			288	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	381	144			288	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			99	
cM capacity (veh/h)	525	884			1286	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	36	191	97	250	462	
Volume Left	2	0	0	19	0	
Volume Right	34	0	1	0	0	
cSH	851	1700	1700	1286	1700	
Volume to Capacity	0.04	0.11	0.06	0.01	0.27	
Queue Length 95th (ft)	3	0	0	1	0	
Control Delay (s)	9.4	0.0	0.0	0.7	0.0	
Lane LOS	A			A		
Approach Delay (s)	9.4	0.0		0.3		
Approach LOS	A					
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			38.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

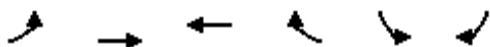
3: NE 115th Ave & NE 16th St

Four Seasons South Subdivision
Year 2020 Total Traffic AM Peak Hour Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	3	5	1	8	1	4	0	1	2	0	12
Future Volume (Veh/h)	6	3	5	1	8	1	4	0	1	2	0	12
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	8	4	6	1	10	1	5	0	1	3	0	15
Pedestrians												
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	11			10			50	36	7	36	38	10
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	11			10			50	36	7	36	38	10
tC, single (s)	4.1			4.3			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.4			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	100	100	100	100	99
cM capacity (veh/h)	1621			1517			937	856	1081	969	853	1077
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	18	12	6	18								
Volume Left	8	1	5	3								
Volume Right	6	1	1	15								
cSH	1621	1517	958	1057								
Volume to Capacity	0.00	0.00	0.01	0.02								
Queue Length 95th (ft)	0	0	0	1								
Control Delay (s)	3.2	0.6	8.8	8.5								
Lane LOS	A	A	A	A								
Approach Delay (s)	3.2	0.6	8.8	8.5								
Approach LOS			A	A								
Intersection Summary												
Average Delay				5.0								
Intersection Capacity Utilization				13.3%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis 4: NE 16th St & NE 118th Ave

Four Seasons South Subdivision
Year 2020 Total Traffic AM Peak Hour Conditions



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Yield	Yield		Yield	
Traffic Volume (vph)	8	0	1	24	5	5
Future Volume (vph)	8	0	1	24	5	5
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	10	0	1	30	6	6
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total (vph)	10	31	12			
Volume Left (vph)	10	0	6			
Volume Right (vph)	0	30	6			
Hadj (s)	0.20	-0.51	0.07			
Departure Headway (s)	4.2	3.4	4.1			
Degree Utilization, x	0.01	0.03	0.01			
Capacity (veh/h)	857	1042	867			
Control Delay (s)	7.2	6.5	7.1			
Approach Delay (s)	7.2	6.5	7.1			
Approach LOS	A	A	A			
Intersection Summary						
Delay			6.8			
Level of Service			A			
Intersection Capacity Utilization			16.6%	ICU Level of Service	A	
Analysis Period (min)			15			

Queues
5: NE 118th St & NE 18th St

Four Seasons South Subdivision
Year 2020 Total Traffic AM Peak Hour Conditions

					
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	644	13	929	22	15
v/c Ratio	0.24	0.02	0.32	0.08	0.06
Control Delay	4.3	2.1	2.8	16.5	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	4.3	2.1	2.8	16.5	10.3
Queue Length 50th (ft)	0	0	0	4	0
Queue Length 95th (ft)	94	5	75	21	12
Internal Link Dist (ft)	835		335	583	
Turn Bay Length (ft)		175		175	
Base Capacity (vph)	3373	916	3438	1732	1397
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.19	0.01	0.27	0.01	0.01
Intersection Summary					

HCM Signalized Intersection Capacity Analysis

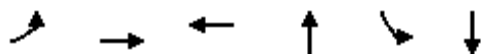
5: NE 118th St & NE 18th St

Four Seasons South Subdivision
Year 2020 Total Traffic AM Peak Hour Conditions

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↘	↑↑	↘	↗
Traffic Volume (vph)	585	1	12	845	20	14
Future Volume (vph)	585	1	12	845	20	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0	5.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3372		1805	3438	1805	1455
Flt Permitted	1.00		0.41	1.00	0.95	1.00
Satd. Flow (perm)	3372		774	3438	1805	1455
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	643	1	13	929	22	15
RTOR Reduction (vph)	0	0	0	0	0	14
Lane Group Flow (vph)	644	0	13	929	22	1
Confl. Peds. (#/hr)		1	1		1	
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	7%	29%	0%	5%	0%	11%
Turn Type	NA		pm+pt	NA	Prot	Prot
Protected Phases	2		1	6	4	4
Permitted Phases			6			
Actuated Green, G (s)	27.6		33.4	33.4	2.4	2.4
Effective Green, g (s)	27.6		33.4	33.4	2.4	2.4
Actuated g/C Ratio	0.60		0.73	0.73	0.05	0.05
Clearance Time (s)	5.0		5.0	5.0	5.0	5.0
Vehicle Extension (s)	1.0		1.0	1.0	3.0	3.0
Lane Grp Cap (vph)	2032		582	2507	94	76
v/s Ratio Prot	0.19		0.00	c0.27	c0.01	0.00
v/s Ratio Perm			0.02			
v/c Ratio	0.32		0.02	0.37	0.23	0.01
Uniform Delay, d1	4.5		1.7	2.3	20.8	20.6
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0		0.0	0.0	1.3	0.1
Delay (s)	4.5		1.7	2.3	22.1	20.6
Level of Service	A		A	A	C	C
Approach Delay (s)	4.5			2.3	21.5	
Approach LOS	A			A	C	
Intersection Summary						
HCM 2000 Control Delay			3.6		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.42			
Actuated Cycle Length (s)			45.8		Sum of lost time (s)	15.0
Intersection Capacity Utilization			35.9%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Queues
6: NE 4 Seasons Ln & NE 18th St

Four Seasons South Subdivision
Year 2020 Total Traffic AM Peak Hour Conditions



Lane Group	EBL	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	62	568	952	1	77	91
v/c Ratio	0.16	0.25	0.53	0.00	0.30	0.16
Control Delay	7.0	6.1	14.0	18.0	21.2	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	6.1	14.0	18.0	21.2	0.6
Queue Length 50th (ft)	5	26	100	0	17	0
Queue Length 95th (ft)	33	114	297	4	61	0
Internal Link Dist (ft)		696	835	313		373
Turn Bay Length (ft)	200				125	
Base Capacity (vph)	816	3164	3048	967	963	1207
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.18	0.31	0.00	0.08	0.08
Intersection Summary						

HCM Signalized Intersection Capacity Analysis

6: NE 4 Seasons Ln & NE 18th St

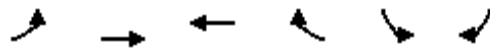
Four Seasons South Subdivision
Year 2020 Total Traffic AM Peak Hour Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	516	1	0	827	39	1	0	0	70	0	83
Future Volume (vph)	56	516	1	0	827	39	1	0	0	70	0	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0			5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95			0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00			1.00			1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00			1.00		1.00	1.00	
Frt	1.00	1.00			0.99			1.00		1.00	0.85	
Flt Protected	0.95	1.00			1.00			0.95		0.95	1.00	
Satd. Flow (prot)	1612	3405			3424			1805		1656	1538	
Flt Permitted	0.20	1.00			1.00			0.70		0.76	1.00	
Satd. Flow (perm)	331	3405			3424			1326		1320	1538	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	62	567	1	0	909	43	1	0	0	77	0	91
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	76	0
Lane Group Flow (vph)	62	568	0	0	949	0	0	1	0	77	15	0
Confl. Peds. (#/hr)	1					1						
Heavy Vehicles (%)	12%	6%	0%	0%	4%	18%	0%	0%	0%	9%	0%	5%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	32.7	32.7			24.3			8.2		8.2	8.2	
Effective Green, g (s)	32.7	32.7			24.3			8.2		8.2	8.2	
Actuated g/C Ratio	0.64	0.64			0.48			0.16		0.16	0.16	
Clearance Time (s)	5.0	5.0			5.0			5.0		5.0	5.0	
Vehicle Extension (s)	1.0	1.0			1.0			1.0		1.0	1.0	
Lane Grp Cap (vph)	298	2187			1634			213		212	247	
v/s Ratio Prot	0.01	c0.17			c0.28						0.01	
v/s Ratio Perm	0.12							0.00		c0.06		
v/c Ratio	0.21	0.26			0.58			0.00		0.36	0.06	
Uniform Delay, d1	4.6	3.9			9.6			17.9		19.0	18.1	
Progression Factor	1.00	1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.0			0.3			0.0		0.4	0.0	
Delay (s)	4.7	3.9			10.0			17.9		19.4	18.1	
Level of Service	A	A			A			B		B	B	
Approach Delay (s)		4.0			10.0			17.9			18.7	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay	8.7			HCM 2000 Level of Service			A					
HCM 2000 Volume to Capacity ratio	0.52											
Actuated Cycle Length (s)	50.9			Sum of lost time (s)			15.0					
Intersection Capacity Utilization	45.9%			ICU Level of Service			A					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

7: NE 16th St & Site Access West

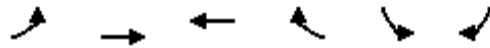
Four Seasons South Subdivision
Year 2020 Total Traffic AM Peak Hour Conditions



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	13	23	1	1	9
Future Volume (Veh/h)	5	13	23	1	1	9
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	6	16	29	1	1	11
Pedestrians						
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	30				58	30
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	30				58	30
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1596				951	1051
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	22	30	12			
Volume Left	6	0	1			
Volume Right	0	1	11			
cSH	1596	1700	1042			
Volume to Capacity	0.00	0.02	0.01			
Queue Length 95th (ft)	0	0	1			
Control Delay (s)	2.0	0.0	8.5			
Lane LOS	A		A			
Approach Delay (s)	2.0	0.0	8.5			
Approach LOS			A			
Intersection Summary						
Average Delay		2.3				
Intersection Capacity Utilization		15.1%	ICU Level of Service	A		
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis 8: NE 16th St & Site Access East

Four Seasons South Subdivision
Year 2020 Total Traffic AM Peak Hour Conditions



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	1	5	4	1	2	1
Future Volume (Veh/h)	1	5	4	1	2	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	1	6	5	1	3	1
Pedestrians						
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	6				14	6
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	6				14	6
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1628				1010	1083
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	7	6	4			
Volume Left	1	0	3			
Volume Right	0	1	1			
cSH	1628	1700	1028			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	1.0	0.0	8.5			
Lane LOS	A		A			
Approach Delay (s)	1.0	0.0	8.5			
Approach LOS			A			
Intersection Summary						
Average Delay		2.4				
Intersection Capacity Utilization		13.3%	ICU Level of Service	A		
Analysis Period (min)		15				

Queues

1: NE 112th Ave & NE 18th St

Four Seasons South Subdivision

Year 2020 Total Traffic PM Peak Hour Conditions

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	477	713	26	98	363	307	40	493	199	415	431	344
v/c Ratio	0.64	0.71	0.04	0.37	0.64	0.48	0.21	0.73	0.34	0.71	0.37	0.32
Control Delay	37.1	32.2	0.1	45.6	40.6	18.5	45.6	40.1	14.0	41.8	23.7	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.1	32.2	0.1	45.6	40.6	18.5	45.6	40.1	14.0	41.8	23.7	1.8
Queue Length 50th (ft)	117	172	0	26	96	96	10	130	39	107	94	0
Queue Length 95th (ft)	224	301	0	61	168	189	31	222	108	190	155	35
Internal Link Dist (ft)		626			696			600			768	
Turn Bay Length (ft)	250		200	350		175	350		180	380		150
Base Capacity (vph)	818	1421	909	780	1476	909	633	1434	823	1170	1861	1117
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.50	0.03	0.13	0.25	0.34	0.06	0.34	0.24	0.35	0.23	0.31
Intersection Summary												

HCM Signalized Intersection Capacity Analysis

1: NE 112th Ave & NE 18th St

Four Seasons South Subdivision

Year 2020 Total Traffic PM Peak Hour Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	467	699	25	96	356	301	39	483	195	407	422	337
Future Volume (vph)	467	699	25	96	356	301	39	483	195	407	422	337
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3400	3374	1455	3242	3505	1524	2633	3406	1553	3242	3438	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3400	3374	1455	3242	3505	1524	2633	3406	1553	3242	3438	1553
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	477	713	26	98	363	307	40	493	199	415	431	344
RTOR Reduction (vph)	0	0	17	0	0	36	0	0	66	0	0	154
Lane Group Flow (vph)	477	713	9	98	363	271	40	493	133	415	431	190
Heavy Vehicles (%)	3%	7%	11%	8%	3%	6%	33%	6%	4%	8%	5%	4%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	7	1	6	3	7	4	1	3	8	5
Permitted Phases			2			6			4			8
Actuated Green, G (s)	18.8	25.6	30.4	7.0	13.8	29.2	4.8	18.4	25.4	15.4	29.0	47.8
Effective Green, g (s)	18.8	25.6	30.4	7.0	13.8	29.2	4.8	18.4	25.4	15.4	29.0	47.8
Actuated g/C Ratio	0.22	0.30	0.35	0.08	0.16	0.34	0.06	0.21	0.29	0.18	0.34	0.55
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	739	999	596	262	559	603	146	725	546	577	1153	949
v/s Ratio Prot	c0.14	c0.21	0.00	0.03	0.10	0.08	0.02	c0.14	0.02	c0.13	0.13	0.04
v/s Ratio Perm			0.01			0.10			0.07			0.08
v/c Ratio	0.65	0.71	0.02	0.37	0.65	0.45	0.27	0.68	0.24	0.72	0.37	0.20
Uniform Delay, d1	30.8	27.1	18.2	37.6	34.0	22.3	39.1	31.3	23.2	33.5	21.8	9.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	2.0	0.0	0.3	2.0	0.2	0.4	2.1	0.1	3.6	0.1	0.0
Delay (s)	32.2	29.2	18.3	38.0	36.0	22.5	39.5	33.4	23.3	37.0	21.9	9.7
Level of Service	C	C	B	D	D	C	D	C	C	D	C	A
Approach Delay (s)		30.1			30.9			31.0			23.7	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			28.5				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			86.4				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			66.0%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: NE 112th Ave & NE 16th St

Four Seasons South Subdivision
Year 2020 Total Traffic PM Peak Hour Conditions

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	22	702	1	28	513
Future Volume (Veh/h)	2	22	702	1	28	513
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	2	22	716	1	29	523
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						680
pX, platoon unblocked	0.92					
vC, conflicting volume	1036	358			717	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	870	358			717	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	97			97	
cM capacity (veh/h)	263	644			893	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	24	477	240	203	349	
Volume Left	2	0	0	29	0	
Volume Right	22	0	1	0	0	
cSH	574	1700	1700	893	1700	
Volume to Capacity	0.04	0.28	0.14	0.03	0.21	
Queue Length 95th (ft)	3	0	0	3	0	
Control Delay (s)	11.5	0.0	0.0	1.6	0.0	
Lane LOS	B			A		
Approach Delay (s)	11.5	0.0		0.6		
Approach LOS	B					
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			45.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: NE 115th Ave & NE 16th St

Four Seasons South Subdivision
Year 2020 Total Traffic PM Peak Hour Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	11	3	1	13	2	3	0	1	1	0	5
Future Volume (Veh/h)	9	11	3	1	13	2	3	0	1	1	0	5
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	11	14	4	1	16	3	4	0	1	1	0	6
Pedestrians												
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	19			18			64	59	16	58	60	18
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	19			18			64	59	16	58	60	18
tC, single (s)	4.1			4.3			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.4			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	100	100	99
cM capacity (veh/h)	1611			1506			925	830	1069	937	829	1067
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	29	20	5	7								
Volume Left	11	1	4	1								
Volume Right	4	3	1	6								
cSH	1611	1506	951	1046								
Volume to Capacity	0.01	0.00	0.01	0.01								
Queue Length 95th (ft)	1	0	0	1								
Control Delay (s)	2.8	0.4	8.8	8.5								
Lane LOS	A	A	A	A								
Approach Delay (s)	2.8	0.4	8.8	8.5								
Approach LOS			A	A								
Intersection Summary												
Average Delay			3.1									
Intersection Capacity Utilization			14.2%	ICU Level of Service			A					
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 4: NE 16th St & NE 118th Ave

Four Seasons South Subdivision
Year 2020 Total Traffic PM Peak Hour Conditions

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Yield	Yield		Yield	
Traffic Volume (vph)	6	0	0	22	35	7
Future Volume (vph)	6	0	0	22	35	7
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	8	0	0	28	44	9
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total (vph)	8	28	53			
Volume Left (vph)	8	0	44			
Volume Right (vph)	0	28	9			
Hadj (s)	0.20	-0.53	0.38			
Departure Headway (s)	4.2	3.5	4.4			
Degree Utilization, x	0.01	0.03	0.06			
Capacity (veh/h)	830	1007	810			
Control Delay (s)	7.3	6.6	7.6			
Approach Delay (s)	7.3	6.6	7.6			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.3			
Level of Service			A			
Intersection Capacity Utilization			15.0%	ICU Level of Service	A	
Analysis Period (min)			15			

Queues
5: NE 118th St & NE 18th St

Four Seasons South Subdivision
Year 2020 Total Traffic PM Peak Hour Conditions

	→	↙	←	↘	↗
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1308	27	801	8	23
v/c Ratio	0.48	0.06	0.26	0.03	0.10
Control Delay	6.4	2.9	2.0	21.9	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.4	2.9	2.0	21.9	12.5
Queue Length 50th (ft)	0	1	0	1	0
Queue Length 95th (ft)	235	7	62	13	18
Internal Link Dist (ft)	835		335	583	
Turn Bay Length (ft)		175		175	
Base Capacity (vph)	3233	625	3438	1577	1274
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.40	0.04	0.23	0.01	0.02
Intersection Summary					

HCM Signalized Intersection Capacity Analysis

5: NE 118th St & NE 18th St

Four Seasons South Subdivision
Year 2020 Total Traffic PM Peak Hour Conditions

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↘	↑↑	↘	↗
Traffic Volume (vph)	1195	21	25	745	7	21
Future Volume (vph)	1195	21	25	745	7	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0	5.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3352		1805	3438	1805	1455
Flt Permitted	1.00		0.17	1.00	0.95	1.00
Satd. Flow (perm)	3352		329	3438	1805	1455
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	1285	23	27	801	8	23
RTOR Reduction (vph)	1	0	0	0	0	22
Lane Group Flow (vph)	1307	0	27	801	8	1
Confl. Peds. (#/hr)		1	1		1	
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	7%	29%	0%	5%	0%	11%
Turn Type	NA		pm+pt	NA	Prot	Prot
Protected Phases	2		1	6	4	4
Permitted Phases			6			
Actuated Green, G (s)	32.3		38.9	38.9	2.1	2.1
Effective Green, g (s)	32.3		38.9	38.9	2.1	2.1
Actuated g/C Ratio	0.63		0.76	0.76	0.04	0.04
Clearance Time (s)	5.0		5.0	5.0	5.0	5.0
Vehicle Extension (s)	1.0		1.0	1.0	3.0	3.0
Lane Grp Cap (vph)	2122		297	2622	74	59
v/s Ratio Prot	c0.39		0.00	c0.23	c0.00	0.00
v/s Ratio Perm			0.07			
v/c Ratio	0.62		0.09	0.31	0.11	0.02
Uniform Delay, d1	5.6		3.7	1.9	23.5	23.5
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4		0.0	0.0	0.6	0.1
Delay (s)	6.0		3.7	1.9	24.2	23.6
Level of Service	A		A	A	C	C
Approach Delay (s)	6.0			2.0	23.7	
Approach LOS	A			A	C	
Intersection Summary						
HCM 2000 Control Delay			4.7		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.59			
Actuated Cycle Length (s)			51.0		Sum of lost time (s)	15.0
Intersection Capacity Utilization			46.2%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Queues
6: NE 4 Seasons Ln & NE 18th St

Four Seasons South Subdivision
Year 2020 Total Traffic PM Peak Hour Conditions

							
Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	167	1217	1	799	1	77	76
v/c Ratio	0.35	0.53	0.00	0.48	0.00	0.32	0.13
Control Delay	7.6	9.6	7.0	15.1	0.0	24.4	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.6	9.6	7.0	15.1	0.0	24.4	0.5
Queue Length 50th (ft)	14	72	0	87	0	18	0
Queue Length 95th (ft)	74	381	2	247	0	68	0
Internal Link Dist (ft)		696		835	313		373
Turn Bay Length (ft)	200		175			125	
Base Capacity (vph)	807	3125	558	2953	1161	873	1136
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.39	0.00	0.27	0.00	0.09	0.07
Intersection Summary							

