City Hall
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Tumwater, WA 98501-6515
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MITIGATED DETERMINATION OF NON-SIGNIFICANCE
Belmont Flats at Tumwater
Permit No. TUM-21-1522
June 28, 2023

Description of Proposal: The applicant is proposing a mixed-use commercial (27,500 sf)/residential (626 units) development with associated open space, parking, landscaping and infrastructure

Applicant: Israel Investments Attn: Todd Hansen 17248 Marsh St. SW, Tenino, WA 98589.

Representative: Brandon Johnson, PE – JSA Civil, LLC; 111 Tumwater Blvd, SE, Suite C210, Tumwater, WA 98501

Location of Proposal: Multiple unaddressed lots. Tax Parcel Numbers: 82700800401, 82700800300, 82700800201, 82700800202 and 827007702100.

Lead agency: City of Tumwater, Community Development Department.
The lead agency for this proposal has determined that, as conditioned, does not have a probable significant adverse impact on the environment. An Environmental Impact Statement (EIS) is not required under RCW 43.21C.030(2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead-agency. This information is available to the public on request.

This MDNS assumes that the applicant will comply with all City ordinances and development standards governing the type of development proposed, including but not limited to, street standards, storm water standards, high groundwater hazard areas ordinance standards, water and sewer utility standards, critical areas ordinance standards, tree protection standards, zoning ordinance standards, land division ordinance standards, building and fire code standards, and level of service standards relating to traffic. These ordinances and standards provide mitigation for adverse environmental impacts of the proposed development.

Condition of Approval for mitigating environmental impacts:
Findings:

1. The Tumwater Boulevard/I-5 northbound ramps intersection currently operates at LOS F during both peak periods for the northbound left-turn movement. The project is projected to add one hundred seventy-seven trips to this intersection. The City has recently developed a SEPA improvement project for the Tumwater Boulevard/I-5 interchange that include intersection improvements at the northbound I-5 ramps intersection, with a peak hour per trip impact fee of $4,219 for each trip entering the interchange area.

2. The Traffic Impact Analysis requires Tyee Drive to be extended to Tumwater Boulevard for the proposed traffic flow to be achieved.

3. The project shall build out the required transportation improvements as described in City plans. Additionally, the City will continue to evaluate the transportation network and make any changes necessary to promote safe traffic patterns.

Mitigation Measures:

1. Prior to issuance of the Building Permit:
    a. Construct a roundabout at the northbound Interstate 5 On/Off Ramp and Tumwater Boulevard intersection; or
    b. Voluntarily pay a mitigation fee of $4,219 per peak trip generated by this project under RCW 82.02.020 to be used as described herein:
    Tumwater Boulevard/I-5 Interchange: The City's planned transportation improvements at the Tumwater Boulevard/I-5 interchange include converting the interchange to a roundabout diamond interchange by replacing the southbound on/off ramp signal and northbound stop controlled intersections with roundabouts. If the subject development has trips to the interchange before the roundabout is constructed, a temporary signal will be required.

2. Prior to any Certificate of Occupancy for the Belmont Flats project the extension of Tyee Drive to Tumwater Boulevard shall be constructed and accepted by the City of Tumwater as referenced in section 5.1 of the traffic study.

3. Proponent shall construct the extension of Tyee Dr through its property per the Transportation Master Plan. Tyee Dr shall be five lanes (four lanes with landscaped median matching Tumwater Blvd in the vicinity of New Market St). The City may allow a reduced road cross section for Tyee Dr, at its discretion, if traffic studies indicate it will perform at or above a level of service C when Tyee Dr extends to Littlerock Rd and all properties in the general area bound by an extension of Bishop Rd, New Market St, 83rd Ave, and west City limits, are developed to the maximum extent probable for the applicable land use designations. With any reduced road section option, roundabout nodes will be required. In addition, a landscaped median will still be required.

4. The property and future subdivided lots will not have full access rights to Tyee Dr as it will be a roundabout corridor with left turn movements occurring at roundabouts. Left turns crossing travel lanes will be kept to the minimum amount necessary for any interim configurations and may be completely eliminated when the extension of Tyee Dr is complete from Israel Rd to Tumwater Blvd if warranted by traffic conditions. The following language shall be included on the plat in substantially similar form:

    Access rights on Tyee Dr are limited to right-in / right-out. Three-quarter or full access will be allowed until such time road striping, pavement markings, or hard improvements resulting in movements other than right turns being illegal are added.

This MDNS is issued under WAC 197-11-350; the lead agency will not act on this proposal for 14 days from the date below. Comments must be submitted no later than July 12, 2023, by 5:00 p.m.

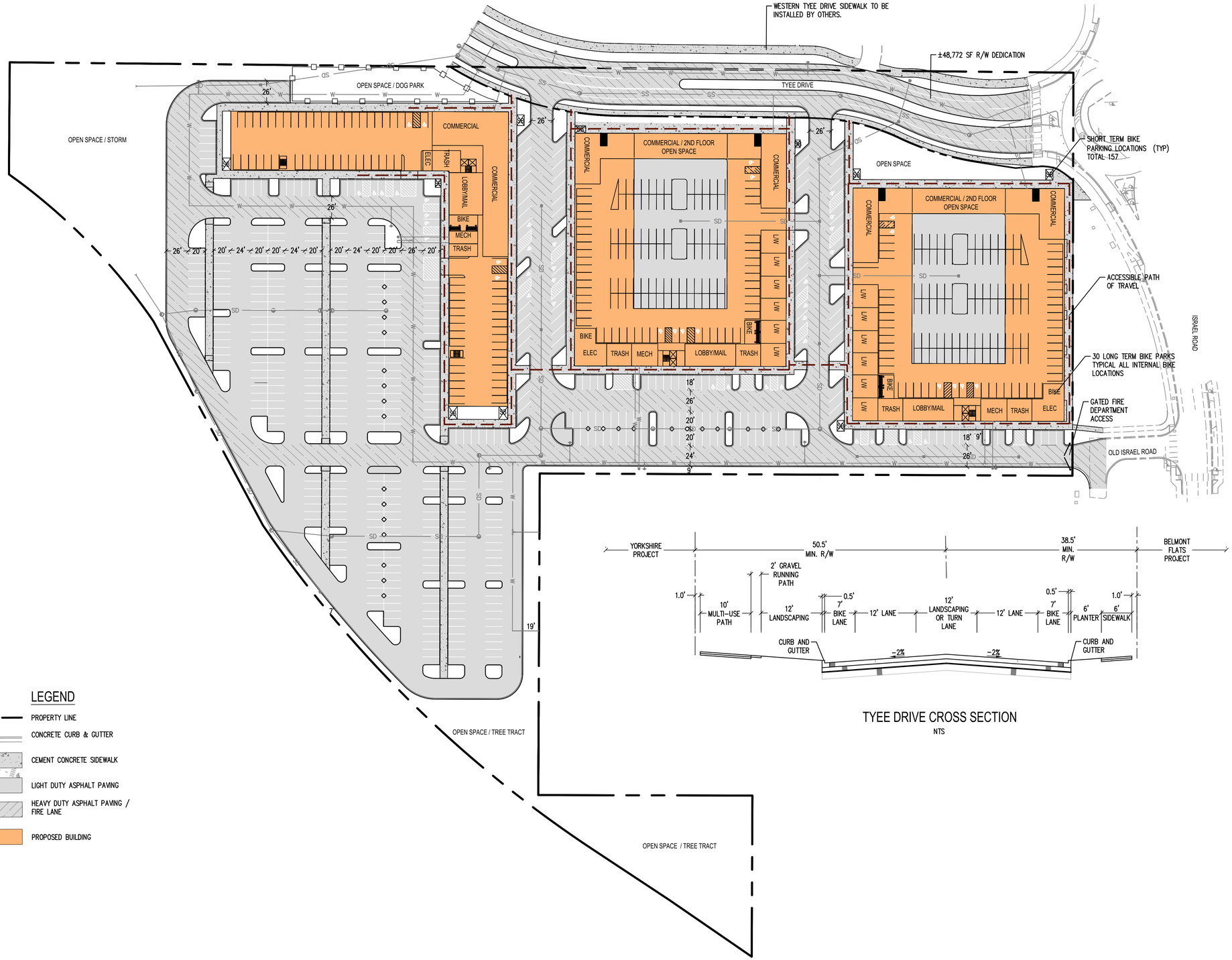
Date: June 28, 2023

Responsible Official:

Michael Matlock, AICP
Community Development Director

Contact person: Alex Baruch, Associate Planner
555 Israel Road SW
Tumwater, WA 98501
abaruch@ci.tumwater.wa.us

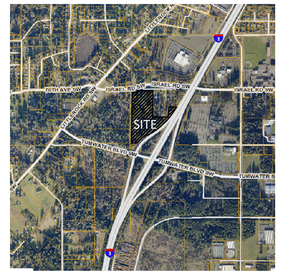
Appeals of this MDNS must be made to the City of Tumwater Community Development Department, no later than July 19, 2023, by 5:00 p.m. All appeals shall be in writing, be signed by the appellant, be accompanied by a filing fee of $175, and set forth the specific basis for such appeal, error alleged and relief requested.



TYEE DRIVE CROSS SECTION
NTS

Mar 17, 2023 - 1:59:43pm - User: bjohnson
C:\USERS\BJOHNSON\JSA CIVIL DROPBOX\BRANDON JOHNSON\TODD HANSEN\100A - ISRAEL INVESTMENTS\1 - BELMONT FLATS\ACAD\100A-SP-01.DWG

JSA CIVIL
Engineering | Planning | Management



VICINITY MAP (NTS)

SITE DATA

TPN	
	82700800401 – 2.19 ACRES
	82700800300 – 9.94 ACRES
	82700800201 – 0.30 ACRES
	82700800202 – 2.10 ACRES
	827007702100 – 0.65 ACRES
TOTAL ACREAGE: 15.18 ACRES	
TOTAL ACREAGE: (MINUS ROW DEDICATION): 14.06 ACRES	
SITE COVERAGE: 10.93 ACRES (78%)	
OPEN SPACE: 3.13 ACRES (22%)	
BUILDING HEIGHT: 55 FT	

PROPOSED USE

ALL BUILDINGS	
	COMMERCIAL: 27,500 SF
	LIVE/WORK: 12 UNITS
	STUDIO: 116 UNITS
	1 BED: 280 UNITS
	2 BED: 206 UNITS
	3 BED: 12 UNITS
	626 TOTAL RESIDENTIAL UNITS

PARKING DATA

COMMERCIAL (3.5/1000 SF)	96
STUDIO (1 PER UNIT)	116
1 BED (1 PER UNIT)	280
2 BED (1 PER UNIT)	206
3 BED (1.5 PER UNIT)	18
GUEST (1 PER 10 UNITS)	87
LIVE/WORK (3 PER UNIT)	30
TOTAL REQUIRED	833
TOTAL PROVIDED	839
TOTAL EV	84 (10%)
TOTAL ACCESSIBLE	48

SCALE:

0 60 120
SCALE IN FEET

THE BELMONT FLATS

SHEET TITLE:
SITE PLAN

SHEET NO.
SP-01

CITY OF TUMWATER

555 ISRAEL RD. SW, TUMWATER, WA 98501

Email: cdd@ci.tumwater.wa.us

(360) 754-4180

TUM-23 - 0319

02-28-2023

RECEIVED BY: Britt

Any person proposing to develop in the incorporated limits of the City of Tumwater is required to submit an environmental checklist unless the project is exempt as specified in WAC 197-11-800 (Categorical Exemptions) of the State Environmental Policy Act Rules. **SUBMITTAL REQUIREMENTS** are as follows:

1. **A COMPLETE ENVIRONMENTAL CHECKLIST.** If the project is located within the Port of Olympia property, the checklist must also be signed by a representative of the Port.
2. **FEE OF $880.00 TO BE PAID UPON SUBMITTAL.** This includes the Public Notice fee.
3. **NAME AND ADDRESS LIST OF PROPERTY OWNERS WITHIN 300 FEET OF THE SUBJECT PROPERTY.**

SEPA ENVIRONMENTAL CHECKLIST

UPDATED 2015

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 impacts.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. 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]

EVALUATION FOR AGENCY USE ONLY

1. Name of proposed project, if applicable: [help]
   Belmont Flats

2. Name of applicant: [help]
   Israel Investments Attn: Brandon Johnson

3. Address and phone number of applicant and contact person: [help]
   111 Tumwater Blvd, Suite C210 Tumwater, WA 98501

   Phone: 360.269.6346

4. Date checklist prepared: [help] September 15, 2022

5. Agency requesting checklist: [help]
   City of Tumwater

6. Proposed timing or schedule (including phasing, if applicable): [help]
   Begin construction in Summer 2023.

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

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal. [help]
   A Geotechnical Report and Groundwater Mounding Analysis has been prepared by Landau; a Gopher assessment, has been prepared by Local Planning Solutions. The reports listed above are enclosed for review.

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]
   There are no known pending applications.

10. List any government approvals or permits that will be needed for your proposal, if known. [help]

City of Tumwater SEPA Determination, Land Use Approval, Building Permit, Boundary Line Adjustment

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]

Proposal includes construction of a commercial/residential mixed-use development on +/- 15.18 acres providing a total of +/- 27,500 SF of commercial space and 624 apartment units. The project includes on-site parking, underground utilities, and stormwater facilities to serve the development.

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 SW quadrant of Israel Road and Tyee Drive, on TPN'S 82700800401, 82700800300, 82700800201, 82700800202 & 827007702100.

EVALUATION FOR AGENCY USE ONLY

Site development grading permit

626 units

B. ENVIRONMENTAL ELEMENTS [help]

1. Earth

a. General description of the site [help]

☑ Flat ☐ Rolling ☐ Hilly ☐ Steep Slopes ☐ Mountainous

☐ Other: _____

b. What is the steepest slope on the site (approximate percent slope)? [help]

Approximately 5%

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]

Per the geotech report the site contains primarily recessional and advanced outwash.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe. [help]

There are no known surface indications or history of unstable soils in the immediate vicinity.

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]

Site grading will include approximately 100,000 CY of material cut and approximately 100,000 CY of material fill. Import fill will be sourced from an approved local borrow pit.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe. [help]

Erosion is always a possibility during construction. BMPs will be maintained to limit erosion impacts.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)? [help]

Approximately 78% of the site will be covered with impervious surfaces after construction.

Max 85% allowed

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any: [help]

BMPs such as a stabilized construction entrance, silt fencing, and covering exposed soils will be used during construction. BMPs will be updated as necessary to limit erosion.

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?

EVALUATION FOR AGENCY USE ONLY

If any, generally describe and give approximate quantities if known. [help]

Emissions from equipment and dust may be present during construction but are expected to be minor. Emissions from vehicles entering and exiting the facility will be present at completion.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe. [help]

There are no known off-site sources of emissions or odor that may affect the proposed project.

c. Proposed measures to reduce or control emissions or other impacts to air, if any: [help]

Construction equipment will not be allowed to idle for extended periods of time.

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]

Trosper Lake, the nearest surface water body, is located approximately 3,700 feet from the project site.

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 work will be performed over, in, or adjacent to the described waters.

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]

No fill or dredge material will be placed in or removed from surface water or wetlands.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and

EVALUATION FOR AGENCY USE ONLY

approximate quantities if known. [help]

No, the proposal will not require surface water withdrawals or diversions.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan. [help]

No, per FEMA FIRM 53067C0281E, the site is not within a 100-year floodplain.

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 waste materials will be discharged to surface waters.

The project will be served by municipal sanitary sewer.

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]

No groundwater will be withdrawn from a well, the project will be connected to municipal water service.

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]

No waste will be discharged into the ground from septic tanks the project will be connected to City of Tumwater sanitary sewer.

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?

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Water sewer availability certificate required.

Will this water flow into other waters? If so, describe. [help]

Stormwater runoff will be collected, treated, and infiltrated in an on-site stormwater facility.

2) Could waste materials enter ground or surface waters? If so, generally describe. [help]

It is unlikely that waste materials will enter ground or surface waters. Sanitary refuse will be stored in covered containers/dumpsters before removal by a refuse company.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

No, stormwater will be infiltrated on-site.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:

Stormwater will be collected, treated, and infiltrated on-site to limit drainage pattern impacts.

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]

Approximately 15-acres of existing vegetation including trees, brush, & grass will be removed.

c. List threatened and endangered species known to be on or near the site. [help]

According to the U.S. Fish & Wildlife's IPaC map, Golden Paintbrush is a threatened flowering plant species which may be affected by project activities in this location. There is no known presence of Golden Paintbrush on the project site, however, we are noting the potential.

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d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any: [help]

Landscaping will be installed to meet or exceed minimum City code requirements.

e. List all noxious weeds and invasive species known to be on or near the site.

Per Thurston County GeoData, Bohemian Knotweed, a noxious weed, was discovered on-site in 2012.

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:

birds: typical crows and raptors found in urban enviroments

mammals: opossum, raccoons, squirrels, mice

b. List any threatened and endangered species known to be on or near the site. [help]

Per IPaC mapping, threatened species include: Olympia Pocket Gopher, Yelm Pocket Gopher, Marbled Murrelet, Streaked Horned Lark, Yellow-billed Cuckoo, Oregon Spotted Frog, & Bull Trout. Endangered species include the Taylor's Checkerspot. There are no know instances of the aforementioned species on-site, however we are noting the potential.

c. Is the site part of a migration route? If so, explain. [help]

Yes, the site is located within the Pacific Flyway.

d. Proposed measures to preserve or enhance wildlife, if any: [help]

No measures are proposed.

e. List any invasive animal species known to be on or near the site.

There are no known invasive animal species on or near the site.

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 to meet the project's energy needs for heating, lighting, etc.

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Gopher report on file referencing City of Tumwater's administrative determination

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe. [help]

The proposed project is not anticipated to affect the potential use of solar energy by adjacent properties.

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]

The project will be designed to comply with current energy code. Energy conservation features may include LED lighting, building insulation, & energy efficient windows.

EVALUATION FOR AGENCY USE ONLY

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]

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.

There are no known hazardous chemicals/conditions that might affect development and design. Per the National Pipeline Mapping System, there are no hazardous liquid or gas transmission pipelines in the vicinity.

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.

Gasoline, oil, and diesel fuels may be stored and used during construction. No hazardous chemicals will be produced by the project during construction or at completion.

4) Describe special emergency services that might be required.

No special emergency services are anticipated.

5) Proposed measures to reduce or control environmental health hazards, if any:

Gasoline, oil, and/or diesel fuels for heavy equipment will be kept in sealed & approved containers.

b. **Noise**

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)? [help]

Traffic on adjacent roadways creates noise in the area but is not anticipated to affect the project.

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]

During construction and development, noise may be present from heavy equipment and contractor's tools. Construction work will be performed during typical daytime work hours. At completion, traffic from vehicles entering and exiting the completed project will occur but noise is expected to be minor.

3) Proposed measures to reduce or control noise impacts, if any: [help]

Work will be limited to typical daytime work hours and equipment will not be allowed to idle for extended periods of time.

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 is currently vacant. Surrounding uses include mostly vacated land with some single family residential.

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]

No, the site has not been used as working farmlands or forest lands.

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, the project will not affect or be affected by surrounding working farm or forest land operations.

c. Describe any structures on the site. [help]

There are no structures on the project site.

d. Will any structures be demolished? If so, what? [help]

No, the site is vacant.

EVALUATION FOR AGENCY USE ONLY

Meet City of Tumwater code requirements for hours of operation

e. What is the current zoning classification of the site? [help]

The site is zoned GC - General Commercial.

f. What is the current comprehensive plan designation of the site? [help]

The comprehensive plan designation is GC - General Commercial.

g. If applicable, what is the current shoreline master program designation of the site? [help]

Not applicable.

h. Has any part of the site been classified as a critical area by the city or county? If so, specify. [help]

Yes, the site is located within a Class 1 Critical Aquifer Recharge Area and a Class I Agricultural Critical Aquifer Recharge Area.

i. Approximately how many people would reside or work in the completed project? [help]

Approximately 50 people will work in the completed project and approximately 1,200 people will reside in the completed project.

j. Approximately how many people would the completed project displace? [help]

No people will be displaced by the completed project.

k. Proposed measures to avoid or reduce displacement impacts, if any: [help]

No displacement impacts are anticipated, no measures are proposed.

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any: [help]

The project will be reviewed by City of Tumwater staff to ensure land use compatibility.

m. Proposed measures to ensure the proposal is compatible with nearby agricultural and forest lands of long-term commercial significance, if any:

No impacts to nearby agricultural or forest lands of long-term commercial significance are anticipated, no measures are proposed.

EVALUATION FOR AGENCY USE ONLY

9. **Housing**

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing. [help]

624 middle-income housing units will be provided.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing. [help]

No housing units will be eliminated by the project.

c. Proposed measures to reduce or control housing impacts, if any: [help]

No housing impacts are anticipated, no measures are proposed.

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]

The tallest height of the proposed buildings is +/- 55 feet. The principal exterior building materials are brick veneer and Hardie siding.

b. What views in the immediate vicinity would be altered or obstructed? [help]

No views in the immediate vicinity will be altered or obstructed.

c. Proposed measures to reduce or control aesthetic impacts, if any: [help]

The project will be designed to comply with City of Tumwater guidelines for development and construction, and will be reviewed by City staff to ensure compatibility with aesthetic requirements for permit approval.

11. **Light and glare**

a. What type of light or glare will the proposal produce? What time of day would it mainly occur? [help]

Light will be produced during evening hours from exterior and pathway lighting, and luminaires within parking areas

b. Could light or glare from the finished project be a safety hazard or interfere with views? [help]

It is unlikely that light or glare from the finished project will cause safety hazards or view interference.

c. What existing off-site sources of light or glare may affect your proposal? [help]

There are no known off-site sources of light or glare that will affect the proposed project.

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626 units

Meet City of Tumwater requirements for illumination and dark sky fixture compliance

d. Proposed measures to reduce or control light and glare impacts, if any: [help]

Exterior lighting will be positioned to prevent light exposure onto adjacent properties.

EVALUATION FOR AGENCY USE ONLY

12. **Recreation**

a. What designated and informal recreational opportunities are in the immediate vicinity? [help]

Trosper Lake Park, an undeveloped neighborhood park which provides access to Trosper Lake, is located in the vicinity of the project.

b. Would the proposed project displace any existing recreational uses? If so, describe. [help]

No, the proposed project will not displace any existing recreational uses.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any: [help]

The project will include roof top open space, a dog park and access to numerous sidewalks, bike lanes and trails

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]

None Known

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]

Historic maps and GIS data.

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.

If cultural or historic resources are discovered during demolition, grading, or construction, activities will cease until a qualified archaeologist evaluates the situation and outlines a course of action.

EVALUATION FOR AGENCY USE ONLY

Cultural resource study will be a requirement of project approval prior to any site development grading permit issuance.

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]

The site is Israel Road and the proposed extension of Tyee Drive along the projects western frontage.

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]

Yes, the site and geographic area are served by Intercity Transit.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate? [help]

The project will have 973 parking spaces. No spaces will be eliminated by the project.

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]

Tyee Drive will be extended south from the existing RAB at Israel Road along the project's western boundary.

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, the project will not use or occur in the immediate vicinity of water, rail, or air transportation.

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]

The project will generate approximately 328 AM peak hour trips and 404 PM peak hour trips per day

Please refer to the enclosed Traffic Impact Analysis report.

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, the project will not interfere with, affect, or be affected by movement of agricultural or forest products in the area.

h. Proposed measures to reduce or control transportation impacts, if any: [help]

The extension of Tyee Drive along the projects western boudndary is proposed as proposed at part of this project. The Traffic Impact Analysis prepared for the project confirms that nearby intersections will operate within acceptable level of service (LOS) thresholds. Please refer to the enclosed Traffic Impact Analysis report for additional information.

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 is likely to result in an increased need for public services such as fire protection, police, public transit, health care, and schools to accommodate residents of the completed project.

b. Proposed measures to reduce or control direct impacts on public services, if any. [help]

Impacts are anticipated to be minor, no measures are proposed.

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]

Electricity - Puget Sound Energy	Refuse - LeMay Pacific Disposal
Water - City of Tumwater	Telephone - Lumen
Sanitary Sewer - City of Tumwater	Cable - Comcast

EVALUATION FOR AGENCY USE ONLY

MDNS states extension of Tyee to Tumwater Blvd shall be constructed and accepted by the City of Tumwater prior to any CO for this project.

C. Signature [HELP]

EVALUATION FOR AGENCY USE ONLY

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.

Digitally signed by Brandon L Johnson
Date: 2022.09.28 11:37:21-07'00'

Signature: _____

Name of signee: Brandon Johnson

Position: Principal

Agency/Organization: JSA Civil, LLC

Date Submitted: _____

D. Signature – Property Owner's Review, Port of Olympia (if applicable)

I certify that I have reviewed the above environmental checklist prepared by the applicant and that the project is consistent with the tenant's lease for Port property. The Port's comments have been incorporated in the document as submitted or as noted.

Port of Olympia – Please Print: _____

Port of Olympia – Signature: _____

Date Submitted: _____

E. CITY OF TUMWATER

Reviewed by: Alex Baruch, Planner, City of Tumwater

Date: June 15, 2023

F. Supplemental sheet for nonproject actions [help]

(**IT IS NOT NECESSARY** to use this sheet for project actions)

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

EVALUATION FOR AGENCY USE ONLY

1. How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?

Proposed measures to avoid or reduce such increases are:

2. How would the proposal be likely to affect plants, animals, fish, or marine life?

Proposed measures to protect or conserve plants, animals, fish, or marine life are:

3. How would the proposal be likely to deplete energy or natural resources?

Proposed measures to protect or conserve energy and natural resources are:

4. How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?

Proposed measures to protect such resources or to avoid or reduce impacts are:

5. How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?

Proposed measures to avoid or reduce shoreline and land use impacts are:

6. How would the proposal be likely to increase demands on transportation or public services and utilities?

Proposed measures to reduce or respond to such demand(s) are:

7. Identify, if possible, whether the proposal may conflict with local state, or federal laws or requirements for the protection of the environment.

EVALUATION FOR AGENCY USE ONLY

City Hall
555 Israel Road SW
Tumwater, WA 98501-6515
Phone: 360-754-5855
Fax: 360-754-4138

June 22, 2023

Israel Investments LLC
Attn: Todd Hansen
17248 Marsh Street SW
Tenino, WA 98589

RE: Water and Sewer Availability – Parcels #82700800401, 82700800300, 82700800201, 82700800202, 82700702100
Sent via email to Brandon Johnson brandon.johnson@jsa-civil.com and Todd Hansen toddh@hansenconstruction.org

Dear Todd Hansen,

The City of Tumwater, WA PWSID #89700Q, is pleased to accommodate your request for water and sewer connection and service to the above parcels sited southwest of the intersection of Israel Rd SW and Tyee Dr SW. The parcels are zoned General Commercial. The requested services can be accommodated by the City under the following conditions:

1. Sewer and water extensions to serve the development will be per the City of Tumwater's comprehensive plans.
2. Easements necessary for utility maintenance shall be dedicated to the City of Tumwater in advance of making the physical connection to the water and sewer systems.
3. All connection/latecomer fees, if any, are due at time of building permit issuance or subdivision occurs.
4. Existing water wells or septic systems, if any, will be legally decommissioned.
5. Follow and comply with all standard city requirements.

This letter serves as the City's Certificate of Water and Sewer Availability for the proposed Belmont Flats Mixed Use development comprised of 624 multi-family units and commercial for domestic water and sewer uses. This includes 2,000 gpd for irrigation from May through September. The project has been approved for **448.5 Water ERUs and 442.7 Wastewater ERUs**, per TMC 13.08 and TMC 13.04. If additional consumptive needs for the project are identified, please notify us as soon as possible.

This agreement will expire 180 days after the date shown above. This agreement will remain valid for the duration of permit approval coverage, including extensions. Additional information may be required to accurately determine wastewater connection fees. If you have further questions, please contact Jeff Query at 360-754-4140.

Regards,
Carrie Gillum
Water Resources Specialist
cc: Dan Smith, Water Resources & Sustainability Director
Jared Crews, Engineer II, Jeff Query, Engineer II

Belmont Flats Mixed-Use Development

SWC Israel Road / Tyee Drive

STORMWATER SITE PLAN

PREPARED BY

JSA CIVIL

Engineering | Planning | Management

6945 LITTLEROCK ROAD SW, SUITE A

TUMWATER, WA 98512

CONTACT: BRANDON JOHNSON, PE

PHONE: 360.515.9600

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Appendices

Appendix 1: WWHM Report
Appendix 2: Geotechnical Report
Appendix 3: Preliminary Engineering Plans

PROJECT ENGINEER'S CERTIFICATION

"I hereby state that this Drainage and Erosion Control Plan/Construction SWPPP for the Belmont Flats Mixed-Use Development project has been prepared by me or under my supervision and meets the requirements of the City of Tumwater Drainage Design and Erosion Control Manual and the standard of care and expertise which is usual and customary in this community for professional engineers. I understand that the City of Tumwater does not and will not assume liability for the sufficiency, suitability, or performance of drainage facilities prepared by me."

Brandon Johnson, PE Date

STORMWATER SITE PLAN

The following report was prepared for the proposed Littlerock Road Mixed-Use Development. This project was prepared to comply with the minimum technical standards and requirements that are set forth in the *2022 City of Tumwater Drainage Design and Erosion Control Manual (DDECM)*.

BOND QUANTITIES WORKSHEET

A Bond Quantities Worksheet will be provided at a later date and will be enclosed as Appendix 3.