HCM Signalized Intersection Capacity Analysis

6: NE 4 Seasons Ln & NE 18th St

Four Seasons South Subdivision
Year 2020 Total Traffic PM Peak Hour Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	157	1144	0	1	682	69	0	0	1	72	0	71
Future Volume (vph)	157	1144	0	1	682	69	0	0	1	72	0	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	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	
Frt	1.00	1.00		1.00	0.99			0.86		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1611	3406		1805	3375			1644		1656	1538	
Flt Permitted	0.25	1.00		0.22	1.00			1.00		0.76	1.00	
Satd. Flow (perm)	428	3406		411	3375			1644		1320	1538	
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)	167	1217	0	1	726	73	0	0	1	77	0	76
RTOR Reduction (vph)	0	0	0	0	6	0	0	1	0	0	66	0
Lane Group Flow (vph)	167	1217	0	1	793	0	0	0	0	77	10	0
Confl. Peds. (#/hr)	1					1						
Heavy Vehicles (%)	12%	6%	0%	0%	4%	18%	0%	0%	0%	9%	0%	5%
Turn Type	pm+pt	NA		pm+pt	NA			NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	39.0	33.4		27.8	27.2			7.7		7.7	7.7	
Effective Green, g (s)	39.0	33.4		27.8	27.2			7.7		7.7	7.7	
Actuated g/C Ratio	0.69	0.59		0.49	0.48			0.14		0.14	0.14	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Vehicle Extension (s)	1.0	1.0		1.0	1.0			1.0		1.0	1.0	
Lane Grp Cap (vph)	436	2006		216	1619			223		179	208	
v/s Ratio Prot	c0.05	c0.36		0.00	0.23			0.00			0.01	
v/s Ratio Perm	0.22			0.00						c0.06		
v/c Ratio	0.38	0.61		0.00	0.49			0.00		0.43	0.05	
Uniform Delay, d1	4.1	7.4		7.4	10.0			21.2		22.5	21.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.4		0.0	0.1			0.0		0.6	0.0	
Delay (s)	4.3	7.8		7.4	10.1			21.2		23.1	21.4	
Level of Service	A	A		A	B			C		C	C	
Approach Delay (s)		7.4			10.1			21.2			22.2	
Approach LOS		A			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			9.3			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			56.7			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			58.9%			ICU Level of Service			B			
Analysis Period (min)			15									

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

7: NE 16th St & Site Access West

Four Seasons South Subdivision
Year 2020 Total Traffic PM Peak Hour Conditions

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	22	20	1	1	4
Future Volume (Veh/h)	7	22	20	1	1	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	9	28	25	1	1	5
Pedestrians						
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	26				72	26
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	26				72	26
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	100
cM capacity (veh/h)	1601				932	1056
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	37	26	6			
Volume Left	9	0	1			
Volume Right	0	1	5			
cSH	1601	1700	1033			
Volume to Capacity	0.01	0.02	0.01			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	1.8	0.0	8.5			
Lane LOS	A		A			
Approach Delay (s)	1.8	0.0	8.5			
Approach LOS			A			
Intersection Summary						
Average Delay			1.7			
Intersection Capacity Utilization			17.3%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 8: NE 16th St & Site Access East

Four Seasons South Subdivision
Year 2020 Total Traffic PM Peak Hour Conditions

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	4	5	1	1	1
Future Volume (Veh/h)	1	4	5	1	1	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	1	5	6	1	1	1
Pedestrians						
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	7				14	6
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	7				14	6
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1627				1010	1082
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	6	7	2			
Volume Left	1	0	1			
Volume Right	0	1	1			
cSH	1627	1700	1045			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	1.2	0.0	8.5			
Lane LOS	A		A			
Approach Delay (s)	1.2	0.0	8.5			
Approach LOS			A			
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization			13.3%	ICU Level of Service		A
Analysis Period (min)			15			

Appendix F 2025 With Site Operations Worksheets

Queues

1: NE 112th Ave & NE 18th St

Four Seasons South Subdivision

Year 2025 Total Traffic AM Peak Hour Conditions

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	233	276	30	139	645	316	20	257	71	346	579	628
v/c Ratio	0.53	0.29	0.04	0.41	0.72	0.36	0.09	0.48	0.12	0.61	0.52	0.64
Control Delay	38.2	23.4	0.1	39.8	32.1	5.2	41.6	33.6	3.3	36.0	24.6	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.2	23.4	0.1	39.8	32.1	5.2	41.6	33.6	3.3	36.0	24.6	9.6
Queue Length 50th (ft)	50	48	0	29	135	19	4	55	0	73	121	83
Queue Length 95th (ft)	118	111	0	78	274	83	19	116	18	161	213	226
Internal Link Dist (ft)		626			696			600			768	
Turn Bay Length (ft)	250		200	350		175	350		180	380		150
Base Capacity (vph)	966	1677	957	921	1742	1202	748	1693	841	1381	2197	1167
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.16	0.03	0.15	0.37	0.26	0.03	0.15	0.08	0.25	0.26	0.54
Intersection Summary												

HCM Signalized Intersection Capacity Analysis

1: NE 112th Ave & NE 18th St

Four Seasons South Subdivision

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)	207	246	27	124	574	281	18	229	63	308	515	559
Future Volume (vph)	207	246	27	124	574	281	18	229	63	308	515	559
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3400	3374	1455	3242	3505	1524	2633	3406	1553	3242	3438	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3400	3374	1455	3242	3505	1524	2633	3406	1553	3242	3438	1553
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	233	276	30	139	645	316	20	257	71	346	579	628
RTOR Reduction (vph)	0	0	21	0	0	132	0	0	50	0	0	196
Lane Group Flow (vph)	233	276	9	139	645	184	20	257	21	346	579	432
Heavy Vehicles (%)	3%	7%	11%	8%	3%	6%	33%	6%	4%	8%	5%	4%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	7	1	6	3	7	4	1	3	8	5
Permitted Phases			2			6			4			8
Actuated Green, G (s)	9.7	20.9	24.1	7.9	19.1	32.2	3.2	14.3	22.2	13.1	24.2	33.9
Effective Green, g (s)	9.7	20.9	24.1	7.9	19.1	32.2	3.2	14.3	22.2	13.1	24.2	33.9
Actuated g/C Ratio	0.13	0.27	0.32	0.10	0.25	0.42	0.04	0.19	0.29	0.17	0.32	0.44
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	432	925	555	336	878	744	110	639	554	557	1091	792
v/s Ratio Prot	0.07	0.08	0.00	0.04	c0.18	0.04	0.01	0.08	0.00	c0.11	0.17	c0.07
v/s Ratio Perm			0.01			0.08			0.01			0.21
v/c Ratio	0.54	0.30	0.02	0.41	0.73	0.25	0.18	0.40	0.04	0.62	0.53	0.55
Uniform Delay, d1	31.2	21.9	17.9	32.0	26.2	14.2	35.2	27.2	19.3	29.2	21.3	15.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.1	0.0	0.3	2.8	0.1	0.3	0.2	0.0	1.6	0.2	0.4
Delay (s)	31.8	21.9	17.9	32.3	29.0	14.3	35.5	27.3	19.4	30.8	21.6	15.9
Level of Service	C	C	B	C	C	B	D	C	B	C	C	B
Approach Delay (s)		26.0			25.2			26.2			21.3	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			23.7				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			76.2				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			68.0%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: NE 112th Ave & NE 16th St

Four Seasons South Subdivision
Year 2025 Total Traffic AM Peak Hour Conditions

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	30	275	1	17	663
Future Volume (Veh/h)	2	30	275	1	17	663
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	2	34	309	1	19	745
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						680
pX, platoon unblocked	0.87					
vC, conflicting volume	720	155			310	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	394	155			310	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			98	
cM capacity (veh/h)	507	869			1262	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	36	206	104	267	497	
Volume Left	2	0	0	19	0	
Volume Right	34	0	1	0	0	
cSH	836	1700	1700	1262	1700	
Volume to Capacity	0.04	0.12	0.06	0.02	0.29	
Queue Length 95th (ft)	3	0	0	1	0	
Control Delay (s)	9.5	0.0	0.0	0.7	0.0	
Lane LOS	A			A		
Approach Delay (s)	9.5	0.0		0.2		
Approach LOS	A					
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			39.8%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: NE 115th Ave & NE 16th St

Four Seasons South Subdivision
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 (veh/h)	6	3	5	1	8	1	4	0	1	2	0	12	
Future Volume (Veh/h)	6	3	5	1	8	1	4	0	1	2	0	12	
Sign Control	Free				Free				Stop		Stop		
Grade	0%				0%				0%		0%		
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	
Hourly flow rate (vph)	8	4	6	1	10	1	5	0	1	3	0	15	
Pedestrians													
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	11			10				50	36	7	36	38	10
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	11			10				50	36	7	36	38	10
tC, single (s)	4.1			4.3				7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)													
tF (s)	2.2			2.4				3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100				99	100	100	100	100	99
cM capacity (veh/h)	1621			1517				937	856	1081	969	853	1077
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	18	12	6	18									
Volume Left	8	1	5	3									
Volume Right	6	1	1	15									
cSH	1621	1517	958	1057									
Volume to Capacity	0.00	0.00	0.01	0.02									
Queue Length 95th (ft)	0	0	0	1									
Control Delay (s)	3.2	0.6	8.8	8.5									
Lane LOS	A	A	A	A									
Approach Delay (s)	3.2	0.6	8.8	8.5									
Approach LOS			A	A									
Intersection Summary													
Average Delay			5.0										
Intersection Capacity Utilization			13.3%		ICU Level of Service				A				
Analysis Period (min)			15										

HCM Unsignalized Intersection Capacity Analysis 4: NE 16th St & NE 118th Ave

Four Seasons South Subdivision
Year 2025 Total Traffic AM Peak Hour Conditions

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Yield	Yield		Yield	
Traffic Volume (vph)	8	0	1	24	5	5
Future Volume (vph)	8	0	1	24	5	5
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	10	0	1	30	6	6
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total (vph)	10	31	12			
Volume Left (vph)	10	0	6			
Volume Right (vph)	0	30	6			
Hadj (s)	0.20	-0.51	0.07			
Departure Headway (s)	4.2	3.4	4.1			
Degree Utilization, x	0.01	0.03	0.01			
Capacity (veh/h)	857	1042	867			
Control Delay (s)	7.2	6.5	7.1			
Approach Delay (s)	7.2	6.5	7.1			
Approach LOS	A	A	A			
Intersection Summary						
Delay			6.8			
Level of Service			A			
Intersection Capacity Utilization			16.6%	ICU Level of Service	A	
Analysis Period (min)			15			

Queues
5: NE 118th St & NE 18th St

Four Seasons South Subdivision
Year 2025 Total Traffic AM Peak Hour Conditions

	→	↙	←	↘	↗
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	691	13	999	22	15
v/c Ratio	0.26	0.02	0.34	0.08	0.06
Control Delay	4.4	2.1	2.9	16.4	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	4.4	2.1	2.9	16.4	10.3
Queue Length 50th (ft)	0	0	0	4	0
Queue Length 95th (ft)	102	5	84	21	12
Internal Link Dist (ft)	835		335	583	
Turn Bay Length (ft)		175		175	
Base Capacity (vph)	3373	896	3438	1731	1396
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.20	0.01	0.29	0.01	0.01
Intersection Summary					

HCM Signalized Intersection Capacity Analysis

5: NE 118th St & NE 18th St

Four Seasons South Subdivision
Year 2025 Total Traffic AM Peak Hour Conditions

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↘	↑↑	↘	↗
Traffic Volume (vph)	628	1	12	909	20	14
Future Volume (vph)	628	1	12	909	20	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0	5.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3372		1805	3438	1805	1455
Flt Permitted	1.00		0.39	1.00	0.95	1.00
Satd. Flow (perm)	3372		739	3438	1805	1455
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	690	1	13	999	22	15
RTOR Reduction (vph)	0	0	0	0	0	14
Lane Group Flow (vph)	691	0	13	999	22	1
Confl. Peds. (#/hr)		1	1		1	
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	7%	29%	0%	5%	0%	11%
Turn Type	NA		pm+pt	NA	Prot	Prot
Protected Phases	2		1	6	4	4
Permitted Phases			6			
Actuated Green, G (s)	27.5		33.3	33.3	2.4	2.4
Effective Green, g (s)	27.5		33.3	33.3	2.4	2.4
Actuated g/C Ratio	0.60		0.73	0.73	0.05	0.05
Clearance Time (s)	5.0		5.0	5.0	5.0	5.0
Vehicle Extension (s)	1.0		1.0	1.0	3.0	3.0
Lane Grp Cap (vph)	2029		557	2505	94	76
v/s Ratio Prot	0.20		0.00	c0.29	c0.01	0.00
v/s Ratio Perm			0.02			
v/c Ratio	0.34		0.02	0.40	0.23	0.01
Uniform Delay, d1	4.6		1.7	2.4	20.8	20.5
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0		0.0	0.0	1.3	0.1
Delay (s)	4.6		1.7	2.4	22.1	20.6
Level of Service	A		A	A	C	C
Approach Delay (s)	4.6			2.4	21.5	
Approach LOS	A			A	C	
Intersection Summary						
HCM 2000 Control Delay			3.7		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.45			
Actuated Cycle Length (s)			45.7		Sum of lost time (s)	15.0
Intersection Capacity Utilization			37.6%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Queues
6: NE 4 Seasons Ln & NE 18th St

Four Seasons South Subdivision
Year 2025 Total Traffic AM Peak Hour Conditions

						
Lane Group	EBL	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	65	612	1025	1	81	97
v/c Ratio	0.18	0.27	0.55	0.00	0.32	0.18
Control Delay	7.0	6.0	14.3	19.0	22.9	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	6.0	14.3	19.0	22.9	0.7
Queue Length 50th (ft)	5	30	114	0	19	0
Queue Length 95th (ft)	34	122	329	4	69	0
Internal Link Dist (ft)		696	835	313		373
Turn Bay Length (ft)	200				125	
Base Capacity (vph)	793	3141	2991	934	935	1179
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.19	0.34	0.00	0.09	0.08
Intersection Summary						

HCM Signalized Intersection Capacity Analysis

6: NE 4 Seasons Ln & NE 18th St

Four Seasons South Subdivision
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)	59	556	1	0	891	42	1	0	0	74	0	88
Future Volume (vph)	59	556	1	0	891	42	1	0	0	74	0	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0			5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95			0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00			1.00			1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00			1.00		1.00	1.00	
Frt	1.00	1.00			0.99			1.00		1.00	0.85	
Flt Protected	0.95	1.00			1.00			0.95		0.95	1.00	
Satd. Flow (prot)	1612	3405			3424			1805		1656	1538	
Flt Permitted	0.18	1.00			1.00			0.69		0.76	1.00	
Satd. Flow (perm)	297	3405			3424			1319		1320	1538	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	65	611	1	0	979	46	1	0	0	81	0	97
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	82	0
Lane Group Flow (vph)	65	612	0	0	1022	0	0	1	0	81	15	0
Confl. Peds. (#/hr)	1					1						
Heavy Vehicles (%)	12%	6%	0%	0%	4%	18%	0%	0%	0%	9%	0%	5%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	34.5	34.5			25.9			8.4		8.4	8.4	
Effective Green, g (s)	34.5	34.5			25.9			8.4		8.4	8.4	
Actuated g/C Ratio	0.65	0.65			0.49			0.16		0.16	0.16	
Clearance Time (s)	5.0	5.0			5.0			5.0		5.0	5.0	
Vehicle Extension (s)	1.0	1.0			1.0			1.0		1.0	1.0	
Lane Grp Cap (vph)	283	2220			1676			209		209	244	
v/s Ratio Prot	0.02	c0.18			c0.30						0.01	
v/s Ratio Perm	0.13							0.00		c0.06		
v/c Ratio	0.23	0.28			0.61			0.00		0.39	0.06	
Uniform Delay, d1	4.8	3.9			9.8			18.7		19.9	18.9	
Progression Factor	1.00	1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.0			0.5			0.0		0.4	0.0	
Delay (s)	4.9	3.9			10.3			18.7		20.4	18.9	
Level of Service	A	A			B			B		C	B	
Approach Delay (s)		4.0			10.3			18.7			19.6	
Approach LOS		A			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			8.9			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			52.9			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			48.1%			ICU Level of Service			A			
Analysis Period (min)			15									

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

7: NE 16th St & Site Access West

Four Seasons South Subdivision
Year 2025 Total Traffic AM Peak Hour Conditions

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	13	23	1	1	9
Future Volume (Veh/h)	5	13	23	1	1	9
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	6	16	29	1	1	11
Pedestrians						
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	30				58	30
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	30				58	30
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1596				951	1051
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	22	30	12			
Volume Left	6	0	1			
Volume Right	0	1	11			
cSH	1596	1700	1042			
Volume to Capacity	0.00	0.02	0.01			
Queue Length 95th (ft)	0	0	1			
Control Delay (s)	2.0	0.0	8.5			
Lane LOS	A		A			
Approach Delay (s)	2.0	0.0	8.5			
Approach LOS			A			
Intersection Summary						
Average Delay			2.3			
Intersection Capacity Utilization		15.1%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis 8: NE 16th St & Site Access East

Four Seasons South Subdivision
Year 2025 Total Traffic AM Peak Hour Conditions

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	5	4	1	2	1
Future Volume (Veh/h)	1	5	4	1	2	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	1	6	5	1	3	1
Pedestrians						
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	6				14	6
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	6				14	6
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1628				1010	1083
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	7	6	4			
Volume Left	1	0	3			
Volume Right	0	1	1			
cSH	1628	1700	1028			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	1.0	0.0	8.5			
Lane LOS	A		A			
Approach Delay (s)	1.0	0.0	8.5			
Approach LOS			A			
Intersection Summary						
Average Delay			2.4			
Intersection Capacity Utilization			13.3%	ICU Level of Service		A
Analysis Period (min)			15			

Queues

1: NE 112th Ave & NE 18th St

Four Seasons South Subdivision

Year 2025 Total Traffic PM Peak Hour Conditions

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	512	767	28	105	391	332	42	529	213	448	462	369
v/c Ratio	0.67	0.74	0.04	0.41	0.69	0.51	0.23	0.76	0.36	0.75	0.38	0.33
Control Delay	39.9	35.0	0.1	48.3	43.9	20.0	48.3	43.0	15.0	44.3	24.1	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.9	35.0	0.1	48.3	43.9	20.0	48.3	43.0	15.0	44.3	24.1	1.9
Queue Length 50th (ft)	136	202	0	29	111	114	11	148	48	124	106	2
Queue Length 95th (ft)	#272	346	0	66	188	214	34	244	121	209	166	38
Internal Link Dist (ft)		626			696			600			768	
Turn Bay Length (ft)	250		200	350		175	350		180	380		150
Base Capacity (vph)	764	1327	894	728	1379	870	592	1339	800	1093	1739	1112
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.58	0.03	0.14	0.28	0.38	0.07	0.40	0.27	0.41	0.27	0.33

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

1: NE 112th Ave & NE 18th St

Four Seasons South Subdivision

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)	502	752	27	103	383	325	41	518	209	439	453	362
Future Volume (vph)	502	752	27	103	383	325	41	518	209	439	453	362
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3400	3374	1455	3242	3505	1524	2633	3406	1553	3242	3438	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3400	3374	1455	3242	3505	1524	2633	3406	1553	3242	3438	1553
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	512	767	28	105	391	332	42	529	213	448	462	369
RTOR Reduction (vph)	0	0	18	0	0	36	0	0	66	0	0	155
Lane Group Flow (vph)	512	767	10	105	391	296	42	529	147	448	462	214
Heavy Vehicles (%)	3%	7%	11%	8%	3%	6%	33%	6%	4%	8%	5%	4%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	7	1	6	3	7	4	1	3	8	5
Permitted Phases			2			6			4			8
Actuated Green, G (s)	20.5	28.0	32.8	7.2	14.7	31.6	4.8	19.7	26.9	16.9	31.8	52.3
Effective Green, g (s)	20.5	28.0	32.8	7.2	14.7	31.6	4.8	19.7	26.9	16.9	31.8	52.3
Actuated g/C Ratio	0.22	0.31	0.36	0.08	0.16	0.34	0.05	0.21	0.29	0.18	0.35	0.57
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	759	1029	599	254	561	607	137	730	539	596	1190	969
v/s Ratio Prot	c0.15	c0.23	0.00	0.03	0.11	0.09	0.02	c0.16	0.02	c0.14	0.13	0.05
v/s Ratio Perm			0.01			0.10			0.07			0.09
v/c Ratio	0.67	0.75	0.02	0.41	0.70	0.49	0.31	0.72	0.27	0.75	0.39	0.22
Uniform Delay, d1	32.6	28.7	19.1	40.3	36.4	23.7	41.9	33.5	24.9	35.5	22.7	9.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	2.6	0.0	0.4	3.0	0.2	0.5	3.0	0.1	4.7	0.1	0.0
Delay (s)	34.5	31.3	19.1	40.7	39.5	23.9	42.4	36.6	25.0	40.2	22.7	9.8
Level of Service	C	C	B	D	D	C	D	D	C	D	C	A
Approach Delay (s)		32.3			33.4			33.7			25.1	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			30.6				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			91.8				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			69.3%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: NE 112th Ave & NE 16th St

Four Seasons South Subdivision
Year 2025 Total Traffic PM Peak Hour Conditions

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	22	754	1	28	551
Future Volume (Veh/h)	2	22	754	1	28	551
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	2	22	769	1	29	562
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						680
pX, platoon unblocked	0.91					
vC, conflicting volume	1108	385			770	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	928	385			770	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	96			97	
cM capacity (veh/h)	238	619			854	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	24	513	257	216	375	
Volume Left	2	0	0	29	0	
Volume Right	22	0	1	0	0	
cSH	546	1700	1700	854	1700	
Volume to Capacity	0.04	0.30	0.15	0.03	0.22	
Queue Length 95th (ft)	3	0	0	3	0	
Control Delay (s)	11.9	0.0	0.0	1.6	0.0	
Lane LOS	B			A		
Approach Delay (s)	11.9	0.0		0.6		
Approach LOS	B					
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			46.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: NE 115th Ave & NE 16th St

Four Seasons South Subdivision
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 (veh/h)	9	11	3	1	13	2	3	0	1	1	0	5	
Future Volume (Veh/h)	9	11	3	1	13	2	3	0	1	1	0	5	
Sign Control	Free			Free			Stop			Stop			
Grade	0%			0%			0%			0%			
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	
Hourly flow rate (vph)	11	14	4	1	16	3	4	0	1	1	0	6	
Pedestrians													
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	19				18			64	59	16	58	60	18
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	19				18			64	59	16	58	60	18
tC, single (s)	4.1				4.3			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)													
tF (s)	2.2				2.4			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99				100			100	100	100	100	100	99
cM capacity (veh/h)	1611				1506			925	830	1069	937	829	1067
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	29	20	5	7									
Volume Left	11	1	4	1									
Volume Right	4	3	1	6									
cSH	1611	1506	951	1046									
Volume to Capacity	0.01	0.00	0.01	0.01									
Queue Length 95th (ft)	1	0	0	1									
Control Delay (s)	2.8	0.4	8.8	8.5									
Lane LOS	A	A	A	A									
Approach Delay (s)	2.8	0.4	8.8	8.5									
Approach LOS				A	A								
Intersection Summary													
Average Delay				3.1									
Intersection Capacity Utilization				14.2%	ICU Level of Service				A				
Analysis Period (min)				15									

HCM Unsignalized Intersection Capacity Analysis 4: NE 16th St & NE 118th Ave

Four Seasons South Subdivision
Year 2025 Total Traffic PM Peak Hour Conditions

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Yield	Yield		Yield	
Traffic Volume (vph)	6	0	0	22	35	7
Future Volume (vph)	6	0	0	22	35	7
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	8	0	0	28	44	9
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total (vph)	8	28	53			
Volume Left (vph)	8	0	44			
Volume Right (vph)	0	28	9			
Hadj (s)	0.20	-0.53	0.38			
Departure Headway (s)	4.2	3.5	4.4			
Degree Utilization, x	0.01	0.03	0.06			
Capacity (veh/h)	830	1007	810			
Control Delay (s)	7.3	6.6	7.6			
Approach Delay (s)	7.3	6.6	7.6			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.3			
Level of Service			A			
Intersection Capacity Utilization			15.0%	ICU Level of Service	A	
Analysis Period (min)			15			

Queues
5: NE 118th St & NE 18th St

Four Seasons South Subdivision
Year 2025 Total Traffic PM Peak Hour Conditions

	→	↘	←	↙	↗
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1406	27	860	8	23
v/c Ratio	0.51	0.07	0.28	0.03	0.11
Control Delay	6.3	2.8	1.9	24.0	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.3	2.8	1.9	24.0	13.3
Queue Length 50th (ft)	0	1	0	2	0
Queue Length 95th (ft)	262	7	66	14	18
Internal Link Dist (ft)	835		335	583	
Turn Bay Length (ft)		175		175	
Base Capacity (vph)	3148	589	3438	1518	1227
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.45	0.05	0.25	0.01	0.02
Intersection Summary					

HCM Signalized Intersection Capacity Analysis

5: NE 118th St & NE 18th St

Four Seasons South Subdivision
Year 2025 Total Traffic PM Peak Hour Conditions

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↘	↑↑	↘	↗
Traffic Volume (vph)	1286	21	25	800	7	21
Future Volume (vph)	1286	21	25	800	7	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0	5.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3353		1805	3438	1805	1455
Flt Permitted	1.00		0.15	1.00	0.95	1.00
Satd. Flow (perm)	3353		290	3438	1805	1455
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	1383	23	27	860	8	23
RTOR Reduction (vph)	1	0	0	0	0	22
Lane Group Flow (vph)	1405	0	27	860	8	1
Confl. Peds. (#/hr)		1	1		1	
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	7%	29%	0%	5%	0%	11%
Turn Type	NA		pm+pt	NA	Prot	Prot
Protected Phases	2		1	6	4	4
Permitted Phases			6			
Actuated Green, G (s)	35.0		41.5	41.5	2.1	2.1
Effective Green, g (s)	35.0		41.5	41.5	2.1	2.1
Actuated g/C Ratio	0.65		0.77	0.77	0.04	0.04
Clearance Time (s)	5.0		5.0	5.0	5.0	5.0
Vehicle Extension (s)	1.0		1.0	1.0	3.0	3.0
Lane Grp Cap (vph)	2189		266	2661	70	57
v/s Ratio Prot	c0.42		0.00	c0.25	c0.00	0.00
v/s Ratio Perm			0.08			
v/c Ratio	0.64		0.10	0.32	0.11	0.02
Uniform Delay, d1	5.6		4.1	1.8	24.9	24.8
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5		0.1	0.0	0.7	0.1
Delay (s)	6.0		4.1	1.8	25.6	24.9
Level of Service	A		A	A	C	C
Approach Delay (s)	6.0			1.9	25.1	
Approach LOS	A			A	C	
Intersection Summary						
HCM 2000 Control Delay			4.7		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.62			
Actuated Cycle Length (s)			53.6		Sum of lost time (s)	15.0
Intersection Capacity Utilization			48.7%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Queues
6: NE 4 Seasons Ln & NE 18th St

Four Seasons South Subdivision
Year 2025 Total Traffic PM Peak Hour Conditions

							
Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	179	1312	1	861	1	81	80
v/c Ratio	0.38	0.56	0.00	0.51	0.00	0.33	0.14
Control Delay	7.8	9.7	7.0	15.4	0.0	26.3	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.8	9.7	7.0	15.4	0.0	26.3	0.5
Queue Length 50th (ft)	15	86	0	102	0	20	0
Queue Length 95th (ft)	78	423	2	272	0	78	0
Internal Link Dist (ft)		696		835	313		373
Turn Bay Length (ft)	200		175			125	
Base Capacity (vph)	802	3100	538	2873	1129	847	1107
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.42	0.00	0.30	0.00	0.10	0.07
Intersection Summary							

HCM Signalized Intersection Capacity Analysis

6: NE 4 Seasons Ln & NE 18th St

Four Seasons South Subdivision
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)	168	1233	0	1	736	73	0	0	1	76	0	75
Future Volume (vph)	168	1233	0	1	736	73	0	0	1	76	0	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	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	
Frt	1.00	1.00		1.00	0.99			0.86		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1612	3406		1805	3376			1644		1656	1538	
Flt Permitted	0.23	1.00		0.19	1.00			1.00		0.76	1.00	
Satd. Flow (perm)	388	3406		358	3376			1644		1320	1538	
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)	179	1312	0	1	783	78	0	0	1	81	0	80
RTOR Reduction (vph)	0	0	0	0	6	0	0	1	0	0	69	0
Lane Group Flow (vph)	179	1312	0	1	855	0	0	0	0	81	11	0
Confl. Peds. (#/hr)	1					1						
Heavy Vehicles (%)	12%	6%	0%	0%	4%	18%	0%	0%	0%	9%	0%	5%
Turn Type	pm+pt	NA		pm+pt	NA			NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	40.5	35.0		28.8	28.3			7.9		7.9	7.9	
Effective Green, g (s)	40.5	35.0		28.8	28.3			7.9		7.9	7.9	
Actuated g/C Ratio	0.69	0.60		0.49	0.48			0.14		0.14	0.14	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Vehicle Extension (s)	1.0	1.0		1.0	1.0			1.0		1.0	1.0	
Lane Grp Cap (vph)	419	2041		188	1635			222		178	208	
v/s Ratio Prot	c0.05	c0.39		0.00	0.25			0.00			0.01	
v/s Ratio Perm	0.24			0.00						c0.06		
v/c Ratio	0.43	0.64		0.01	0.52			0.00		0.46	0.05	
Uniform Delay, d1	4.4	7.6		7.6	10.4			21.8		23.3	22.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.5		0.0	0.1			0.0		0.7	0.0	
Delay (s)	4.6	8.2		7.6	10.5			21.8		23.9	22.0	
Level of Service	A	A		A	B			C		C	C	
Approach Delay (s)		7.7			10.5			21.8			23.0	
Approach LOS		A			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			9.7			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			58.4			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			61.6%			ICU Level of Service			B			
Analysis Period (min)			15									

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

7: NE 16th St & Site Access West

Four Seasons South Subdivision
Year 2025 Total Traffic PM Peak Hour Conditions

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	22	20	1	1	4
Future Volume (Veh/h)	7	22	20	1	1	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	9	28	25	1	1	5
Pedestrians						
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	26				72	26
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	26				72	26
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	100
cM capacity (veh/h)	1601				932	1056
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	37	26	6			
Volume Left	9	0	1			
Volume Right	0	1	5			
cSH	1601	1700	1033			
Volume to Capacity	0.01	0.02	0.01			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	1.8	0.0	8.5			
Lane LOS	A		A			
Approach Delay (s)	1.8	0.0	8.5			
Approach LOS			A			
Intersection Summary						
Average Delay			1.7			
Intersection Capacity Utilization			17.3%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 8: NE 16th St & Site Access East

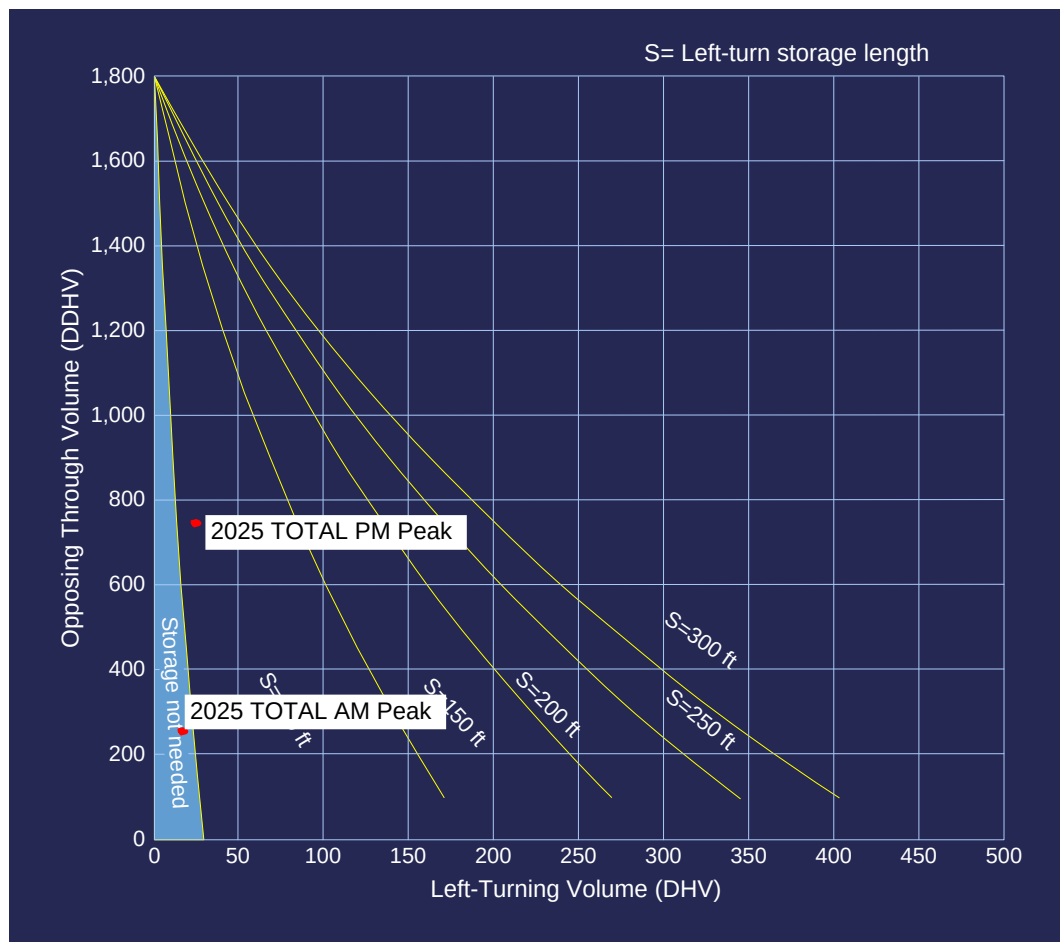
Four Seasons South Subdivision
Year 2025 Total Traffic PM Peak Hour Conditions

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	4	5	1	1	1
Future Volume (Veh/h)	1	4	5	1	1	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	1	5	6	1	1	1
Pedestrians						
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	7				14	6
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	7				14	6
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1627				1010	1082
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	6	7	2			
Volume Left	1	0	1			
Volume Right	0	1	1			
cSH	1627	1700	1045			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	1.2	0.0	8.5			
Lane LOS	A		A			
Approach Delay (s)	1.2	0.0	8.5			
Approach LOS			A			
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization			13.3%	ICU Level of Service	A	
Analysis Period (min)			15			

Appendix G WSDOT Crash Data

Appendix H Left-turn Lane Warrant

Exhibit 1310-7b Left-Turn Storage Guidelines: Four-Lane, Unsignalized



Determine the storage length on two-lane highways by using [Exhibits 1310-8a](#) through [8c](#). On four-lane highways, use [Exhibit 1310-7b](#). These lengths do not consider trucks. Use [Exhibit 1310-9](#) for storage length when trucks are present.

Use turn simulation software (such as AutoTURN®) to verify that left-turn movements for the design vehicle(s) do not have conflicts. Design opposing left-turn design vehicle paths with a minimum 4-foot (12-foot desirable) clearance between opposing turning paths.

Where one-way left-turn channelization with curbing is to be provided, evaluate surface water runoff and design additional drainage facilities if needed to control the runoff.

Provide illumination at left-turn lanes in accordance with the guidelines in [Chapter 1040](#).

Appendix I Signal Warrant Analysis Worksheets



KITTELSON & ASSOCIATES, INC.
610 SW Alder, Suite 700
Portland, Oregon 97205
(503) 228-5230

Project #: 22152
Project Name: Four Seasons South
Analyst: CKD
Date: 10/17/2018
File: #N/A
Intersection: NE 16th & NE 112th Ave
Scenario: 2025 Total AM

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	-

Analysis Traffic Volumes

Hour	Begin	End	Major Street		Minor Street	
			NB	SB	EB	WB
7:15 AM	8:15 AM		276	680	0	32
2nd Highest Hour			258	636	0	30
3rd Highest Hour			254	627	0	30
4th Highest Hour			247	609	0	29
5th Highest Hour			226	556	0	28
6th Highest Hour			222	548	0	28
7th Highest Hour			208	512	0	27
8th Highest Hour			194	477	0	26
9th Highest Hour			194	477	0	26
10th Highest Hour			190	468	0	24
11th Highest Hour			179	442	0	23
12th Highest Hour			168	415	0	23
13th Highest Hour			165	406	0	22
14th Highest Hour			158	389	0	19
15th Highest Hour			125	309	0	15
16th Highest Hour			118	291	0	14
17th Highest Hour			108	265	0	10
18th Highest Hour			93	230	0	8
19th Highest Hour			75	185	0	4
20th Highest Hour			36	88	0	3
21st Highest Hour			32	79	0	3
22nd Highest Hour			22	53	0	2
23rd Highest Hour			18	44	0	1
24th Highest Hour			18	44	0	1

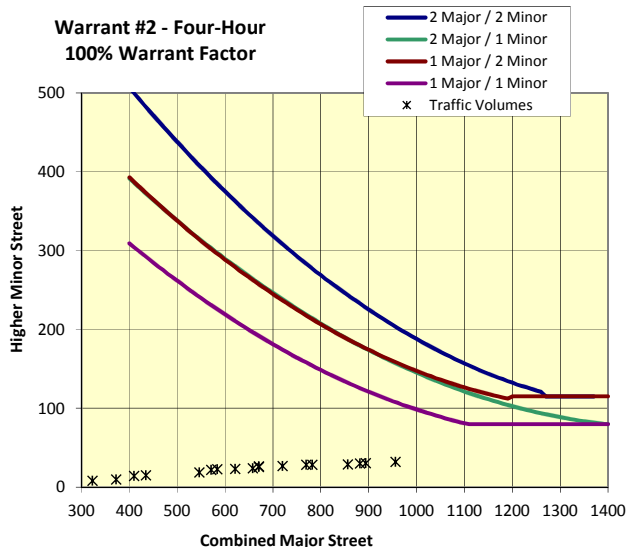
Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	2
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	89%
Minor Street: 8th-Highest Hour / Peak Hour	83%

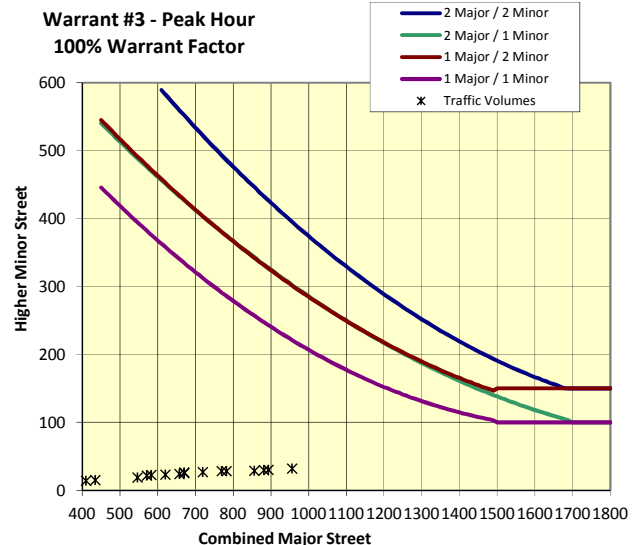
Warrant #1 - Eight Hour

Warrant Factor	Condition	Major Street Requirement	Minor Street Requirement	Hours That Condition Is Met	Condition for Warrant Factor Met?	Signal Warrant Met?
100%	A	600	150	0	No	No
	B	900	75	0	No	No
80%	A	480	120	0	No	No
	B	720	60	0	No	No
70%	A	420	105	0	No	No
	B	630	53	0	No	No
56%	A	336	84	0	No	No
	B	504	42	0	No	No

Warrant #2 - Four-Hour 100% Warrant Factor



Warrant #3 - Peak Hour 100% Warrant Factor





KITTELSON & ASSOCIATES, INC.
 610 SW Alder, Suite 700
 Portland, Oregon 97205
 (503) 228-5230

Project #: 22152
Project Name: Four Seasons South
Analyst: CKD
Date: 10/17/2018
File: H:\22\22152 - Four Seasons South
 Subdivision\excel\September 2018 TIA files\Signal
 Warrant files\Signal Warrant Analysis 16th and
Intersection: NE 16th & NE 112th Ave
Scenario: 2025 Total PM

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 =	2
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	89%
Minor Street: 8th-Highest Hour / Peak Hour	83%