DETERMINATION OF MINIMUM REQUIREMENTS

The proposed residential development will result in more than 5,000 ft^2 of new impervious surface. In accordance with the *DDECM*, a Drainage Report is required for this project. As a result, Minimum Requirements 1-12 will need to be addressed. The below table summarizes how each requirement will be met.

MINIMUM REQUIREMENT	COMPLIANCE WITH MINIMUM REQUIREMENT
#1 - Stormwater Site Planning	The contents of this report and all included appendices are intended to satisfy this requirement.
#2 - Construction SWPPP	A Construction SWPPP will be prepared and included with the final design documents.
#3 - Source Control of Pollution	A Source Control Pollution Prevention Plan will be prepared and included with the O&M manual.
#4 - Drainage Path Preservation	Preservation of the site's previously established natural drainage paths will be maintained to the maximum extent practicable.
#5 - Stormwater Management	Stormwater management and BMP strategies for this project are described within this report and all included in the appendices.
#6 - Runoff Treatment	Runoff Treatment will be provided via StormFilter catch basins.
#7 - Flow Control	Flow control will be provided via Infiltration Galleries and Basins.
#8 - Wetlands Protection	There are no known on-site wetlands.
#9 - Operation and Maintenance	An Agreement to Maintain Stormwater Facilities will be prepared prior to the City issuing certificate of occupancy to the proposed apartments.
#10 - Financial Liability	A Bond Quantities Worksheet will be completed during final permitting.
#11 - Offsite Analysis and Mitigation	Historical drainage courses will not be altered. Consequently, downstream impacts are not anticipated.

Table 1: Compliance with Minimum Technical Requirements

SECTION 1: PROPOSED PROJECT DESCRIPTION

The following report summarizes the stormwater design analysis for the Belmont Flats Mixed-Use Development project located on TPN's 82700800401, 82700800300, 82700800201, 82700800202, & 827007702100. The current proposal includes developing the approximately 15.18 acre site into three new mixed-use buildings and associated access, parking, sidewalks, & utilities. In addition, Tyee Drive will be extended along the project' western boundary.

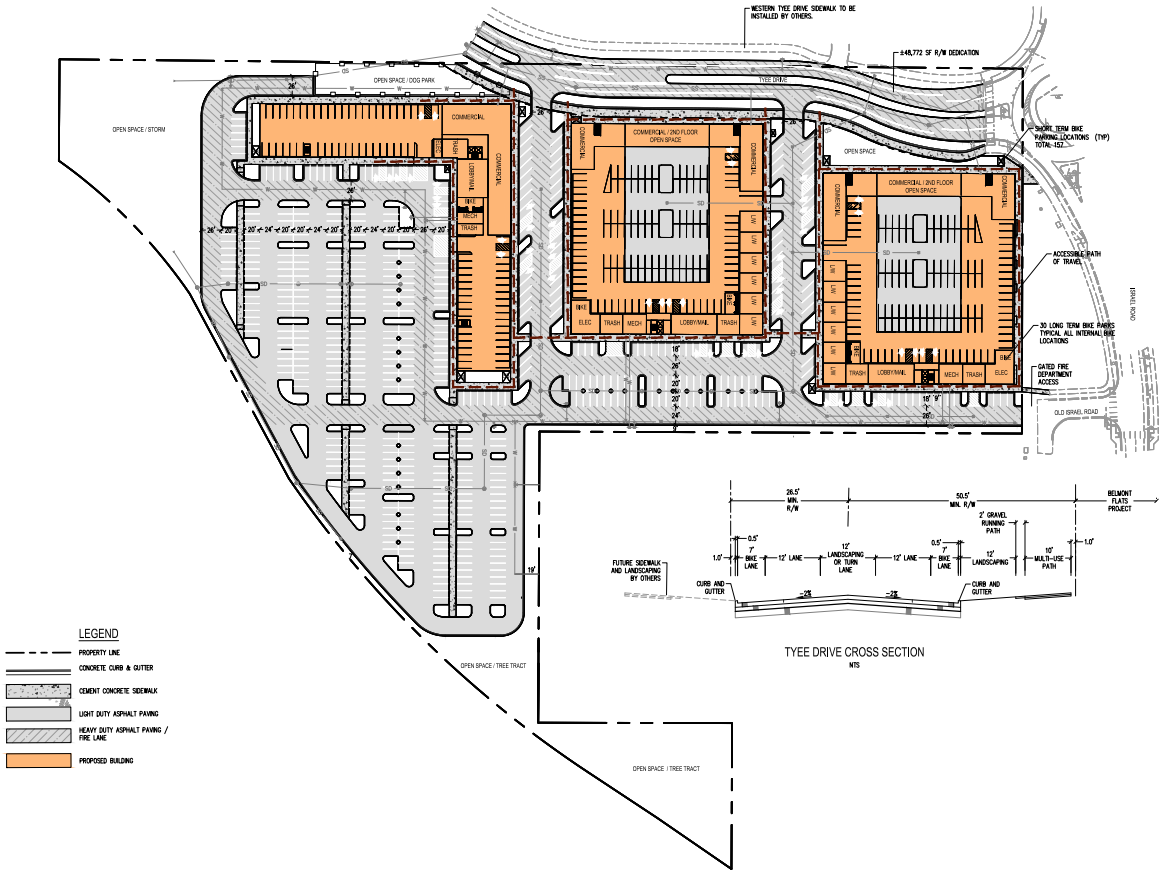


Figure 1: Site Plan

SECTION 2: EXISTING SITE CONDITIONS

The site is vegetated with a dense combination of trees, grass, and brush with no existing structures. Existing slopes range from 0 to 5%. Based on available historic photographs, the site has historically been undeveloped There are no known wetlands on the site.

Aerial photographs from 1990 & 2021 are provided in Figure 2.

Figure 2: 2021 and 1991 Existing Conditions

SECTION 3: INFILTRATION / GEOTECHNICAL REPORT

A soils report dated May 24, 2022 including winter groundwater monitoring, was completed by Landau Associates. The report identifies design infiltration rates between 0.5 and 1.6 inches per hour. See Appendix 2 for a full copy of the geotechnical report.

A Groundwater Mounding Analysis has been prepared by Landau and Associated (submitted under separate cover). Figure 3 below shows the maximum mounding elevations due to the project.

Figure 3: Mounding Elevations

SECTION 4: WELL AND SEPTIC SYSTEMS

WSDOE and WSDOH records as well as on-site inspections have revealed no known wells in the vicinity of the project.

SECTION 5: FUEL TANKS

No fuel tanks were discovered during the project survey and/or on-site exploration activities.

SECTION 6: ANALYSIS OF THE 100-YEAR FLOOD

According to FEMA Community Panel Number 53067C0281, the project is located outside of the 100-year flood zone.

SECTION 7: AESTHETIC CONSIDERATIONS FOR FACILITIES

The proposed stormwater facilities will be underground and/or landscaped and will not detract from the overall site surroundings. All post-construction land features outside of the development area will be restored to pre-construction condition or better.

SECTION 8: FACILITY SIZING AND OFF-SITE ANALYSIS

The proposed facilities consist of filter catch basins, stormwater piping collecting and conveying runoff to four interconnected underground galleries, and an above-ground infiltration pond. The facilities have been sized per Tumwater DDECM 2022 using WWHM2012 to infiltrate 100% of the runoff sent through the facilities, with an overflow discharging to the south. Figure 4 provides the Basin Areas tributary to the proposed facility. Each basin, except the pond area, has been sized as 100% impervious.

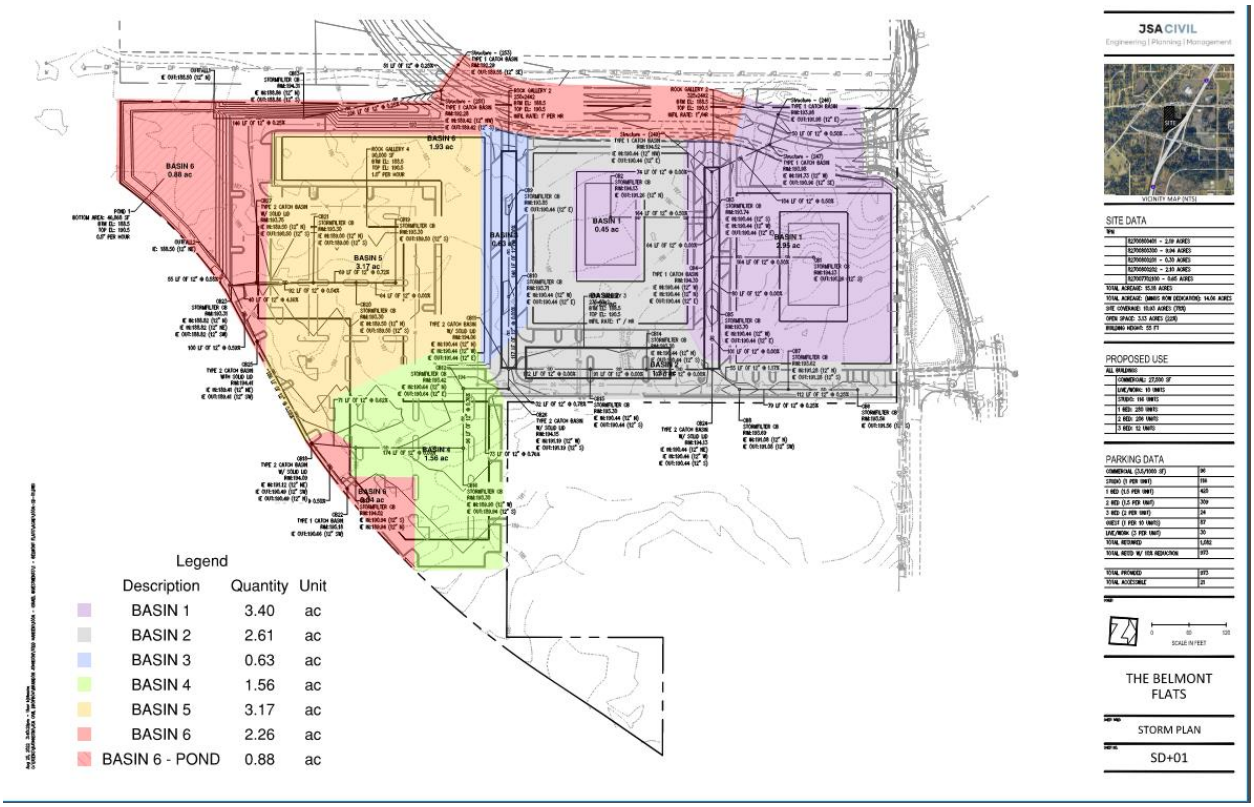


Figure 4: Basin Areas

Collection / Treatment:

Runoff from the proposed PGIS will be collected and treated via StormFilter catch basins throughout the site. The largest tributary area to any CB is 0.99 acres, which per WWHM is found to have a treatment flow of 0.074 CFS or 33.36 GPM. Assuming a 27" ZPG cartridge, which has a treat flow rate of 11.3 GPM per cartridge, each StormFilter CB will require 3 cartridges or less. See Appendix 1 for the treatment WWHM report and Figure 5 for the Treatment Areas tributary to each StormFilter CB.

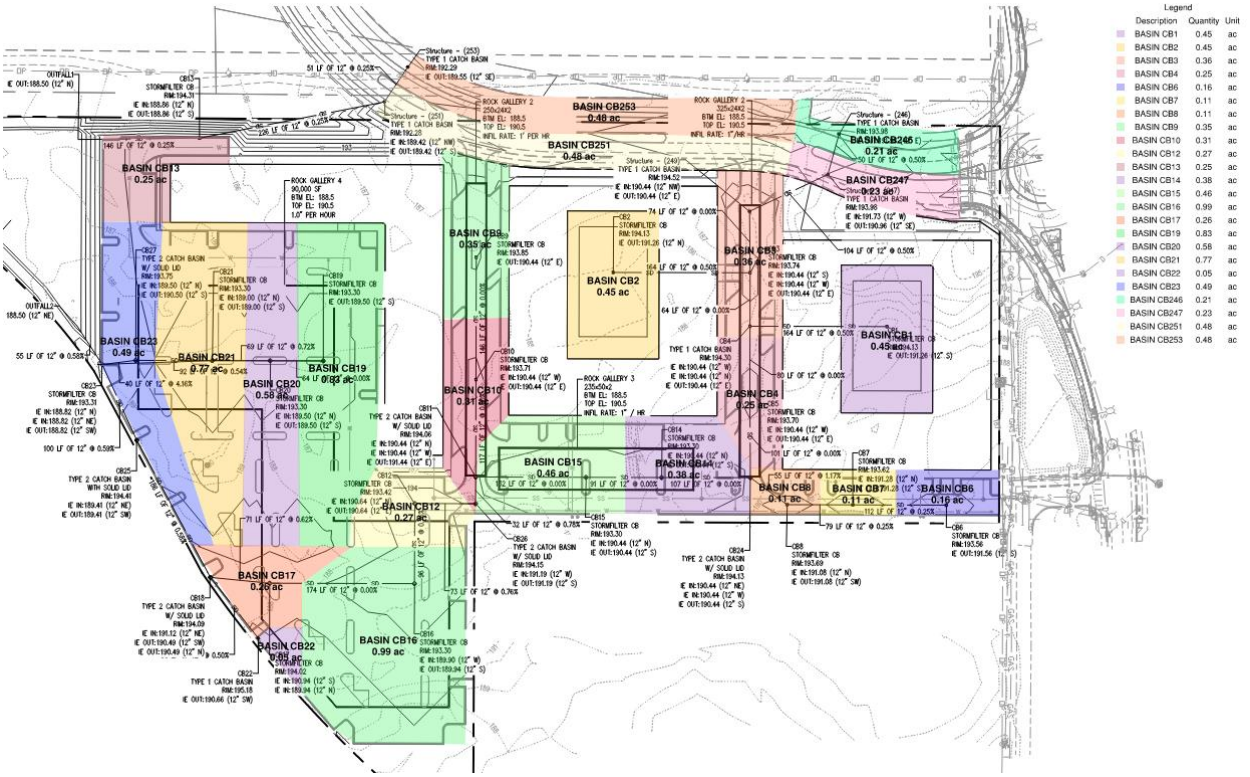


Figure 5: Treatment Areas

Infiltration:

100% of the stormwater will be infiltrated through a series of interconnected underground rock galleries and an open infiltration basin. The table below describes the general configuration of each underground rock gallery and the pond.

GALLERY	BTM ELEV	DIMENSIONS	DEPTH TO GW[1]	INFIL RATE	TRIBUTARY BASINS
1	188.5	325X24X2	4	1”	1
2	188.5	250X24X2	3.8	1”	3
3	188.5	235X50X2	4	1”	2
4	188.5	90K SF X 2	3.3	1”	4,5
POND	188.5	47K SF X 2	3.2	0.5”	6

Figure 5: Pond Information

The depth described above is total pond depth which includes one (1) foot of freeboard / overflow storage. A screenshot of the *WWHM2012* modeling is provided below showing 100% infiltration. The full report in enclosed herein as Appendix 1.

[1] Per Winter 1999 Groundwater Elevations from Landau Associates Groundwater Mounding Analysis (NVGD29)

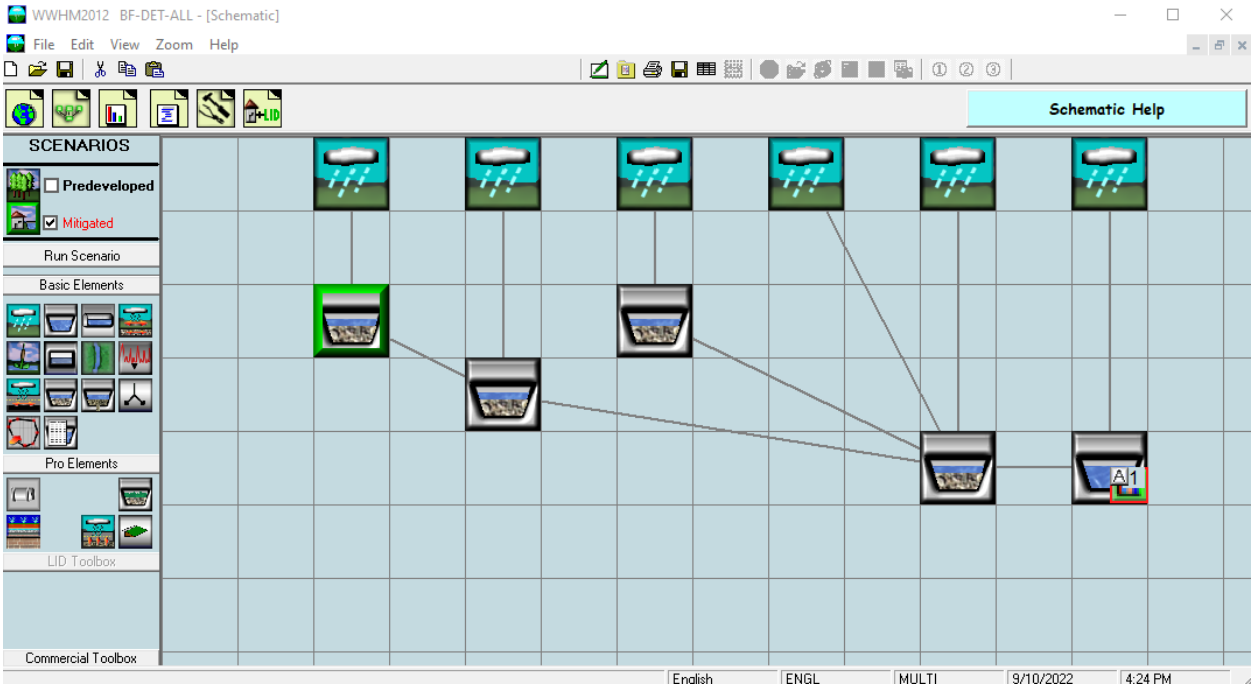


Figure 6: WWHM Results

SECTION 9: PROPERTY OWNERS ASSOCIATION ARTICLES OF INCORPORATION

To be provided at a later date.

END OF STORMWATER SITE PLAN

APPENDIX 1
WWHM REPORT

JSA CIVIL
Engineering | Planning | Management
6945 Littlerock Rd SW | Tumwater, WA | 98512

WWHM2012

PROJECT REPORT

General Model Information

Project Name:	BF-DET-ALL
Site Name:	BF
Site Address:	
City:	
Report Date:	9/28/2022
Gage:	Olympia Airport
Data Start:	1955/10/01
Data End:	2008/09/30
Timestep:	15 Minute
Precip Scale:	1.111
Version Date:	2019/09/13
Version:	4.2.17

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data

Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A B, Forest, Flat	1.39
Pervious Total	1.39
Impervious Land Use	acre
Impervious Total	0
Basin Total	1.39

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

CB1TO5

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
PERVIOUS Total	0
Impervious Land Use	acre
PARKING FLAT	3.4
Impervious Total	3.4
Basin Total	3.4

Element Flows To:

Surface	Interflow	Groundwater
Gravel Trench Bed 1	Gravel Trench Bed 1	

CB9TO10

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
Pervious Total	0
Impervious Land Use	acre
PARKING FLAT	0.63
Impervious Total	0.63
Basin Total	0.63

Element Flows To:

Surface	Interflow	Groundwater
Gravel Trench Bed 2	Gravel Trench Bed 2	

CB6,7,8,14,15

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
Pervious Total	0
Impervious Land Use	acre
PARKING FLAT	2.61
Impervious Total	2.61
Basin Total	2.61

Element Flows To:

Surface	Interflow	Groundwater
Gravel Trench Bed 3	Gravel Trench Bed 3	

BASIN D

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
Pervious Total	0
Impervious Land Use	acre
PARKING FLAT	1.56
Impervious Total	1.56
Basin Total	1.56

Element Flows To:

Surface	Interflow	Groundwater
Gravel Trench Bed 4	Gravel Trench Bed 4	

Basin 5

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
Pervious Total	0
Impervious Land Use	acre
PARKING FLAT	3.17
Impervious Total	3.17
Basin Total	3.17

Element Flows To:

Surface	Interflow	Groundwater
Gravel Trench Bed 4	Gravel Trench Bed 4	

Basin 6

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
Pervious Total	0
Impervious Land Use	acre
ROOF TOPS FLAT	1
PARKING FLAT	2.26
POND	0.88
Impervious Total	4.14
Basin Total	4.14

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1	Trapezoidal Pond 1	

Routing Elements
Predeveloped Routing

Mitigated Routing

Gravel Trench Bed 1

Bottom Length:	340.00 ft.
Bottom Width:	24.00 ft.
Trench bottom slope 1:	0 To 1
Trench Left side slope 0:	0 To 1
Trench right side slope 2:	0 To 1
Material thickness of first layer:	2
Pour Space of material for first layer:	0.4
Material thickness of second layer:	0
Pour Space of material for second layer:	0
Material thickness of third layer:	0
Pour Space of material for third layer:	0
Infiltration On	
Infiltration rate:	1
Infiltration safety factor:	1
Wetted surface area On	
Total Volume Infiltrated (ac-ft.):	635.225
Total Volume Through Riser (ac-ft.):	98.673
Total Volume Through Facility (ac-ft.):	733.898
Percent Infiltrated:	86.55
Total Precip Applied to Facility:	0
Total Evap From Facility:	0
Discharge Structure	
Riser Height:	1 ft.
Riser Diameter:	12 in.
Element Flows To:	
Outlet 1	Outlet 2
Gravel Trench Bed 3	

Gravel Trench Bed Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.187	0.000	0.000	0.000
0.0222	0.187	0.001	0.000	0.188
0.0444	0.187	0.003	0.000	0.188
0.0667	0.187	0.005	0.000	0.188
0.0889	0.187	0.006	0.000	0.188
0.1111	0.187	0.008	0.000	0.188
0.1333	0.187	0.010	0.000	0.188
0.1556	0.187	0.011	0.000	0.188
0.1778	0.187	0.013	0.000	0.188
0.2000	0.187	0.015	0.000	0.188
0.2222	0.187	0.016	0.000	0.188
0.2444	0.187	0.018	0.000	0.188
0.2667	0.187	0.020	0.000	0.188
0.2889	0.187	0.021	0.000	0.188
0.3111	0.187	0.023	0.000	0.188
0.3333	0.187	0.025	0.000	0.188
0.3556	0.187	0.026	0.000	0.188
0.3778	0.187	0.028	0.000	0.188
0.4000	0.187	0.030	0.000	0.188
0.4222	0.187	0.031	0.000	0.188
0.4444	0.187	0.033	0.000	0.188
0.4667	0.187	0.035	0.000	0.188
0.4889	0.187	0.036	0.000	0.188

0.5111	0.187	0.038	0.000	0.188
0.5333	0.187	0.040	0.000	0.188
0.5556	0.187	0.041	0.000	0.188
0.5778	0.187	0.043	0.000	0.188
0.6000	0.187	0.045	0.000	0.188
0.6222	0.187	0.046	0.000	0.188
0.6444	0.187	0.048	0.000	0.188
0.6667	0.187	0.050	0.000	0.188
0.6889	0.187	0.051	0.000	0.188
0.7111	0.187	0.053	0.000	0.188
0.7333	0.187	0.054	0.000	0.188
0.7556	0.187	0.056	0.000	0.188
0.7778	0.187	0.058	0.000	0.188
0.8000	0.187	0.059	0.000	0.188
0.8222	0.187	0.061	0.000	0.188
0.8444	0.187	0.063	0.000	0.188
0.8667	0.187	0.064	0.000	0.188
0.8889	0.187	0.066	0.000	0.188
0.9111	0.187	0.068	0.000	0.188
0.9333	0.187	0.069	0.000	0.188
0.9556	0.187	0.071	0.000	0.188
0.9778	0.187	0.073	0.000	0.188
1.0000	0.187	0.074	0.000	0.188
1.0222	0.187	0.076	0.035	0.188
1.0444	0.187	0.078	0.099	0.188
1.0667	0.187	0.079	0.182	0.188
1.0889	0.187	0.081	0.280	0.188
1.1111	0.187	0.083	0.389	0.188
1.1333	0.187	0.084	0.509	0.188
1.1556	0.187	0.086	0.637	0.188
1.1778	0.187	0.088	0.770	0.188
1.2000	0.187	0.089	0.907	0.188
1.2222	0.187	0.091	1.046	0.188
1.2444	0.187	0.093	1.183	0.188
1.2667	0.187	0.094	1.318	0.188
1.2889	0.187	0.096	1.447	0.188
1.3111	0.187	0.098	1.569	0.188
1.3333	0.187	0.099	1.683	0.188
1.3556	0.187	0.101	1.786	0.188
1.3778	0.187	0.103	1.879	0.188
1.4000	0.187	0.104	1.960	0.188
1.4222	0.187	0.106	2.029	0.188
1.4444	0.187	0.108	2.088	0.188
1.4667	0.187	0.109	2.138	0.188
1.4889	0.187	0.111	2.182	0.188
1.5111	0.187	0.113	2.251	0.188
1.5333	0.187	0.114	2.300	0.188
1.5556	0.187	0.116	2.347	0.188
1.5778	0.187	0.118	2.394	0.188
1.6000	0.187	0.119	2.439	0.188
1.6222	0.187	0.121	2.484	0.188
1.6444	0.187	0.123	2.528	0.188
1.6667	0.187	0.124	2.571	0.188
1.6889	0.187	0.126	2.614	0.188
1.7111	0.187	0.128	2.656	0.188
1.7333	0.187	0.129	2.697	0.188
1.7556	0.187	0.131	2.737	0.188
1.7778	0.187	0.133	2.777	0.188

1.8000	0.187	0.134	2.817	0.188
1.8222	0.187	0.136	2.856	0.188
1.8444	0.187	0.138	2.894	0.188
1.8667	0.187	0.139	2.932	0.188
1.8889	0.187	0.141	2.969	0.188
1.9111	0.187	0.143	3.006	0.188
1.9333	0.187	0.144	3.042	0.188
1.9556	0.187	0.146	3.078	0.188
1.9778	0.187	0.148	3.114	0.188
2.0000	0.187	0.149	3.149	0.188

Gravel Trench Bed 2

Bottom Length:	350.00 ft.
Bottom Width:	24.00 ft.
Trench bottom slope 1:	0 To 1
Trench Left side slope 0:	0 To 1
Trench right side slope 2:	0 To 1
Material thickness of first layer:	2
Pour Space of material for first layer:	0.4
Material thickness of second layer:	0
Pour Space of material for second layer:	0
Material thickness of third layer:	0
Pour Space of material for third layer:	0
Infiltration On	
Infiltration rate:	1
Infiltration safety factor:	1
Total Volume Infiltrated (ac-ft.):	135.925
Total Volume Through Riser (ac-ft.):	0
Total Volume Through Facility (ac-ft.):	135.925
Percent Infiltrated:	100
Total Precip Applied to Facility:	0
Total Evap From Facility:	0
Discharge Structure	
Riser Height:	1 ft.
Riser Diameter:	12 in.

Element Flows To:
Outlet 1 Outlet 2
Gravel Trench Bed 4

Gravel Trench Bed Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.192	0.000	0.000	0.000
0.0222	0.192	0.001	0.000	0.194
0.0444	0.192	0.003	0.000	0.194
0.0667	0.192	0.005	0.000	0.194
0.0889	0.192	0.006	0.000	0.194
0.1111	0.192	0.008	0.000	0.194
0.1333	0.192	0.010	0.000	0.194
0.1556	0.192	0.012	0.000	0.194
0.1778	0.192	0.013	0.000	0.194
0.2000	0.192	0.015	0.000	0.194
0.2222	0.192	0.017	0.000	0.194
0.2444	0.192	0.018	0.000	0.194
0.2667	0.192	0.020	0.000	0.194
0.2889	0.192	0.022	0.000	0.194
0.3111	0.192	0.024	0.000	0.194
0.3333	0.192	0.025	0.000	0.194
0.3556	0.192	0.027	0.000	0.194
0.3778	0.192	0.029	0.000	0.194
0.4000	0.192	0.030	0.000	0.194
0.4222	0.192	0.032	0.000	0.194
0.4444	0.192	0.034	0.000	0.194
0.4667	0.192	0.036	0.000	0.194
0.4889	0.192	0.037	0.000	0.194
0.5111	0.192	0.039	0.000	0.194
0.5333	0.192	0.041	0.000	0.194
0.5556	0.192	0.042	0.000	0.194

0.5778	0.192	0.044	0.000	0.194
0.6000	0.192	0.046	0.000	0.194
0.6222	0.192	0.048	0.000	0.194
0.6444	0.192	0.049	0.000	0.194
0.6667	0.192	0.051	0.000	0.194
0.6889	0.192	0.053	0.000	0.194
0.7111	0.192	0.054	0.000	0.194
0.7333	0.192	0.056	0.000	0.194
0.7556	0.192	0.058	0.000	0.194
0.7778	0.192	0.060	0.000	0.194
0.8000	0.192	0.061	0.000	0.194
0.8222	0.192	0.063	0.000	0.194
0.8444	0.192	0.065	0.000	0.194
0.8667	0.192	0.066	0.000	0.194
0.8889	0.192	0.068	0.000	0.194
0.9111	0.192	0.070	0.000	0.194
0.9333	0.192	0.072	0.000	0.194
0.9556	0.192	0.073	0.000	0.194
0.9778	0.192	0.075	0.000	0.194
1.0000	0.192	0.077	0.000	0.194
1.0222	0.192	0.078	0.035	0.194
1.0444	0.192	0.080	0.099	0.194
1.0667	0.192	0.082	0.182	0.194
1.0889	0.192	0.084	0.280	0.194
1.1111	0.192	0.085	0.389	0.194
1.1333	0.192	0.087	0.509	0.194
1.1556	0.192	0.089	0.637	0.194
1.1778	0.192	0.090	0.770	0.194
1.2000	0.192	0.092	0.907	0.194
1.2222	0.192	0.094	1.046	0.194
1.2444	0.192	0.096	1.183	0.194
1.2667	0.192	0.097	1.318	0.194
1.2889	0.192	0.099	1.447	0.194
1.3111	0.192	0.101	1.569	0.194
1.3333	0.192	0.102	1.683	0.194
1.3556	0.192	0.104	1.786	0.194
1.3778	0.192	0.106	1.879	0.194
1.4000	0.192	0.108	1.960	0.194
1.4222	0.192	0.109	2.029	0.194
1.4444	0.192	0.111	2.088	0.194
1.4667	0.192	0.113	2.138	0.194
1.4889	0.192	0.114	2.182	0.194
1.5111	0.192	0.116	2.251	0.194
1.5333	0.192	0.118	2.300	0.194
1.5556	0.192	0.120	2.347	0.194
1.5778	0.192	0.121	2.394	0.194
1.6000	0.192	0.123	2.439	0.194
1.6222	0.192	0.125	2.484	0.194
1.6444	0.192	0.126	2.528	0.194
1.6667	0.192	0.128	2.571	0.194
1.6889	0.192	0.130	2.614	0.194
1.7111	0.192	0.132	2.656	0.194
1.7333	0.192	0.133	2.697	0.194
1.7556	0.192	0.135	2.737	0.194
1.7778	0.192	0.137	2.777	0.194
1.8000	0.192	0.138	2.817	0.194
1.8222	0.192	0.140	2.856	0.194
1.8444	0.192	0.142	2.894	0.194

1.8667	0.192	0.144	2.932	0.194
1.8889	0.192	0.145	2.969	0.194
1.9111	0.192	0.147	3.006	0.194
1.9333	0.192	0.149	3.042	0.194
1.9556	0.192	0.150	3.078	0.194
1.9778	0.192	0.152	3.114	0.194
2.0000	0.192	0.154	3.149	0.194

Gravel Trench Bed 3

Bottom Length:	235.00 ft.
Bottom Width:	50.00 ft.
Trench bottom slope 1:	0 To 1
Trench Left side slope 0:	0 To 1
Trench right side slope 2:	0 To 1
Material thickness of first layer:	2
Pour Space of material for first layer:	0.4
Material thickness of second layer:	0
Pour Space of material for second layer:	0
Material thickness of third layer:	0
Pour Space of material for third layer:	0
Infiltration On	
Infiltration rate:	1
Infiltration safety factor:	1
Total Volume Infiltrated (ac-ft.):	569.036
Total Volume Through Riser (ac-ft.):	92.967
Total Volume Through Facility (ac-ft.):	662.002
Percent Infiltrated:	85.96
Total Precip Applied to Facility:	0
Total Evap From Facility:	0
Discharge Structure	
Riser Height:	1 ft.
Riser Diameter:	12 in.
Element Flows To:	
Outlet 1	Outlet 2

Gravel Trench Bed 4

Gravel Trench Bed Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.269	0.000	0.000	0.000
0.0222	0.269	0.002	0.000	0.272
0.0444	0.269	0.004	0.000	0.272
0.0667	0.269	0.007	0.000	0.272
0.0889	0.269	0.009	0.000	0.272
0.1111	0.269	0.012	0.000	0.272
0.1333	0.269	0.014	0.000	0.272
0.1556	0.269	0.016	0.000	0.272
0.1778	0.269	0.019	0.000	0.272
0.2000	0.269	0.021	0.000	0.272
0.2222	0.269	0.024	0.000	0.272
0.2444	0.269	0.026	0.000	0.272
0.2667	0.269	0.028	0.000	0.272
0.2889	0.269	0.031	0.000	0.272
0.3111	0.269	0.033	0.000	0.272
0.3333	0.269	0.036	0.000	0.272
0.3556	0.269	0.038	0.000	0.272
0.3778	0.269	0.040	0.000	0.272
0.4000	0.269	0.043	0.000	0.272
0.4222	0.269	0.045	0.000	0.272
0.4444	0.269	0.048	0.000	0.272
0.4667	0.269	0.050	0.000	0.272
0.4889	0.269	0.052	0.000	0.272
0.5111	0.269	0.055	0.000	0.272
0.5333	0.269	0.057	0.000	0.272
0.5556	0.269	0.059	0.000	0.272

0.5778	0.269	0.062	0.000	0.272
0.6000	0.269	0.064	0.000	0.272
0.6222	0.269	0.067	0.000	0.272
0.6444	0.269	0.069	0.000	0.272
0.6667	0.269	0.071	0.000	0.272
0.6889	0.269	0.074	0.000	0.272
0.7111	0.269	0.076	0.000	0.272
0.7333	0.269	0.079	0.000	0.272
0.7556	0.269	0.081	0.000	0.272
0.7778	0.269	0.083	0.000	0.272
0.8000	0.269	0.086	0.000	0.272
0.8222	0.269	0.088	0.000	0.272
0.8444	0.269	0.091	0.000	0.272
0.8667	0.269	0.093	0.000	0.272
0.8889	0.269	0.095	0.000	0.272
0.9111	0.269	0.098	0.000	0.272
0.9333	0.269	0.100	0.000	0.272
0.9556	0.269	0.103	0.000	0.272
0.9778	0.269	0.105	0.000	0.272
1.0000	0.269	0.107	0.000	0.272
1.0222	0.269	0.110	0.035	0.272
1.0444	0.269	0.112	0.099	0.272
1.0667	0.269	0.115	0.182	0.272
1.0889	0.269	0.117	0.280	0.272
1.1111	0.269	0.119	0.389	0.272
1.1333	0.269	0.122	0.509	0.272
1.1556	0.269	0.124	0.637	0.272
1.1778	0.269	0.127	0.770	0.272
1.2000	0.269	0.129	0.907	0.272
1.2222	0.269	0.131	1.046	0.272
1.2444	0.269	0.134	1.183	0.272
1.2667	0.269	0.136	1.318	0.272
1.2889	0.269	0.139	1.447	0.272
1.3111	0.269	0.141	1.569	0.272
1.3333	0.269	0.143	1.683	0.272
1.3556	0.269	0.146	1.786	0.272
1.3778	0.269	0.148	1.879	0.272
1.4000	0.269	0.151	1.960	0.272
1.4222	0.269	0.153	2.029	0.272
1.4444	0.269	0.155	2.088	0.272
1.4667	0.269	0.158	2.138	0.272
1.4889	0.269	0.160	2.182	0.272
1.5111	0.269	0.163	2.251	0.272
1.5333	0.269	0.165	2.300	0.272
1.5556	0.269	0.167	2.347	0.272
1.5778	0.269	0.170	2.394	0.272
1.6000	0.269	0.172	2.439	0.272
1.6222	0.269	0.175	2.484	0.272
1.6444	0.269	0.177	2.528	0.272
1.6667	0.269	0.179	2.571	0.272
1.6889	0.269	0.182	2.614	0.272
1.7111	0.269	0.184	2.656	0.272
1.7333	0.269	0.187	2.697	0.272
1.7556	0.269	0.189	2.737	0.272
1.7778	0.269	0.191	2.777	0.272
1.8000	0.269	0.194	2.817	0.272
1.8222	0.269	0.196	2.856	0.272
1.8444	0.269	0.199	2.894	0.272

1.8667	0.269	0.201	2.932	0.272
1.8889	0.269	0.203	2.969	0.272
1.9111	0.269	0.206	3.006	0.272
1.9333	0.269	0.208	3.042	0.272
1.9556	0.269	0.211	3.078	0.272
1.9778	0.269	0.213	3.114	0.272
2.0000	0.269	0.215	3.149	0.272

Gravel Trench Bed 4

Bottom Length:	305.00 ft.
Bottom Width:	305.00 ft.
Trench bottom slope 1:	0 To 1
Trench Left side slope 0:	0 To 1
Trench right side slope 2:	0 To 1
Material thickness of first layer:	2
Pour Space of material for first layer:	0.4
Material thickness of second layer:	0
Pour Space of material for second layer:	0
Material thickness of third layer:	0
Pour Space of material for third layer:	0
Infiltration On	
Infiltration rate:	1
Infiltration safety factor:	1
Total Volume Infiltrated (ac-ft.):	1113.899
Total Volume Through Riser (ac-ft.):	0
Total Volume Through Facility (ac-ft.):	1113.899
Percent Infiltrated:	100
Total Precip Applied to Facility:	0
Total Evap From Facility:	0
Discharge Structure	
Riser Height:	1.75 ft.
Riser Diameter:	24 in.
Element Flows To:	
Outlet 1	Outlet 2
Trapezoidal Pond 1	

Gravel Trench Bed Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	2.135	0.000	0.000	0.000
0.0222	2.135	0.019	0.000	2.153
0.0444	2.135	0.038	0.000	2.153
0.0667	2.135	0.056	0.000	2.153
0.0889	2.135	0.075	0.000	2.153
0.1111	2.135	0.094	0.000	2.153
0.1333	2.135	0.113	0.000	2.153
0.1556	2.135	0.132	0.000	2.153
0.1778	2.135	0.151	0.000	2.153
0.2000	2.135	0.170	0.000	2.153
0.2222	2.135	0.189	0.000	2.153
0.2444	2.135	0.208	0.000	2.153
0.2667	2.135	0.227	0.000	2.153
0.2889	2.135	0.246	0.000	2.153
0.3111	2.135	0.265	0.000	2.153
0.3333	2.135	0.284	0.000	2.153
0.3556	2.135	0.303	0.000	2.153
0.3778	2.135	0.322	0.000	2.153
0.4000	2.135	0.341	0.000	2.153
0.4222	2.135	0.360	0.000	2.153
0.4444	2.135	0.379	0.000	2.153
0.4667	2.135	0.398	0.000	2.153
0.4889	2.135	0.417	0.000	2.153
0.5111	2.135	0.436	0.000	2.153
0.5333	2.135	0.455	0.000	2.153
0.5556	2.135	0.474	0.000	2.153

0.5778	2.135	0.493	0.000	2.153
0.6000	2.135	0.512	0.000	2.153
0.6222	2.135	0.531	0.000	2.153
0.6444	2.135	0.550	0.000	2.153
0.6667	2.135	0.569	0.000	2.153
0.6889	2.135	0.588	0.000	2.153
0.7111	2.135	0.607	0.000	2.153
0.7333	2.135	0.626	0.000	2.153
0.7556	2.135	0.645	0.000	2.153
0.7778	2.135	0.664	0.000	2.153
0.8000	2.135	0.683	0.000	2.153
0.8222	2.135	0.702	0.000	2.153
0.8444	2.135	0.721	0.000	2.153
0.8667	2.135	0.740	0.000	2.153
0.8889	2.135	0.759	0.000	2.153
0.9111	2.135	0.778	0.000	2.153
0.9333	2.135	0.797	0.000	2.153
0.9556	2.135	0.816	0.000	2.153
0.9778	2.135	0.835	0.000	2.153
1.0000	2.135	0.854	0.000	2.153
1.0222	2.135	0.873	0.000	2.153
1.0444	2.135	0.892	0.000	2.153
1.0667	2.135	0.911	0.000	2.153
1.0889	2.135	0.930	0.000	2.153
1.1111	2.135	0.949	0.000	2.153
1.1333	2.135	0.968	0.000	2.153
1.1556	2.135	0.987	0.000	2.153
1.1778	2.135	1.006	0.000	2.153
1.2000	2.135	1.025	0.000	2.153
1.2222	2.135	1.044	0.000	2.153
1.2444	2.135	1.063	0.000	2.153
1.2667	2.135	1.082	0.000	2.153
1.2889	2.135	1.101	0.000	2.153
1.3111	2.135	1.120	0.000	2.153
1.3333	2.135	1.139	0.000	2.153
1.3556	2.135	1.157	0.000	2.153
1.3778	2.135	1.176	0.000	2.153
1.4000	2.135	1.195	0.000	2.153
1.4222	2.135	1.214	0.000	2.153
1.4444	2.135	1.233	0.000	2.153
1.4667	2.135	1.252	0.000	2.153
1.4889	2.135	1.271	0.000	2.153
1.5111	2.135	1.290	0.000	2.153
1.5333	2.135	1.309	0.000	2.153
1.5556	2.135	1.328	0.000	2.153
1.5778	2.135	1.347	0.000	2.153
1.6000	2.135	1.366	0.000	2.153
1.6222	2.135	1.385	0.000	2.153
1.6444	2.135	1.404	0.000	2.153
1.6667	2.135	1.423	0.000	2.153
1.6889	2.135	1.442	0.000	2.153
1.7111	2.135	1.461	0.000	2.153
1.7333	2.135	1.480	0.000	2.153
1.7556	2.135	1.499	0.008	2.153
1.7778	2.135	1.518	0.098	2.153
1.8000	2.135	1.537	0.237	2.153
1.8222	2.135	1.556	0.411	2.153
1.8444	2.135	1.575	0.615	2.153

1.8667	2.135	1.594	0.844	2.153
1.8889	2.135	1.613	1.095	2.153
1.9111	2.135	1.632	1.367	2.153
1.9333	2.135	1.651	1.657	2.153
1.9556	2.135	1.670	1.964	2.153
1.9778	2.135	1.689	2.287	2.153
2.0000	2.135	1.708	2.623	2.153

Trapezoidal Pond 1

Bottom Length:	220.00 ft.	
Bottom Width:	220.00 ft.	
Depth:	2 ft.	
Volume at riser head:	1.1417 acre-feet.	
Infiltration On		
Infiltration rate:	0.5	
Infiltration safety factor:	1	
Wetted surface area On		
Total Volume Infiltrated (ac-ft.):		893.621
Total Volume Through Riser (ac-ft.):		0.042
Total Volume Through Facility (ac-ft.):		893.663
Percent Infiltrated:		100
Total Precip Applied to Facility:		0
Total Evap From Facility:		0
Side slope 1:	3 To 1	
Side slope 2:	3 To 1	
Side slope 3:	3 To 1	
Side slope 4:	3 To 1	
Discharge Structure		
Riser Height:	1 ft.	
Riser Diameter:	36 in.	
Element Flows To:		
Outlet 1	Outlet 2	

Pond Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	1.111	0.000	0.000	0.000
0.0222	1.112	0.024	0.000	0.560
0.0444	1.113	0.049	0.000	0.561
0.0667	1.115	0.074	0.000	0.562
0.0889	1.116	0.099	0.000	0.562
0.1111	1.117	0.123	0.000	0.563
0.1333	1.119	0.148	0.000	0.564
0.1556	1.120	0.173	0.000	0.564
0.1778	1.121	0.198	0.000	0.565
0.2000	1.123	0.223	0.000	0.566
0.2222	1.124	0.248	0.000	0.567
0.2444	1.126	0.273	0.000	0.567
0.2667	1.127	0.298	0.000	0.568
0.2889	1.128	0.323	0.000	0.569
0.3111	1.130	0.348	0.000	0.569
0.3333	1.131	0.373	0.000	0.570
0.3556	1.132	0.398	0.000	0.571
0.3778	1.134	0.424	0.000	0.571
0.4000	1.135	0.449	0.000	0.572
0.4222	1.136	0.474	0.000	0.573
0.4444	1.138	0.499	0.000	0.573
0.4667	1.139	0.525	0.000	0.574
0.4889	1.140	0.550	0.000	0.575
0.5111	1.142	0.575	0.000	0.575
0.5333	1.143	0.601	0.000	0.576
0.5556	1.145	0.626	0.000	0.577
0.5778	1.146	0.652	0.000	0.578
0.6000	1.147	0.677	0.000	0.578

0.6222	1.149	0.703	0.000	0.579
0.6444	1.150	0.728	0.000	0.580
0.6667	1.151	0.754	0.000	0.580
0.6889	1.153	0.779	0.000	0.581
0.7111	1.154	0.805	0.000	0.582
0.7333	1.156	0.831	0.000	0.582
0.7556	1.157	0.856	0.000	0.583
0.7778	1.158	0.882	0.000	0.584
0.8000	1.160	0.908	0.000	0.584
0.8222	1.161	0.934	0.000	0.585
0.8444	1.162	0.960	0.000	0.586
0.8667	1.164	0.985	0.000	0.587
0.8889	1.165	1.011	0.000	0.587
0.9111	1.167	1.037	0.000	0.588
0.9333	1.168	1.063	0.000	0.589
0.9556	1.169	1.089	0.000	0.589
0.9778	1.171	1.115	0.000	0.590
1.0000	1.172	1.141	0.000	0.591
1.0222	1.173	1.167	0.105	0.591
1.0444	1.175	1.193	0.298	0.592
1.0667	1.176	1.220	0.547	0.593
1.0889	1.178	1.246	0.843	0.594
1.1111	1.179	1.272	1.178	0.594
1.1333	1.180	1.298	1.548	0.595
1.1556	1.182	1.324	1.950	0.596
1.1778	1.183	1.351	2.381	0.596
1.2000	1.185	1.377	2.840	0.597
1.2222	1.186	1.403	3.325	0.598
1.2444	1.187	1.430	3.833	0.598
1.2667	1.189	1.456	4.364	0.599
1.2889	1.190	1.483	4.915	0.600
1.3111	1.192	1.509	5.487	0.601
1.3333	1.193	1.536	6.077	0.601
1.3556	1.194	1.562	6.684	0.602
1.3778	1.196	1.589	7.307	0.603
1.4000	1.197	1.615	7.944	0.603
1.4222	1.199	1.642	8.596	0.604
1.4444	1.200	1.669	9.260	0.605
1.4667	1.201	1.695	9.934	0.605
1.4889	1.203	1.722	10.62	0.606
1.5111	1.204	1.749	11.31	0.607
1.5333	1.206	1.775	12.01	0.608
1.5556	1.207	1.802	12.72	0.608
1.5778	1.208	1.829	13.43	0.609
1.6000	1.210	1.856	14.14	0.610
1.6222	1.211	1.883	14.86	0.610
1.6444	1.213	1.910	15.58	0.611
1.6667	1.214	1.937	16.30	0.612
1.6889	1.215	1.964	17.02	0.613
1.7111	1.217	1.991	17.73	0.613
1.7333	1.218	2.018	18.45	0.614
1.7556	1.220	2.045	19.15	0.615
1.7778	1.221	2.072	19.85	0.615
1.8000	1.222	2.099	20.54	0.616
1.8222	1.224	2.127	21.23	0.617
1.8444	1.225	2.154	21.90	0.618
1.8667	1.227	2.181	22.56	0.618
1.8889	1.228	2.208	23.21	0.619

1.9111	1.230	2.236	23.85	0.620
1.9333	1.231	2.263	24.47	0.620
1.9556	1.232	2.290	25.07	0.621
1.9778	1.234	2.318	25.66	0.622
2.0000	1.235	2.345	26.24	0.623
2.0222	1.237	2.373	26.79	0.623

Analysis Results

POC 1

POC #1 was not reported because POC must exist in both scenarios and both scenarios must have been run.

Model Default Modifications

Total of 0 changes have been made.

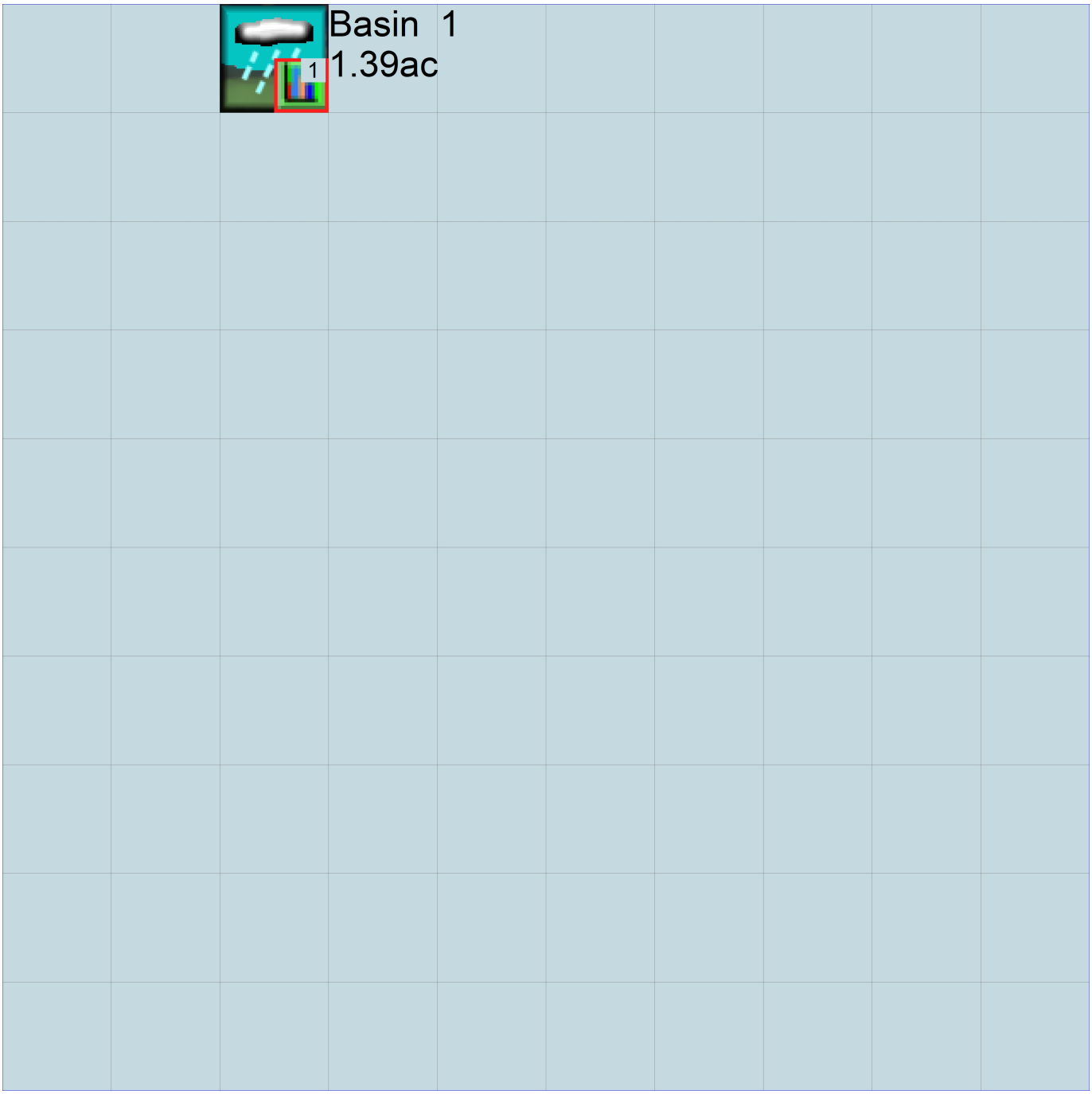
PERLND Changes

No PERLND changes have been made.

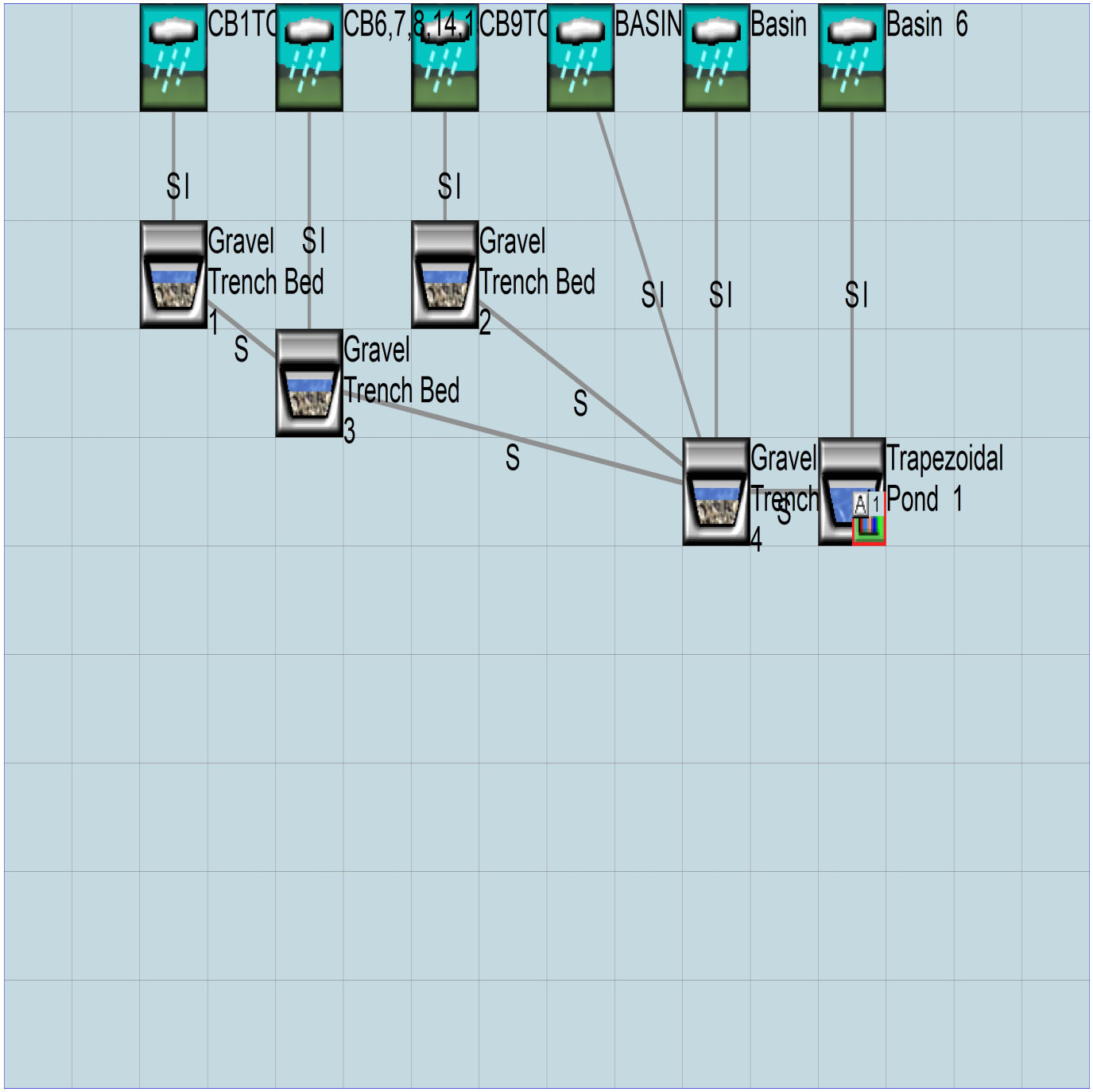
IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1955 10 01        END    2008 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   BF-DET-ALL.wdm
MESSU       25   MitBF-DET-ALL.MES
            27   MitBF-DET-ALL.L61
            28   MitBF-DET-ALL.L62
            30   POCBF-DET-ALL1.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:15
      IMPLND      11
      IMPLND       4
      IMPLND      14
      RCHRES       1
      RCHRES       2
      RCHRES       3
      RCHRES       4
      RCHRES       5
      COPY         1
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Trapezoidal Pond  1         MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out           ***
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
  END ACTIVITY
```

```
  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
   11      PARKING/FLAT           1    1    1   27    0
    4      ROOF TOPS/FLAT         1    1    1   27    0
   14      POND                   1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
   11         0    0    1    0    0    0
    4         0    0    1    0    0    0
   14         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
   11         0    0    4    0    0    0    1    9
    4         0    0    4    0    0    0    1    9
   14         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
   11         0    0    0    0    0
    4         0    0    0    0    0
   14         0    0    0    0    0
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
```

```
   11            400      0.01       0.1       0.1
    4            400      0.01       0.1       0.1
   14            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
   11              0         0
    4              0         0
   14              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
   11              0         0
    4              0         0
   14              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
CB1TO5***
IMPLND  11                       3.4     RCHRES   1      5
CB9TO10***
IMPLND  11                      0.63     RCHRES   2      5
CB6,7,8,14,15***
IMPLND  11                      2.61     RCHRES   3      5
BASIN D***
IMPLND  11                      1.56     RCHRES   4      5
Basin  5***
IMPLND  11                      3.17     RCHRES   4      5
Basin  6***
IMPLND   4                         1     RCHRES   5      5
IMPLND  11                      2.26     RCHRES   5      5
IMPLND  14                      0.88     RCHRES   5      5

******Routing******
RCHRES   1                         1     RCHRES   3      7
RCHRES   2                         1     RCHRES   4      7
RCHRES   3                         1     RCHRES   4      7
RCHRES   4                         1     RCHRES   5      7
RCHRES   4                               COPY     1     17
IMPLND   4                         1     COPY     1     15
IMPLND  11                      2.26     COPY     1     15
IMPLND  14                      0.88     COPY     1     15
RCHRES   5                         1     COPY   501     17
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
    1     Gravel Trench Be-005    2    1    1    1   28    0    1
```