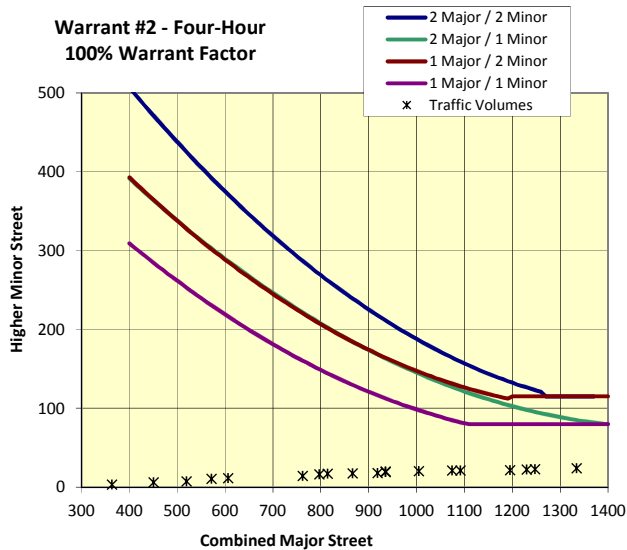
Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	NB	SB	EB	WB
4:35 PM	5:35 PM	755	579	0	24
2nd Highest Hour		706	541	0	23
3rd Highest Hour		696	534	0	22
4th Highest Hour		677	519	0	21
5th Highest Hour		618	474	0	21
6th Highest Hour		608	466	0	21
7th Highest Hour		569	436	0	20
8th Highest Hour		529	406	0	20
9th Highest Hour		529	406	0	19
10th Highest Hour		520	399	0	18
11th Highest Hour		490	376	0	17
12th Highest Hour		461	353	0	17
13th Highest Hour		451	346	0	16
14th Highest Hour		431	331	0	14
15th Highest Hour		343	263	0	11
16th Highest Hour		324	248	0	11
17th Highest Hour		294	226	0	7
18th Highest Hour		255	196	0	6
19th Highest Hour		206	158	0	3
20th Highest Hour		98	75	0	2
21st Highest Hour		88	68	0	2
22nd Highest Hour		59	45	0	1
23rd Highest Hour		49	38	0	1
24th Highest Hour		49	38	0	1

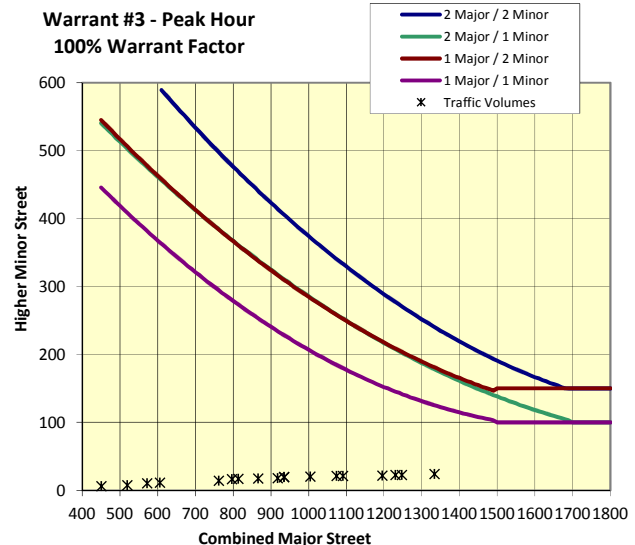
Warrant #1 - Eight Hour

Warrant Factor	Condition	Major Street Requirement	Minor Street Requirement	Hours That Condition Is Met	Condition for Warrant Factor Met?	Signal Warrant Met?
100%	A	600	150	0	No	No
	B	900	75	0	No	No
80%	A	480	120	0	No	No
	B	720	60	0	No	No
70%	A	420	105	0	No	No
	B	630	53	0	No	No
56%	A	336	84	0	No	No
	B	504	42	0	No	No

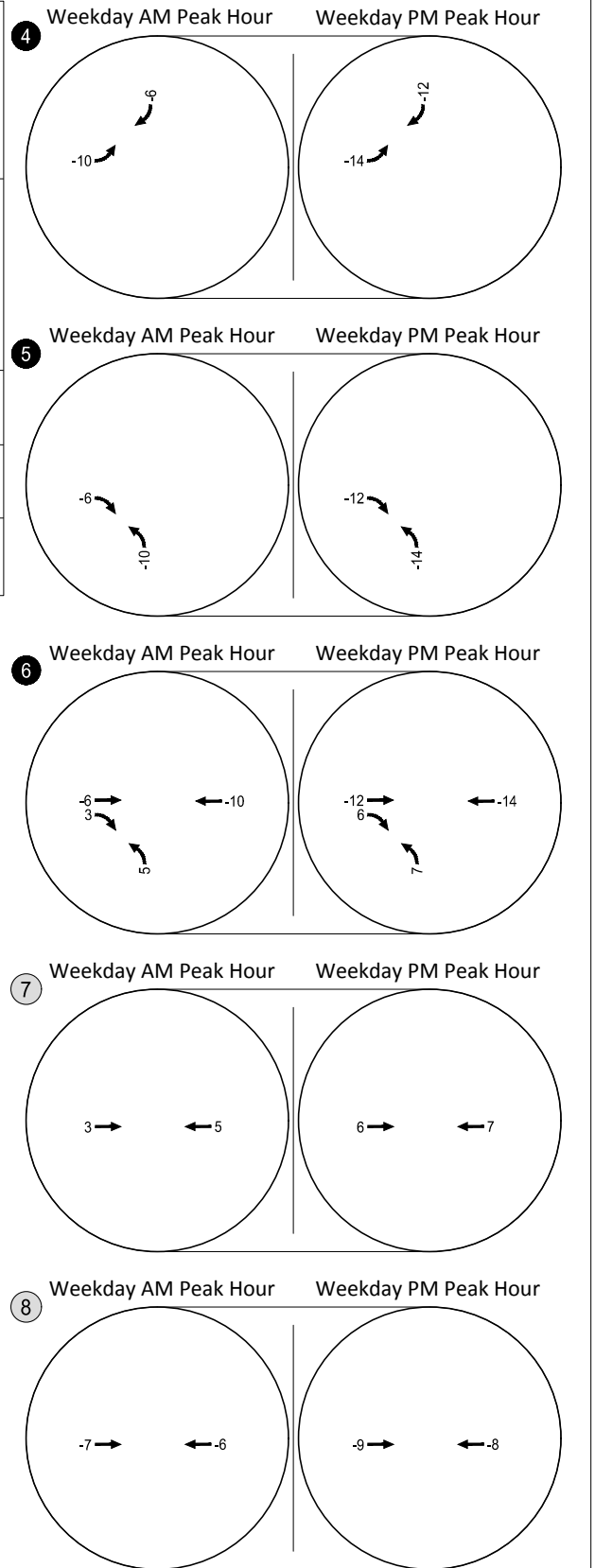
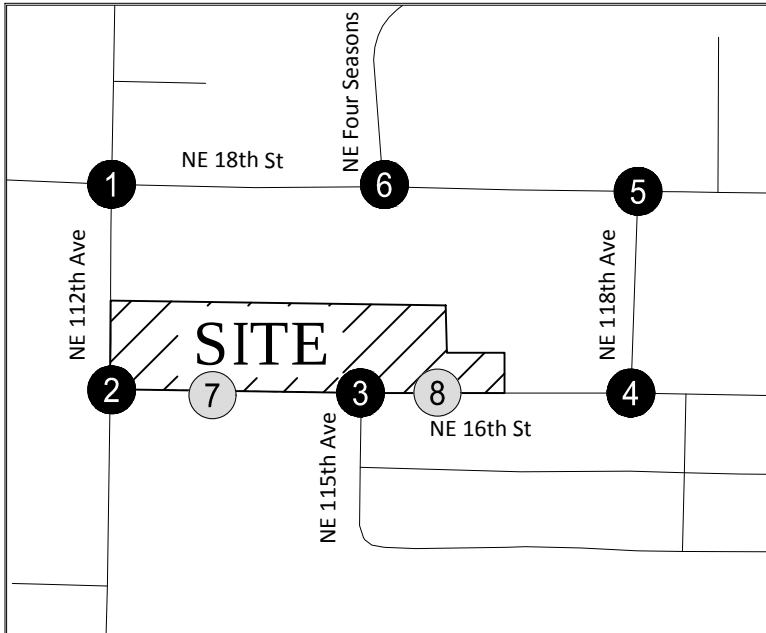
Warrant #2 - Four-Hour 100% Warrant Factor



Warrant #3 - Peak Hour 100% Warrant Factor



Appendix J 2020 With Site Operations
Worksheets – North Access
Scenario



LEGEND

- # - Study Intersections
- # - Site Access Intersections

**North Access Scenerio - Redistributed Trips
Weekday AM and PM Peak Hour
Vancouver, Washington**

**Figure
J-1**

Queues

1: NE 112th Ave & NE 18th St

Four Seasons South Subdivision

Year 2020 North Access Total Traffic AM Peak Hour Conditions

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	217	261	26	129	606	302	13	231	66	328	530	584
v/c Ratio	0.50	0.29	0.04	0.37	0.71	0.34	0.05	0.44	0.11	0.59	0.49	0.59
Control Delay	36.1	22.9	0.1	37.5	30.9	3.8	39.3	31.2	2.6	34.2	23.2	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.1	22.9	0.1	37.5	30.9	3.8	39.3	31.2	2.6	34.2	23.2	7.5
Queue Length 50th (ft)	43	43	0	25	118	8	2	46	0	64	104	52
Queue Length 95th (ft)	107	104	0	71	250	57	14	100	14	148	185	162
Internal Link Dist (ft)		626			696			600			768	
Turn Bay Length (ft)	250		200	350		175	350		180	380		150
Base Capacity (vph)	1021	1773	968	974	1842	1234	791	1790	868	1461	2323	1193
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.15	0.03	0.13	0.33	0.24	0.02	0.13	0.08	0.22	0.23	0.49

Intersection Summary

HCM Signalized Intersection Capacity Analysis

1: NE 112th Ave & NE 18th St

Four Seasons South Subdivision

Year 2020 North Access Total Traffic AM Peak Hour Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	193	232	23	115	539	269	12	206	59	292	472	520
Future Volume (vph)	193	232	23	115	539	269	12	206	59	292	472	520
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3400	3374	1455	3242	3505	1524	2633	3406	1553	3242	3438	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3400	3374	1455	3242	3505	1524	2633	3406	1553	3242	3438	1553
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	217	261	26	129	606	302	13	231	66	328	530	584
RTOR Reduction (vph)	0	0	18	0	0	156	0	0	47	0	0	213
Lane Group Flow (vph)	217	261	8	129	606	146	13	231	19	328	530	371
Heavy Vehicles (%)	3%	7%	11%	8%	3%	6%	33%	6%	4%	8%	5%	4%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	7	1	6	3	7	4	1	3	8	5
Permitted Phases			2			6			4			8
Actuated Green, G (s)	9.1	18.9	22.1	7.5	17.3	29.4	3.2	13.6	21.1	12.1	22.5	31.6
Effective Green, g (s)	9.1	18.9	22.1	7.5	17.3	29.4	3.2	13.6	21.1	12.1	22.5	31.6
Actuated g/C Ratio	0.13	0.26	0.31	0.10	0.24	0.41	0.04	0.19	0.29	0.17	0.31	0.44
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	429	884	546	337	841	727	116	642	562	544	1072	788
v/s Ratio Prot	0.06	0.08	0.00	0.04	c0.17	0.03	0.00	0.07	0.00	c0.10	0.15	c0.06
v/s Ratio Perm			0.00			0.06			0.01			0.18
v/c Ratio	0.51	0.30	0.01	0.38	0.72	0.20	0.11	0.36	0.03	0.60	0.49	0.47
Uniform Delay, d1	29.4	21.3	17.4	30.1	25.2	13.8	33.1	25.5	18.2	27.8	20.2	14.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.1	0.0	0.3	2.6	0.0	0.2	0.1	0.0	1.3	0.1	0.2
Delay (s)	29.7	21.3	17.4	30.4	27.8	13.8	33.2	25.6	18.2	29.1	20.3	14.5
Level of Service	C	C	B	C	C	B	C	C	B	C	C	B
Approach Delay (s)	24.8					24.0		24.3		19.9		
Approach LOS	C					C		C		B		
Intersection Summary												
HCM 2000 Control Delay			22.4		HCM 2000 Level of Service				C			
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			72.1		Sum of lost time (s)				20.0			
Intersection Capacity Utilization			64.6%		ICU Level of Service				C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: NE 112th Ave & NE 16th St

Four Seasons South Subdivision
Year 2020 North Access Total Traffic AM Peak Hour Conditions

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	17	255	1	7	617
Future Volume (Veh/h)	2	17	255	1	7	617
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	2	19	287	1	8	693
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						680
pX, platoon unblocked	0.89					
vC, conflicting volume	650	144			288	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	364	144			288	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	98			99	
cM capacity (veh/h)	544	884			1286	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	21	191	97	239	462	
Volume Left	2	0	0	8	0	
Volume Right	19	0	1	0	0	
cSH	834	1700	1700	1286	1700	
Volume to Capacity	0.03	0.11	0.06	0.01	0.27	
Queue Length 95th (ft)	2	0	0	0	0	
Control Delay (s)	9.4	0.0	0.0	0.3	0.0	
Lane LOS	A			A		
Approach Delay (s)	9.4	0.0		0.1		
Approach LOS	A					
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			32.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: NE 115th Ave & NE 16th St

Four Seasons South Subdivision

Year 2020 North Access Total Traffic AM Peak Hour Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	1	2	1	4	4	2	2	1	0	3	7
Future Volume (Veh/h)	3	1	2	1	4	4	2	2	1	0	3	7
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	4	1	3	1	5	5	3	3	1	0	4	9
Pedestrians												
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	10			4			31	22	2	22	22	8
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	10			4			31	22	2	22	22	8
tC, single (s)	4.1			4.3			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.4			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	99
cM capacity (veh/h)	1623			1525			968	872	1087	989	873	1081
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	8	11	7	13								
Volume Left	4	1	3	0								
Volume Right	3	5	1	9								
cSH	1623	1525	939	1007								
Volume to Capacity	0.00	0.00	0.01	0.01								
Queue Length 95th (ft)	0	0	1	1								
Control Delay (s)	3.6	0.7	8.9	8.6								
Lane LOS	A	A	A	A								
Approach Delay (s)	3.6	0.7	8.9	8.6								
Approach LOS			A	A								
Intersection Summary												
Average Delay				5.4								
Intersection Capacity Utilization				13.3%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

4: NE 16th St & NE 118th Ave

Four Seasons South Subdivision
Year 2020 North Access Total Traffic AM Peak Hour Conditions

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Yield	Yield		Yield	
Traffic Volume (vph)	4	0	1	24	5	4
Future Volume (vph)	4	0	1	24	5	4
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	5	0	1	30	6	5
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total (vph)	5	31	11			
Volume Left (vph)	5	0	6			
Volume Right (vph)	0	30	5			
Hadj (s)	0.20	-0.51	0.11			
Departure Headway (s)	4.1	3.4	4.1			
Degree Utilization, x	0.01	0.03	0.01			
Capacity (veh/h)	858	1045	862			
Control Delay (s)	7.2	6.5	7.1			
Approach Delay (s)	7.2	6.5	7.1			
Approach LOS	A	A	A			
Intersection Summary						
Delay			6.7			
Level of Service			A			
Intersection Capacity Utilization			13.7%	ICU Level of Service	A	
Analysis Period (min)			15			

Queues

5: NE 118th St & NE 18th St

Four Seasons South Subdivision

Year 2020 North Access Total Traffic AM Peak Hour Conditions

	→	↖	←	↗	
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	648	12	930	22	11
v/c Ratio	0.24	0.02	0.32	0.08	0.05
Control Delay	4.2	2.1	2.7	16.9	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	4.2	2.1	2.7	16.9	10.9
Queue Length 50th (ft)	0	0	0	4	0
Queue Length 95th (ft)	94	4	76	21	11
Internal Link Dist (ft)	835		335	583	
Turn Bay Length (ft)		175		175	
Base Capacity (vph)	3373	913	3438	1718	1386
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.19	0.01	0.27	0.01	0.01
Intersection Summary					

HCM Signalized Intersection Capacity Analysis

5: NE 118th St & NE 18th St

Four Seasons South Subdivision

Year 2020 North Access Total Traffic AM Peak Hour Conditions

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↘	↑↑	↘	↗
Traffic Volume (vph)	589	1	11	846	20	10
Future Volume (vph)	589	1	11	846	20	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0	5.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3372		1805	3438	1805	1455
Flt Permitted	1.00		0.41	1.00	0.95	1.00
Satd. Flow (perm)	3372		771	3438	1805	1455
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	647	1	12	930	22	11
RTOR Reduction (vph)	0	0	0	0	0	10
Lane Group Flow (vph)	648	0	12	930	22	1
Confl. Peds. (#/hr)		1	1		1	
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	7%	29%	0%	5%	0%	11%
Turn Type	NA		pm+pt	NA	Prot	Prot
Protected Phases	2		1	6	4	4
Permitted Phases			6			
Actuated Green, G (s)	28.1		33.9	33.9	2.3	2.3
Effective Green, g (s)	28.1		33.9	33.9	2.3	2.3
Actuated g/C Ratio	0.61		0.73	0.73	0.05	0.05
Clearance Time (s)	5.0		5.0	5.0	5.0	5.0
Vehicle Extension (s)	1.0		1.0	1.0	3.0	3.0
Lane Grp Cap (vph)	2050		583	2522	89	72
v/s Ratio Prot	0.19		0.00	c0.27	c0.01	0.00
v/s Ratio Perm			0.01			
v/c Ratio	0.32		0.02	0.37	0.25	0.01
Uniform Delay, d1	4.4		1.7	2.2	21.1	20.9
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0		0.0	0.0	1.5	0.0
Delay (s)	4.4		1.7	2.3	22.6	20.9
Level of Service	A		A	A	C	C
Approach Delay (s)	4.4			2.3	22.0	
Approach LOS	A			A	C	
Intersection Summary						
HCM 2000 Control Delay			3.5		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.42			
Actuated Cycle Length (s)			46.2		Sum of lost time (s)	15.0
Intersection Capacity Utilization			35.9%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Queues

6: NE 4 Seasons Ln & NE 18th St

Four Seasons South Subdivision

Year 2020 North Access Total Traffic AM Peak Hour Conditions

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	62	579	1	952	15	4	77	91
v/c Ratio	0.16	0.27	0.00	0.52	0.06	0.01	0.30	0.16
Control Delay	7.0	8.0	7.0	13.9	18.1	0.0	21.0	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	8.0	7.0	13.9	18.1	0.0	21.0	0.6
Queue Length 50th (ft)	5	27	0	100	3	0	17	0
Queue Length 95th (ft)	33	151	3	293	18	0	60	0
Internal Link Dist (ft)		696		835		313		373
Turn Bay Length (ft)	200		175		125		125	
Base Capacity (vph)	824	3163	734	3051	968	1284	960	1207
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.18	0.00	0.31	0.02	0.00	0.08	0.08
Intersection Summary								

HCM Signalized Intersection Capacity Analysis

6: NE 4 Seasons Ln & NE 18th St

Four Seasons South Subdivision

Year 2020 North Access Total Traffic AM Peak Hour Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	516	11	1	827	39	14	0	4	70	0	83
Future Volume (vph)	56	516	11	1	827	39	14	0	4	70	0	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1612	3399		1805	3424		1805	1615		1656	1538	
Flt Permitted	0.22	1.00		0.43	1.00		0.70	1.00		0.76	1.00	
Satd. Flow (perm)	371	3399		824	3424		1326	1615		1316	1538	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	62	567	12	1	909	43	15	0	4	77	0	91
RTOR Reduction (vph)	0	1	0	0	3	0	0	3	0	0	77	0
Lane Group Flow (vph)	62	578	0	1	949	0	15	1	0	77	14	0
Confl. Peds. (#/hr)	1					1						
Heavy Vehicles (%)	12%	6%	0%	0%	4%	18%	0%	0%	0%	9%	0%	5%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	32.4	29.1		27.0	26.4		8.2	8.2		8.2	8.2	
Effective Green, g (s)	32.4	29.1		27.0	26.4		8.2	8.2		8.2	8.2	
Actuated g/C Ratio	0.61	0.55		0.51	0.50		0.16	0.16		0.16	0.16	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	304	1869		431	1708		205	250		203	238	
v/s Ratio Prot	c0.01	c0.17		0.00	c0.28			0.00			0.01	
v/s Ratio Perm	0.11			0.00			0.01			c0.06		
v/c Ratio	0.20	0.31		0.00	0.56		0.07	0.00		0.38	0.06	
Uniform Delay, d1	4.8	6.5		6.3	9.2		19.1	18.9		20.1	19.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.0		0.0	0.2		0.1	0.0		0.4	0.0	
Delay (s)	4.9	6.5		6.3	9.4		19.2	18.9		20.5	19.1	
Level of Service	A	A		A	A		B	B		C	B	
Approach Delay (s)		6.3			9.4			19.1			19.7	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			9.4			HCM 2000 Level of Service			A			
HCM 2000 Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			52.9			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			51.3%			ICU Level of Service			A			
Analysis Period (min)			15									

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

7: NE 16th St & Site Access West

Four Seasons South Subdivision
Year 2020 North Access Total Traffic AM Peak Hour Conditions

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	6	13	0	0	6
Future Volume (Veh/h)	2	6	13	0	0	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	3	8	16	0	0	8
Pedestrians						
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	16				30	16
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	16				30	16
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1615				988	1069
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	11	16	8			
Volume Left	3	0	0			
Volume Right	0	0	8			
cSH	1615	1700	1069			
Volume to Capacity	0.00	0.01	0.01			
Queue Length 95th (ft)	0	0	1			
Control Delay (s)	2.0	0.0	8.4			
Lane LOS	A		A			
Approach Delay (s)	2.0	0.0	8.4			
Approach LOS			A			
Intersection Summary						
Average Delay			2.5			
Intersection Capacity Utilization			13.3%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 8: NE 16th St & Site Access East

Four Seasons South Subdivision
Year 2020 North Access Total Traffic AM Peak Hour Conditions

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	2	3	1	1	1
Future Volume (Veh/h)	0	2	3	1	1	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	0	3	4	1	1	1
Pedestrians						
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	5				8	4
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	5				8	4
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1630				1019	1085
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	3	5	2			
Volume Left	0	0	1			
Volume Right	0	1	1			
cSH	1630	1700	1051			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	8.4			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	8.4			
Approach LOS			A			
Intersection Summary						
Average Delay			1.7			
Intersection Capacity Utilization			13.3%	ICU Level of Service		A
Analysis Period (min)			15			

Queues

1: NE 112th Ave & NE 18th St

Four Seasons South Subdivision

Year 2020 North Access Total Traffic PM Peak Hour Conditions

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	477	718	20	98	366	314	37	486	199	427	419	344
v/c Ratio	0.64	0.71	0.03	0.37	0.65	0.48	0.19	0.73	0.34	0.72	0.33	0.31
Control Delay	37.4	32.5	0.1	45.9	40.9	18.5	45.8	40.3	14.1	41.9	22.0	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.4	32.5	0.1	45.9	40.9	18.5	45.8	40.3	14.1	41.9	22.0	1.8
Queue Length 50th (ft)	118	175	0	26	97	99	9	129	40	111	92	0
Queue Length 95th (ft)	225	305	0	61	170	194	30	220	109	196	150	35
Internal Link Dist (ft)		626			696			600			768	
Turn Bay Length (ft)	250		200	350		175	350		180	380		150
Base Capacity (vph)	814	1414	908	776	1469	908	630	1428	818	1165	1853	1152
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.51	0.02	0.13	0.25	0.35	0.06	0.34	0.24	0.37	0.23	0.30
Intersection Summary												

HCM Signalized Intersection Capacity Analysis

1: NE 112th Ave & NE 18th St

Four Seasons South Subdivision

Year 2020 North Access Total Traffic PM Peak Hour Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	467	704	20	96	359	308	36	476	195	418	411	337
Future Volume (vph)	467	704	20	96	359	308	36	476	195	418	411	337
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3400	3374	1455	3242	3505	1524	2633	3406	1553	3242	3438	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3400	3374	1455	3242	3505	1524	2633	3406	1553	3242	3438	1553
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	477	718	20	98	366	314	37	486	199	427	419	344
RTOR Reduction (vph)	0	0	13	0	0	37	0	0	66	0	0	146
Lane Group Flow (vph)	477	718	7	98	366	277	37	486	133	427	419	198
Heavy Vehicles (%)	3%	7%	11%	8%	3%	6%	33%	6%	4%	8%	5%	4%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	7	1	6	3	7	4	1	3	8	5
Permitted Phases			2			6			4			8
Actuated Green, G (s)	18.9	25.7	29.1	7.0	13.8	29.6	3.4	19.3	26.3	15.8	31.7	50.6
Effective Green, g (s)	18.9	25.7	29.1	7.0	13.8	29.6	3.4	19.3	26.3	15.8	31.7	50.6
Actuated g/C Ratio	0.22	0.29	0.33	0.08	0.16	0.34	0.04	0.22	0.30	0.18	0.36	0.58
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	731	987	565	258	550	600	101	748	553	583	1241	983
v/s Ratio Prot	c0.14	c0.21	0.00	0.03	0.10	0.08	0.01	c0.14	0.02	c0.13	0.12	0.04
v/s Ratio Perm			0.00			0.10			0.07			0.08
v/c Ratio	0.65	0.73	0.01	0.38	0.67	0.46	0.37	0.65	0.24	0.73	0.34	0.20
Uniform Delay, d1	31.5	27.9	19.7	38.3	34.8	22.8	41.1	31.2	23.2	34.0	20.4	8.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.6	2.3	0.0	0.3	2.4	0.2	0.8	1.5	0.1	4.1	0.1	0.0
Delay (s)	33.1	30.2	19.7	38.7	37.2	23.0	42.0	32.6	23.3	38.1	20.5	9.0
Level of Service	C	C	B	D	D	C	D	C	C	D	C	A
Approach Delay (s)		31.1			31.7			30.5			23.5	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			28.8									
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			87.8									
Intersection Capacity Utilization			66.2%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: NE 112th Ave & NE 16th St

Four Seasons South Subdivision
Year 2020 North Access Total Traffic PM Peak Hour Conditions

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	12	702	1	12	513
Future Volume (Veh/h)	2	12	702	1	12	513
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	2	12	716	1	12	523
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (ft)						680
pX, platoon unblocked	0.93					
vC, conflicting volume	1002	358			717	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	850	358			717	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	98			99	
cM capacity (veh/h)	278	644			893	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	14	477	240	186	349	
Volume Left	2	0	0	12	0	
Volume Right	12	0	1	0	0	
cSH	542	1700	1700	893	1700	
Volume to Capacity	0.03	0.28	0.14	0.01	0.21	
Queue Length 95th (ft)	2	0	0	1	0	
Control Delay (s)	11.8	0.0	0.0	0.7	0.0	
Lane LOS	B			A		
Approach Delay (s)	11.8	0.0		0.2		
Approach LOS	B					
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			32.8%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: NE 115th Ave & NE 16th St

Four Seasons South Subdivision

Year 2020 North Access Total Traffic PM Peak Hour Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	5	1	1	6	6	1	2	1	4	2	4
Future Volume (Veh/h)	4	5	1	1	6	6	1	2	1	4	2	4
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	5	6	1	1	8	8	1	3	1	5	3	5
Pedestrians												
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	16			7			37	34	6	33	31	12
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	16			7			37	34	6	33	31	12
tC, single (s)	4.1			4.3			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.4			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	99	100	100
cM capacity (veh/h)	1615			1521			964	859	1082	973	863	1074
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	12	17	5	13								
Volume Left	5	1	1	5								
Volume Right	1	8	1	5								
cSH	1615	1521	917	980								
Volume to Capacity	0.00	0.00	0.01	0.01								
Queue Length 95th (ft)	0	0	0	1								
Control Delay (s)	3.0	0.4	8.9	8.7								
Lane LOS	A	A	A	A								
Approach Delay (s)	3.0	0.4	8.9	8.7								
Approach LOS			A	A								
Intersection Summary												
Average Delay				4.3								
Intersection Capacity Utilization				13.3%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

4: NE 16th St & NE 118th Ave

Four Seasons South Subdivision
Year 2020 North Access Total Traffic PM Peak Hour Conditions

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Yield	Yield		Yield	
Traffic Volume (vph)	4	0	0	22	35	5
Future Volume (vph)	4	0	0	22	35	5
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	5	0	0	28	44	6
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total (vph)	5	28	50			
Volume Left (vph)	5	0	44			
Volume Right (vph)	0	28	6			
Hadj (s)	0.20	-0.53	0.43			
Departure Headway (s)	4.2	3.5	4.4			
Degree Utilization, x	0.01	0.03	0.06			
Capacity (veh/h)	832	1011	803			
Control Delay (s)	7.3	6.6	7.7			
Approach Delay (s)	7.3	6.6	7.7			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.3			
Level of Service			A			
Intersection Capacity Utilization			13.7%	ICU Level of Service	A	
Analysis Period (min)			15			

Queues

5: NE 118th St & NE 18th St

Four Seasons South Subdivision

Year 2020 North Access Total Traffic PM Peak Hour Conditions

	→	↖	←	↗	↘
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1310	25	803	8	20
v/c Ratio	0.48	0.06	0.26	0.03	0.09
Control Delay	6.2	2.8	1.9	22.1	12.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.2	2.8	1.9	22.1	12.9
Queue Length 50th (ft)	0	1	0	1	0
Queue Length 95th (ft)	234	6	61	13	16
Internal Link Dist (ft)	835		335	583	
Turn Bay Length (ft)		175		175	
Base Capacity (vph)	3216	625	3438	1570	1268
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.41	0.04	0.23	0.01	0.02
Intersection Summary					

HCM Signalized Intersection Capacity Analysis

5: NE 118th St & NE 18th St

Four Seasons South Subdivision
Year 2020 North Access Total Traffic PM Peak Hour Conditions

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑	↑↑	↑	↑
Traffic Volume (vph)	1197	21	23	747	7	19
Future Volume (vph)	1197	21	23	747	7	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0	5.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3352		1805	3438	1805	1455
Flt Permitted	1.00		0.17	1.00	0.95	1.00
Satd. Flow (perm)	3352		330	3438	1805	1455
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	1287	23	25	803	8	20
RTOR Reduction (vph)	1	0	0	0	0	19
Lane Group Flow (vph)	1309	0	25	803	8	1
Confl. Peds. (#/hr)		1	1		1	
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	7%	29%	0%	5%	0%	11%
Turn Type	NA		pm+pt	NA	Prot	Prot
Protected Phases	2		1	6	4	4
Permitted Phases			6			
Actuated Green, G (s)	32.7		39.2	39.2	2.1	2.1
Effective Green, g (s)	32.7		39.2	39.2	2.1	2.1
Actuated g/C Ratio	0.64		0.76	0.76	0.04	0.04
Clearance Time (s)	5.0		5.0	5.0	5.0	5.0
Vehicle Extension (s)	1.0		1.0	1.0	3.0	3.0
Lane Grp Cap (vph)	2136		295	2627	73	59
v/s Ratio Prot	c0.39		0.00	c0.23	c0.00	0.00
v/s Ratio Perm			0.06			
v/c Ratio	0.61		0.08	0.31	0.11	0.01
Uniform Delay, d1	5.5		3.6	1.9	23.7	23.6
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4		0.0	0.0	0.7	0.1
Delay (s)	5.9		3.7	1.9	24.4	23.7
Level of Service	A		A	A	C	C
Approach Delay (s)	5.9			1.9	23.9	
Approach LOS	A			A	C	
Intersection Summary						
HCM 2000 Control Delay			4.6		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.59			
Actuated Cycle Length (s)			51.3		Sum of lost time (s)	15.0
Intersection Capacity Utilization			46.3%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Queues

6: NE 4 Seasons Ln & NE 18th St

Four Seasons South Subdivision

Year 2020 North Access Total Traffic PM Peak Hour Conditions

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	167	1234	3	799	11	3	77	76
v/c Ratio	0.35	0.54	0.01	0.48	0.05	0.01	0.32	0.13
Control Delay	7.6	9.6	6.7	15.0	20.8	0.0	24.6	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.6	9.6	6.7	15.0	20.8	0.0	24.6	0.5
Queue Length 50th (ft)	14	74	0	88	3	0	18	0
Queue Length 95th (ft)	74	387	4	247	18	0	70	0
Internal Link Dist (ft)		696		835		313		373
Turn Bay Length (ft)	200		175		125		125	
Base Capacity (vph)	806	3117	553	2950	888	1140	870	1135
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.40	0.01	0.27	0.01	0.00	0.09	0.07
Intersection Summary								

HCM Signalized Intersection Capacity Analysis

6: NE 4 Seasons Ln & NE 18th St

Four Seasons South Subdivision

Year 2020 North Access Total Traffic PM Peak Hour Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	157	1144	16	3	682	69	10	0	3	72	0	71
Future Volume (vph)	157	1144	16	3	682	69	10	0	3	72	0	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1611	3401		1805	3375		1805	1615		1656	1538	
Flt Permitted	0.25	1.00		0.21	1.00		0.71	1.00		0.76	1.00	
Satd. Flow (perm)	428	3401		399	3375		1344	1615		1318	1538	
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)	167	1217	17	3	726	73	11	0	3	77	0	76
RTOR Reduction (vph)	0	1	0	0	6	0	0	3	0	0	66	0
Lane Group Flow (vph)	167	1233	0	3	793	0	11	0	0	77	10	0
Confl. Peds. (#/hr)	1					1						
Heavy Vehicles (%)	12%	6%	0%	0%	4%	18%	0%	0%	0%	9%	0%	5%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	39.2	33.6		28.0	27.4		7.8	7.8		7.8	7.8	
Effective Green, g (s)	39.2	33.6		28.0	27.4		7.8	7.8		7.8	7.8	
Actuated g/C Ratio	0.69	0.59		0.49	0.48		0.14	0.14		0.14	0.14	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	435	2004		210	1622		183	221		180	210	
v/s Ratio Prot	c0.05	c0.36		0.00	0.23			0.00			0.01	
v/s Ratio Perm	0.22			0.01			0.01			c0.06		
v/c Ratio	0.38	0.62		0.01	0.49		0.06	0.00		0.43	0.05	
Uniform Delay, d1	4.1	7.5		7.4	10.0		21.4	21.2		22.6	21.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.4		0.0	0.1		0.1	0.0		0.6	0.0	
Delay (s)	4.3	7.9		7.4	10.1		21.5	21.2		23.2	21.4	
Level of Service	A	A		A	B		C	C		C	C	
Approach Delay (s)		7.5			10.1			21.4			22.3	
Approach LOS		A			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			9.4			HCM 2000 Level of Service			A			
HCM 2000 Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			57.0			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			59.5%			ICU Level of Service			B			
Analysis Period (min)			15									

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

7: NE 16th St & Site Access West

Four Seasons South Subdivision
Year 2020 North Access Total Traffic PM Peak Hour Conditions

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	10	11	0	0	3
Future Volume (Veh/h)	3	10	11	0	0	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	4	13	14	0	0	4
Pedestrians						
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	14				35	14
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	14				35	14
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1617				981	1072
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	17	14	4			
Volume Left	4	0	0			
Volume Right	0	0	4			
cSH	1617	1700	1072			
Volume to Capacity	0.00	0.01	0.00			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	1.7	0.0	8.4			
Lane LOS	A		A			
Approach Delay (s)	1.7	0.0	8.4			
Approach LOS			A			
Intersection Summary						
Average Delay			1.8			
Intersection Capacity Utilization		13.3%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

8: NE 16th St & Site Access East

Four Seasons South Subdivision
Year 2020 North Access Total Traffic PM Peak Hour Conditions

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	2	3	1	1	0
Future Volume (Veh/h)	0	2	3	1	1	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	0	3	4	1	1	0
Pedestrians						
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	5				8	4
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	5				8	4
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1630				1019	1085
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	3	5	1			
Volume Left	0	0	1			
Volume Right	0	1	0			
cSH	1630	1700	1019			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	8.5			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	8.5			
Approach LOS			A			
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			13.3%	ICU Level of Service		A
Analysis Period (min)			15			

Appendix K 2025 With Site Operations
Worksheets – North Access
Scenario

Queues

1: NE 112th Ave & NE 18th St

Four Seasons South Subdivision

Year 2025 North Access Total Traffic AM Peak Hour Conditions

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	233	280	27	139	651	325	15	248	71	354	571	628
v/c Ratio	0.53	0.30	0.04	0.41	0.73	0.37	0.07	0.47	0.12	0.62	0.51	0.63
Control Delay	38.3	23.5	0.1	39.9	32.3	5.1	41.9	33.7	3.3	35.9	24.5	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.3	23.5	0.1	39.9	32.3	5.1	41.9	33.7	3.3	35.9	24.5	9.2
Queue Length 50th (ft)	50	49	0	29	136	19	3	53	0	74	120	76
Queue Length 95th (ft)	119	113	0	79	278	83	15	113	18	165	211	218
Internal Link Dist (ft)		626			696			600			768	
Turn Bay Length (ft)	250		200	350		175	350		180	380		150
Base Capacity (vph)	966	1678	958	921	1744	1205	748	1694	837	1382	2199	1172
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.17	0.03	0.15	0.37	0.27	0.02	0.15	0.08	0.26	0.26	0.54

Intersection Summary

HCM Signalized Intersection Capacity Analysis

1: NE 112th Ave & NE 18th St

Four Seasons South Subdivision

Year 2025 North Access Total Traffic AM Peak Hour Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	207	249	24	124	579	289	13	221	63	315	508	559
Future Volume (vph)	207	249	24	124	579	289	13	221	63	315	508	559
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3400	3374	1455	3242	3505	1524	2633	3406	1553	3242	3438	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3400	3374	1455	3242	3505	1524	2633	3406	1553	3242	3438	1553
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	233	280	27	139	651	325	15	248	71	354	571	628
RTOR Reduction (vph)	0	0	18	0	0	137	0	0	50	0	0	204
Lane Group Flow (vph)	233	280	9	139	651	188	15	248	21	354	571	424
Heavy Vehicles (%)	3%	7%	11%	8%	3%	6%	33%	6%	4%	8%	5%	4%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	7	1	6	3	7	4	1	3	8	5
Permitted Phases			2			6			4			8
Actuated Green, G (s)	9.7	20.9	24.1	7.9	19.1	32.3	3.2	14.2	22.1	13.2	24.2	33.9
Effective Green, g (s)	9.7	20.9	24.1	7.9	19.1	32.3	3.2	14.2	22.1	13.2	24.2	33.9
Actuated g/C Ratio	0.13	0.27	0.32	0.10	0.25	0.42	0.04	0.19	0.29	0.17	0.32	0.44
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	432	925	555	336	878	746	110	634	552	561	1091	792
v/s Ratio Prot	0.07	0.08	0.00	0.04	c0.19	0.04	0.01	0.07	0.00	c0.11	0.17	c0.07
v/s Ratio Perm			0.01			0.08			0.01			0.20
v/c Ratio	0.54	0.30	0.02	0.41	0.74	0.25	0.14	0.39	0.04	0.63	0.52	0.53
Uniform Delay, d1	31.2	21.9	17.9	32.0	26.3	14.2	35.2	27.2	19.4	29.2	21.3	15.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.1	0.0	0.3	3.0	0.1	0.2	0.1	0.0	1.7	0.2	0.3
Delay (s)	31.8	22.0	17.9	32.3	29.3	14.2	35.4	27.4	19.4	30.9	21.5	15.8
Level of Service	C	C	B	C	C	B	D	C	B	C	C	B
Approach Delay (s)	26.0		25.3			26.0			21.3			
Approach LOS	C		C			C			C			
Intersection Summary												
HCM 2000 Control Delay			23.7	HCM 2000 Level of Service					C			
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			76.2	Sum of lost time (s)					20.0			
Intersection Capacity Utilization			68.1%	ICU Level of Service					C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: NE 112th Ave & NE 16th St

Four Seasons South Subdivision
Year 2025 North Access Total Traffic AM Peak Hour Conditions

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	17	275	1	7	663
Future Volume (Veh/h)	2	17	275	1	7	663
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	2	19	309	1	8	745
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (ft)						680
pX, platoon unblocked	0.88					
vC, conflicting volume	698	155			310	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	377	155			310	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	98			99	
cM capacity (veh/h)	526	869			1262	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	21	206	104	256	497	
Volume Left	2	0	0	8	0	
Volume Right	19	0	1	0	0	
cSH	818	1700	1700	1262	1700	
Volume to Capacity	0.03	0.12	0.06	0.01	0.29	
Queue Length 95th (ft)	2	0	0	0	0	
Control Delay (s)	9.5	0.0	0.0	0.3	0.0	
Lane LOS	A			A		
Approach Delay (s)	9.5	0.0		0.1		
Approach LOS	A					
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			33.2%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: NE 115th Ave & NE 16th St