```
    2     Gravel Trench Be-007    2    1    1    1   28    0    1
    3     Gravel Trench Be-009    2    1    1    1   28    0    1
    4     Gravel Trench Be-011    2    1    1    1   28    0    1
    5     Trapezoidal Pond-016    2    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
    1         1    0    0    0    0    0    0    0    0    0
    2         1    0    0    0    0    0    0    0    0    0
    3         1    0    0    0    0    0    0    0    0    0
    4         1    0    0    0    0    0    0    0    0    0
    5         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
    2         4    0    0    0    0    0    0    0    0    0    1    9
    3         4    0    0    0    0    0    0    0    0    0    1    9
    4         4    0    0    0    0    0    0    0    0    0    1    9
    5         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
           FG FG FG FG  possible  exit  *** possible  exit      possible  exit
            *  *  *  *    *  *  *  *  *       *  *  *  *  *       ***
    1        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
    2        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
    3        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
    4        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
    5        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->      ***
    1              1      0.06       0.0       0.0       0.5       0.0
    2              2      0.07       0.0       0.0       0.5       0.0
    3              3      0.04       0.0       0.0       0.5       0.0
    4              4      0.06       0.0       0.0       0.5       0.0
    5              5      0.04       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                     ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1           0         4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    2           0         4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    3           0         4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    4           0         4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    5           0         4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE      1
   92    5
     Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)      (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.187328  0.000000  0.000000  0.000000
  0.022222  0.187328  0.001665  0.000000  0.188889
```

0.044444	0.187328	0.003330	0.000000	0.188889
0.066667	0.187328	0.004995	0.000000	0.188889
0.088889	0.187328	0.006661	0.000000	0.188889
0.111111	0.187328	0.008326	0.000000	0.188889
0.133333	0.187328	0.009991	0.000000	0.188889
0.155556	0.187328	0.011656	0.000000	0.188889
0.177778	0.187328	0.013321	0.000000	0.188889
0.200000	0.187328	0.014986	0.000000	0.188889
0.222222	0.187328	0.016651	0.000000	0.188889
0.244444	0.187328	0.018316	0.000000	0.188889
0.266667	0.187328	0.019982	0.000000	0.188889
0.288889	0.187328	0.021647	0.000000	0.188889
0.311111	0.187328	0.023312	0.000000	0.188889
0.333333	0.187328	0.024977	0.000000	0.188889
0.355556	0.187328	0.026642	0.000000	0.188889
0.377778	0.187328	0.028307	0.000000	0.188889
0.400000	0.187328	0.029972	0.000000	0.188889
0.422222	0.187328	0.031638	0.000000	0.188889
0.444444	0.187328	0.033303	0.000000	0.188889
0.466667	0.187328	0.034968	0.000000	0.188889
0.488889	0.187328	0.036633	0.000000	0.188889
0.511111	0.187328	0.038298	0.000000	0.188889
0.533333	0.187328	0.039963	0.000000	0.188889
0.555556	0.187328	0.041628	0.000000	0.188889
0.577778	0.187328	0.043294	0.000000	0.188889
0.600000	0.187328	0.044959	0.000000	0.188889
0.622222	0.187328	0.046624	0.000000	0.188889
0.644444	0.187328	0.048289	0.000000	0.188889
0.666667	0.187328	0.049954	0.000000	0.188889
0.688889	0.187328	0.051619	0.000000	0.188889
0.711111	0.187328	0.053284	0.000000	0.188889
0.733333	0.187328	0.054949	0.000000	0.188889
0.755556	0.187328	0.056615	0.000000	0.188889
0.777778	0.187328	0.058280	0.000000	0.188889
0.800000	0.187328	0.059945	0.000000	0.188889
0.822222	0.187328	0.061610	0.000000	0.188889
0.844444	0.187328	0.063275	0.000000	0.188889
0.866667	0.187328	0.064940	0.000000	0.188889
0.888889	0.187328	0.066605	0.000000	0.188889
0.911111	0.187328	0.068271	0.000000	0.188889
0.933333	0.187328	0.069936	0.000000	0.188889
0.955556	0.187328	0.071601	0.000000	0.188889
0.977778	0.187328	0.073266	0.000000	0.188889
1.000000	0.187328	0.074931	0.000000	0.188889
1.022222	0.187328	0.076596	0.035147	0.188889
1.044444	0.187328	0.078261	0.099321	0.188889
1.066667	0.187328	0.079927	0.182234	0.188889
1.088889	0.187328	0.081592	0.279955	0.188889
1.111111	0.187328	0.083257	0.389839	0.188889
1.133333	0.187328	0.084922	0.509662	0.188889
1.155556	0.187328	0.086587	0.637321	0.188889
1.177778	0.187328	0.088252	0.770709	0.188889
1.200000	0.187328	0.089917	0.907676	0.188889
1.222222	0.187328	0.091582	1.046030	0.188889
1.244444	0.187328	0.093248	1.183559	0.188889
1.266667	0.187328	0.094913	1.318080	0.188889
1.288889	0.187328	0.096578	1.447495	0.188889
1.311111	0.187328	0.098243	1.569860	0.188889
1.333333	0.187328	0.099908	1.683468	0.188889
1.355556	0.187328	0.101573	1.786929	0.188889
1.377778	0.187328	0.103238	1.879270	0.188889
1.400000	0.187328	0.104904	1.960035	0.188889
1.422222	0.187328	0.106569	2.029388	0.188889
1.444444	0.187328	0.108234	2.088233	0.188889
1.466667	0.187328	0.109899	2.138326	0.188889
1.488889	0.187328	0.111564	2.182401	0.188889
1.511111	0.187328	0.113229	2.251735	0.188889
1.533333	0.187328	0.114894	2.300165	0.188889
1.555556	0.187328	0.116560	2.347596	0.188889
1.577778	0.187328	0.118225	2.394087	0.188889

```
1.600000  0.187328  0.119890  2.439693  0.188889
1.622222  0.187328  0.121555  2.484462  0.188889
1.644444  0.187328  0.123220  2.528438  0.188889
1.666667  0.187328  0.124885  2.571662  0.188889
1.688889  0.187328  0.126550  2.614172  0.188889
1.711111  0.187328  0.128215  2.656001  0.188889
1.733333  0.187328  0.129881  2.697182  0.188889
1.755556  0.187328  0.131546  2.737743  0.188889
1.777778  0.187328  0.133211  2.777713  0.188889
1.800000  0.187328  0.134876  2.817115  0.188889
1.822222  0.187328  0.136541  2.855973  0.188889
1.844444  0.187328  0.138206  2.894310  0.188889
1.866667  0.187328  0.139871  2.932146  0.188889
1.888889  0.187328  0.141537  2.969500  0.188889
1.911111  0.187328  0.143202  3.006389  0.188889
1.933333  0.187328  0.144867  3.042832  0.188889
1.955556  0.187328  0.146532  3.078843  0.188889
1.977778  0.187328  0.148197  3.114438  0.188889
2.000000  0.187328  0.149862  3.149630  0.188889
2.022222  0.187328  0.154025  3.184434  0.188889
END FTABLE  1
FTABLE      2
 92    5
   Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
    (ft)   (acres) (acre-ft)   (cfs)     (cfs)   (ft/sec)    (Minutes)***
0.000000  0.192837  0.000000  0.000000  0.000000
0.022222  0.192837  0.001714  0.000000  0.194444
0.044444  0.192837  0.003428  0.000000  0.194444
0.066667  0.192837  0.005142  0.000000  0.194444
0.088889  0.192837  0.006856  0.000000  0.194444
0.111111  0.192837  0.008571  0.000000  0.194444
0.133333  0.192837  0.010285  0.000000  0.194444
0.155556  0.192837  0.011999  0.000000  0.194444
0.177778  0.192837  0.013713  0.000000  0.194444
0.200000  0.192837  0.015427  0.000000  0.194444
0.222222  0.192837  0.017141  0.000000  0.194444
0.244444  0.192837  0.018855  0.000000  0.194444
0.266667  0.192837  0.020569  0.000000  0.194444
0.288889  0.192837  0.022283  0.000000  0.194444
0.311111  0.192837  0.023998  0.000000  0.194444
0.333333  0.192837  0.025712  0.000000  0.194444
0.355556  0.192837  0.027426  0.000000  0.194444
0.377778  0.192837  0.029140  0.000000  0.194444
0.400000  0.192837  0.030854  0.000000  0.194444
0.422222  0.192837  0.032568  0.000000  0.194444
0.444444  0.192837  0.034282  0.000000  0.194444
0.466667  0.192837  0.035996  0.000000  0.194444
0.488889  0.192837  0.037710  0.000000  0.194444
0.511111  0.192837  0.039425  0.000000  0.194444
0.533333  0.192837  0.041139  0.000000  0.194444
0.555556  0.192837  0.042853  0.000000  0.194444
0.577778  0.192837  0.044567  0.000000  0.194444
0.600000  0.192837  0.046281  0.000000  0.194444
0.622222  0.192837  0.047995  0.000000  0.194444
0.644444  0.192837  0.049709  0.000000  0.194444
0.666667  0.192837  0.051423  0.000000  0.194444
0.688889  0.192837  0.053137  0.000000  0.194444
0.711111  0.192837  0.054852  0.000000  0.194444
0.733333  0.192837  0.056566  0.000000  0.194444
0.755556  0.192837  0.058280  0.000000  0.194444
0.777778  0.192837  0.059994  0.000000  0.194444
0.800000  0.192837  0.061708  0.000000  0.194444
0.822222  0.192837  0.063422  0.000000  0.194444
0.844444  0.192837  0.065136  0.000000  0.194444
0.866667  0.192837  0.066850  0.000000  0.194444
0.888889  0.192837  0.068564  0.000000  0.194444
0.911111  0.192837  0.070279  0.000000  0.194444
0.933333  0.192837  0.071993  0.000000  0.194444
0.955556  0.192837  0.073707  0.000000  0.194444
0.977778  0.192837  0.075421  0.000000  0.194444
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1.000000  0.192837  0.077135  0.000000  0.194444
1.022222  0.192837  0.078849  0.035147  0.194444
1.044444  0.192837  0.080563  0.099321  0.194444
1.066667  0.192837  0.082277  0.182234  0.194444
1.088889  0.192837  0.083991  0.279955  0.194444
1.111111  0.192837  0.085706  0.389839  0.194444
1.133333  0.192837  0.087420  0.509662  0.194444
1.155556  0.192837  0.089134  0.637321  0.194444
1.177778  0.192837  0.090848  0.770709  0.194444
1.200000  0.192837  0.092562  0.907676  0.194444
1.222222  0.192837  0.094276  1.046030  0.194444
1.244444  0.192837  0.095990  1.183559  0.194444
1.266667  0.192837  0.097704  1.318080  0.194444
1.288889  0.192837  0.099418  1.447495  0.194444
1.311111  0.192837  0.101133  1.569860  0.194444
1.333333  0.192837  0.102847  1.683468  0.194444
1.355556  0.192837  0.104561  1.786929  0.194444
1.377778  0.192837  0.106275  1.879270  0.194444
1.400000  0.192837  0.107989  1.960035  0.194444
1.422222  0.192837  0.109703  2.029388  0.194444
1.444444  0.192837  0.111417  2.088233  0.194444
1.466667  0.192837  0.113131  2.138326  0.194444
1.488889  0.192837  0.114845  2.182401  0.194444
1.511111  0.192837  0.116560  2.251735  0.194444
1.533333  0.192837  0.118274  2.300165  0.194444
1.555556  0.192837  0.119988  2.347596  0.194444
1.577778  0.192837  0.121702  2.394087  0.194444
1.600000  0.192837  0.123416  2.439693  0.194444
1.622222  0.192837  0.125130  2.484462  0.194444
1.644444  0.192837  0.126844  2.528438  0.194444
1.666667  0.192837  0.128558  2.571662  0.194444
1.688889  0.192837  0.130272  2.614172  0.194444
1.711111  0.192837  0.131987  2.656001  0.194444
1.733333  0.192837  0.133701  2.697182  0.194444
1.755556  0.192837  0.135415  2.737743  0.194444
1.777778  0.192837  0.137129  2.777713  0.194444
1.800000  0.192837  0.138843  2.817115  0.194444
1.822222  0.192837  0.140557  2.855973  0.194444
1.844444  0.192837  0.142271  2.894310  0.194444
1.866667  0.192837  0.143985  2.932146  0.194444
1.888889  0.192837  0.145699  2.969500  0.194444
1.911111  0.192837  0.147414  3.006389  0.194444
1.933333  0.192837  0.149128  3.042832  0.194444
1.955556  0.192837  0.150842  3.078843  0.194444
1.977778  0.192837  0.152556  3.114438  0.194444
2.000000  0.192837  0.154270  3.149630  0.194444
2.022222  0.192837  0.158555  3.184434  0.194444
END FTABLE  2
FTABLE      3
 92    5
   Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
    (ft)   (acres) (acre-ft)   (cfs)      (cfs)   (ft/sec)    (Minutes)***
0.000000  0.269743  0.000000  0.000000  0.000000
0.022222  0.269743  0.002398  0.000000  0.271991
0.044444  0.269743  0.004795  0.000000  0.271991
0.066667  0.269743  0.007193  0.000000  0.271991
0.088889  0.269743  0.009591  0.000000  0.271991
0.111111  0.269743  0.011989  0.000000  0.271991
0.133333  0.269743  0.014386  0.000000  0.271991
0.155556  0.269743  0.016784  0.000000  0.271991
0.177778  0.269743  0.019182  0.000000  0.271991
0.200000  0.269743  0.021579  0.000000  0.271991
0.222222  0.269743  0.023977  0.000000  0.271991
0.244444  0.269743  0.026375  0.000000  0.271991
0.266667  0.269743  0.028773  0.000000  0.271991
0.288889  0.269743  0.031170  0.000000  0.271991
0.311111  0.269743  0.033568  0.000000  0.271991
0.333333  0.269743  0.035966  0.000000  0.271991
0.355556  0.269743  0.038363  0.000000  0.271991
0.377778  0.269743  0.040761  0.000000  0.271991
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0.400000	0.269743	0.043159	0.000000	0.271991
0.422222	0.269743	0.045557	0.000000	0.271991
0.444444	0.269743	0.047954	0.000000	0.271991
0.466667	0.269743	0.050352	0.000000	0.271991
0.488889	0.269743	0.052750	0.000000	0.271991
0.511111	0.269743	0.055147	0.000000	0.271991
0.533333	0.269743	0.057545	0.000000	0.271991
0.555556	0.269743	0.059943	0.000000	0.271991
0.577778	0.269743	0.062341	0.000000	0.271991
0.600000	0.269743	0.064738	0.000000	0.271991
0.622222	0.269743	0.067136	0.000000	0.271991
0.644444	0.269743	0.069534	0.000000	0.271991
0.666667	0.269743	0.071931	0.000000	0.271991
0.688889	0.269743	0.074329	0.000000	0.271991
0.711111	0.269743	0.076727	0.000000	0.271991
0.733333	0.269743	0.079125	0.000000	0.271991
0.755556	0.269743	0.081522	0.000000	0.271991
0.777778	0.269743	0.083920	0.000000	0.271991
0.800000	0.269743	0.086318	0.000000	0.271991
0.822222	0.269743	0.088715	0.000000	0.271991
0.844444	0.269743	0.091113	0.000000	0.271991
0.866667	0.269743	0.093511	0.000000	0.271991
0.888889	0.269743	0.095909	0.000000	0.271991
0.911111	0.269743	0.098306	0.000000	0.271991
0.933333	0.269743	0.100704	0.000000	0.271991
0.955556	0.269743	0.103102	0.000000	0.271991
0.977778	0.269743	0.105499	0.000000	0.271991
1.000000	0.269743	0.107897	0.000000	0.271991
1.022222	0.269743	0.110295	0.035147	0.271991
1.044444	0.269743	0.112693	0.099321	0.271991
1.066667	0.269743	0.115090	0.182234	0.271991
1.088889	0.269743	0.117488	0.279955	0.271991
1.111111	0.269743	0.119886	0.389839	0.271991
1.133333	0.269743	0.122283	0.509662	0.271991
1.155556	0.269743	0.124681	0.637321	0.271991
1.177778	0.269743	0.127079	0.770709	0.271991
1.200000	0.269743	0.129477	0.907676	0.271991
1.222222	0.269743	0.131874	1.046030	0.271991
1.244444	0.269743	0.134272	1.183559	0.271991
1.266667	0.269743	0.136670	1.318080	0.271991
1.288889	0.269743	0.139067	1.447495	0.271991
1.311111	0.269743	0.141465	1.569860	0.271991
1.333333	0.269743	0.143863	1.683468	0.271991
1.355556	0.269743	0.146261	1.786929	0.271991
1.377778	0.269743	0.148658	1.879270	0.271991
1.400000	0.269743	0.151056	1.960035	0.271991
1.422222	0.269743	0.153454	2.029388	0.271991
1.444444	0.269743	0.155851	2.088233	0.271991
1.466667	0.269743	0.158249	2.138326	0.271991
1.488889	0.269743	0.160647	2.182401	0.271991
1.511111	0.269743	0.163045	2.251735	0.271991
1.533333	0.269743	0.165442	2.300165	0.271991
1.555556	0.269743	0.167840	2.347596	0.271991
1.577778	0.269743	0.170238	2.394087	0.271991
1.600000	0.269743	0.172635	2.439693	0.271991
1.622222	0.269743	0.175033	2.484462	0.271991
1.644444	0.269743	0.177431	2.528438	0.271991
1.666667	0.269743	0.179829	2.571662	0.271991
1.688889	0.269743	0.182226	2.614172	0.271991
1.711111	0.269743	0.184624	2.656001	0.271991
1.733333	0.269743	0.187022	2.697182	0.271991
1.755556	0.269743	0.189419	2.737743	0.271991
1.777778	0.269743	0.191817	2.777713	0.271991
1.800000	0.269743	0.194215	2.817115	0.271991
1.822222	0.269743	0.196613	2.855973	0.271991
1.844444	0.269743	0.199010	2.894310	0.271991
1.866667	0.269743	0.201408	2.932146	0.271991
1.888889	0.269743	0.203806	2.969500	0.271991
1.911111	0.269743	0.206203	3.006389	0.271991
1.933333	0.269743	0.208601	3.042832	0.271991

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1.955556  0.269743  0.210999  3.078843  0.271991
1.977778  0.269743  0.213397  3.114438  0.271991
2.000000  0.269743  0.215794  3.149630  0.271991
2.022222  0.269743  0.221789  3.184434  0.271991
END FTABLE  3
FTABLE      4
 92    5
   Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
    (ft)   (acres) (acre-ft)   (cfs)     (cfs)   (ft/sec)    (Minutes)***
0.000000  2.135560  0.000000  0.000000  0.000000
0.022222  2.135560  0.018983  0.000000  2.153356
0.044444  2.135560  0.037966  0.000000  2.153356
0.066667  2.135560  0.056948  0.000000  2.153356
0.088889  2.135560  0.075931  0.000000  2.153356
0.111111  2.135560  0.094914  0.000000  2.153356
0.133333  2.135560  0.113897  0.000000  2.153356
0.155556  2.135560  0.132879  0.000000  2.153356
0.177778  2.135560  0.151862  0.000000  2.153356
0.200000  2.135560  0.170845  0.000000  2.153356
0.222222  2.135560  0.189828  0.000000  2.153356
0.244444  2.135560  0.208810  0.000000  2.153356
0.266667  2.135560  0.227793  0.000000  2.153356
0.288889  2.135560  0.246776  0.000000  2.153356
0.311111  2.135560  0.265759  0.000000  2.153356
0.333333  2.135560  0.284741  0.000000  2.153356
0.355556  2.135560  0.303724  0.000000  2.153356
0.377778  2.135560  0.322707  0.000000  2.153356
0.400000  2.135560  0.341690  0.000000  2.153356
0.422222  2.135560  0.360672  0.000000  2.153356
0.444444  2.135560  0.379655  0.000000  2.153356
0.466667  2.135560  0.398638  0.000000  2.153356
0.488889  2.135560  0.417621  0.000000  2.153356
0.511111  2.135560  0.436603  0.000000  2.153356
0.533333  2.135560  0.455586  0.000000  2.153356
0.555556  2.135560  0.474569  0.000000  2.153356
0.577778  2.135560  0.493552  0.000000  2.153356
0.600000  2.135560  0.512534  0.000000  2.153356
0.622222  2.135560  0.531517  0.000000  2.153356
0.644444  2.135560  0.550500  0.000000  2.153356
0.666667  2.135560  0.569483  0.000000  2.153356
0.688889  2.135560  0.588465  0.000000  2.153356
0.711111  2.135560  0.607448  0.000000  2.153356
0.733333  2.135560  0.626431  0.000000  2.153356
0.755556  2.135560  0.645414  0.000000  2.153356
0.777778  2.135560  0.664396  0.000000  2.153356
0.800000  2.135560  0.683379  0.000000  2.153356
0.822222  2.135560  0.702362  0.000000  2.153356
0.844444  2.135560  0.721345  0.000000  2.153356
0.866667  2.135560  0.740328  0.000000  2.153356
0.888889  2.135560  0.759310  0.000000  2.153356
0.911111  2.135560  0.778293  0.000000  2.153356
0.933333  2.135560  0.797276  0.000000  2.153356
0.955556  2.135560  0.816259  0.000000  2.153356
0.977778  2.135560  0.835241  0.000000  2.153356
1.000000  2.135560  0.854224  0.000000  2.153356
1.022222  2.135560  0.873207  0.000000  2.153356
1.044444  2.135560  0.892190  0.000000  2.153356
1.066667  2.135560  0.911172  0.000000  2.153356
1.088889  2.135560  0.930155  0.000000  2.153356
1.111111  2.135560  0.949138  0.000000  2.153356
1.133333  2.135560  0.968121  0.000000  2.153356
1.155556  2.135560  0.987103  0.000000  2.153356
1.177778  2.135560  1.006086  0.000000  2.153356
1.200000  2.135560  1.025069  0.000000  2.153356
1.222222  2.135560  1.044052  0.000000  2.153356
1.244444  2.135560  1.063034  0.000000  2.153356
1.266667  2.135560  1.082017  0.000000  2.153356
1.288889  2.135560  1.101000  0.000000  2.153356
1.311111  2.135560  1.119983  0.000000  2.153356
1.333333  2.135560  1.138965  0.000000  2.153356
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1.355556  2.135560  1.157948  0.000000  2.153356
1.377778  2.135560  1.176931  0.000000  2.153356
1.400000  2.135560  1.195914  0.000000  2.153356
1.422222  2.135560  1.214896  0.000000  2.153356
1.444444  2.135560  1.233879  0.000000  2.153356
1.466667  2.135560  1.252862  0.000000  2.153356
1.488889  2.135560  1.271845  0.000000  2.153356
1.511111  2.135560  1.290827  0.000000  2.153356
1.533333  2.135560  1.309810  0.000000  2.153356
1.555556  2.135560  1.328793  0.000000  2.153356
1.577778  2.135560  1.347776  0.000000  2.153356
1.600000  2.135560  1.366758  0.000000  2.153356
1.622222  2.135560  1.385741  0.000000  2.153356
1.644444  2.135560  1.404724  0.000000  2.153356
1.666667  2.135560  1.423707  0.000000  2.153356
1.688889  2.135560  1.442690  0.000000  2.153356
1.711111  2.135560  1.461672  0.000000  2.153356
1.733333  2.135560  1.480655  0.000000  2.153356
1.755556  2.135560  1.499638  0.008795  2.153356
1.777778  2.135560  1.518621  0.098274  2.153356
1.800000  2.135560  1.537603  0.237213  2.153356
1.822222  2.135560  1.556586  0.411623  2.153356
1.844444  2.135560  1.575569  0.615253  2.153356
1.866667  2.135560  1.594552  0.844221  2.153356
1.888889  2.135560  1.613534  1.095735  2.153356
1.911111  2.135560  1.632517  1.367580  2.153356
1.933333  2.135560  1.651500  1.657872  2.153356
1.955556  2.135560  1.670483  1.964924  2.153356
1.977778  2.135560  1.689465  2.287161  2.153356
2.000000  2.135560  1.708448  2.623072  2.153356
2.022222  2.135560  1.755905  2.971172  2.153356
END FTABLE  4
FTABLE      5
 91    5
   Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
    (ft)   (acres) (acre-ft)   (cfs)      (cfs)   (ft/sec)    (Minutes)***
0.000000  1.111111  0.000000  0.000000  0.000000
0.022222  1.112458  0.024706  0.000000  0.560864
0.044444  1.113806  0.049443  0.000000  0.561544
0.066667  1.115155  0.074209  0.000000  0.562224
0.088889  1.116505  0.099005  0.000000  0.562905
0.111111  1.117855  0.123831  0.000000  0.563585
0.133333  1.119207  0.148688  0.000000  0.564267
0.155556  1.120559  0.173574  0.000000  0.564948
0.177778  1.121912  0.198490  0.000000  0.565630
0.200000  1.123265  0.223437  0.000000  0.566313
0.222222  1.124620  0.248413  0.000000  0.566996
0.244444  1.125975  0.273420  0.000000  0.567679
0.266667  1.127331  0.298456  0.000000  0.568363
0.288889  1.128689  0.323523  0.000000  0.569047
0.311111  1.130046  0.348620  0.000000  0.569732
0.333333  1.131405  0.373748  0.000000  0.570417
0.355556  1.132764  0.398905  0.000000  0.571102
0.377778  1.134125  0.424093  0.000000  0.571788
0.400000  1.135486  0.449311  0.000000  0.572474
0.422222  1.136848  0.474559  0.000000  0.573161
0.444444  1.138210  0.499837  0.000000  0.573848
0.466667  1.139574  0.525146  0.000000  0.574535
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0.688889  1.153254  0.779903  0.000000  0.581432
0.711111  1.154627  0.805546  0.000000  0.582124
0.733333  1.156000  0.831220  0.000000  0.582817
```

```
  0.755556  1.157374  0.856924  0.000000  0.583509
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  1.288889  1.190599  1.483029  4.915755  0.600260
  1.311111  1.191993  1.509502  5.487151  0.600963
  1.333333  1.193388  1.536007  6.076986  0.601667
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  1.511111  1.204581  1.749159  11.31319  0.607309
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  1.600000  1.210197  1.856482  14.14927  0.610141
  1.622222  1.211602  1.883391  14.86748  0.610850
  1.644444  1.213009  1.910331  15.58681  0.611559
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  2.000000  1.235629  2.345638  26.24267  0.622963
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END FTABLES

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<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1.111          PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.111          IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.76           PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.76           IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES
```

```
EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
RCHRES   5 HYDR   RO     1 1        1      WDM   1008 FLOW     ENGL      REPL
RCHRES   5 HYDR   O      1 1        1      WDM   1009 FLOW     ENGL      REPL
RCHRES   5 HYDR   O      2 1        1      WDM   1010 FLOW     ENGL      REPL
RCHRES   5 HYDR   STAGE  1 1        1      WDM   1011 STAG     ENGL      REPL
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>             <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    5

  MASS-LINK        7
RCHRES     OFLOW  OVOL   1                 RCHRES         INFLOW IVOL
  END MASS-LINK    7

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15

  MASS-LINK       17
RCHRES     OFLOW  OVOL   1                 COPY           INPUT  MEAN
  END MASS-LINK   17


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

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APPENDIX 2
GEOTECH REPORT

JSA CIVIL
Engineering | Planning | Management
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Technical Memorandum

TO:	Todd Hansen, Israel Investments LLC
FROM:	Lance Levine, PE, and Steven R. Wright, PE
DATE:	May 24, 2022
RE:	**Summary of Geotechnical Engineering Services** **Israel Road Commercial Development** **Tumwater, Washington** **Landau Associates Project No. 2010001.010.011**

Introduction

This memorandum summarizes the results of geotechnical engineering services provided by Landau Associates, Inc. (Landau) in support of the Israel Road Commercial Development project, located at 1589 Old Israel Road Southwest in Tumwater, Washington (site; Figure 1).

This memorandum was prepared with information provided by JSA Civil (project civil engineer) and with data collected during Landau's geotechnical field exploration and laboratory testing programs.

Project Understanding

Israel Investments LLC (project owner) proposes to develop the site with a commercial park, including paved drive lanes and parking, utilities, and stormwater facilities. The commercial park will include three buildings, each up to five stories tall. As part of the proposed development, Tyee Drive Southwest likely will be extended south of the roundabout located near the western site boundary.

Landau installed datalogger transducers in monitoring wells MW-1, MW-2, and MW-3 and collected groundwater data from November 10, 2021 to April 30, 2022. During the groundwater monitoring period, Landau excavated test pits and completed pilot infiltration test (PIT) investigations. The resultant data were used to develop design infiltration rates.

Site Conditions

The 15.18-acre site includes six parcels (Thurston County parcel numbers 82700800401, 82700800300, 82700700500, 82700800201, 82700800202, and 82700702100) that are currently undeveloped and forested. The site is bordered by Interstate 5 to the east and southeast; by an overhead power corridor to the west; by forestland and Tumwater Boulevard Southwest to the south; and by single-family residences, Old Israel Road Southwest, and Israel Road Southwest to the north. The site is nearly level, with a total relief of approximately 4 feet (ft).

Geologic Setting

Geologic information for the site and the surrounding area was obtained from the *Geologic Map of the Maytown 7.5-minute Quadrangle, Thurston County, Washington* (Logan et al. 2009). Surficial

deposits at the site are mapped as Vashon recessional outwash sand and silt (Qgos). Recessional outwash generally consists of well-sorted, moderately to well-rounded sand and silt. The soils observed in Landau 's September 2021 and March 2022 explorations generally were consistent with the mapped geology for the site.