Four Seasons South Subdivision

Year 2025 North Access Total Traffic AM Peak Hour Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	1	2	1	4	4	2	2	1	0	3	7
Future Volume (Veh/h)	3	1	2	1	4	4	2	2	1	0	3	7
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	4	1	3	1	5	5	3	3	1	0	4	9
Pedestrians												
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	10			4			31	22	2	22	22	8
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	10			4			31	22	2	22	22	8
tC, single (s)	4.1			4.3			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.4			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	99
cM capacity (veh/h)	1623			1525			968	872	1087	989	873	1081
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	8	11	7	13								
Volume Left	4	1	3	0								
Volume Right	3	5	1	9								
cSH	1623	1525	939	1007								
Volume to Capacity	0.00	0.00	0.01	0.01								
Queue Length 95th (ft)	0	0	1	1								
Control Delay (s)	3.6	0.7	8.9	8.6								
Lane LOS	A	A	A	A								
Approach Delay (s)	3.6	0.7	8.9	8.6								
Approach LOS			A	A								
Intersection Summary												
Average Delay				5.4								
Intersection Capacity Utilization				13.3%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis 4: NE 16th St & NE 118th Ave

Four Seasons South Subdivision
Year 2025 North Access Total Traffic AM Peak Hour Conditions

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Yield	Yield		Yield	
Traffic Volume (vph)	4	0	1	24	5	4
Future Volume (vph)	4	0	1	24	5	4
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	5	0	1	30	6	5
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total (vph)	5	31	11			
Volume Left (vph)	5	0	6			
Volume Right (vph)	0	30	5			
Hadj (s)	0.20	-0.51	0.11			
Departure Headway (s)	4.1	3.4	4.1			
Degree Utilization, x	0.01	0.03	0.01			
Capacity (veh/h)	858	1045	862			
Control Delay (s)	7.2	6.5	7.1			
Approach Delay (s)	7.2	6.5	7.1			
Approach LOS	A	A	A			
Intersection Summary						
Delay			6.7			
Level of Service			A			
Intersection Capacity Utilization			13.7%	ICU Level of Service	A	
Analysis Period (min)			15			

Queues

5: NE 118th St & NE 18th St

Four Seasons South Subdivision

Year 2025 North Access Total Traffic AM Peak Hour Conditions

	→	↖	←	↗	↘
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	696	12	1000	22	11
v/c Ratio	0.26	0.02	0.34	0.08	0.05
Control Delay	4.3	2.1	2.8	16.9	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	4.3	2.1	2.8	16.9	10.9
Queue Length 50th (ft)	0	0	0	4	0
Queue Length 95th (ft)	103	4	84	21	11
Internal Link Dist (ft)	835		335	583	
Turn Bay Length (ft)		175		175	
Base Capacity (vph)	3373	892	3438	1717	1385
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.21	0.01	0.29	0.01	0.01
Intersection Summary					

HCM Signalized Intersection Capacity Analysis

5: NE 118th St & NE 18th St

Four Seasons South Subdivision
Year 2025 North Access Total Traffic AM Peak Hour Conditions

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↘	↑↑	↘	↗
Traffic Volume (vph)	632	1	11	910	20	10
Future Volume (vph)	632	1	11	910	20	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0	5.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3372		1805	3438	1805	1455
Flt Permitted	1.00		0.39	1.00	0.95	1.00
Satd. Flow (perm)	3372		735	3438	1805	1455
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	695	1	12	1000	22	11
RTOR Reduction (vph)	0	0	0	0	0	10
Lane Group Flow (vph)	696	0	12	1000	22	1
Confl. Peds. (#/hr)		1	1		1	
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	7%	29%	0%	5%	0%	11%
Turn Type	NA		pm+pt	NA	Prot	Prot
Protected Phases	2		1	6	4	4
Permitted Phases			6			
Actuated Green, G (s)	28.1		33.9	33.9	2.4	2.4
Effective Green, g (s)	28.1		33.9	33.9	2.4	2.4
Actuated g/C Ratio	0.61		0.73	0.73	0.05	0.05
Clearance Time (s)	5.0		5.0	5.0	5.0	5.0
Vehicle Extension (s)	1.0		1.0	1.0	3.0	3.0
Lane Grp Cap (vph)	2046		556	2517	93	75
v/s Ratio Prot	0.21		0.00	c0.29	c0.01	0.00
v/s Ratio Perm			0.02			
v/c Ratio	0.34		0.02	0.40	0.24	0.01
Uniform Delay, d1	4.5		1.7	2.3	21.1	20.8
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0		0.0	0.0	1.3	0.0
Delay (s)	4.5		1.7	2.4	22.4	20.9
Level of Service	A		A	A	C	C
Approach Delay (s)	4.5			2.4	21.9	
Approach LOS	A			A	C	
Intersection Summary						
HCM 2000 Control Delay			3.6		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.45			
Actuated Cycle Length (s)			46.3		Sum of lost time (s)	15.0
Intersection Capacity Utilization			37.7%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Queues

6: NE 4 Seasons Ln & NE 18th St

Four Seasons South Subdivision

Year 2025 North Access Total Traffic AM Peak Hour Conditions

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	65	623	1	1025	15	4	81	97
v/c Ratio	0.17	0.29	0.00	0.55	0.06	0.01	0.31	0.18
Control Delay	6.9	7.9	7.0	14.1	19.6	0.0	22.7	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.9	7.9	7.0	14.1	19.6	0.0	22.7	0.7
Queue Length 50th (ft)	5	31	0	114	3	0	19	0
Queue Length 95th (ft)	34	163	2	324	20	0	67	0
Internal Link Dist (ft)		696		835		313		373
Turn Bay Length (ft)	200		175		125		125	
Base Capacity (vph)	800	3139	718	2994	935	1251	933	1179
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.20	0.00	0.34	0.02	0.00	0.09	0.08
Intersection Summary								

HCM Signalized Intersection Capacity Analysis

6: NE 4 Seasons Ln & NE 18th St

Four Seasons South Subdivision

Year 2025 North Access Total Traffic AM Peak Hour Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	556	11	1	891	42	14	0	4	74	0	88
Future Volume (vph)	59	556	11	1	891	42	14	0	4	74	0	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1612	3400		1805	3424		1805	1615		1656	1538	
Flt Permitted	0.19	1.00		0.42	1.00		0.69	1.00		0.76	1.00	
Satd. Flow (perm)	329	3400		790	3424		1319	1615		1316	1538	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	65	611	12	1	979	46	15	0	4	81	0	97
RTOR Reduction (vph)	0	1	0	0	2	0	0	3	0	0	82	0
Lane Group Flow (vph)	65	622	0	1	1023	0	15	1	0	81	15	0
Confl. Peds. (#/hr)	1					1						
Heavy Vehicles (%)	12%	6%	0%	0%	4%	18%	0%	0%	0%	9%	0%	5%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	34.3	30.8		28.5	27.9		8.5	8.5		8.5	8.5	
Effective Green, g (s)	34.3	30.8		28.5	27.9		8.5	8.5		8.5	8.5	
Actuated g/C Ratio	0.62	0.56		0.52	0.51		0.15	0.15		0.15	0.15	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	287	1907		421	1740		204	250		203	238	
v/s Ratio Prot	c0.01	c0.18		0.00	c0.30			0.00			0.01	
v/s Ratio Perm	0.13			0.00			0.01			c0.06		
v/c Ratio	0.23	0.33		0.00	0.59		0.07	0.00		0.40	0.06	
Uniform Delay, d1	5.0	6.5		6.4	9.5		19.8	19.6		20.9	19.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.0		0.0	0.3		0.1	0.0		0.5	0.0	
Delay (s)	5.1	6.5		6.4	9.8		19.9	19.6		21.4	19.8	
Level of Service	A	A		A	A		B	B		C	B	
Approach Delay (s)		6.4			9.8			19.8			20.5	
Approach LOS		A			A			B			C	
Intersection Summary												
HCM 2000 Control Delay			9.7			HCM 2000 Level of Service			A			
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			54.9			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			53.4%			ICU Level of Service			A			
Analysis Period (min)			15									

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

7: NE 16th St & Site Access West

Four Seasons South Subdivision
Year 2025 North Access Total Traffic AM Peak Hour Conditions

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	6	13	0	0	6
Future Volume (Veh/h)	2	6	13	0	0	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	3	8	16	0	0	8
Pedestrians						
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	16				30	16
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	16				30	16
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1615				988	1069
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	11	16	8			
Volume Left	3	0	0			
Volume Right	0	0	8			
cSH	1615	1700	1069			
Volume to Capacity	0.00	0.01	0.01			
Queue Length 95th (ft)	0	0	1			
Control Delay (s)	2.0	0.0	8.4			
Lane LOS	A		A			
Approach Delay (s)	2.0	0.0	8.4			
Approach LOS			A			
Intersection Summary						
Average Delay			2.5			
Intersection Capacity Utilization			13.3%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8: NE 16th St & Site Access East

Four Seasons South Subdivision
Year 2025 North Access Total Traffic AM Peak Hour Conditions

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	2	3	1	1	1
Future Volume (Veh/h)	0	2	3	1	1	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	0	3	4	1	1	1
Pedestrians						
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	5				8	4
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	5				8	4
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1630				1019	1085
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	3	5	2			
Volume Left	0	0	1			
Volume Right	0	1	1			
cSH	1630	1700	1051			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	8.4			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	8.4			
Approach LOS			A			
Intersection Summary						
Average Delay			1.7			
Intersection Capacity Utilization			13.3%	ICU Level of Service		A
Analysis Period (min)			15			

Queues

1: NE 112th Ave & NE 18th St

Four Seasons South Subdivision

Year 2025 North Access Total Traffic PM Peak Hour Conditions

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	512	772	22	105	394	339	39	521	213	459	451	369
v/c Ratio	0.67	0.75	0.03	0.41	0.69	0.52	0.21	0.76	0.36	0.75	0.37	0.33
Control Delay	40.1	35.3	0.1	48.5	44.2	20.1	48.3	43.1	15.2	44.4	23.9	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.1	35.3	0.1	48.5	44.2	20.1	48.3	43.1	15.2	44.4	23.9	1.8
Queue Length 50th (ft)	137	204	0	29	112	117	10	147	48	127	103	0
Queue Length 95th (ft)	#273	350	0	66	190	219	32	241	121	213	162	36
Internal Link Dist (ft)		626			696			600			768	
Turn Bay Length (ft)	250		200	350		175	350		180	380		150
Base Capacity (vph)	761	1322	892	726	1374	868	589	1335	796	1089	1732	1115
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.58	0.02	0.14	0.29	0.39	0.07	0.39	0.27	0.42	0.26	0.33

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

1: NE 112th Ave & NE 18th St

Four Seasons South Subdivision

Year 2025 North Access Total Traffic PM Peak Hour Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	502	757	22	103	386	332	38	511	209	450	442	362
Future Volume (vph)	502	757	22	103	386	332	38	511	209	450	442	362
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3400	3374	1455	3242	3505	1524	2633	3406	1553	3242	3438	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3400	3374	1455	3242	3505	1524	2633	3406	1553	3242	3438	1553
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	512	772	22	105	394	339	39	521	213	459	451	369
RTOR Reduction (vph)	0	0	14	0	0	36	0	0	67	0	0	158
Lane Group Flow (vph)	512	772	8	105	394	303	39	521	146	459	451	211
Heavy Vehicles (%)	3%	7%	11%	8%	3%	6%	33%	6%	4%	8%	5%	4%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	7	1	6	3	7	4	1	3	8	5
Permitted Phases			2			6			4			8
Actuated Green, G (s)	20.5	28.1	32.9	7.2	14.8	32.0	4.8	19.6	26.8	17.2	32.0	52.5
Effective Green, g (s)	20.5	28.1	32.9	7.2	14.8	32.0	4.8	19.6	26.8	17.2	32.0	52.5
Actuated g/C Ratio	0.22	0.31	0.36	0.08	0.16	0.35	0.05	0.21	0.29	0.19	0.35	0.57
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	756	1029	598	253	563	612	137	724	536	605	1194	969
v/s Ratio Prot	c0.15	c0.23	0.00	0.03	0.11	0.09	0.01	c0.15	0.02	c0.14	0.13	0.05
v/s Ratio Perm			0.00			0.11			0.07			0.09
v/c Ratio	0.68	0.75	0.01	0.42	0.70	0.50	0.28	0.72	0.27	0.76	0.38	0.22
Uniform Delay, d1	32.8	28.8	19.1	40.4	36.5	23.7	42.0	33.7	25.1	35.5	22.6	9.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	2.8	0.0	0.4	3.1	0.2	0.4	2.9	0.1	4.8	0.1	0.0
Delay (s)	34.7	31.6	19.1	40.8	39.6	23.9	42.4	36.6	25.2	40.3	22.6	9.8
Level of Service	C	C	B	D	D	C	D	D	C	D	C	A
Approach Delay (s)		32.6			33.4			33.7			25.3	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			30.7									
HCM 2000 Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			92.1									
Intersection Capacity Utilization			69.6%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: NE 112th Ave & NE 16th St

Four Seasons South Subdivision
Year 2025 North Access Total Traffic PM Peak Hour Conditions

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	12	754	1	12	551
Future Volume (Veh/h)	2	12	754	1	12	551
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	2	12	769	1	12	562
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						680
pX, platoon unblocked	0.92					
vC, conflicting volume	1074	385			770	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	899	385			770	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	98			99	
cM capacity (veh/h)	255	619			854	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	14	513	257	199	375	
Volume Left	2	0	0	12	0	
Volume Right	12	0	1	0	0	
cSH	514	1700	1700	854	1700	
Volume to Capacity	0.03	0.30	0.15	0.01	0.22	
Queue Length 95th (ft)	2	0	0	1	0	
Control Delay (s)	12.2	0.0	0.0	0.7	0.0	
Lane LOS	B			A		
Approach Delay (s)	12.2	0.0		0.2		
Approach LOS	B					
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			33.8%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: NE 115th Ave & NE 16th St

Four Seasons South Subdivision

Year 2025 North Access Total Traffic PM Peak Hour Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	5	1	1	6	6	1	2	1	4	2	4
Future Volume (Veh/h)	4	5	1	1	6	6	1	2	1	4	2	4
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	5	6	1	1	8	8	1	3	1	5	3	5
Pedestrians												
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	16			7			37	34	6	33	31	12
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	16			7			37	34	6	33	31	12
tC, single (s)	4.1			4.3			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.4			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	99	100	100
cM capacity (veh/h)	1615			1521			964	859	1082	973	863	1074
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	12	17	5	13								
Volume Left	5	1	1	5								
Volume Right	1	8	1	5								
cSH	1615	1521	917	980								
Volume to Capacity	0.00	0.00	0.01	0.01								
Queue Length 95th (ft)	0	0	0	1								
Control Delay (s)	3.0	0.4	8.9	8.7								
Lane LOS	A	A	A	A								
Approach Delay (s)	3.0	0.4	8.9	8.7								
Approach LOS			A	A								
Intersection Summary												
Average Delay				4.3								
Intersection Capacity Utilization				13.3%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

4: NE 16th St & NE 118th Ave

Four Seasons South Subdivision
Year 2025 North Access Total Traffic PM Peak Hour Conditions

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Yield	Yield		Yield	
Traffic Volume (vph)	4	0	0	22	35	5
Future Volume (vph)	4	0	0	22	35	5
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	5	0	0	28	44	6
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total (vph)	5	28	50			
Volume Left (vph)	5	0	44			
Volume Right (vph)	0	28	6			
Hadj (s)	0.20	-0.53	0.43			
Departure Headway (s)	4.2	3.5	4.4			
Degree Utilization, x	0.01	0.03	0.06			
Capacity (veh/h)	832	1011	803			
Control Delay (s)	7.3	6.6	7.7			
Approach Delay (s)	7.3	6.6	7.7			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.3			
Level of Service			A			
Intersection Capacity Utilization			13.7%	ICU Level of Service	A	
Analysis Period (min)			15			

Queues

5: NE 118th St & NE 18th St

Four Seasons South Subdivision

Year 2025 North Access Total Traffic PM Peak Hour Conditions

	→	↖	←	↗	
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1408	25	862	8	20
v/c Ratio	0.51	0.06	0.28	0.03	0.09
Control Delay	6.2	2.7	1.9	24.3	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.2	2.7	1.9	24.3	13.7
Queue Length 50th (ft)	0	1	0	2	0
Queue Length 95th (ft)	261	6	65	14	17
Internal Link Dist (ft)	835		335	583	
Turn Bay Length (ft)		175		175	
Base Capacity (vph)	3132	588	3438	1511	1221
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.45	0.04	0.25	0.01	0.02
Intersection Summary					

HCM Signalized Intersection Capacity Analysis

5: NE 118th St & NE 18th St

Four Seasons South Subdivision

Year 2025 North Access Total Traffic PM Peak Hour Conditions

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↘	↑↑	↘	↗
Traffic Volume (vph)	1288	21	23	802	7	19
Future Volume (vph)	1288	21	23	802	7	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0	5.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3353		1805	3438	1805	1455
Flt Permitted	1.00		0.15	1.00	0.95	1.00
Satd. Flow (perm)	3353		290	3438	1805	1455
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	1385	23	25	862	8	20
RTOR Reduction (vph)	1	0	0	0	0	19
Lane Group Flow (vph)	1407	0	25	862	8	1
Confl. Peds. (#/hr)		1	1		1	
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	7%	29%	0%	5%	0%	11%
Turn Type	NA		pm+pt	NA	Prot	Prot
Protected Phases	2		1	6	4	4
Permitted Phases			6			
Actuated Green, G (s)	35.4		41.9	41.9	2.0	2.0
Effective Green, g (s)	35.4		41.9	41.9	2.0	2.0
Actuated g/C Ratio	0.66		0.78	0.78	0.04	0.04
Clearance Time (s)	5.0		5.0	5.0	5.0	5.0
Vehicle Extension (s)	1.0		1.0	1.0	3.0	3.0
Lane Grp Cap (vph)	2202		267	2672	66	53
v/s Ratio Prot	c0.42		0.00	c0.25	c0.00	0.00
v/s Ratio Perm			0.07			
v/c Ratio	0.64		0.09	0.32	0.12	0.01
Uniform Delay, d1	5.5		4.0	1.8	25.1	25.0
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5		0.1	0.0	0.8	0.1
Delay (s)	5.9		4.0	1.8	25.9	25.1
Level of Service	A		A	A	C	C
Approach Delay (s)	5.9			1.9	25.3	
Approach LOS	A			A	C	
Intersection Summary						
HCM 2000 Control Delay			4.6		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.62			
Actuated Cycle Length (s)			53.9		Sum of lost time (s)	15.0
Intersection Capacity Utilization			48.8%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Queues

6: NE 4 Seasons Ln & NE 18th St

Four Seasons South Subdivision

Year 2025 North Access Total Traffic PM Peak Hour Conditions

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	179	1329	3	861	11	3	81	80
v/c Ratio	0.39	0.57	0.01	0.63	0.05	0.01	0.34	0.14
Control Delay	7.9	9.8	6.7	17.0	22.7	0.0	26.8	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.9	9.8	6.7	17.0	22.7	0.0	26.8	0.5
Queue Length 50th (ft)	15	87	0	102	3	0	20	0
Queue Length 95th (ft)	77	430	4	270	19	0	79	0
Internal Link Dist (ft)		696		835		313		373
Turn Bay Length (ft)	200		175		125		125	
Base Capacity (vph)	776	3092	532	2866	852	1102	838	1100
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.43	0.01	0.30	0.01	0.00	0.10	0.07
Intersection Summary								

HCM Signalized Intersection Capacity Analysis

6: NE 4 Seasons Ln & NE 18th St

Four Seasons South Subdivision

Year 2025 North Access Total Traffic PM Peak Hour Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	168	1233	16	3	736	73	10	0	3	76	0	75
Future Volume (vph)	168	1233	16	3	736	73	10	0	3	76	0	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1612	3402		1805	3376		1805	1615		1656	1538	
Flt Permitted	0.22	1.00		0.20	1.00		0.70	1.00		0.76	1.00	
Satd. Flow (perm)	371	3402		374	3376		1339	1615		1318	1538	
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)	179	1312	17	3	783	78	11	0	3	81	0	80
RTOR Reduction (vph)	0	1	0	0	6	0	0	3	0	0	69	0
Lane Group Flow (vph)	179	1328	0	3	855	0	11	0	0	81	11	0
Confl. Peds. (#/hr)	1					1						
Heavy Vehicles (%)	12%	6%	0%	0%	4%	18%	0%	0%	0%	9%	0%	5%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	41.5	36.0		27.8	27.3		8.0	8.0		8.0	8.0	
Effective Green, g (s)	41.5	36.0		27.8	27.3		8.0	8.0		8.0	8.0	
Actuated g/C Ratio	0.70	0.61		0.47	0.46		0.13	0.13		0.13	0.13	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	450	2058		186	1548		180	217		177	206	
v/s Ratio Prot	c0.06	c0.39		0.00	0.25			0.00			0.01	
v/s Ratio Perm	0.22			0.01			0.01			c0.06		
v/c Ratio	0.40	0.65		0.02	0.55		0.06	0.00		0.46	0.05	
Uniform Delay, d1	4.5	7.6		8.5	11.7		22.5	22.3		23.7	22.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.5		0.0	0.2		0.1	0.0		0.7	0.0	
Delay (s)	4.7	8.1		8.5	11.9		22.5	22.3		24.4	22.5	
Level of Service	A	A		A	B		C	C		C	C	
Approach Delay (s)		7.7			11.9			22.5			23.5	
Approach LOS		A			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			10.2			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			59.5			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			62.1%			ICU Level of Service			B			
Analysis Period (min)			15									

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

7: NE 16th St & Site Access West

Four Seasons South Subdivision
Year 2025 North Access Total Traffic PM Peak Hour Conditions

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	10	11	0	0	3
Future Volume (Veh/h)	3	10	11	0	0	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	4	13	14	0	0	4
Pedestrians						
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	14				35	14
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	14				35	14
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1617				981	1072
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	17	14	4			
Volume Left	4	0	0			
Volume Right	0	0	4			
cSH	1617	1700	1072			
Volume to Capacity	0.00	0.01	0.00			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	1.7	0.0	8.4			
Lane LOS	A		A			
Approach Delay (s)	1.7	0.0	8.4			
Approach LOS			A			
Intersection Summary						
Average Delay			1.8			
Intersection Capacity Utilization		13.3%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

8: NE 16th St & Site Access East

Four Seasons South Subdivision
Year 2025 North Access Total Traffic PM Peak Hour Conditions

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	2	3	1	1	0
Future Volume (Veh/h)	0	2	3	1	1	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	0	3	4	1	1	0
Pedestrians						
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	5				8	4
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	5				8	4
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1630				1019	1085
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	3	5	1			
Volume Left	0	0	1			
Volume Right	0	1	0			
cSH	1630	1700	1019			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	8.5			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	8.5			
Approach LOS			A			
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			13.3%	ICU Level of Service		A
Analysis Period (min)			15			

**BEFORE THE HEARING EXAMINER
FOR CITY OF VANCOUVER**

In the Matter of the Application of	)	NO. PRJ-156552/LUP-70974
	)	
	)	
Four Seasons Subdivision LLC	)	Four Seasons South PUD
	)	
	)	
	)	
for Approval of a Boundary Line	)	FINDINGS, CONCLUSIONS,
Adjustment, Preliminary Plat, and Planned	)	AND RECOMMENDATION
<u>Development</u>	)	

SUMMARY OF RECOMMENDATION

The Vancouver Hearing Examiner recommends to the City Council that the requested boundary line adjustment, preliminary plat, and planned development to allow the subdivision 8.47 acres into 70 single-family residential lots be **APPROVED** subject to conditions.