Subsurface Explorations

On September 28, 2021, Landau explored site subsurface conditions by advancing three borings (MW-1 through MW-3) at the approximate locations shown on Figure 2. The borings were advanced 21.5 to 61.5 ft below ground surface (bgs), and a monitoring well was constructed in each borehole. On March 9, 2022, Landau's excavating subcontractor advanced five test pits (TP-1 through TP-5) 10 to 11.5 ft bgs. On March 9 and 10, 2022, Landau completed PIT investigations (PIT-1 and PIT-2) at 3 ft bgs.

Landau personnel coordinated and monitored the field explorations, collected representative soil samples, and maintained detailed logs of the subsurface soil and groundwater conditions observed. Subsurface conditions were described using the soil classification system shown on Figure 3, in general accordance with ASTM International (ASTM) standard D2488, *Standard Practice for Description and Identification of Soils (Visual-Manual Procedures).* Summary logs of the explorations are presented on Figures 4 through 10.

Soil samples were transported to Landau's geotechnical laboratory for further examination and testing. Natural moisture content determinations were performed on select soil samples in accordance with ASTM standard test method D2216, *Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.* The natural moisture content is shown as W = xx (i.e., percentage of dry weight) in the "Test Data" column on Figures 4 through 6 and 8 through 10. Grain size analyses were performed in accordance with ASTM standard test method D6913, *Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis.* Samples selected for grain size analysis are designated with a "GS" in the "Test Data" column on Figures 4 through 6 and 8 through 10. Results of the grain size analyses are presented on Figures 11 through 13.

Soil Conditions

The soils observed underlying existing surface conditions (i.e., topsoil) were categorized into two general units:

- **Recessional outwash:** Recessional outwash was observed beneath the topsoil in all three borings. The recessional outwash typically consisted of brown to gray sand or sand with silt in a loose to dense condition. Borings MW-2 and MW-3 and test pits TP-1 through TP-5 were terminated in this unit.

- **Advance outwash:** Advance outwash was observed beneath the recessional outwash in boring MW-1. The advance outwash typically consisted of gray sand or sandy gravel in a medium dense to very dense condition. Boring MW-1 was terminated in this unit.

Groundwater Conditions

At time of drilling, groundwater was observed at 22.0 ft bgs in boring MW-1 and at 16.6 ft bgs in borings MW-2 and MW-3. On March 9 and 10, 2022, groundwater seepage was observed in test pits TP-1, TP-2, TP-4, and TP-5. Seepage was observed from 6 to 9.2 ft bgs. Minor groundwater seepage was observed in PIT-2 at 4 and 8 ft bgs.

The groundwater conditions reported herein are for the specific locations and dates indicated and may not be representative of other locations and/or times. Groundwater conditions will vary depending on local subsurface conditions, weather conditions, and other factors. Site groundwater levels are expected to fluctuate seasonally, with maximum groundwater levels occurring during late winter and early spring. Hand-measured groundwater depths are presented in Table 1.

Table 1. Hand-Measured Groundwater Depths

Date	MW-1 (ft bgs)	MW-2 (ft bgs)	MW-3 (ft bgs)
11-10-2021	12.58	14.32	13.62
1-10-2022	10.14	7.74	6.92
2-11-2022	7.51	7.29	6.04
3-4-2022	5.15	5.90	4.66
4-15-2022	5.35	6.32	5.35

bgs = below ground surface
ft = feet
MW = monitoring well

Landau installed pressure transducer dataloggers in monitoring wells MW-1, MW-2, and MW-3 to record groundwater data from November 10, 2021 to April 30, 2022. Landau also collected daily precipitation data for this period from the National Oceanic and Atmospheric Administration's National Centers for Environmental Information (NOAA; accessed May 9, 2022); data were collected for Station USW00024227 in Tumwater, Washington. The highest recorded groundwater levels (measured by hand or with the dataloggers) were 4.89, 5.90, and 4.66 ft bgs for monitoring wells MW-1, MW-2, and MW-3, respectively. Groundwater and precipitation data are presented on Figure 14.

Conclusions and Recommendations

The near-surface soils observed in Landau's explorations will provide adequate support of shallow foundations and pavement sections, provided the geotechnical recommendations presented herein are incorporated into the project design.

Seismic Design Considerations

Landau understands that seismic design will be completed using *2018 International Building Code* standards (ICC 2017). The parameters in Table 2 can be used to compute seismic base shear forces.

Table 2. *2018 International Building Code* Seismic Design Parameters

Spectral response acceleration at short periods (S_S) = 1.385g
Spectral response acceleration at 1-second periods (S_1) = 0.521g
Site class = D[(a)]
Site coefficient (F_a) = 1.0
Site coefficient (F_v) = 1.779[(b)]

(a) The site includes potentially liquefiable soils and is categorized by the American Society of Civil Engineers (ASCE) as Site Class F. The ASCE provides a site class exception for structures with a fundamental period of vibration equal to or less than 0.5 second (2017). Landau recommends using a categorization of Site Class D if the structure has a fundamental period of vibration equal to or less than 0.5 second.
(b) When using the coefficient F_v = 1.779, adhere to Exception 2 requirements for a ground motion hazard analysis. See Section 11.4.8 of the ASCE's *Minimum Design Loads and Associated Criteria for Buildings and Other Structures.* The coefficient should be used only to calculate T_s.
F_a, F_v = short-period (0.2-second period) and long-period (1.0-second period) site coefficients, respectively
g = force of gravity
S_s, S_1 = 0.2-second and 1.0-second period spectral accelerations, respectively

Based on the subsurface conditions observed in Landau's explorations, there is a moderate risk that seismically induced soil liquefaction will occur at the site. Landau estimates that up to 3 inches of total and differential settlement could occur following a design-level earthquake. To mitigate risks associated with liquefaction-induced settlement, shallow foundations should be tied together in accordance with *Minimum Design Loads and Associated Criteria for Buildings and Other Structures* (ASCE 2017).

Based on the subsurface conditions observed in Landau's explorations, there is a low risk that lateral spreading or slope instability will occur at the site. Given the distance between the site and the nearest known active crustal fault, the risk of ground rupture due to surface faulting is low.

Foundation Support

Shallow foundations should be constructed on a prepared subgrade that consists of medium dense to dense recessional outwash soil or on structural fill extending to such soil. The design parameters in Table 3 should be used in conjunction with the complete recommendations in this memorandum.

Table 3. Summary of Design Parameters for Shallow Foundations

Allowable soil bearing pressure = 2,500 psf[(a)]
Allowable soil bearing pressure = 3,000 psf[(b)]
Allowable friction coefficient = 0.35
Allowable passive earth pressure = 300 pcf
Minimum foundation width = 12 inches (continuous), 18 inches (isolated)

(a) Allowable soil bearing pressure for footings established on compacted native soils.
(b) Allowable soil bearing pressure for footings established on at least 12 inches of granular structural fill.
pcf = pounds per cubic foot
psf = pounds per square foot

When developing the design parameters in Table 3, Landau assumed that shallow foundations would be established on medium dense to dense subgrades, prepared as recommended herein. The geotechnical engineer should evaluate prepared subgrades prior to placement of structural fill.

The allowable soil bearing pressures in Table 3 apply to long-term dead and live loads, exclusive of the weight of the footing and any overlying backfill. The bearing pressures can be increased by one-third for transient loads, such as those induced by wind and seismic forces.

For frost protection, perimeter footings should be embedded at least 12 inches below the lowest adjacent grade, where the ground is flat. Interior footings should be embedded at least 6 inches below the nearest adjacent grade. Landau estimates that continuous and isolated foundations will settle 1 inch or less if constructed in accordance with the recommendations for static loading conditions. Differential settlement between similarly loaded foundation elements is estimated to be on the order of ½ inch or less for static loading conditions. Settlement is expected to occur as building loads are applied during construction.

Landau estimates that up to 3 inches of total and differential settlement could occur following a design-level earthquake. Landau assumes that the proposed five-story buildings will be Risk Category II structures without concrete or masonry wall systems and that the span between bearing points (L) will be at least 25 ft. Structures may be supported on shallow foundations, provided the estimated liquefaction-induced differential settlement is below the limits in Table 12.13-3 of the American Society of Civil Engineers' *Minimum Design Loads and Associated Criteria for Buildings and Other*

Structures, i.e., 0.010L, 3.0 inches for these structures; structures should be designed in accordance with Section 12.13.9.2.1 (ASCE 2017).

An allowable coefficient of sliding resistance of 0.35, applied to vertical dead loads only, can be used to compute frictional resistance acting on the base of footings. This coefficient includes a factor of safety of 1.5 on the calculated ultimate value.

The passive resistance of properly compacted structural fill placed against the sides of foundations can be considered equivalent to a fluid with a density of 300 pounds per cubic foot. The foundation passive earth pressure has been reduced by a factor of 1.5 to limit deflections to less than 2 percent of the embedded depth. The passive earth pressure and friction components can be combined, provided the passive component does not exceed two-thirds of the total. The top foot of soil should be excluded from the calculation, unless the foundation perimeter will be covered by a slab-on-grade or pavement.

Landau recommends that perimeter foundation footing drains are included in the design of structures. Landscape and hardscape should slope away from structures at a grade of at least 2 percent.

Foundation Ties

To mitigate seismically induced structural damage, individual footings should be connected with foundation ties, per Section 12.13.9.2.1.1 of *Minimum Design Loads and Associated Criteria for Buildings and Other Structures* (ASCE 2017). The foundation ties should have a tensile and compressive strength equal to at least 25 percent of the total gravity load of all footings along the column or wall lines. Individual footings should be connected to a reinforced concrete, two-way slab-on-grade, measuring at least 5 inches thick. The slab should be reinforced in two horizontal, perpendicular directions with a minimum reinforcing ratio of 0.0025. All foundation elements must be supported on at least 12 inches of import structural fill.

Slabs-On-Grade

Slabs-on-grade should be installed on a uniformly firm, unyielding subgrade that consists of sand and/or gravel. A modulus of vertical subgrade reaction (subgrade modulus) can be used to design slabs-on-grade. The subgrade modulus will vary based on the dimensions of the slab and the magnitude of applied loads on the slab surface; slabs with larger dimensions and loads are influenced by soils to a greater depth. Landau recommends using a subgrade modulus of 200 pounds per cubic inch to design on-grade floor slabs. This subgrade modulus is for a 1-ft-by-1-ft square plate and is not the overall modulus of a larger area.

Interior slabs-on-grade should include a vapor barrier and a capillary break layer, designed and installed in accordance with industry standards.

Pavement Design

Asphalt pavement sections should be constructed on compacted subgrade (i.e., on existing sand or structural fill), prepared as recommended herein. When developing the recommendations in Table 4, Landau assumed a 20-year design life and a maximum equivalent single-axle load (ESAL) of 100,000 for the drive lanes and parking pavement section. A maximum ESAL of 7,000,000 was assumed for the commercial/industrial collector pavement section.

Table 4. Recommended Asphalt Pavement Design Section

Pavement Section Type	Asphalt Concrete Pavement Thickness	Crushed Surfacing Top Course Thickness	Crushed Surfacing Base Course Thickness	Subgrade
Commercial/Industrial Collector[(a)]	6 inches	2.5 inches	12 inches	8 inches of Ballast
Drive Lanes and Parking	2 inches	2 inches	8 inches	Compacted Native Soils

(a) Refer to *Tumwater Development Guide Chapter 4 Amendment, Table 1 Street Section Design* (City of Tumwater 2020).

Base and top course material should be compacted to at least 95 percent of the maximum dry density, determined in accordance with ASTM standard test method D1557, *Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).*

Compacted base and top course should meet the requirements in Section 9-03.9(3) of the Washington State Department of Transportation's 2022 *Standard Specifications for Road, Bridge, and Municipal Construction* (*2022 WSDOT Standard Specifications*). Prevention of road-base saturation is essential for pavement durability; efforts should be made to limit the amount of water entering the base and top course.

Asphalt concrete should consist of Class B aggregate material or hot-mix asphalt, class ½ inch and PG58H-22 binder. Asphalt should conform to the requirements in Section 5-04 of the *2022 WSDOT Standard Specifications* and should be compacted to at least 91 percent of the Rice density.

Stormwater Infiltration

Site groundwater levels are expected to fluctuate seasonally, with maximum groundwater levels occurring during late winter and early spring. Groundwater was observed from 16.6 to 22.0 ft bgs in Landau's September 2021 explorations. Landau recommends using seasonal high groundwater depths of 4.89, 5.90, and 4.66 ft bgs, respectively, to design stormwater facilities near monitoring wells MW-

1, MW-2, and MW-3. In Landau's experience, a groundwater mounding analysis is likely to be required by the City.

Pilot Infiltration Test Investigation

Landau completed two small-scale PIT investigations (PIT-1 and PIT-2) at the approximate locations shown on Figure 2. The investigations were completed in general accordance with the requirements in the City's 2018 *Drainage Design and Erosion Control Manual.*

The PIT investigations were completed in excavations with bases that measured approximately 4 ft wide, 4 to 5 ft long, and 3 ft deep. After an initial 6-hour soak period, flow rates were recorded every 15 minutes. The final rates were 4.0 and 1.4 gallons per minute.

Correction factors were applied to *in situ* infiltration rates to account for the test method ($F_{testing}$ = 0.5), infiltration facility geometry and depth-to-groundwater ($F_{geometry}$ = 0.25 and 0.20), and soil plugging effects due to siltation ($F_{plugging}$ = 0.8). The recommended design infiltration rates in Table 5 are based on the proposed stormwater facility widths (40 ft) and maximum groundwater elevations.

Table 5. Recommended Design Infiltration Rates

Exploration	Depth (ft)	Design Infiltration Rate (in/hr)
PIT-1	3	1.6
PIT-2	3	0.5

ft = feet
in/hr = inches per hour
PIT = pilot infiltration test

Construction Considerations

The following key points should be considered when developing project plans and specifications:

- **Stripping:** Up to 18 inches of topsoil (dark brown, silty sand) should be stripped from areas designated for development (i.e., the proposed locations of footings, slabs-on-grade, and pavement sections). Topsoil is not considered suitable for reuse as structural fill.
- **Subgrade preparation:** Before structural fill, formwork, or pavement base course is placed, the prepared subgrade should be proof-rolled in the presence of a qualified geotechnical engineer, who is familiar with the site and can check for soft/disturbed areas. Areas of limited access can be evaluated with a steel T-probe. If probing or proof-rolling reveals loose and/or disturbed subgrades, the upper 1 ft of subgrade should be scarified; moisture-conditioned; and compacted to a firm, unyielding condition. Alternatively, unsuitable soils can be overexcavated and replaced with compacted structural fill.
- **Utility trench excavation and backfill:** Landau anticipates that utility trenches will be excavated in loose to medium dense outwash soils. Caving may occur. A heavy-duty hydraulic

excavator should be able to reach the required trench depths (10 to 12 ft bgs). A smooth-bladed bucket should be used to remove loose and/or disturbed soil from the trench bottom. The final trench bottom should be firm and free of roots, topsoil, lumps of silt and clay, and organic and inorganic debris.

- **Site soil:** Site soils contain up to 11 percent fines (silt and clay) and are moisture sensitive. If site soils will be reused as structural fill, earthwork should be avoided during periods of wet weather, and material larger than 6 inches in diameter (e.g., large cobbles and boulders) should be screened and removed.
- **Import structural fill:** Gravel Borrow, as described in Section 9-03.14(1) of the *2022 WSDOT Standard Specifications,* is a suitable source of import structural fill. During periods of wet weather, the fines content should not exceed 5 percent, based on the minus ¾-inch fraction.
- **Fill placement and compaction:** Structural fill should be placed on an approved subgrade, and compacted in accordance with Section 2-03.3(14)C, Method C of the *2022 WSDOT Standard Specifications.* Method A is appropriate for non-structural areas, such as landscaping. Each layer of structural fill should be compacted to at least 95 percent of the maximum dry density, determined in accordance with the requirements in Section 2-03.3(14)D of the *2022 WSDOT Standard Specifications.* Alternatively, the maximum dry density can be determined using ASTM standard test method D1557.
- **Construction dewatering:** Though not observed in Landau's explorations, zones of perched groundwater may be encountered during the wet season (typically late October through June). Temporary excavations should be dewatered to allow construction to be completed in the dry. Conventional sumps and pumps should be sufficient to dewater excavations in which perched groundwater seepage is encountered. Substantial dewatering efforts (i.e., well points, deep wells) would be required for excavations extending below the true groundwater table. The contractor should be responsible for the design, monitoring, and maintenance of dewatering systems.
- **Temporary slopes:** Temporary excavations should be completed in accordance with the requirements in Section 2-09 of the *2022 WSDOT Standard Specifications.* Temporary excavations in excess of 4 ft should be shored or sloped in accordance with the requirements outlined in Safety Standards for Construction Work, Part N (Washington Administrative Code Chapter 296-155). The soil likely to be exposed in construction excavations should be considered Type C, with a maximum allowable excavation inclination of 1½ horizontal to 1 vertical (1½H:1V). If groundwater seepage is present, flatter slopes, temporary shoring, and/or dewatering may be required.

  The contractor should be responsible for actual excavation configurations and the maintenance of safe working conditions, including temporary excavation stability. All applicable local, state, and federal safety codes should be followed.
- **Permanent slopes:** Permanent cut-and-fill slopes should be no steeper than 2H:1V. This design recommendation does not apply to stormwater pond slopes, which are typically 3H:1V or flatter. Stormwater pond slopes should be designed in accordance with local stormwater codes. Permanent and temporary slopes should be protected from erosion and reseeded or revegetated as soon as practical.

Use of This Technical Memorandum

Landau Associates has prepared this technical memorandum for the exclusive use of Israel Investments LLC and its design team for specific application to the Israel Road Commercial Development project in Tumwater, Washington. No other party is entitled to rely on the information, conclusions, and recommendations included in this document without the express written consent of Landau Associates. Reuse of the information, conclusions, and recommendations provided herein for extensions of the project or for any other project, without review and authorization by Landau Associates, shall be at the user's sole risk. Landau Associates warrants that, within the limitations of scope, schedule, and budget, its services have been provided in a manner consistent with that level of skill and care ordinarily exercised by members of the profession currently practicing in the same locality, under similar conditions as this project. Landau Associates makes no other warranty, either express or implied.

Closing

We appreciate the opportunity to assist you with this project. If you have questions or comments, please contact Lance Levine at 360.791.3178 or at llevine@landauinc.com.

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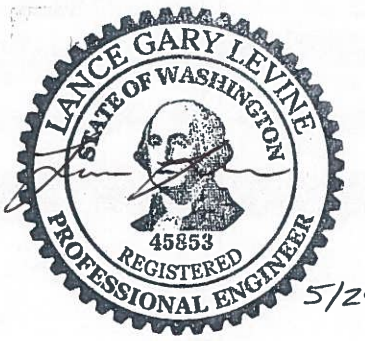

Lance Levine, PE
Senior Engineer

Steven R. Wright, PE
Principal

LGL/SZW/mcs
[\\OLYMPIA1\PROJECTS\2010\001.010\R\ISRAEL ROAD COMMERCIAL DEVELOPMENT TECHNICAL MEMORANDUM 5.24.2022.DOCX]

Attachments: Figure 1. Vicinity Map
Figure 2. Site and Exploration Plan
Figure 3. Soil Classification System and Key
Figures 4–6. Logs of Borings MW-1 through MW-3
Figure 7. Logs of PIT-1 and PIT-2
Figures 8–10. Logs of Test Pits TP-1 through TP-5
Figures 11–13. Grain Size Distribution
Figure 14. Groundwater and Precipitation Data

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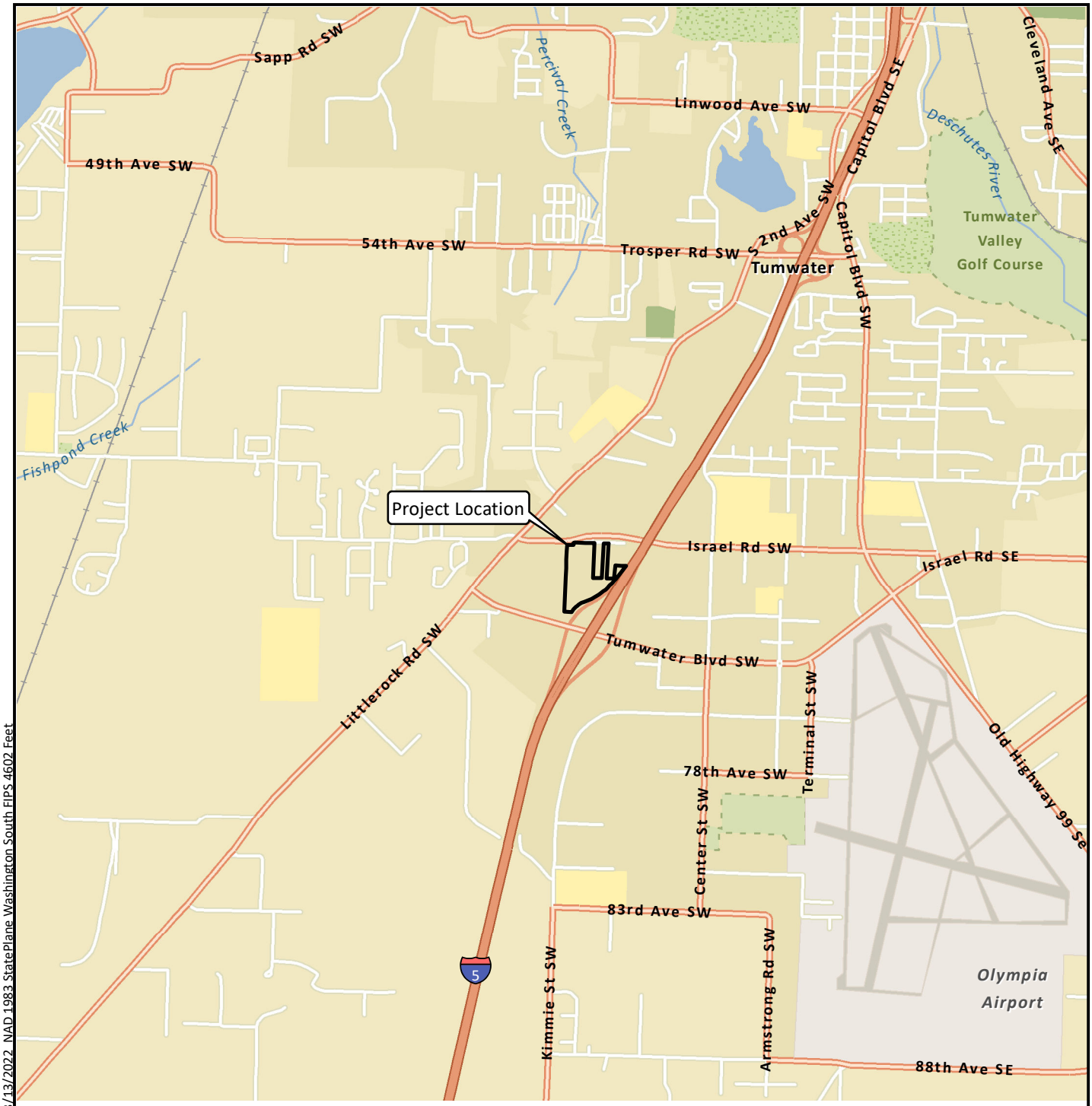

N

0 0.5 1

Miles

Data Source: Esri.

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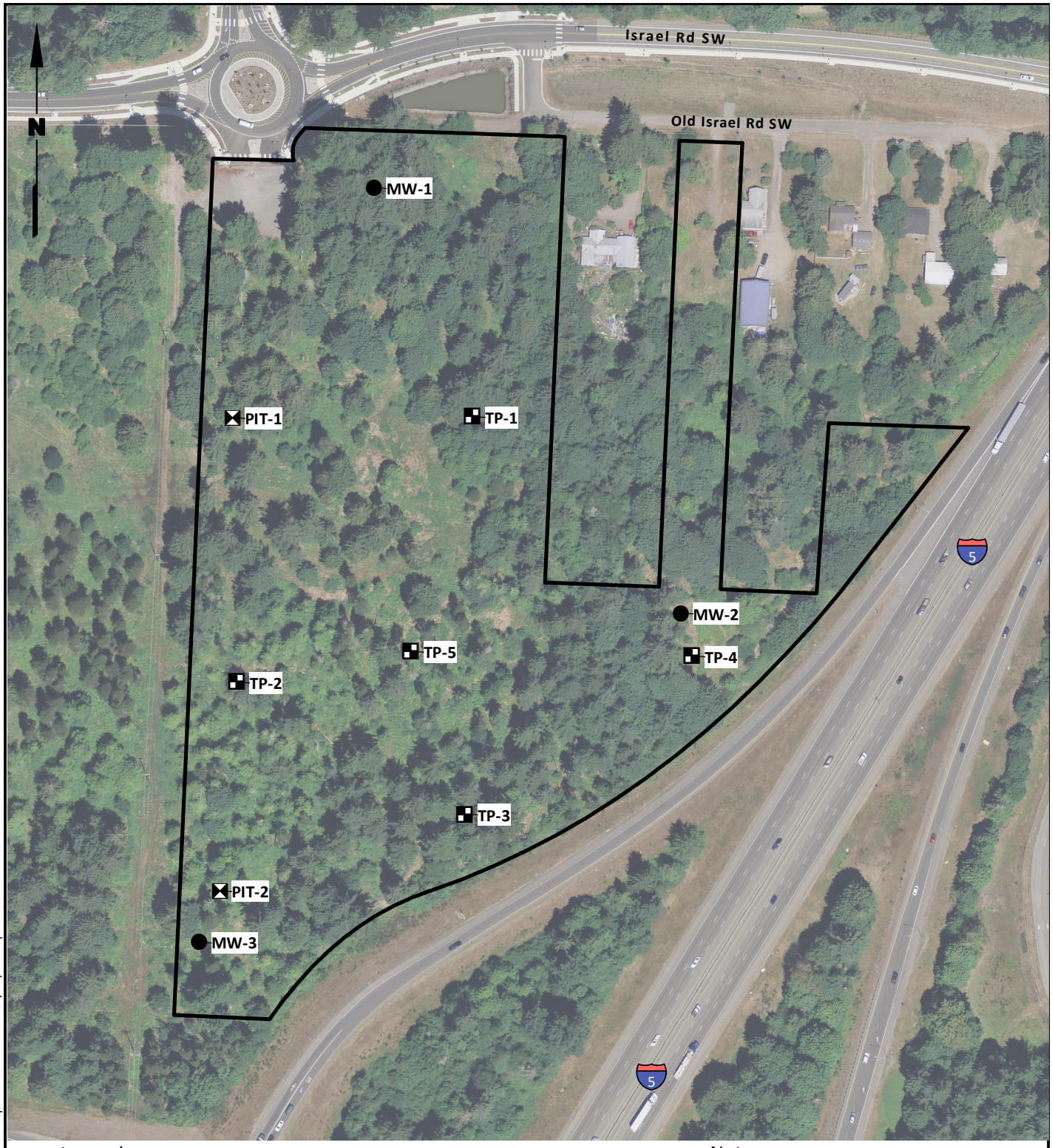
Israel Road Commercial Development Tumwater, Washington	**Vicinity Map**	Figure 1



Legend

- **MW-1** ● Approximate Monitoring Well Location and Designation
- **PIT-1** ⊠ Approximate Pilot Infiltration Test Location and Designation
- **TP-1** ▪ Approximate Test Pit Location and Designation
- Subject Property

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 200 400

Scale in Feet

Data Source: Thurston County GIS.

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Israel Road Commercial Development Tumwater, Washington	**Site and Exploration Plan**	Figure 2

Soil Classification System

MAJOR DIVISIONS			GRAPHIC SYMBOL	USCS LETTER SYMBOL[1]	TYPICAL DESCRIPTIONS [2][3]
COARSE-GRAINED SOIL (More than 50% of material is larger than No. 200 sieve size)	GRAVEL AND GRAVELLY SOIL (More than 50% of coarse fraction retained on No. 4 sieve)	CLEAN GRAVEL (Little or no fines)		GW	Well-graded gravel; gravel/sand mixture(s); little or no fines
				GP	Poorly graded gravel; gravel/sand mixture(s); little or no fines
		GRAVEL WITH FINES (Appreciable amount of fines)		GM	Silty gravel; gravel/sand/silt mixture(s)
				GC	Clayey gravel; gravel/sand/clay mixture(s)
	SAND AND SANDY SOIL (More than 50% of coarse fraction passed through No. 4 sieve)	CLEAN SAND (Little or no fines)		SW	Well-graded sand; gravelly sand; little or no fines
				SP	Poorly graded sand; gravelly sand; little or no fines
		SAND WITH FINES (Appreciable amount of fines)		SM	Silty sand; sand/silt mixture(s)
				SC	Clayey sand; sand/clay mixture(s)
FINE-GRAINED SOIL (More than 50% of material is smaller than No. 200 sieve size)	SILT AND CLAY (Liquid limit less than 50)			ML	Inorganic silt and very fine sand; rock flour; silty or clayey fine sand or clayey silt with slight plasticity
				CL	Inorganic clay of low to medium plasticity; gravelly clay; sandy clay; silty clay; lean clay
				OL	Organic silt; organic, silty clay of low plasticity
	SILT AND CLAY (Liquid limit greater than 50)			MH	Inorganic silt; micaceous or diatomaceous fine sand
				CH	Inorganic clay of high plasticity; fat clay
				OH	Organic clay of medium to high plasticity; organic silt
	HIGHLY ORGANIC SOIL			PT	Peat; humus; swamp soil with high organic content

OTHER MATERIALS	GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
PAVEMENT		AC or PC	Asphalt concrete pavement or Portland cement pavement
ROCK		RK	Rock (See Rock Classification)
WOOD		WD	Wood, lumber, wood chips
DEBRIS		DB	Construction debris, garbage

Notes:
1. USCS letter symbols correspond to symbols used by the Unified Soil Classification System and ASTM classification methods. Dual letter symbols (e.g., SP-SM for sand or gravel) indicate soil with an estimated 5-15% fines. Multiple letter symbols (e.g., ML/CL) indicate borderline or multiple soil classifications.
2. Soil descriptions are based on the general approach presented in the Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), outlined in ASTM D 2488. Where laboratory index testing has been conducted, soil classifications are based on the Standard Test Method for Classification of Soils for Engineering Purposes, as outlined in ASTM D 2487.
3. Soil description terminology is based on visual estimates (in the absence of laboratory test data) of the percentages of each soil type and is defined as follows:

Primary Constituent:	> 50% - "GRAVEL," "SAND," "SILT," "CLAY," etc.
Secondary Constituents:	> 30% and ≤ 50% - "very gravelly," "very sandy," "very silty," etc.
	> 15% and ≤ 30% - "gravelly," "sandy," "silty," etc.
Additional Constituents:	> 5% and ≤ 15% - "with gravel," "with sand," "with silt," etc.
	≤ 5% - "with trace gravel," "with trace sand," "with trace silt," etc., or not noted.

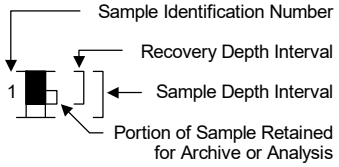
4. Soil density or consistency descriptions are based on judgement using a combination of sampler penetration blow counts, drilling or excavating conditions, field tests, and laboratory tests, as appropriate.

Drilling and Sampling Key

SAMPLER TYPE

Code	Description
a	3.25-inch O.D., 2.42-inch I.D. Split Spoon
b	2.00-inch O.D., 1.50-inch I.D. Split Spoon
c	Shelby Tube
d	Grab Sample
e	Single-Tube Core Barrel
f	Double-Tube Core Barrel
g	2.50-inch O.D., 2.00-inch I.D. WSDOT
h	3.00-inch O.D., 2.375-inch I.D. Mod. California
i	Other - See text if applicable
1	300-lb Hammer, 30-inch Drop
2	140-lb Hammer, 30-inch Drop
3	Pushed
4	Vibrocore (Rotosonic/Geoprobe)
5	Other - See text if applicable

SAMPLE NUMBER & INTERVAL



Field and Lab Test Data

Code	Description
PP = 1.0	Pocket Penetrometer, tsf
TV = 0.5	Torvane, tsf
PID = 100	Photoionization Detector VOC screening, ppm
W = 10	Moisture Content, %
D = 120	Dry Density, pcf
-200 = 60	Material smaller than No. 200 sieve, %
GS	Grain Size - See separate figure for data
AL	Atterberg Limits - See separate figure for data
GT	Other Geotechnical Testing
CA	Chemical Analysis

Groundwater

▽	Approximate water level at time of drilling (ATD)
▼	Approximate water level at time after drilling/excavation/well

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Soil Classification System and Key

Figure 3

MW-1

LAI Project No: 2010001.010

SAMPLE DATA | **SOIL PROFILE** | **WELL DETAIL** (DOE#: BNG 446)

Drilling Method: Mud Rotary
Ground Elevation (ft): 188.76
Drilled By: Holocene Drilling Inc.
Logged By: LGL Date: 09/28/21

Moisture Content (%) — Plastic Limit — Liquid Limit
20 40 60 80
▲ SPT N-Value ▲
△ Non-Standard N-Value △
20 40 60 80
× Fines Content (%) ×
20 40 60 80

Depth (ft)	Elevation (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	Test Data	Graphic Symbol	USCS Symbol	Soil Description
0							SM	16 inches of dark brown, silty SAND with organics (very loose, moist) **(TOPSOIL)**
							SP-SM	Brown, fine to medium SAND with silt (very loose, moist) **(RECESSIONAL OUTWASH)**
	185	S-1	b2	1	W = 33 GS			
5		S-2	b2	6	W = 25 GS			Grades to loose
	180	S-3	b2	14				Grades to brownish-gray and medium dense
10		S-4	b2	14				
	175							
15		S-5	b2	12				
	170							
20		S-6	b2	16				
	165							
25		S-7	b2	9	W = 29 GS			Grades to loose and wet
	160							
30		S-8	b2	15				Grades to medium dense

22.0 ft ATD

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

2010001.01 5/23/22 \\OLYMPIA1\PROJECTS\2010\001.010\T\2010001.010.GPJ SOIL BORING LOG WITH GRAPH

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Log of Boring MW-1

Figure 4 (1 of 2)

MW-1

LAI Project No: 2010001.010

SAMPLE DATA | **SOIL PROFILE** | **WELL DETAIL** (DOE#: BNG 446)

Drilling Method: Mud Rotary
Ground Elevation (ft): 188.76
Drilled By: Holocene Drilling Inc.
Logged By: LGL Date: 09/28/21

Moisture Content (%) — Plastic Limit — Liquid Limit — 20 40 60 80
▲ SPT N-Value ▲ △ Non-Standard N-Value △ — 20 40 60 80
× Fines Content (%) × — 20 40 60 80

Depth (ft)	Elevation (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	Test Data	Graphic Symbol	USCS Symbol	Soil Description
35	155	S-9	b2	19			SP-SM	Brown, fine to medium SAND with silt (very loose, moist) **(RECESSIONAL OUTWASH)**
40	150	S-10	b2	35			GP	Gray, sandy, fine to coarse GRAVEL (dense, wet) **(ADVANCE OUTWASH)**
45	145	S-11	b2	24			SP	Grades to fine gravel Gray, fine to coarse SAND (medium dense, wet)
50	140	S-12	b2	36				Grades to gravelly and dense
55	135	S-13	b2	31				Grades to with gravel
60	130	S-14	b2	51				Grades to very dense

Boring Completed 09/28/21
Total Depth of Boring = 61.5 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

2010001.01 5/23/22 \\OLYMPIA1\PROJECTS\2010\001.010\T\2010001.010.GPJ SOIL BORING LOG WITH GRAPH

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Tumwater, Washington

Log of Boring MW-1

Figure 4 (2 of 2)

MW-2

LAI Project No: 2010001.010

SAMPLE DATA | **SOIL PROFILE** | **WELL DETAIL** (DOE#: BNG 447)

Drilling Method: Hollow-Stem Auger
Ground Elevation (ft): 189.83
Drilled By: Holocene Drilling Inc.
Logged By: LGL Date: 09/28/21

Moisture Content (%) — Plastic Limit — Liquid Limit — 20 40 60 80
▲ SPT N-Value ▲ △ Non-Standard N-Value △ — 20 40 60 80
× Fines Content (%) × — 20 40 60 80

Depth (ft)	Elevation (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	Test Data	Graphic Symbol	USCS Symbol	Soil Description
0							SM	18 inches of dark brown, silty SAND with organics (loose, moist) **(TOPSOIL)**
							SP-SM	Brown, fine to medium SAND with silt (loose, moist) **(RECESSIONAL OUTWASH)**
		S-1	b2	8				
5	185	S-2	b2	5	W = 5 GS			
		S-3	b2	8				
10	180	S-4	b2	13				Grades to medium dense
15	175	S-5	b2	8				Grades to gray, fine to coarse, loose, and wet
20	170	S-6	b2	12				Grades to medium dense
25								

WELL DETAIL: 16.6 ft ATD

Boring Completed 09/28/21
Total Depth of Boring = 21.5 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

2010001.01 5/23/22 \\OLYMPIA1\PROJECTS\2010\001.010\T\2010001.010.GPJ SOIL BORING LOG WITH GRAPH

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Log of Boring MW-2

Figure 5

MW-3

LAI Project No: 2010001.010

SAMPLE DATA | **SOIL PROFILE** | **WELL DETAIL** (DOE#: BNG 448)

Drilling Method: Hollow-Stem Auger
Ground Elevation (ft): 187.50
Drilled By: Holocene Drilling Inc.
Logged By: LGL Date: 09/28/21

Moisture Content (%) — Plastic Limit — Liquid Limit — 20 40 60 80
▲ SPT N-Value ▲ △ Non-Standard N-Value △ — 20 40 60 80
× Fines Content (%) × — 20 40 60 80

Depth (ft)	Elevation (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	Test Data	Graphic Symbol	USCS Symbol	
0							SM	18 inches of dark brown, silty SAND with organics (loose, moist) **(TOPSOIL)**
							SP	Brown, fine to medium SAND (loose, moist) **(RECESSIONAL OUTWASH)**
	185	S-1	b2	7				
5		S-2	b2	8	W = 7 GS		SP-SM	Brown, fine to medium SAND with silt (loose, moist)
	180	S-3	b2	8				Grades to gray
10		S-4	b2	8				
	175							
15		S-5	b2	6	W = 31 GS		SP-SM	Gray, fine to medium SAND with silt (loose, moist)
								Grades to wet
	170							
20		S-6	b2	12				Grades to medium dense
25								

WELL DETAIL: 16.6 ft ATD

Boring Completed 09/28/21
Total Depth of Boring = 21.5 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

2010001.01 5/23/22 \\OLYMPIA1\PROJECTS\2010\001.010\T\2010001.010.GPJ SOIL BORING LOG WITH GRAPH

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Log of Boring MW-3

Figure 6

PIT-1

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Elevation (ft)	Sample Number & Interval	Sampler Type	Test Data	Graphic Symbol	USCS Symbol	Excavation Method: Tracked Excavator Ground Elevation (ft): 188 Excavated By: Howards Const & Excvtg Logged By: LGL	
0	188					SM	Dark brown, silty, fine to medium SAND (loose, moist)	Groundwater not encountered.
2	186					SP-SM	**(TOPSOIL)** Brown, fine to medium SAND with silt (loose, moist) **(RECESSIONAL OUTWASH)** Severe caving from 4 to 9 ft bgs Grades to gray Grades to medium dense	
4	184							
6	182							
8	180							
10							Test Pit Completed 03/09/22 Total Depth of Test Pit = 9.0 ft.	
12								
14								

PIT-2

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Elevation (ft)	Sample Number & Interval	Sampler Type	Test Data	Graphic Symbol	USCS Symbol	Excavation Method: Tracked Excavator Ground Elevation (ft): 187 Excavated By: Howards Const & Excvtg Logged By: LGL	
0	186					SM	Dark brown, silty, fine to medium SAND (loose, moist)	Groundwater not encountered.
2	184					SP-SM	**(TOPSOIL)** Brown, fine to medium SAND with silt (loose, moist) **(RECESSIONAL OUTWASH)** Minor seepage at 4 ft bgs Grades to gray and without mottling Minor caving from 5 to 9 ft bgs Faint mottling Minor seepage at 8 ft bgs	
4	182							
6	180							
8	178							
10							Test Pit Completed 03/10/22 Total Depth of Test Pit = 9.0 ft.	
12								
14								

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Tumwater, Washington

Log of Test Pits

Figure 7

TP-1

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Elevation (ft)	Sample Number & Interval	Sampler Type	Test Data	Graphic Symbol	USCS Symbol		
0	188					SM	Dark brown, silty, fine to medium SAND (loose, moist)	Groundwater not encountered.
2	186					SP-SM	**(TOPSOIL)**	
		S-1	d	W = 14 GS			Brown, fine to medium SAND with silt (loose, moist)	
4	184						**(RECESSIONAL OUTWASH)**	
		S-2	d	W = 23 GS			Grades to grayish-brown and medium dense	
6	182						Grades to gray	
8	180						Grades to dense and wet	
10	178						Moderate seepage at 9.2 ft bgs	
12								
14								

Excavation Method: Tracked Excavator
Ground Elevation (ft): 188
Excavated By: Howards Const & Excvtg
Logged By: LGL

Test Pit Completed 03/09/22
Total Depth of Test Pit = 11.5 ft.

TP-2

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Elevation (ft)	Sample Number & Interval	Sampler Type	Test Data	Graphic Symbol	USCS Symbol		
0	186					SM	Dark brown, silty, fine to medium SAND (loose, moist)	Groundwater not encountered.
2	184					SP	**(TOPSOIL)**	
		S-1	d	W = 13 GS			Brown, fine to medium SAND (loose, moist)	
4	182						**(RECESSIONAL OUTWASH)**	
						SP-SM	Brown, fine to medium SAND with silt (medium dense, moist)	
6	180						Moderate caving from 4 to 10 ft bgs	
8	178						Moderate seepage at 6 ft bgs	
		S-2	d				Grades to gray	
10	176							
12								
14								

Excavation Method: Tracked Excavator
Ground Elevation (ft): 186
Excavated By: Howards Const & Excvtg
Logged By: LGL

Test Pit Completed 03/09/22
Total Depth of Test Pit = 10.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Commercial Development
Tumwater, Washington

Log of Test Pits

Figure 8

TP-3

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Elevation (ft)	Sample Number & Interval	Sampler Type	Test Data	Graphic Symbol	USCS Symbol	Excavation Method: Tracked Excavator Ground Elevation (ft): 189 Excavated By: Howards Const & Excvtg Logged By: LGL	
0	188					SM	Dark brown, silty, fine to medium SAND (loose, moist)	Groundwater not encountered.
2						SP-SM	**(TOPSOIL)**	
	186	S-1	d	W = 14 GS			Brown, fine to medium SAND with silt (loose, moist)	
4							**(RECESSIONAL OUTWASH)**	
	184						Grades to grayish-brown and medium dense	
6							Severe caving from 6 to 11 ft bgs	
	182						Grades to gray	
8		S-2	d	W = 32 GS				
	180						Grades to moist to wet	
10	178							
12								
14								

Test Pit Completed 03/09/22
Total Depth of Test Pit = 11.0 ft.

TP-4

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Elevation (ft)	Sample Number & Interval	Sampler Type	Test Data	Graphic Symbol	USCS Symbol	Excavation Method: Tracked Excavator Ground Elevation (ft): 188 Excavated By: Howards Const & Excvtg Logged By: LGL	
0	188					SM	Dark brown, silty, fine to medium SAND (loose, moist)	Groundwater not encountered.
2	186					SP-SM	**(TOPSOIL)**	
		S-1	d	W = 15 GS			Brown, fine to medium SAND with silt (loose, moist)	
4	184						**(RECESSIONAL OUTWASH)**	
							Grades to gray and medium dense	
6	182	S-2	d				Minor caving from 5 to 10 ft bgs	
8	180						Rapid seepage at 6.5 ft bgs	
10	178							
12								
14								

Test Pit Completed 03/09/22
Total Depth of Test Pit = 10.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

LANDAU ASSOCIATES

Israel Road
Commercial Development
Tumwater, Washington

Log of Test Pits

Figure 9

TP-5

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Elevation (ft)	Sample Number & Interval	Sampler Type	Test Data	Graphic Symbol	USCS Symbol		
							Excavation Method: Tracked Excavator Ground Elevation (ft): 188 Excavated By: Howards Const & Excvtg Logged By: LGL	
0	188					SM	Dark brown, silty, fine to medium SAND (loose, moist)	
						SM	**(TOPSOIL)**	Groundwater not encountered.
2	186	S-1	d	W = 16 GS		SP-SM	Dark brown, silty, fine to medium SAND (loose, moist)	
4	184	S-2	d	W = 23 GS			**(RECESSIONAL OUTWASH)**	
6	182						Grayish-brown, fine to medium SAND with silt (loose, moist)	
8	180						Severe caving from 3 to 10 ft bgs Grades to gray and moist to wet Slow seepage at 8 ft bgs	
10	178						Grades to medium dense	
12								
14								

Test Pit Completed 03/09/22
Total Depth of Test Pit = 10.0 ft.

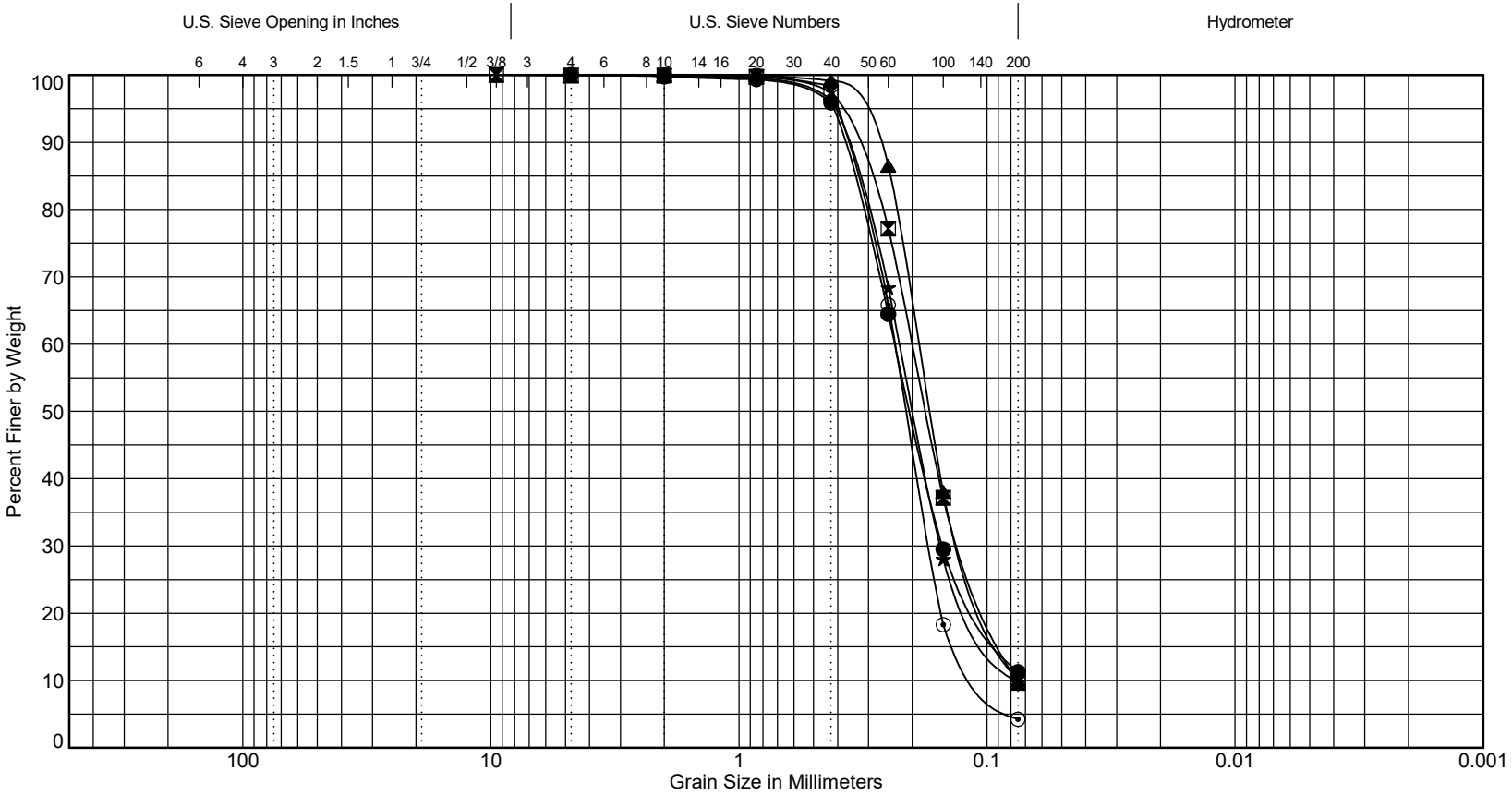
Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

LANDAU ASSOCIATES

Israel Road
Commercial Development
Tumwater, Washington

Log of Test Pits

Figure
10



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

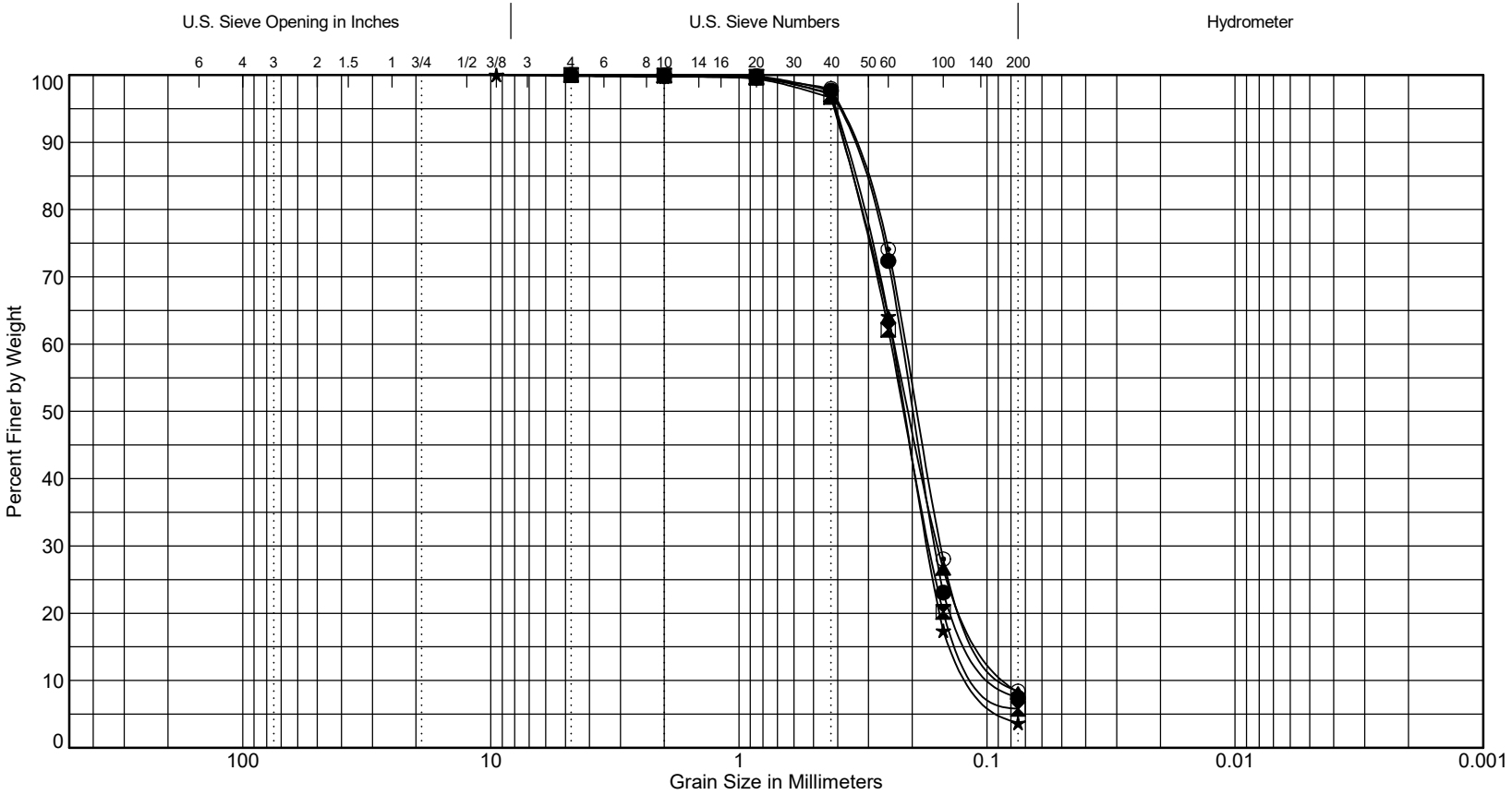
Symbol	Exploration Number	Sample Number	Depth (ft)	Natural Moisture (%)	Soil Description	Unified Soil Classification
●	MW-1	S-1	2.5	33	Fine to medium SAND with silt	SP-SM
⊠	MW-1	S-2	5.0	25	Fine to medium SAND with silt	SP-SM
▲	MW-1	S-7	25.0	29	Fine to medium SAND with silt	SP-SM
★	MW-2	S-2	5.0	5	Fine to medium SAND with silt	SP-SM
⊙	MW-3	S-2	5.0	7	Fine to medium SAND	SP

LANDAU ASSOCIATES

Israel Road
Commercial Development
Tumwater, Washington

Grain Size Distribution

Figure
11



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

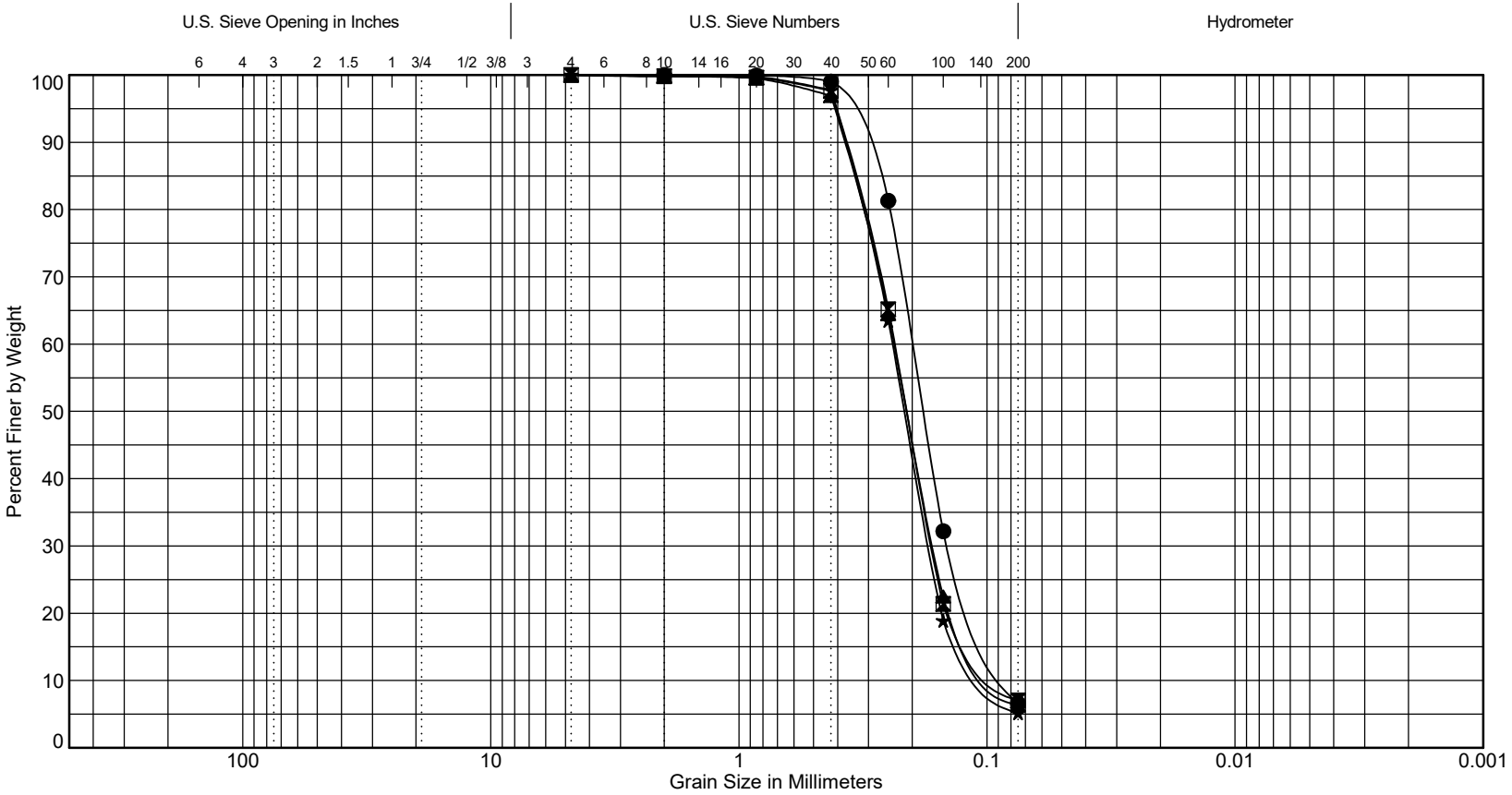
Symbol	Exploration Number	Sample Number	Depth (ft)	Natural Moisture (%)	Soil Description	Unified Soil Classification
●	MW-3	S-5	15.0	31	Fine to medium SAND with silt	SP-SM
⊠	TP-1	S-1	3.0	14	Fine to medium SAND with silt	SP-SM
▲	TP-1	S-2	5.0	23	Fine to medium SAND with silt	SP-SM
★	TP-2	S-1	2.5	13	Fine to medium SAND	SP
⊙	TP-3	S-1	3.0	14	Fine to medium SAND with silt	SP-SM

LANDAU ASSOCIATES

Israel Road
Commercial Development
Tumwater, Washington

Grain Size Distribution

Figure
12



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

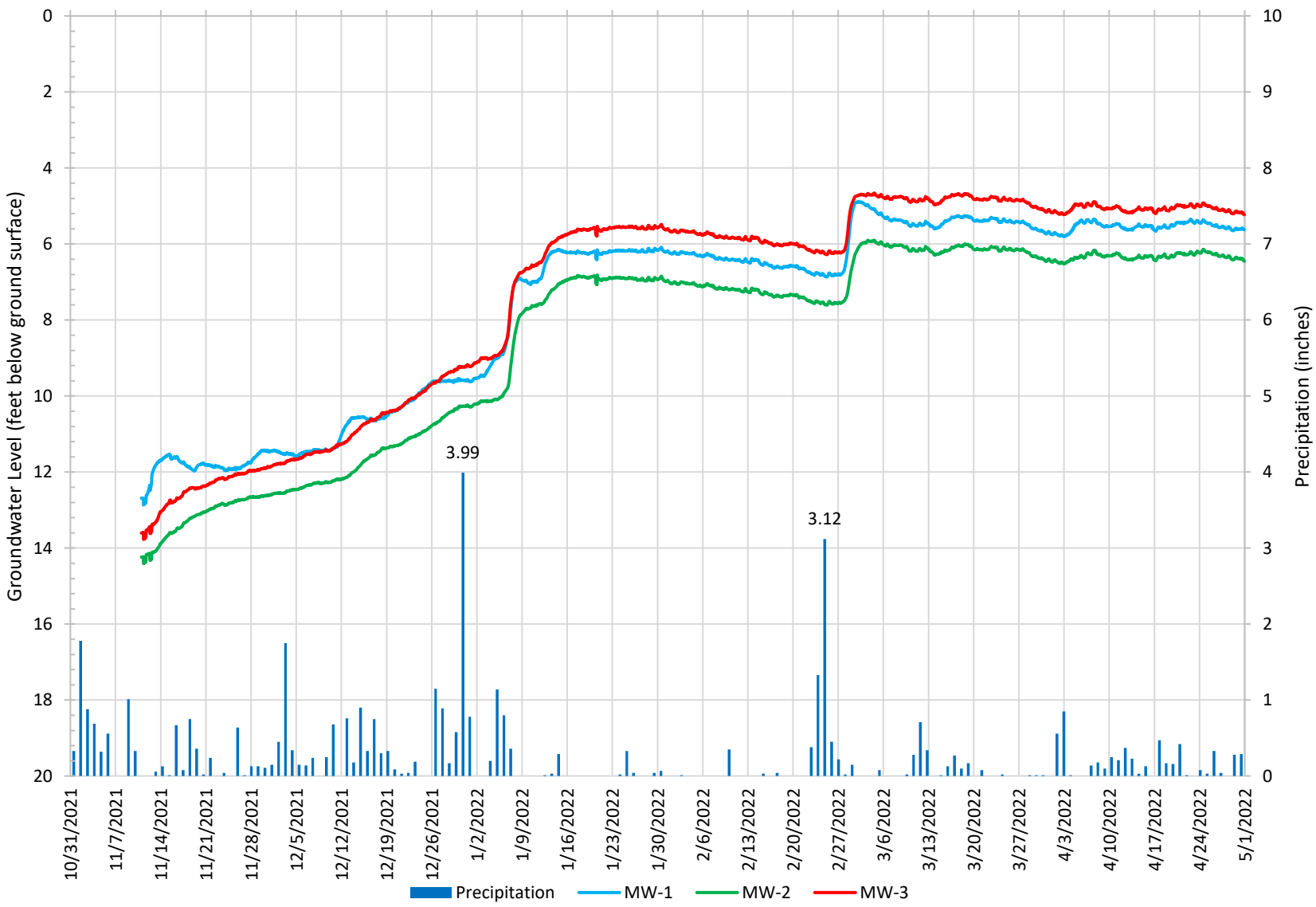
Symbol	Exploration Number	Sample Number	Depth (ft)	Natural Moisture (%)	Soil Description	Unified Soil Classification
●	TP-3	S-2	8.0	32	Fine to medium SAND with silt	SP-SM
⊠	TP-4	S-1	2.5	15	Fine to medium SAND with silt	SP-SM
▲	TP-5	S-1	1.5	16	Fine to medium SAND with silt	SP-SM
★	TP-5	S-2	3.5	23	Fine to medium SAND with silt	SP-SM

LANDAU ASSOCIATES

Israel Road
Commercial Development
Tumwater, Washington

Grain Size Distribution

Figure
13



Note

Precipitation data source: National Oceanic and Atmospheric Administration National Centers for Environmental Information, Station USW00024227.