SUMMARY OF RECORD

Request:

Four Seasons Subdivision LLC (Applicant) requested approval of a boundary line adjustment (BLA), preliminary plat and planned development to allow the subdivision of 8.47 acres into 70 single-family residential lots. The BLA is requested because the subject property currently consists of four tax parcels totaling 9.47 acres. After the BLA one of the parcels, which contains an existing single-family residence, would be one acre in area and would be excluded from the proposed development. The subject property is located on the east side of NE 112th Avenue and the north side of NE 16th Street in Vancouver, Washington.

Hearing Date:

The Vancouver Hearing Examiner held an open record hearing on the application on February 19, 2019.

Testimony:

At the open record hearing the following individuals presented testimony under oath:

Phil Wuest, representing the Applicant
Scott Taylor, SGA Engineering, representing the Applicant
Kristian Corbin, Associate Planner, City of Vancouver
Eric Hahn, P.E., City of Vancouver

Exhibits:

At the open record hearing the following exhibits were admitted in the record:

1. Staff Report
2. Application
3. Applicant Narrative
4. Applicant's Supplemental Narrative
5. Preliminary Plat Reduced Copy
6. Affidavit of mailing/posting dated Nov. 30, 2018
7. Notice of Application, Public Hearing and Optional SEPA DNS Nov. 30, 2018
8. SEPA Checklist dated Sept. 28, 2018
9. Geotech Report prepared by Columbia West dated Dec. 4, 2017
10. Letter from Department of Ecology dated Jan. 2, 2019
11. Letter from Clark County Public Health dated Aug. 21, 2017
12. City of Vancouver Traffic Impact Calculation Worksheet dated Jan. 22, 2019
13. Slope Easement - 4783753 EAS
14. Washington State Department of Health comments, dated January 8, 2019
15. Final Determination of Nonsignificance dated Jan. 3, 2019
16. 112th Avenue Subarea guidelines
17. Traffic Study
18. City of Vancouver Standard Plan Number T10-15A, Local Access Option A
19. Applicant PowerPoint Presentation
20. City PowerPoint Presentation

Upon consideration of the testimony and exhibits admitted in the record, the Hearing Examiner enters the following findings and conclusions:

FINDINGS

1. The Applicant requested approval of a boundary line adjustment (BLA), preliminary plat, and planned development to allow the subdivision of 8.47 acres into 70 single-family residential lots. The BLA is requested because the subject property currently consists of four tax parcels, one of which contains an existing residence, totaling 9.47 acres.¹ After

¹ The legal description of the subject property is a portion of the NW Quarter of Section 27, Township 2 North, Range 2 East of the WM; also known as Assessor Parcel Nos. 110235-000, 110250-000, 110251-000, and 110252-000. *Exhibit 1.*

the BLA, the existing residence would be retained on a one . acre parcel excluded from the proposed development. The subject property is located on the east side of NE 112th Avenue and the north side of NE 16th Street in Vancouver, Washington. *Exhibits 1, 2, 3, and 5.*

2. The application was received by the City on September 28, 2018 and determined fully complete on November 16, 2018. *Exhibit 1.* While the application as originally submitted was to create a senior (age 55+) community, the Applicant now proposes to remove the age restriction to allow sale to all potential buyers. However, the Applicant still proposes to make the development attractive to seniors or first time home buyers and requests adjustments to zoning standards as allowed through the planned development process to provide for these demographics, including allowance for increased lot coverage to allow for single-story floorplans and reducing the minimum lot area in the portion of the site that is zoned R-9. *Exhibits 1, 2, 3, and 4; Phil Wuest Testimony.*
3. The proposal is not a re-plat of a prior subdivision. *Exhibit 1.*
4. Other than a slope located on the western edge of the subject property along NE 112th Avenue, which is within a slope easement, the subject property is relatively flat and does not contain any environmentally sensitive areas. The slope and easement would be contained in one of the proposed open space tracts and would not be developed. *Exhibits 1, 13, and 19; Phil Wuest Testimony.*
5. Surrounding development includes single-family residential development to the east and southeast, agricultural land to the north, and City-owned vacant land to the southwest containing a municipal water tower on the south side of NE 16th Street, west of NE 115th Avenue. *Exhibits 1, 19 (Slides 2 and 3) and 20 (Slide 3).*
6. The proposed BLA would adjust the boundary between parcels 110252-000 and 110235-000 but would not create an additional parcel. Although the BLA would result in parcels that do not meet the minimum density standard and exceed the maximum lot area standard of the zoning districts in which the parcels are located, pursuant to VMC 20.310.050, the parcels are exempt from the requirement to comply with these standards because they were created prior to 2004. Thus, the creation of a one-acre parcel to be excluded from the development is permissible under the BLA criteria. The other parcel would be incorporated into the planned development and subdivided at a density that satisfies ordinance standards. The proposed post-BLA parcels would have legal street access via connections to NE 16th Street. *Exhibits 1, 3, and 5.*
7. With approval of the BLA, the subject property would consist of 3.79 acres that are zoned Low-Density Residential (R-9) and 4.68 acres that are zoned Higher Density Residential (R-22). *Exhibits 1 and 19.* The purpose of the R-9 zone is “to accommodate detached single dwellings with or without accessory residential units at a minimum lot size of 5,000 square feet and a density of 5.9 to 8.7 units/net acre.” VMC 20.410.020. The purpose of the R-22 zone is “to accommodate rowhouses, garden-type apartments, and

lower-density multi-dwelling structures at a minimum lot size of 1,500 square feet per unit.” *VMC 20.420.020*. Planned developments are a land use development tool intended to provide a means for creating planned environments in any base zoning district through the application of flexible standards, including zero-lot lines, narrower streets, and other innovative planning practices that result in well-designed, efficient and functional urban environments. *VMC 20.260.010*. Planned developments are allowed in both the R-9 and R-22 zoning districts. *VMC 20.260.020*.

8. The development would include a mixture of attached single-family residences (18 of the proposed 70 units) and detached single-family residences (52 of the proposed 70 units). Both housing styles are allowed outright within planned developments in the R-9 and R-18 zones. *Exhibits 1, 4 and 5; VMC 20.260.020*.
9. When a planned development contains multiple zoning designations, the minimum and maximum densities are proportionate to the amount of land in each zoning designation. *VMC 20.260.020*. The minimum required net density (i.e., area excluding public and private streets, stormwater facilities and unbuildable critical areas) in the R-9 zone is 5.9 dwelling units per acre, and the maximum is 8.7 dwelling units per acre. The subject property’s net area within the R-9 zone is 2.3 acres, requiring a minimum of 14 units and a maximum of 20 units. For the R-22 zone, the minimum required net density is 18.1 dwelling units per acre, and the maximum is 22 dwelling units per acre. The subject property’s net area within the R-22 zone is 3.09 acres, requiring a minimum of 56 dwelling units and a maximum of 67 dwelling units. The resulting required range for the subject property is a minimum of 70 and a maximum of 87 dwelling units. The Applicant proposes 70 dwelling units. *Exhibit 1; VMC 20.420.050*.
10. The minimum lot area required in the R-9 and R-22 zones are 5,000 square feet and 1,500 square feet, respectively. The maximum lot coverage in both zones is 50%, or 55% in the R-9 zone and 65% in the R-22 zone when more than 50% of the units are served by alleys pursuant to the City’s narrow lot development standards. *VMC 20.927.050*. Adjustments to these development standards are authorized by *VMC 20.260.050.B* if: 1) the adjustment is warranted given site conditions and/or characteristics of the design; 2) the benefits outweigh any potential adverse impacts; and 3) any impacts are mitigated to the extent practical. *VMC 20.260.050.B*. The Applicant proposes to modify both the lot area and lot coverage standards in order to satisfy the City’s minimum density standard while creating a housing product and community design that are attractive to people age 55 and over, with features including small yards, predominately single-story floor plans with two-car garages, and front porches. The proposed lot sizes would range from 2,450 to 3,800 square feet, and the lot coverage would be as high as 75% for single-story residences. For the not more than 20% of the residences proposed to be two story, proposed lot coverage would be 68%. The Applicant asserted, and Planning Staff concurred, that this would create a more cohesive community design than a design in which the western R-22 portion of the site were developed at a higher density and the eastern R-9 portion were developed at a lower density. To off-set the reduced yards created by the smaller lots and increased lot coverage, the Applicant proposes to set aside

approximately 13% of the site area as open space (exceeding the 10% minimum required, and to develop a trail through the site to the approximately 300-foot wide BPA right-of-way on the north side of the subject property. The BPA right-of-way is currently farmed by the owner of one of the subject parcels (who operates Joe's Place Farms), and this use would continue. Only one row of proposed houses in the southeast corner of the subject property (proposed Lots 32 through 44) would face a row of existing residences on larger lots across NE 16th Street and one larger residential lot to the east. In most areas, the proposed development would abut vacant properties or City land. Lots 32 through 44 would take access from a rear alley rather than from NE 16th Street. *Exhibits 1, 4, and 5; Phil Wuest and Joe Beaudoin Testimony.*

11. Although the minimum lot width requirements of the underlying zoning districts do not apply in planned developments, the Applicant has elected to be subject to the City's narrow lot development standards (VMC 20.927) in order to take advantage of incentives for providing alleys, including higher maximum lot coverage,² decreased rear yard setback (to four feet) for garages accessed from alleys, and six-foot encroachment of front porches into the front yard setback (where the standard required in the underlying zoning is 10 feet, or 18 feet for garages/carports). *Exhibits 1 and 3.* Narrow lots are those that are less than 40 feet wide. *VMC 20.927.020.* In order to qualify for these incentives, the Applicant proposes alley access for more than 50% of the lots (48 of 70). Consistent with the narrow lot development standards, the Applicant has demonstrated that utilities, driveways, street trees and other elements have been designed to minimize conflicts with each other, that adequate common guest parking would be provided (see Finding 19), that alleys would exceed the minimum width of 20 feet, and that the front driveways serving Lots 5 through 26 would not exceed 10 feet in width. With respect to solid waste and recycling access, Planning Staff identified Lots 1 through 8 as potentially not being accessible to collection vehicles due to their location on a looped alley, and recommended as a condition of approval that the Applicant submit an access and collection plan demonstrating that collection is feasible, or providing an alternate location for residents of those lots to place their carts. *Exhibits 1 and 5.*
12. The subdivision ordinance requires a minimum street frontage of 20 feet per lot. Each of the proposed lots would satisfy this requirement. *Exhibit 1; VMC 20.320.040.*
13. To off-site the proposed higher residential densities, smaller lots, and relaxed development standards, VMC 20.260.060.C requires developers of planned developments to provide common open space for active and passive recreational activities in an amount that is at least 10% of the gross site area. The project includes three open space tracts as follows: Tract A is a landscaped open space tract abutting the eastern perimeter of the site; Tract B comprises 7,145 square feet of open space in the western portion of the site, also proposed to be landscaped; and Tract C, 11,567 square feet encompassing the steep

² The increased maximum lot coverage allowed by VMC 20.957.050 (55% for lower density districts, and 65% for higher density districts) is not sufficient for the lot coverage proposed; the Applicant is seeking a deviation from the lot coverage standard through the planned development ordinance. *Exhibit 4.*

slope easement that exists abutting the western site perimeter. The project also includes a trail tract through the approximate center of the site that connects to the BPA right-of-way on the north side of the development site. Planning Staff submitted that the proposed open space amounts to 50,506 square feet of common open space, or 13.6% of the gross site area. Planning Staff submitted that, conditioned to require a plat note stating that the homeowners' association is responsible for maintenance of all open space tracts, the proposed open space satisfies ordinance standards. *Exhibit 1*. However, the site plan does not provide a tract table and the square footage of Tract A and of the trail tract are not legible on the site plan in the record. *Exhibit 5*. Also, the Applicant indicated that the project proposes 10% of the gross site as common open space. *Exhibit 3*. Further complicating verification of Staff's math is VMC 20.260.060.C.1.c, pursuant to which only 50% of Tract C may be counted towards the planned development common open space requirement, making verification of compliance with the planned development common open space standards problematic on the record provided. This could also be addressed by a condition of approval.

14. Pursuant to VMC Chapter 20.925, a minimum of 10% of the net lot area of each lot must be landscaped. Compliance with this requirement would be determined at the time of building permit review. In addition to landscaping on individual lots, street trees are required at a maximum spacing of 30 feet. The Applicant has submitted a tree plan demonstrating compliance with the street tree requirement. *Exhibits 1 and 5*.
15. The proposal is subject to the requirements of the City's tree conservation ordinance, which requires tree preservation and planting to achieve a minimum of 30 tree units per net acre. For tree conservation ordinance purposes, net site area excludes right-of-way, shared driveways, and stormwater facilities. The net site area 5.5 acres requires a minimum of 165 tree units. The Applicant proposes to retain 90.5 units of trees within the open space tracts, and to plant sufficient additional trees to reach a total 171.5 tree units. *Exhibits 1 and 5*.
16. The subject property is within the 112th Avenue Corridor Plan District and therefore is required to be consistent with the intent of the 112th Avenue Corridor Design Guidelines, including the connecting streets, trails, and open spaces illustrated on the Conceptual Site Plan within the 112th Avenue Corridor Design Guidelines. *Exhibit 1*. The 112th Corridor Design Guidelines describe the plan concept as follows:

The 112th Avenue Corridor is envisioned as a walkable (connected, safe, and comfortable) community. The primary street, 112th Avenue, as well as its adjacent developments, will provide for safe pedestrian, bicycle, and vehicle travel, allowing connectivity to services, jobs, housing, and amenities along the corridor. To achieve walkability, future development will incorporate interconnected streets and trails, diverse housing choices, mix of uses, gathering spaces, and enhanced pedestrian amenities.

Exhibit 16, page 5. The Design Guidelines encourage development that is oriented to the

street and interconnected open spaces and pathways. *Exhibit 16.* The NE 112th Avenue and NE 16th Street frontages, along with the internal public streets, would be improved with detached sidewalks, planter strips and street trees. A majority of the residences would be loaded from rear alleys, providing for unbroken sidewalks along the fronting streets. The residences would be further oriented to the street by use of front porches in the architectural design in lieu of larger front yards. The proposed open spaces would be accessible from the internal street/sidewalk system, and a trail corridor would provide an additional connection between NE 16th Street and the right-of-way to the north of the subject property. City Planning Staff reviewed the proposal against the Design Guidelines and determined that it is consistent with the intent of the guidelines as well as the provisions for connecting streets, trails, and open spaces. *Exhibits 1, 3, and 5.*

17. Access to the subdivision would be from a northward extension of NE 115th Avenue through the subject property (and the adjacent BPA right-of-way) to NE 18th Street at the NE Four Seasons Lane intersection; and from NE 16th Street, which connects to NE 18th Street east of the subject property via NE 118th Avenue. Although NE 16th Street provides a potential access to NE 112th Avenue to the west (the western segment of NE 16th Street is currently gravel and is closed to public use; it is used for agricultural and water tower access), the NE 112th Avenue/NE 16th Street intersection would not be used for subdivision traffic. The proposed use of NE 115th Avenue and NE 118th Avenue for subdivision traffic would improve safety by ensuring that all traffic enters the external street system via a signalized intersection, and improve operation of the NE 112th Avenue/NE 18th Street intersection (a short distance north of the NE 112th Avenue/NE 16th Street intersection), which provides freeway access. The Applicant would improve NE 16th Street from the westernmost subdivision access to the eastern property boundary to local access street standards. With respect to the extension of NE 115th Avenue, the City would work with BPA on resolving right-of-way issues, and the Applicant would be responsible for a portion of the design and construction costs, with potential for credit against traffic impact fees (traffic impact fees are assessed pursuant to VMC 20.915). Northeast 115th Avenue would be improved to local access standards. *Exhibits 1 and 5; Testimony of Phil Wuest and Joe Beaudoin.*
18. Access to individual lots within the subdivision would be from an internal network of streets and alleys with connections to NE 16th Street and the extended NE 115th Avenue. No lot would take direct access from NE 16th Street or NE 115th Avenue. Consistent with the requirements of the subdivision ordinance, none of the blocks would exceed 1,300 feet in length, and there would be no blocks sufficiently long as to require a pedestrian/bicycle way through the center of the block. The side lot lines would approach streets at essentially right angles. *Exhibits 1 and 5.*
19. Guest parking would be provided at a rate exceeding the requirement of the narrow lot development standards, which require one stall per every three narrow lots). A five-stall parking area would be provided on each of the north and south sides of the open space located in the western portion of the subdivision, and eight parallel parking spaces would be provided along the south side of the open space located in the eastern portion of the

subdivision. Street parking (which qualifies towards the guest parking requirement) would be available along NE 16th Street and proposed NE 17th Street. A total of 46 guest parking spaces would be available, exceeding the 23 required by the narrow lot development standards. Because only 18 spaces are explicitly demarcated on the project plans (the Applicant did not demarcate the public street parking), to meet the letter of the law the City requested a condition of approval requiring the Applicant to show five additional demarcated spaces on the site plan to demonstrate compliance with the ordinance. *Exhibits 1, 3 and 18; Testimony of Phil Wuest and Kristian Corbin.*

20. The Applicant submitted a professionally prepared transportation impact report dated October 23, 2018. The project's trip generation was estimated using the rate contained in the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 9th Edition* for Land Use Code 251 – Senior Adult Housing, Detached. Using this rate, the trip generation of the development would be 258 average daily trips, including 42 AM peak hour trips and 34 PM peak hour trips. With respect to trip assignment, it was assumed that the intersection of NE 16th Street and NE 112th Avenue would be open, but there was also analysis of the northward extension of NE 115th Avenue. The conclusion of the analysis was that all affected intersections would operate acceptably under the City's level of service standards, and the only mitigation recommended was installation of stop signs. *Exhibit 17.*
21. Although the Applicant's proposed removal of the 55+ age restriction from the project takes it into a different ITE trip generation land use category (and higher trip generation rate), City Transportation Staff submitted at hearing that the City is satisfied that project traffic impacts would be adequately mitigated with the extension of NE 115th Avenue and use of the signalized intersection at NE 18th Street. Because a revised traffic report would not affect the design of the subdivision street improvements, Staff felt that it would be unnecessary to ask the Applicant to prepare one. *Eric Hahn Testimony.*
22. The Fire Department has reviewed the proposed project and determined that it can meet the requirements of VMC Title 16 and the International Fire Code. The Department's recommended conditions of approval address fire hydrants and signage. *Exhibit 1.*
23. Public water and sewer utilities are available to the site and would be extended through the development to serve the proposed lots. *Exhibit 1.* Existing sewage disposal systems and wells on site would be decommissioned in accordance with Clark County requirements. *Exhibit 11.*
24. The subject property is located within the Evergreen School District, and students residing within the subdivision would attend Fircrest Elementary School, Cascade Middle School, and Evergreen High School. The District would provide bus service. Current school bus stop locations are on NE 16th Street and NE 18th Street. There would be sidewalks between the subdivision and these existing bus stop locations. School impacts would be mitigated through payment of impact fees as required by VMC 20.915. The current fee is \$6,100 per single-family dwelling unit. *Exhibit 1; Corbin Testimony.*

25. The subject property is within Park District C. Although no parkland dedication is required, the Applicant would be required to pay park impact fees pursuant to VMC 20.915. The current fee amount is \$2,142 per single-family dwelling unit. Park Impact Fees are \$2,007 per single-family and \$1,467 per multi-family unit. *Exhibit 1.*
26. An archaeological predetermination was conducted on site; no evidence of archaeological materials was found. Planning Staff recommended a condition of approval requiring work to stop if archaeological deposits are found during construction. *Exhibit 1.*
27. A geotechnical study was conducted on site. The study concluded that the proposed design is compatible with the underlying soils, provided the construction recommendations contained in the report are followed. *Exhibit 9.*
28. Stormwater runoff from pollution-generating surfaces would be treated in several proposed bioretention cells and infiltrated on site through infiltration trenches. City Staff reviewed the proposed stormwater design and concluded that it would be feasible and would satisfy the City's water quality treatment and quantity control requirements. *Exhibit 1.*
29. Pursuant to the State Environmental Policy Act (SEPA), the City of Vancouver assumed the role of lead agency for review of environmental impacts caused by the proposal. After review of the Applicant's environmental checklist and application materials, the SEPA Responsible Official issued a notice of application, public hearing, and optional determination of non-significance (DNS) on November 30, 2018. The City issued a final DNS on January 3, 2019, with an appeal period ending January 17, 2019. No appeals were filed, but a comment was received from the Washington Department of Health requesting that the project be reviewed against wellhead protection requirements. The City conducted the review and did not identify any needed mitigation. *Exhibits 1, 6, 7, 14 and 15.*
30. Public comment was submitted at hearing by Mr. Joe Beaudoin, who expressed concern regarding continued agricultural access to the land her farms north of the project site after NE 115th Avenue is extended north and paved. *Joe Beaudoin Testimony.* City and Applicant representatives agreed that agricultural access would be allowed to continue via the proposed extension of NE 115th Avenue. *Testimony of Phil Wuest and Eric Hahn.*

CONCLUSIONS

Jurisdiction:

Per Vancouver Municipal Code 20.210.020 Table 20.210-1, boundary line adjustments are Type I development applications, which are decided by the Planning Official, and preliminary subdivisions are Type III development applications, which are decided by the Hearing Examiner. Per Vancouver Municipal Code 20.260.030, the Hearing Examiner is authorized to hear and issue

findings, conclusions, and recommendations on planned developments pursuant to the Type IV review process. Pursuant to VMC 20.210.020.D, when more than one permit is required for a given proposal, all applications are consolidated into a single review subject to the highest type of procedure that applies to any of the applications. For the subject application, this would be a Type IV review process with a recommendation by the Hearing Examiner to City Council.

Boundary Line Adjustment Criteria for Review:

Pursuant to VMC 20.310.050, a Boundary Line Adjustment shall be approved or approved with conditions if the following criteria are satisfied:

1. No additional parcel(s) shall be created by the boundary adjustment.
2. The lot and location of any structure(s) on the lots shall comply with the minimum density, dimensional and area requirements of the zoning district, unless a variance is sought in conjunction with the request per the requirements of Chapter 20.290 Per VMC 20.410.040(C)(1)(a), lots developed or approved before March 11, 2004, are exempt from the requirement for minimum density/maximum lot size. However, if a site is completely redeveloped, the new development must comply with the minimum density requirements contained in Table 20.410.010-1.
3. Legal access shall be provided to each of the lots.

Planned Development Criteria for Review:

Pursuant to VMC 20.260.050.B, to receive approval for a planned development, the Applicant must demonstrate compliance with all of the following criteria:

1. Content. The concept plan contains all of the components required in Section 20.260.070. Compliance with all applicable standards. The proposed development and uses comply with all applicable standards of the Title, except where adjustments are being approved as part of the concept plan application, pursuant to Section 20.260.030(D)(2).
2. Architectural and site design. The proposed development demonstrates the use of innovative, aesthetic, energy-efficient and environmentally-friendly architectural and site design.
3. Transportation system capacity. There is either sufficient capacity in the transportation system to safely support the development proposed in all future phases or there will be adequate capacity by the time each phase of development is completed.
4. Availability of public services. There is either sufficient capacity within public services such as water supply, police and fire services, and sanitary waste and storm water disposal, to adequately serve the development proposed in all future phases, or there will be adequate capacity available by the time each phase is completed.

5. Protection of designated resources. City-designated resources such as historic landmarks, significant trees and sensitive natural resources are protected in compliance with the standards in this and other Titles of the VMC.
6. Compatibility with adjacent uses. The concept plan contains design, landscaping, parking/traffic management and multi-modal transportation elements that limit conflicts between the planned development and adjacent uses. If zoning districts are shifted per section 20.260.020(C) VMC, there shall be a demonstration that the reconfiguration of uses is compatible with surrounding uses by means of appropriate setbacks, design features or other techniques.
7. Mitigation of off-site impacts. All potential off-site impacts including litter, noise, shading, glare and traffic, will be identified and mitigated to the extent practicable.

Subdivision Criteria for Review:

Pursuant to VMC 20.320.040, to obtain approval of a preliminary subdivision, the Applicant must demonstrate compliance with all of the following criteria:

- A. Public facilities provision. Appropriate provisions to the extent necessary to mitigate an impact of the development have been made for transportation, water, storm drainage, erosion control and sanitary sewage disposal methods that are consistent with the City's current ordinances, standards and plans;
- B. Proposed improvements. Appropriate provisions have been made for proposed streets, alleys and public ways, utilities and other improvements that are consistent with the City's current ordinances, standards and plans, and Department of Health and/or Washington State Department of Transportation standards and plans, where applicable;
- C. Open space and dedications. Appropriate provisions to the extent necessary to mitigate an impact of the development have been made for open space, parks, schools, dedications, easements and reservations;
- D. Physical characteristics. The design of the proposed short subdivision or subdivision site has taken into consideration the physical features of the site, including but not limited, to: topography, soil conditions, susceptibility to flooding, inundation or swamp conditions, steep slopes or unique natural features such as wildlife habitat or wetlands;
- E. Re-platting of existing subdivisions. When re-platting an existing subdivision, the short subdivision or subdivision shall comply with all of the terms and conditions of the existing subdivision's conditions of approval;

- F. Compliance with all requirements of this title. The proposed short subdivision or subdivision complies with all applicable requirements of this title unless modified through the approval; and
- G. Compliance with State requirements. That the proposed short subdivision or subdivision complies with the requirements of RCW 58.17.110.
- H. Narrow Lot Additional Criteria. Land divisions which contain one or more residential lots having a width of less than 40 feet shall meet additional criteria of VMC 20.927.030 A, B and C.

Conclusions Based on Findings:

1. The proposal demonstrates compliance with the criteria for a BLA. No new parcel would be created. The resulting parcel sizes would be acceptable due to exemption from minimum density/maximum lot area standard based on the date of parent parcel creation. The reconfigured parcels would all have access to public roads. *Findings 1, 6, and 7.*
2. With conditions, the proposal demonstrates compliance with the criteria for a planned development.
 - a. The Applicant submitted a concept development plan as required by the planned development ordinances. The proposed residential uses are allowed within planned developments and within the underlying zoning designations. The proposed development would be consistent with the standards of Title 20, with the exception of authorized adjustments and incentives. The requested adjustments to the minimum lot area and maximum lot coverage standards are consistent with the approval criteria in that they are needed for the single-story/front porch design concept, would provide for a cohesive neighborhood, and would not result in unmitigated impacts. The conditions recommended by Planning Staff that would ensure the plans more clearly demarcate all required guest parking and demonstrate compliance with the waste disposal requirements of the narrow lot development standards have been incorporated into this recommendation. *Findings 1, 2, 7, 8, 9, 10, 11, 12, 13, and 19.*
 - b. The proposal provides for an architectural and site design that is consistent with the 112th Avenue Corridor Plan District. With the proposed alley-loaded lots and front porches, the residences would have a strong street orientation. The proposed streetscapes and trail would promote walking. Trees would be retained and planted in a quantity exceeding minimum ordinance requirements. *Findings 15, 16, and 17.*
 - c. With the proposed street improvements, including the off-site extension of NE 115th Avenue, there would be sufficient transportation system capacity for the development. *Exhibits 16, 17, and 18.*

- d. Utilities are available to serve the development, and stormwater would be infiltrated on-site. No phasing is proposed. The recommended conditions of approval address Fire Department requirements. *Findings 22, 23, and 28.*
 - e. There are no sensitive natural resources on site that would require protection under the critical areas ordinance. The steep slope in the western end of the site would be retained in the existing easement and untouched by the project. Trees would be retained within the open space tracts. No archaeological resources have been identified on-site; however, a recommended condition of approval includes stop work and notification requirements if archaeological resources are discovered during construction. *Findings 4, 13, 15, and 26.*
 - f. The proposed development would be compatible with adjacent uses. Adjacent lands are developed with single-family residences, used for agriculture, or are undeveloped. Only a small portion of the development would directly face an existing neighborhood with larger lots. However, those lots facing existing larger lots would be served by an interior alley, reducing potential conflict. Interior guest parking would be provided, and the improvements to NE 16th Street would allow for guest parking. Landscaping and street trees would be provided. *Findings 5, 10, 14, and 19.*
 - g. With payment of mitigation fees and construction of street improvements, off-site impacts would be adequately mitigated. *Findings 17, 118, 20, and 21.*
3. With conditions, the proposal satisfies the criteria for a preliminary subdivision.
- a. Appropriate provision would be made for public facilities, including water, sewer, stormwater control, and transportation. *Findings 16, 17, 18, 19, 20, 21, 22, 23, 27, and 28.*
 - b. Appropriate provision would be made for proposed improvements, including streets, alleys, and utilities. The street improvements would be designed consistent with City standards. Existing sewage disposal systems and wells would be decommissioned in accordance with County health department requirements. *Findings 16, 17, 18, 19, 20, 21, 22, 23, 27, and 28.*
 - c. Appropriate provision would be made for parks and open spaces. *Findings 13, 14, and 25.*
 - d. The design of the subdivision would take into account the physical characteristics of the site, including the slope along the NE 112th Avenue right-of-way and the soil types. *Findings 4, 8, 27, and 28.*
 - e. The proposal is not a re-plat of a prior subdivision. *Finding 3.*

- f. The proposal would comply with all applicable requirements of Title 20, except as modified through the planned development process and through use of incentives. *Findings 7, 8, 9, 10, 11, 12, 13, 14, 15, 19, 24, 25, and 26.*
- g. Compliance with the above criteria demonstrates compliance with most of the criteria contained in RCW 58.17. In addition to what has already been stated, the proposal makes appropriate provision for schools and for safe walking conditions for students. Also relevant is that the City reviewed the proposal under the State Environmental Policy Act and issued a determination of non-significance. *Findings 24 and 29.*
- h. With a condition ensuring adequate access for waste collection for Lots 1 through 8 (or designation of alternate space within the development for placement of carts), the Applicant has demonstrated compliance with the narrow lot additional criteria. *Findings 11 and 12.*

RECOMMENDATION

Based on the foregoing findings and conclusions, the requested boundary line adjustment, preliminary plat, and planned development to allow the subdivision 8.47 acres into 70 single-family residential lots **SHOULD BE APPROVED** subject to the following conditions to be satisfied by the Applicant or successors in interest:

Prior to Civil Plan Approval, the Applicant shall:

1. Submit for civil plan review with ten (10) new sets of check prints showing all the revisions requested, two (2) sets of all necessary reports (geotechnical, hydrology, traffic analysis, road modification, etc.), and any redlines documents that were returned during the preliminary review process. Submit these to the Community and Economic Development Department Permit Center; request engineering staff for counter assistance. For questions on these requirements please contact 360-487-7804.
2. Grading plan review fees will be due upon submittal of civil plans for review. Contact Permit Center staff at 360-487-7802 to obtain a fee quote.
3. Prior to the issuance of civil plan approval, the Applicant shall pay concurrency modeling fees totaling \$1,500.00.
4. Prior to the issuance of civil plan approval, the Applicant shall enter into an agreement with the City of Vancouver to assist in the design and construction of NE 115th Avenue from the proposed subdivision, across BPA property, to connect to the existing signalized intersection at NE 18th Street and NE Four Seasons Lane.
5. New and existing fire hydrant locations shall be shown on the revised site plan.

6. The revised site plan shall include an open space tract table, shall clearly identify the square footage of Tracts A, B, C, and the trail tract, and shall include a calculation identifying the exact amount and locations of common open space provided to address the planned development standards at VMC 20.260.060.C.

Prior to Commencing Public Improvement Construction

7. The Applicant shall obtain all required permits to complete the sewer construction.
8. Fire hydrants for emergency use shall be established and maintained.
9. Street identification signs shall be installed for emergency response.

During Public Improvement Construction

10. Temporary address signage shall be visible and legible from the street fronting the property for emergency response during construction.

Prior to Final Plat Approval

11. The Applicant shall submit a final plat application along with five (5) full size copies and 1 reduced 8 ½ x 11 copy of the proposed plat and tree/landscape plan. Applications can be found under Building, Planning and Environments on the City of Vancouver website, www.cityofvancouver.us.
12. The following note shall be placed on the final plat: “If any archaeological deposits are found during construction, work shall stop and the City of Vancouver’s Community & Economic Development and the Washington State Department of Archaeology and Historic Preservation shall be notified.”
13. The following note shall be placed on the final plat: “Development within this subdivision is subject to an approved tree plan. Tree removal is subject to approval by the City of Vancouver. Street trees must be planted prior to occupancy per the approved plan.”
14. The Applicant shall indicate the following as a note on the final plat: minimum lot size 2,400 square feet, maximum lot coverage for single story structures 75%, maximum lot coverage for two-story structures 68%, and the corresponding lot numbers dedicated as two-story structures.
15. The following note shall be placed on the final plat: Homeowners Association is responsible for maintenance of all open space tracts listed on this plat.
16. A note shall be recorded on the plat requiring maintenance of the common parking areas as the responsibility of a homeowner’s association.

17. The Applicant shall submit an access and collection plan that demonstrates recycling truck maneuvering is feasible at the narrow looped alley as proposed, or provide an alternate location for Lots 1 through 8 to stage their carts for collection.
18. Prior to the issuance of final subdivision approval, the Applicant shall install City of Vancouver standard frontage improvements along NE 112th Avenue including right of way dedication as needed to meet the minimum required half-width, detached sidewalks, street lighting, ADA ramps, planting strip, traffic control devices as warranted, and storm drainage as required by the city stormwater ordinance. The sidewalk shall be placed at the back of the right of way at the appropriate elevation so that when NE 112th Avenue is reconstructed to the standard the sidewalk will not need to be replaced. The design shall include transition to existing sidewalks on adjacent properties.
19. Prior to the issuance of Final Subdivision Approval, the Applicant shall install the following City of Vancouver standard frontage improvements along NE 16th Street:
 - From NE 113th Avenue to the western property line of Water Station #7, the Applicant shall install standard frontage improvements per T10-03 – Local Access and Loop Road Half Street Construction; including right of way dedication as needed to meet the minimum standard, detached sidewalks, street lighting, ADA ramps, planting strip, and traffic control devices as warranted. The pavement width shall be 25 feet.
 - Across the entire street frontage of Water Station #7, the Applicant will be required to meet the full-width street requirements of city standard T10-15A. Such improvements include full-width pavement. Also included will be curb-and-gutter, detached sidewalks, planting strips, and street lighting on both sides of the street. A driveway approach for the water station must be constructed and the sidewalk on the south side of the street must connect with the existing dead-end sidewalk near the east property line of Water Station #7.
 - From the eastern property line of Water Station #7 to the east end of the subdivision, the applicant shall dedicate right-of-way as necessary to meet the standard, and install City of Vancouver standard frontage improvements including curb, gutter, detached sidewalks, planting strip, street lighting, ADA ramps, traffic control devices as warranted, and storm drainage as required by the city stormwater ordinance.
20. Prior to the issuance of final subdivision approval, within the boundaries of the subdivision property, the Applicant shall install City of Vancouver standard frontage improvements along NE 115th Avenue including curb, gutter, detached sidewalks, planting strip, street lighting, ADA ramps, traffic control devices as warranted, and storm drainage as required by the city stormwater ordinance.
21. Prior to the issuance of final subdivision approval, the Applicant shall install City of Vancouver standard frontage improvements along NE 113th Avenue and NE 17th Street including right of way dedication, detached sidewalks, street lighting, ADA ramps,

planting strip, traffic control devices as warranted, and storm drainage as required by the city stormwater ordinance.

22. Prior to the issuance of final subdivision approval, the Applicant shall install City of Vancouver standard full-width improvements along the alleys including flat curbs, center valley gutter, street lighting, and storm drainage as required by the city stormwater ordinance.
23. Prior to the issuance of final subdivision approval, the Applicant shall coordinate with the city's traffic engineer to provide stop signs at the locations specified in the applicant's traffic impact analysis. Information pertaining to the placement of the new stop signs shall be included in the signing and striping plan section of the approved civil plans. Signing and striping plans are required even if not proposing any new striping in the public right of way. If no new striping is proposed then the plan should indicate what exists.
24. The Applicant shall satisfy all of the submittal and other related requirements itemized in the projects upcoming Notification of Civil Plan Approval (plan approval letter).
25. If attached dwellings require fire sprinkler protection, a note shall be included on the plat stating that all buildings require fire sprinkler protection.
26. The Applicant shall dedicate an easement to the City of Vancouver for access and inspection of the stormwater facilities on the final plat.
27. The Applicant shall depict the five additional guest parking spaces required on the final site development plan.
28. The Applicant shall place a note on the plat regarding maintenance of private alleys as the responsibility of a homeowner's association.

Prior to Issuance of any Building/Development Permits

29. Public sewer (possibly) built by this project, service laterals and connections to public sewer shall meet City of Vancouver construction inspection requirements.
30. Address signage shall be visible and legible from the street fronting the property for emergency response. If applicable, individual suite numbers shall be posted at the suite doors.
31. Any fire protection features identified as being required during the construction permit review shall be installed and approved prior to occupancy.
32. Fire lane signs shall be posted throughout the site in accordance with the approved sign and striping plans.

Issued March 5, 2019.

By:



Sharon A. Rice
City of Vancouver Hearing Examiner

Note: The hearing examiner's decision may be appealed to the Vancouver City Council within fourteen (14) calendar days after the date the hearing examiner's decision is mailed. Appeals must be made in writing and be received within this time period. The letter of appeal shall state the case number designated by the city and the name of the applicant, name and signature of each petitioner, a statement showing that each petitioner is entitled to file the appeal under VMC Chapter 20.210.130.B, the specific aspect(s) of the decision and/or SEPA issue being appealed, the reasons each aspect is in error as a matter of fact or law, and the evidence relied upon to prove the error (VMC 20.210.130.A). A fee of \$1,826.00 must accompany the appeal. However, if the aggrieved party is a recognized neighborhood association, the fee assessed is \$138.00. The association must demonstrate at the time of appeal submittal that the decision to appeal was made pursuant to association bylaws. Submit the appeal request and fee to Community & Economic Development Department, Permit Center, 415 W 6th Street, or mail to PO Box 1995, Vancouver, WA 98668-1995. Permit center hours are 8 a.m.–12:30 p.m. and 1:30 p.m.–4 p.m., except Wednesday, when permit center hours begin at 9 a.m.