LANDAU ASSOCIATES

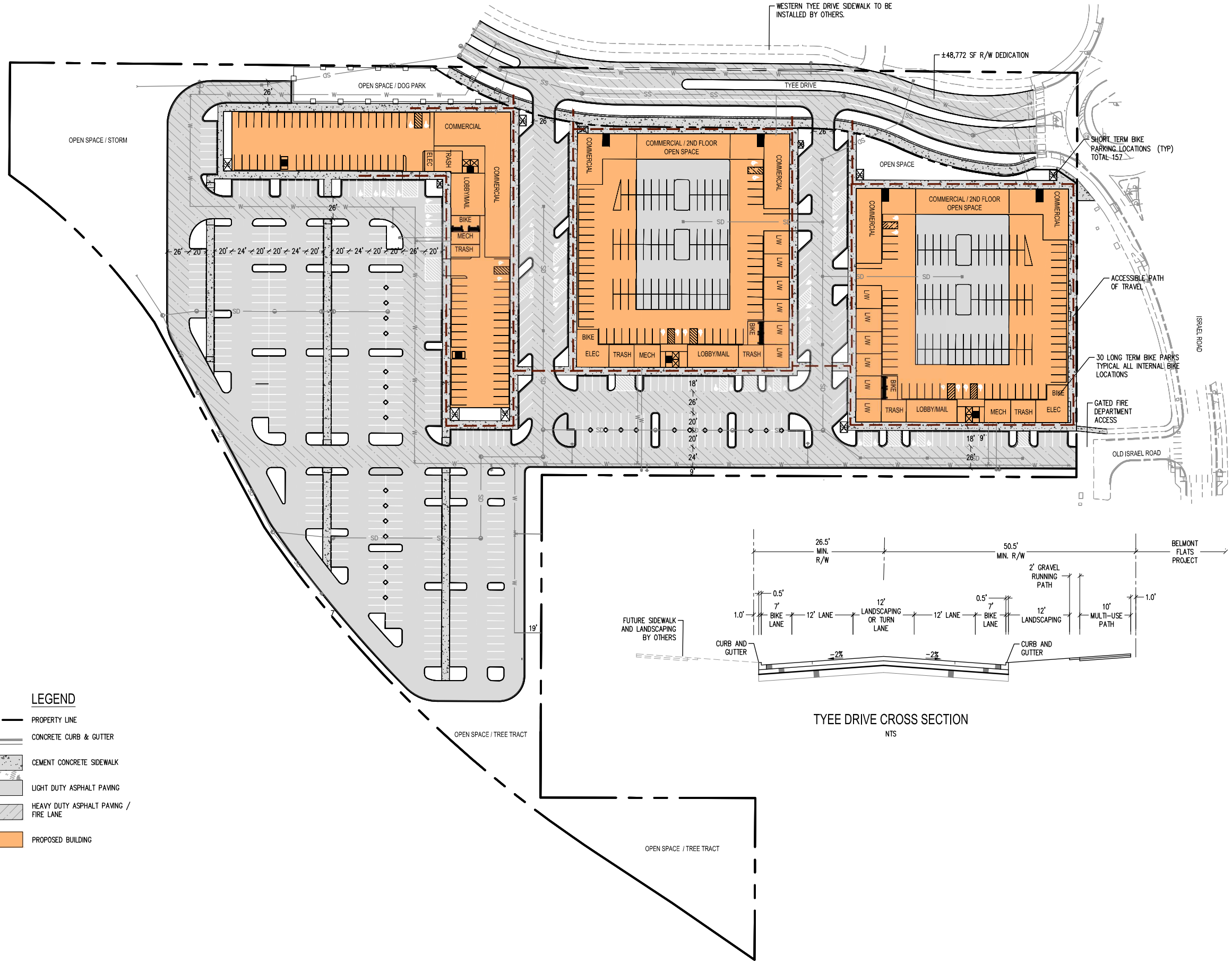
Israel Road
Commercial Development
Tumwater, Washington

Groundwater and Precipitation Data

Figure
14

APPENDIX 3
PRELIMINARY PLANS

JSA CIVIL
Engineering | Planning | Management
6945 Littlerock Rd SW | Tumwater, WA | 98512



TYEE DRIVE CROSS SECTION

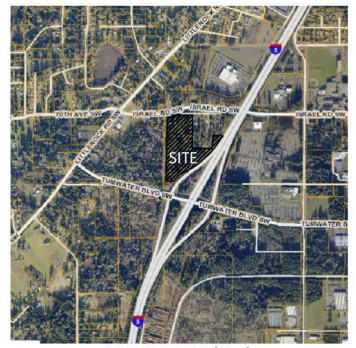
NTS

LEGEND

- PROPERTY LINE
- CONCRETE CURB & GUTTER
- CEMENT CONCRETE SIDEWALK
- LIGHT DUTY ASPHALT PAVING
- HEAVY DUTY ASPHALT PAVING / FIRE LANE
- PROPOSED BUILDING

Feb 24, 2023 - 4:30:37pm - User Johnson
C:\USERS\BJOHNSON\JSA CIVIL DROPBOX\BRANDON JOHNSON\TODD HANSEN\100A - ISRAEL INVESTMENTS\1 - BELMONT FLATS\ACAD\100A-SP-01.DWG

JSA CIVIL
Engineering | Planning | Management



VICINITY MAP (NTS)

SITE DATA

TPN	
	82700800401 – 2.19 ACRES
	82700800300 – 9.94 ACRES
	82700800201 – 0.30 ACRES
	82700800202 – 2.10 ACRES
	827007702100 – 0.65 ACRES
TOTAL ACREAGE: 15.18 ACRES	
TOTAL ACREAGE: (MINUS ROW DEDICATION): 14.06 ACRES	
SITE COVERAGE: 10.93 ACRES (78%)	
OPEN SPACE: 3.13 ACRES (22%)	
BUILDING HEIGHT: 55 FT	

PROPOSED USE

ALL BUILDINGS	
	COMMERCIAL: 27,500 SF
	LIVE/WORK: 12 UNITS
	STUDIO: 116 UNITS
	1 BED: 280 UNITS
	2 BED: 206 UNITS
	3 BED: 12 UNITS
	626 TOTAL RESIDENTIAL UNITS

PARKING DATA

COMMERCIAL (3.5/1000 SF)	96
STUDIO (1 PER UNIT)	116
1 BED (1 PER UNIT)	280
2 BED (1 PER UNIT)	206
3 BED (1.5 PER UNIT)	18
GUEST (1 PER 10 UNITS)	87
LIVE/WORK (3 PER UNIT)	30
TOTAL REQUIRED	833
TOTAL PROVIDED	840
TOTAL EV	84 (10%)
TOTAL ACCESSIBLE	48

SCALE:

0 60 120

SCALE IN FEET

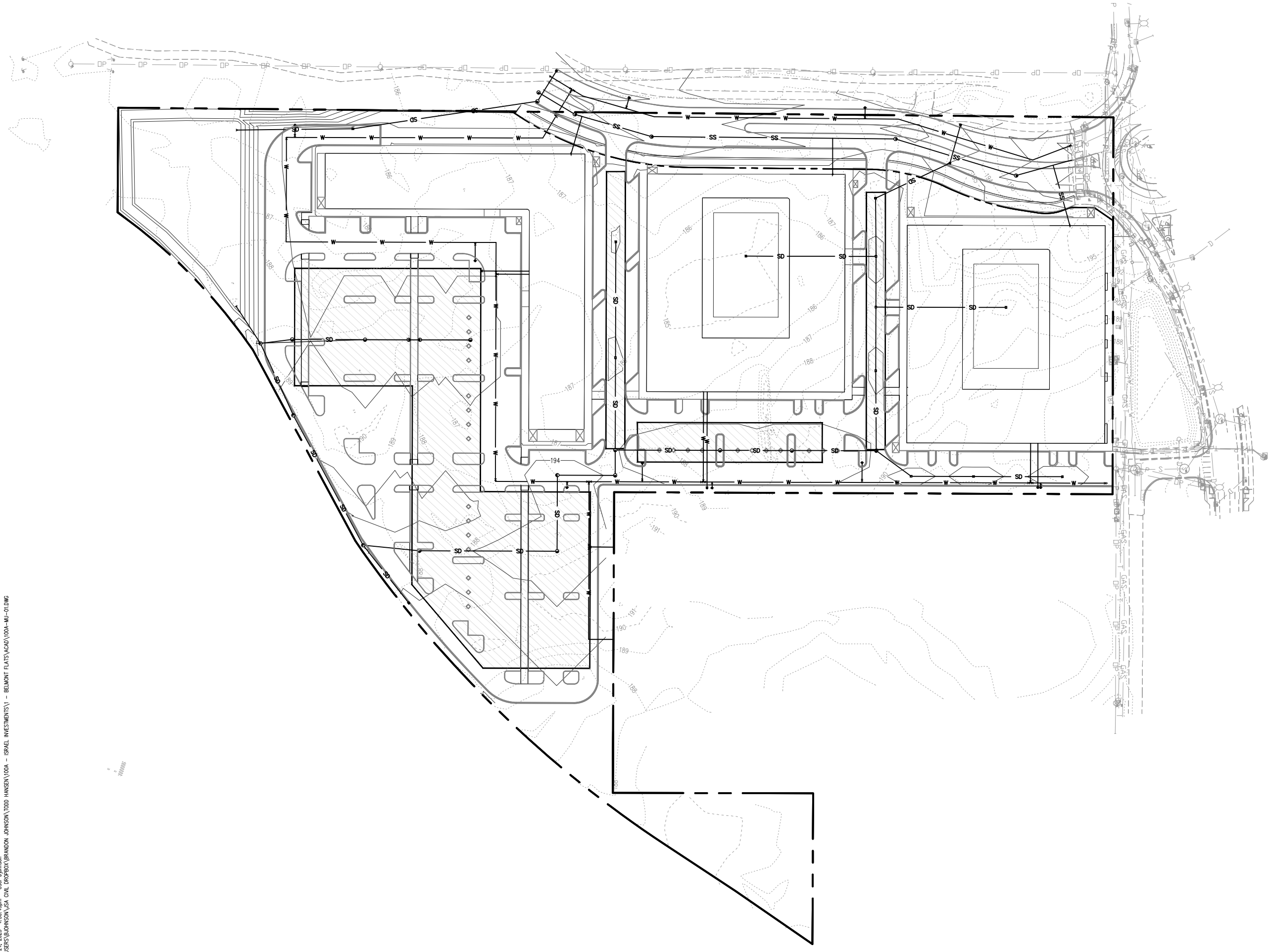
THE BELMONT FLATS

SHEET TITLE:

SITE PLAN

SHEET NO.

SP-01



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JSA CIVIL
Engineering | Planning | Management

VICINITY MAP (NTS)

SITE DATA

TPN	
	82700800401 – 2.19 ACRES
	82700800300 – 9.94 ACRES
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BUILDING HEIGHT: 55 FT	

PROPOSED USE

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3 BED (1.5 PER UNIT)	18
GUEST (1 PER 10 UNITS)	87
LIVE/WORK (3 PER UNIT)	30
TOTAL REQUIRED	833
TOTAL PROVIDED	840
TOTAL EV	84 (10%)
TOTAL ACCESSIBLE	48

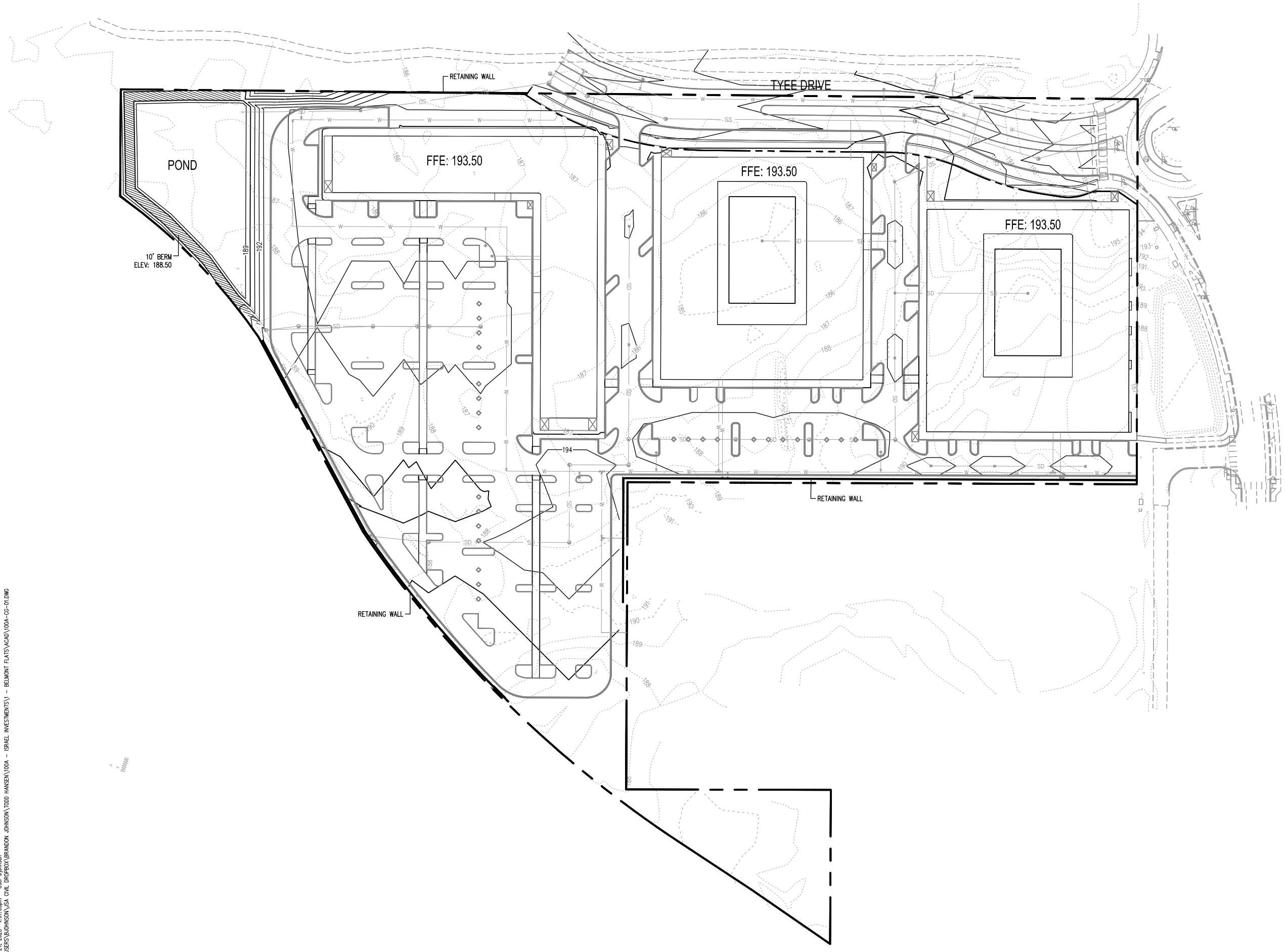
SCALE:

0 60 120
SCALE IN FEET

THE BELMONT FLATS

SHEET TITLE:
MASTER UTILITY PLAN

SHEET NO.
MU-01



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JSA CIVIL
Engineering | Planning | Management

VICINITY MAP (NTS)

SITE DATA

TPN	
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OPEN SPACE: 3.13 ACRES (22%)	
BUILDING HEIGHT: 55 FT	

PROPOSED USE

ALL BUILDINGS	
	COMMERCIAL: 27,500 SF
	LIVE/WORK: 12 UNITS
	STUDIO: 116 UNITS
	1 BED: 280 UNITS
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	3 BED: 12 UNITS
	626 TOTAL RESIDENTIAL UNITS

PARKING DATA

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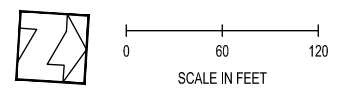
GUEST (1 PER 10 UNITS)	87
LIVE/WORK (3 PER UNIT)	30
TOTAL REQUIRED	833
TOTAL PROVIDED	840
TOTAL EV	84 (10%)
TOTAL ACCESSIBLE	48

SCALE:



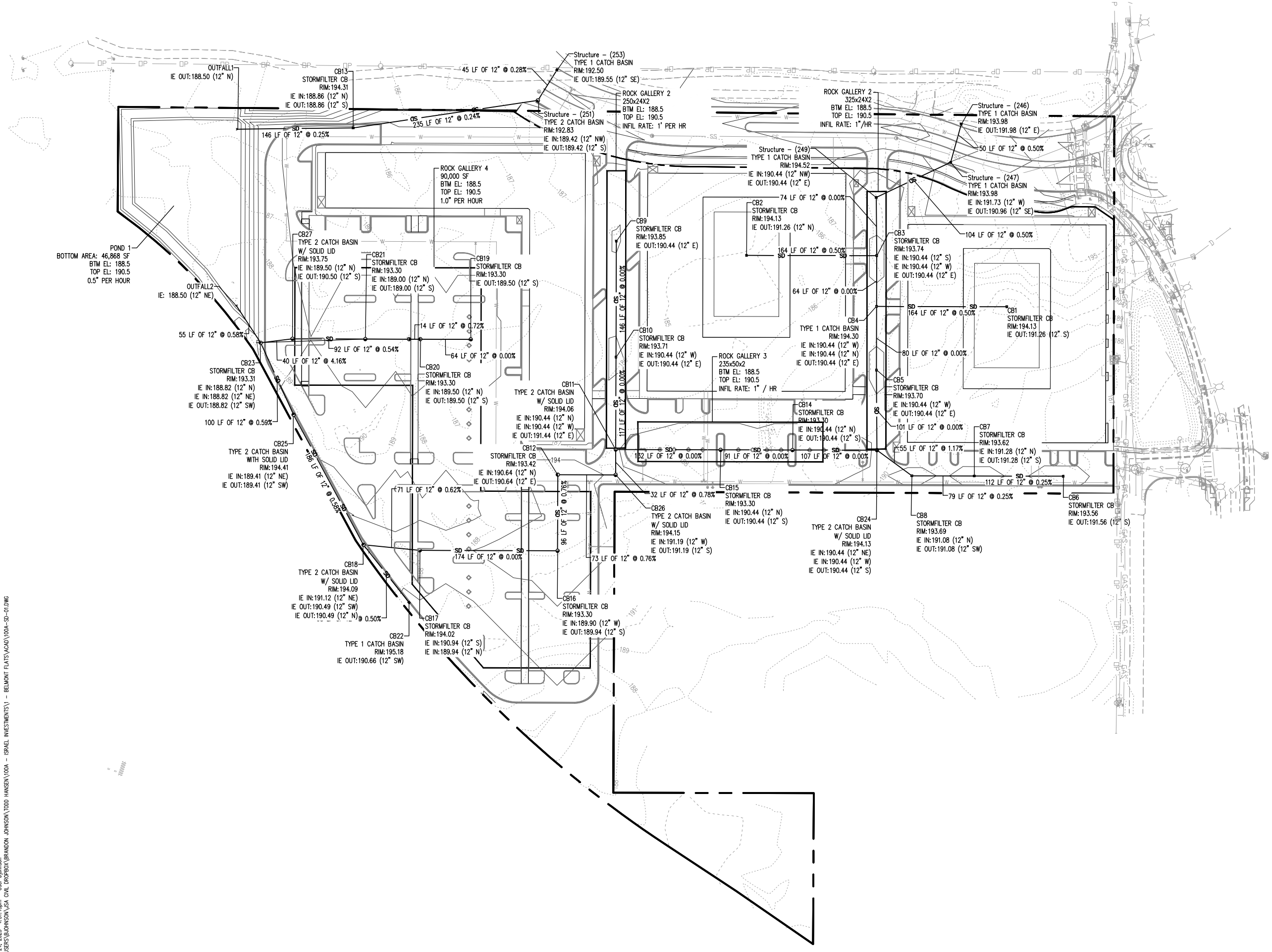
THE BELMONT FLATS

SHEET TITLE:

GRADING PLAN

SHEET NO.

CG-01



VICINITY MAP (NTS)

SITE DATA

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OPEN SPACE: 3.13 ACRES (22%)	
BUILDING HEIGHT: 55 FT	

PROPOSED USE

ALL BUILDINGS	
	COMMERCIAL: 27,500 SF
	LIVE/WORK: 12 UNITS
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GUEST (1 PER 10 UNITS)	87
LIVE/WORK (3 PER UNIT)	30
TOTAL REQUIRED	833
TOTAL PROVIDED	840
TOTAL EV	84 (10%)
TOTAL ACCESSIBLE	48

SCALE:

0 60 120

SCALE IN FEET

THE BELMONT FLATS

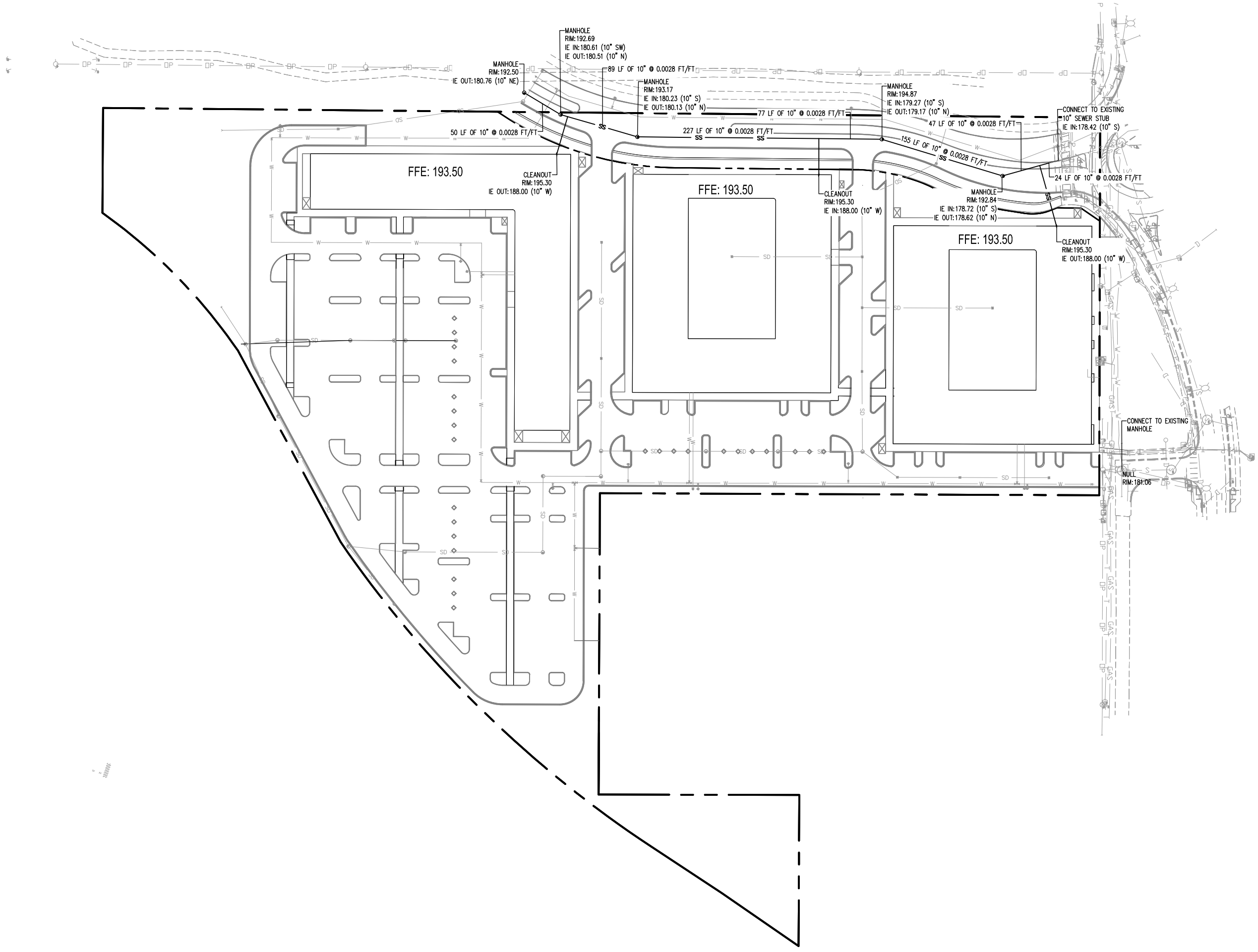
SHEET TITLE:

STORM PLAN

SHEET NO.

SD+01

JSA CIVIL
Engineering | Planning | Management



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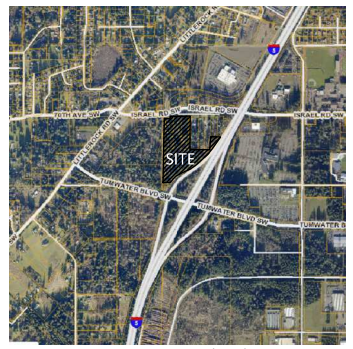
JSA CIVIL
Engineering | Planning | Management



VICINITY MAP (NTS)

SITE DATA

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OPEN SPACE: 3.13 ACRES (22%)	
BUILDING HEIGHT: 55 FT	

PROPOSED USE

ALL BUILDINGS	
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PARKING DATA

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3 BED (1.5 PER UNIT)	18
GUEST (1 PER 10 UNITS)	87
LIVE/WORK (3 PER UNIT)	30
TOTAL REQUIRED	833
TOTAL PROVIDED	840
TOTAL EV	84 (10%)
TOTAL ACCESSIBLE	48

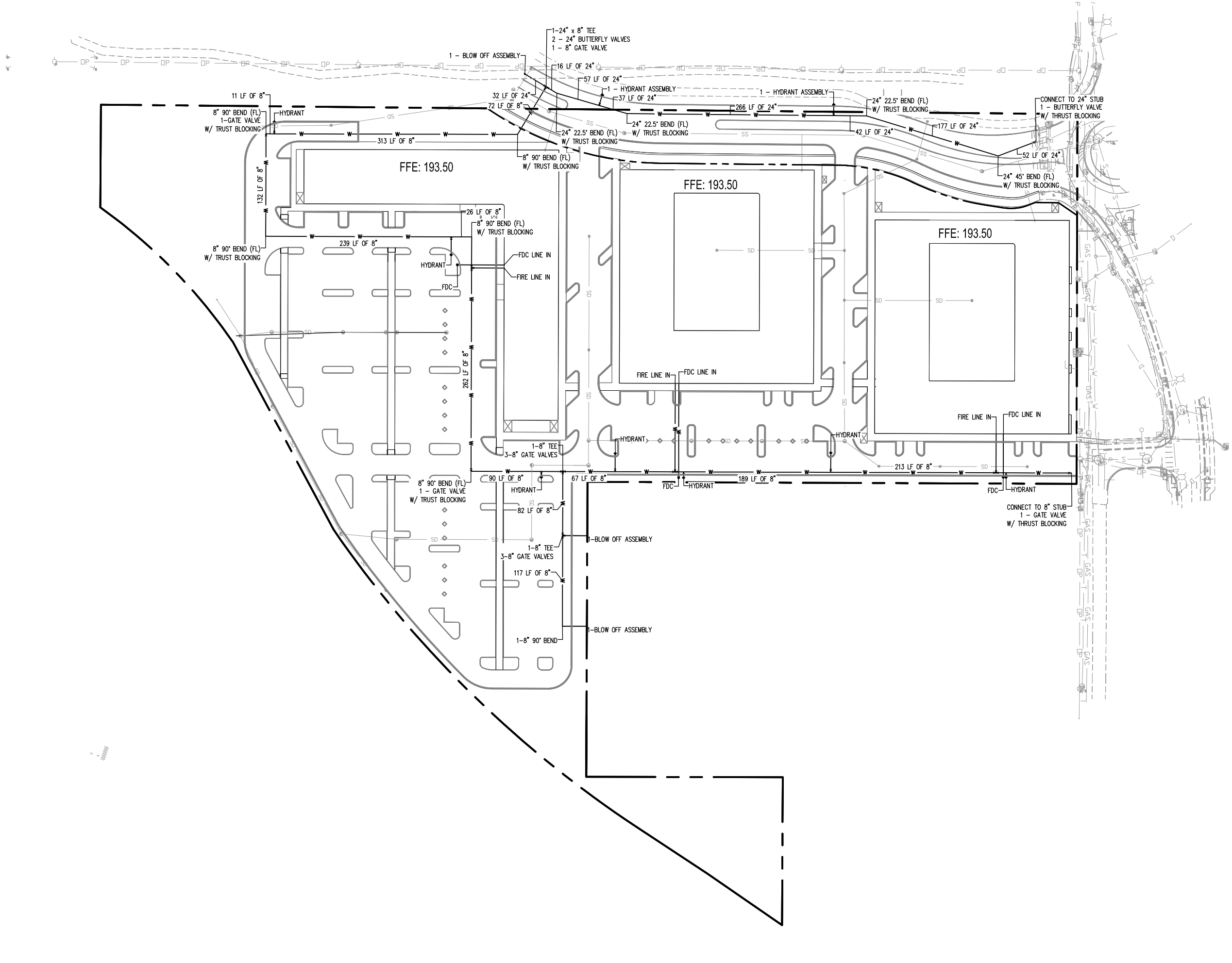
SCALE:

0 60 120
SCALE IN FEET

THE BELMONT FLATS

SHEET TITLE:
SEWER PLAN

SHEET NO.
SS-01



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JSA CIVIL
Engineering | Planning | Management

VICINITY MAP (NTS)

SITE DATA

TPN	
	82700800401 – 2.19 ACRES
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BUILDING HEIGHT: 55 FT	

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3 BED (1.5 PER UNIT)	18
GUEST (1 PER 10 UNITS)	87
LIVE/WORK (3 PER UNIT)	30
TOTAL REQUIRED	833

TOTAL PROVIDED	840
TOTAL EV	84 (10%)
TOTAL ACCESSIBLE	48

SCALE:

0 60 120
SCALE IN FEET

THE BELMONT FLATS

SHEET TITLE:
WATER PLAN

SHEET NO.
WT-01

SUF

SOUND URBAN FORESTRY
Appraisals, Planning, Urban Landscape Design and Management

Belmont Flats Mixed-Use Project
Tyee Drive
Tumwater, Washington 98501

Tree Protection Plan

Prepared for: Israel Investments, LLC

JSA Civil, Brandon Johnson

Prepared by: Kevin M. McFarland, SUF
Consulting Urban Forester/ISA Certified Arborist & Tree Risk Assessor Qualified

Date: 12/21/2022

This report has been developed as part of the proposed 15.18-acre Belmont Flats mixed-use project along Tyee Drive, in Tumwater, Washington. This plan will satisfy the requirements as specified by the City of Tumwater Protection of Trees and Vegetation Ordinance (TMC 16.08) and Development Guidelines and Standards.

I. Overall Site & Vegetation Description

The site contains 3 distinct vegetation types. The northern half is dominated by western red cedar and Douglas fir with scattered red alder, shore pine and big leaf maple. The southern half is dominated by red alder with some shore pine and Douglas fir. Along the eastern edge are large Douglas firs with a few shore pine and big leaf maple. The trees are in overall fair to good conditions and with the exception of the alders, are even aged and well-spaced. Understory vegetation is typical of lowland forests and includes salal, mahonia, hazelnut, sword fern and snowberry. The property had been mowed in the last 5-10 years resulting in open areas and lack of regeneration.

II. Inventory of Trees

A 100% inventory of all trees measuring 6" and greater within the parcels was conducted in December 2022. This information is presented in the table below.

Table 1. Inventory of Trees within Property

Species	DBH	Number of Trees
Big Leaf Maple	6-46"	198
Western Red Cedar	6-36"	93
Douglas Fir	6-38"	184
Shore Pine	8-24"	63
Grand Fir	8-24"	3
Red Alder	8-26"	5
Bird Cherry	12-32"	6
Bitter Cherry	12-32"	1
Pacific Dogwood	8-16"	7
Western Hemlock	14"	1
		Total = 561

Landmark Trees

I found no trees within the site that would be considered specimen or 'Landmark' trees.

Off-Site & Edge Trees

No offsite trees were identified with the potential of impacts.

III. Tree Retention Calculations

Trees to be retained are located within the Tree Protection Open Space in the southeast corner of the project. A summary of those trees can be found within Table 2. Per the TMC, trees that measure 24" and greater count as two.

Table 2. Inventory of Trees to be Retained within Tree Protection Open Space

Species	DBH	Number of Trees	Count Toward Retention
Big Leaf Maple	6-24"	6	6
Big Leaf Maple	24"+	4	8
Western Red Cedar	36"	1	2
Douglas Fir	24"+	3	6
Red Alder	26"	1	2
Pacific Dogwood	8-16"	5	5
Bitter Cherry	12" & 32"	2	3
			Total = 32

Table 3. Summary of Tree Retention Calculations

Gross Acreage (15.18 – 1.12 Dedicated ROW)	14.06
Total Trees Within Site (Table 1)	561
20% Tree Retention	112 Trees
*12 Trees/ Acre Retention	169 Trees
Proposed Tree Retention	32 Trees
Shortfall on Required Retention	137 Trees
Required Replanting (3:1)	411 Trees

***This is the greater amount and therefore required by TMC**

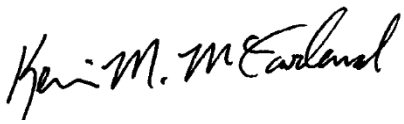
IV. Replanting

This project falls short of the minimum retention by 137 trees. Because it would be possible to meet that minimum, the applicant will be required to replant at a rate of 3:1 within the site. Per the standards outlined in TMC 16.08.070, priority must be given to replanting within the tree protection open space in order to obtain 80% coverage in 15 years. There is ample room within the open space for replanting. These requirements will be addressed with the submitted landscape plans.

IV. Tree Protection

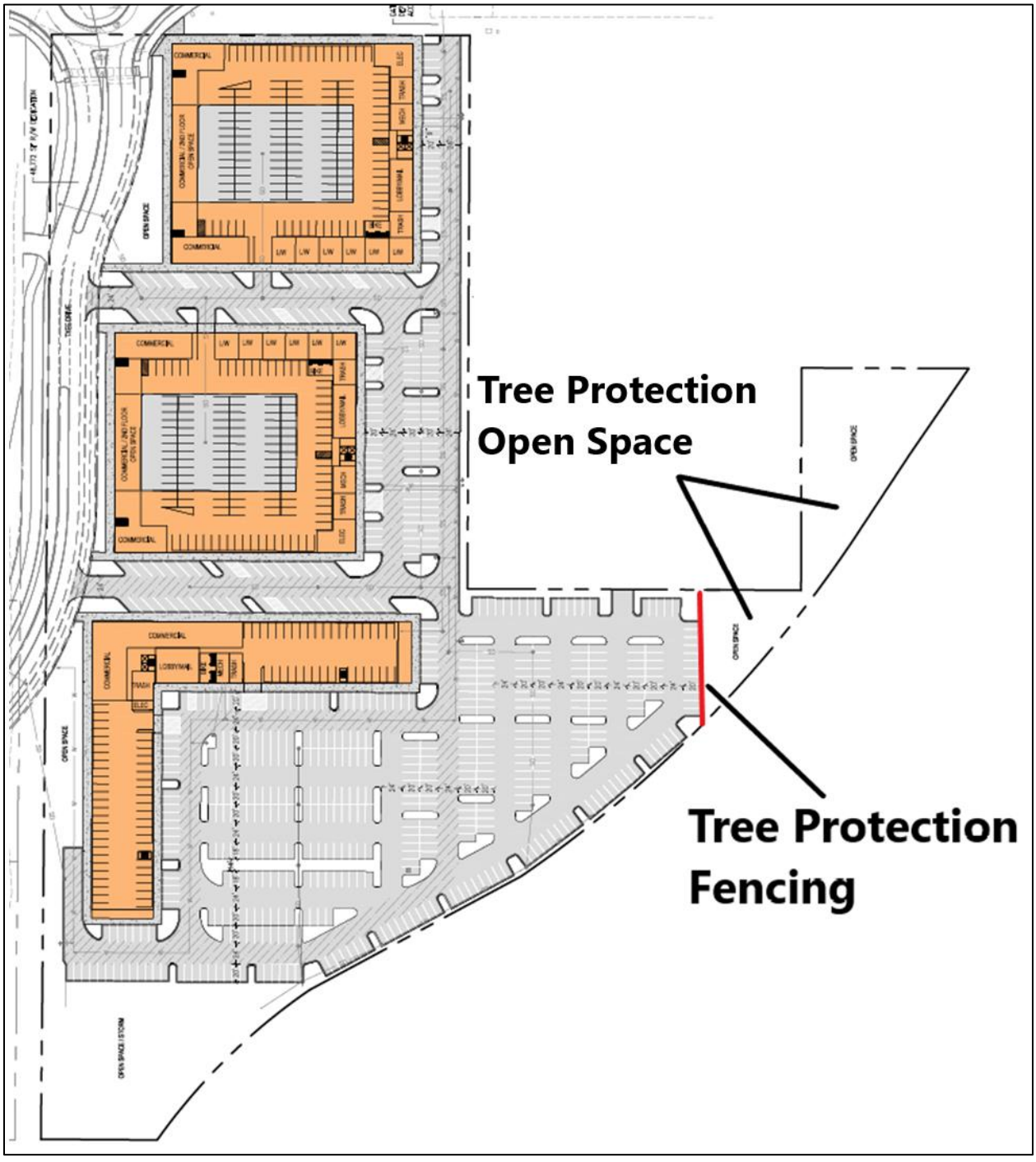
Due to the limited access of the Tree Protection Open Space, protection fencing will only be necessary along the western most perimeter, as shown on the attached site plan. Fencing will meet the City's standards and be installed prior to any site work.

Professionally Submitted,



Kevin M. McFarland, Principal
ISA Certified Arborist PN-0373 & ISA Tree Risk Assessment Qualified
Sound Urban Forestry, LLC

Location of Tree Protection Open Space and Recommended Tree Protection Fencing



Traffic Impact Analysis

Belmont Flats
Tumwater, WA

Prepared For:
City of Tumwater

Prepared By:
SCJ Alliance
8730 Tallon Lane NE, Suite 200
Lacey, WA 98516
360.352.1465

February 2023

SCJ ALLIANCE
CONSULTING SERVICES

Traffic Impact Analysis

Project Information

Project:	Belmont Flats
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Reviewing Agency

Jurisdiction:	City of Tumwater

Project Representative

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Signature

The technical material and data contained in this document were prepared under the supervision and direction of the undersigned, whose seal, as a professional engineer licensed to practice as such, is affixed below.

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02/06/23

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1 Introduction

1.1 Project Overview

Israel Investments LLC plans to construct *The Belmont Flats,* a mixed-use development to be located at the southwest corner of the Tyee Drive/Israel Road intersection in Tumwater, Washington. The proposed project includes 624 apartment units and 27,500 square feet of general commercial space. **Figure 1** illustrates the site vicinity and the transportation network serving the project area.

Figure 1. Site Vicinity Map

1.2 Study Context

This report has been prepared to provide the traffic analysis and project information for the City of Tumwater in reviewing the development proposal. Based on a recently completed Traffic Scoping letter dated June 7, 2022 and comments received from the city, we have identified to need to evaluate existing and forecasted operations at the following intersections:

- Littlerock Road at 70th Avenue/Israel Road
- Tyee Drive at Israel Road
- Israel Road at Old Israel Road
- Linderson Way at Israel Road
- Capital Boulevard at Israel Road
- Tyee Drive Extension at Tumwater Boulevard
- Littlerock Road at Tumwater Boulevard
- I-5 Southbound Ramps at Tumwater Boulevard
- I-5 Northbound Ramps at Tumwater Boulevard
- Linderson Way/Center Street at Tumwater Boulevard

- Capitol Boulevard at Tumwater Boulevard
- Tyee Drive at North Site Driveway
- Tyee Drive at South Site Driveway

Operational analysis has been prepared for existing 2022 PM peak hour conditions and forecasted 2024 PM peak hour conditions with and without completion of the development.

2 Project Description

2.1 Development Proposal

The proposed project would construct three new mixed-use buildings providing 624 apartment units, and 27,500 square feet of general commercial space on undeveloped land in the City of Tumwater. Access to the project will be provided by three driveways, two with access on an extension of Tyee Drive and one with access on Israel Road. One of the proposed driveways on Tyee Drive will provide full access while the other will be limited to right-in right-out. Tyee Drive is proposed to be extended south to Tumwater Boulevard as part of an adjacent development located immediately west of *The Belmont Flats* project.

The project is anticipated to open in 2024. The preliminary site plan is provided in **Figure 2** which illustrates the location of buildings, parking, and additional on-site traffic circulation.

Figure 2. Preliminary Site Plan

3 Existing Conditions Summary

3.1 Area Land Uses

The Belmont Flats site is currently undeveloped and lies immediately west of Interstate 5 generally between Israel Road and Tumwater Boulevard. Nearby properties include Toyota of Olympia and a small cluster of single family houses to the north, vacant property proposed for large scale residential development to the immediate west, a variety of other commercial services to the west, and large government offices, primarily to the east of I-5.

3.2 Roadway Inventory

The following paragraphs provide a description of key roadways in the study area. A summary of the intersection channelization and control type for each of the study intersections is provided in **Figure 3.**

3.2.1 Israel Road

Israel Road is an east/west collector street that runs from 70th Avenue/Littlerock Road on the west to Tumwater Boulevard on the east, serving destinations in the south side of the City of Tumwater. In the project vicinity the roadway has a single lane in each direction with paved shoulders that transition to bicycle lanes just east of the intersection with Old Israel Road. Sidewalks are provided along the south side of the street through the study area, and on the north side between Old Israel Road and Littlerock Road. The street has a posted speed limit of 35 mph.

3.2.2 Tyee Drive

Tyee Drive is a two-lane local street that runs north/south along the west side of I-5, generally north of the study area. Near the project it has sidewalks along both sides and a bicycle lane in the southbound direction until approaching Toyota of Olympia at which point there are bicycle lanes on both sides. The intersection of Tyee Drive with Israel Road is a single lane roundabout. The roadway has a posted speed limit of 25 mph. It is anticipated that there will be a southerly extension of Tyee Drive to connect with Tumwater Boulevard when the adjacent property to the west is developed for proposed residential uses.

3.2.3 Littlerock Road

Littlerock Road is a two-lane arterial that runs north/south to the west of the study area. It has paved shoulders with no curb, gutter, or sidewalks except adjacent to newly developed properties close to the intersection with Greaves Way. The roadway has a posted speed limit of 35 mph and a single lane roundabout at its intersections with both Tumwater Boulevard and Israel Road.

3.2.4 Old Israel Road

Old Israel Road is a two-lane local street that provides access to residential properties located along the south side of Israel Road. No direct access is available to these properties from Israel Road. No sidewalks or bicycle lanes are provided and the road is not posted for speed.

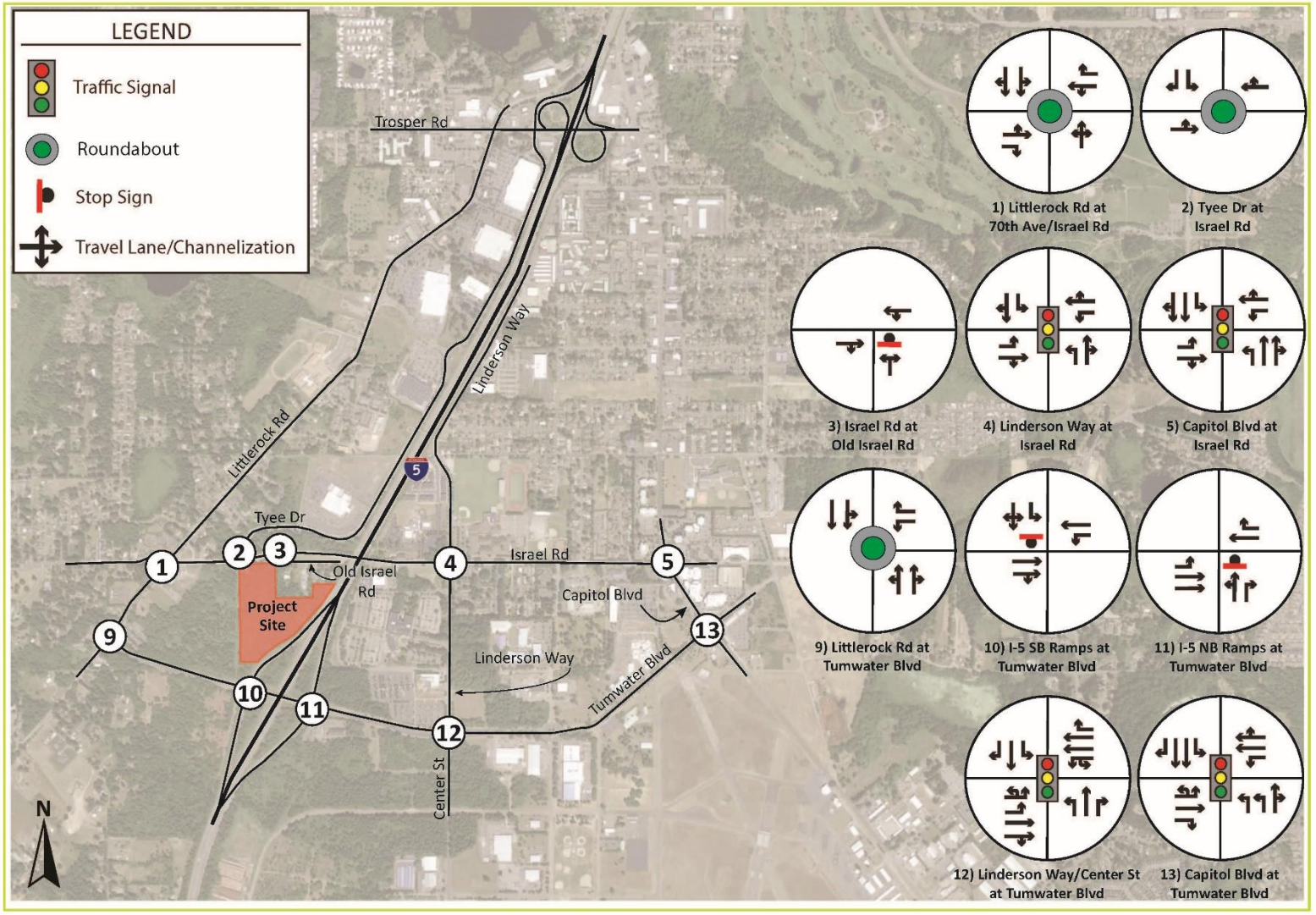

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Figure 3
Existing Channelization and Intersection Control

3.2.5 Linderson Way

Linderson Way is a two-lane collector that runs north/south to the east of the study area. It has bicycle lanes and sidewalks on both sides and provides direct access to several large state office buildings including Labor and Industries, and Department of Corrections. The roadway has a posted speed limit of 30 mph.

3.3 Traffic Volume Data

Given the current COVID-19 impact on traffic volumes associated with the largely vacant state office buildings in the project area, the traffic counts taken for *The Belmont Flats* project on July 26, 2022 were adjusted. This adjustment used counts taken in 2015 for the city's most recent *Transportation Master Plan* update and compared them to what traffic levels should have been in 2022 if volumes had continued to grow at the anticipated rate. A comparison between the anticipated 2022 volumes and those actually counted revealed that current counts are about 30 percent lower than anticipated. Accordingly, all movements at all intersections for which July 2022 counts were collected were increased by 30 percent for both AM and PM peak periods. In addition, multiple specific movements at intersections in the study area received an added adjustment to reflect the loss of traffic to/from the state offices during this time period.

Figure 4 shows the adjusted 2022 PM peak hour traffic volumes for study intersections. The original turning movement counts are provided in **Appendix A**, while adjustments are included in **Appendix B**.

3.4 Crash History

The Washington Department of Transportation provides crash data for study area roadways. The data was collected over the five-year span between January 1, 2017 and December 31, 2021 and reviewed for the study area intersections. The total crashes by severity are provided in **Table 1**.

Overall, approximately 70 percent of all the reported crashes were classified as property damage only (with no apparent injury). There were no fatal or serious injury crashes reported.

Table 1. Existing Crash Severity By Intersection

Intersection	Fatal	Serious Injury	Minor Injury	Possible Injury	Property Damage Only	Unknown	Total
Littlerock Road at 70th Avenue/Israel Road	0	0	0	1	14	0	15
Tyee Drive at Israel Road	0	0	1	0	1	0	2
Israel Road at Old Israel Road	0	0	0	0	2	0	2
Linderson Way at Israel Road	0	0	0	2	5	1	8
Capital Boulevard at Israel Road	0	0	2	4	16	0	22
Littlerock Road at Tumwater Boulevard	0	0	0	2	7	1	10
I-5 Southbound Ramps at Tumwater Boulevard	0	0	1	2	11	0	14
I-5 Northbound Ramps at Tumwater Boulevard	0	0	3	5	18	0	26
Linderson Way/Center Street at Tumwater Boulevard	0	0	3	6	18	0	27
Capitol Boulevard at Tumwater Boulevard	0	0	0	4	10	0	14
Total Crashes	**0**	**0**	**10**	**26**	**102**	**2**	**140**

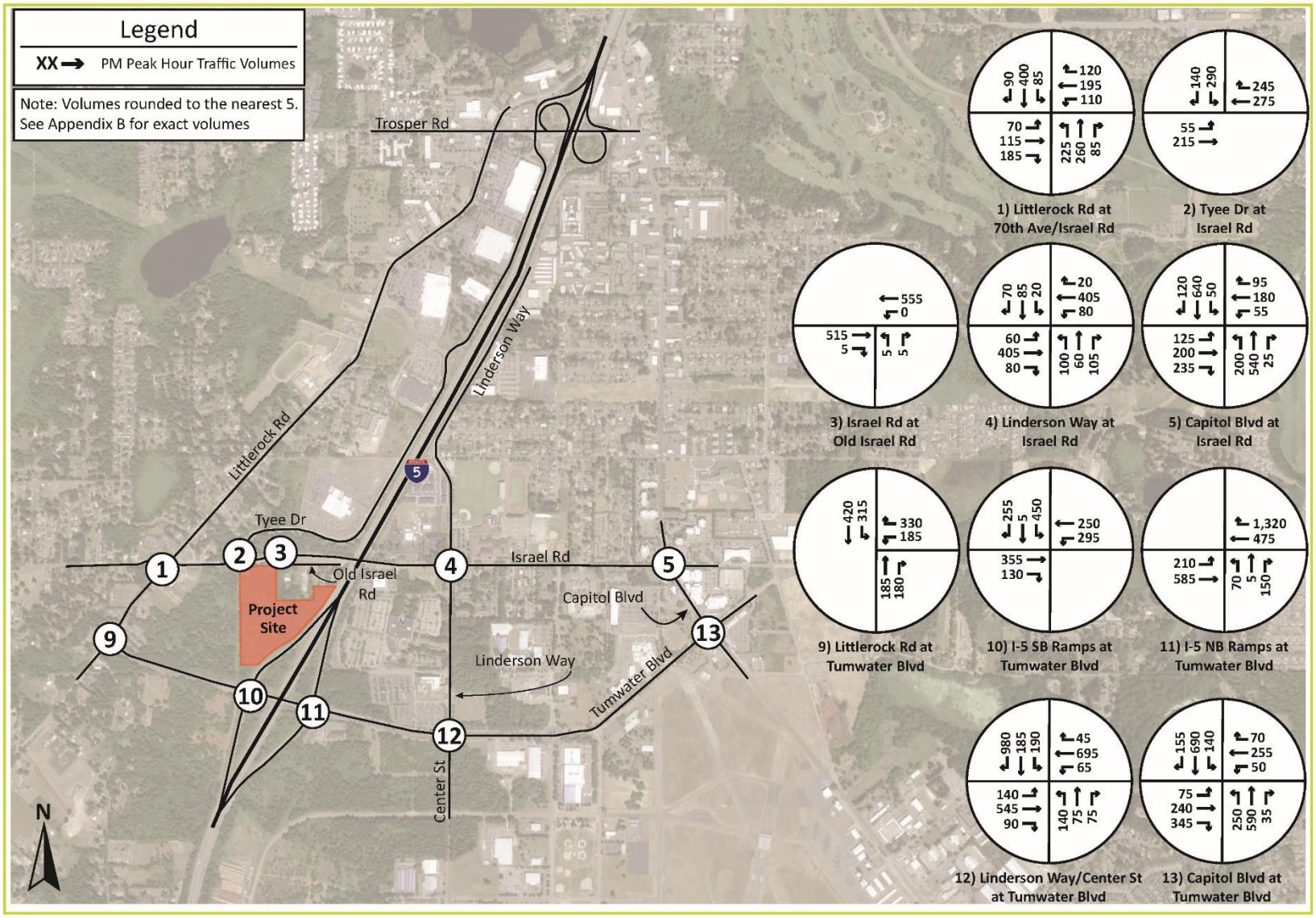

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Figure 4
Existing 2022 PM Peak Hour Traffic Volumes

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4 Project Traffic Characteristics

The project-related characteristics having the most effect on area traffic conditions are peak hour trip generation and the directional distribution of traffic volumes on the surrounding roadway network.

4.1 Site-Generated Traffic Volumes

Vehicle trip generation was calculated using the trip generation rates contained in the 11th edition of the *Trip Generation Manual* by the Institute of Transportation Engineers (ITE). Multifamily Housing (Mid-Rise) Not Close to Rail Transit (land use code 221) and Strip Retail Plaza (<40k) (land use code 822) land use categories match the proposed development and have been used to calculate the trip generation.

For this analysis, the "fitted-curve" equation was used when available to estimate trips in preference to using the average trip rate as this approach was recommended by ITE.

4.1.1 Internal Capture

Internal capture calculations were prepared to reflect on-site interaction between the mix of uses in the proposed *Belmont Flats* project. The internal trip discount for the AM and PM peak period were derived from the methodology of the 3rd edition of the *Trip Generation Handbook* by ITE.

4.1.2 Pass-By

It is anticipated that this project will attract some traffic from people already driving on adjacent roadways. These trips are not new trips added to the local roadway system (primary trips) but represent "pass-by" trips according to the following definition:

> *Pass-by trips*: Pass-by trips are trips made as an intermediate stop from an origin to a primary destination (i.e., stopping to shop on the way home from work) by vehicles passing directly by the project driveway.

The pass-by percentage for shopping center, contained in the 3rd edition of the *Trip Generation Handbook* by ITE was used for *The Belmont Flats* mixed-use development with a PM Peak hour rate of 34 percent. The pass-by trips were assigned to Israel Road and Tumwater Boulevard and taken equally from both travel directions.

The trip generation rates used for the AM peak hour are shown in **Table 2** and the PM peak hour trip are shown in **Table 3.**

Table 2. AM Peak Hour Trip Generation Rates

Land Use Category	Land Use Code (LUC)	Unit	Trip Rate	Internal Capture Rate	Pass-By Rate	Enter %	Exit %
Multifamily Housing (Mid-Rise) Not Close to Rail Transit	221	Dwelling Units	0.42*	1%	0%	23%	77%
Strip Retail Plaza (<40k)	822	1,000 sqft	2.36	5%	0%	60%	40%

*Fitted-curve equation rate

Table 3. PM Peak Hour Trip Generation Rates

Land Use Category	Land Use Code (LUC)	Unit	Trip Rate	Internal Capture Rate	Pass-By Rate	Enter %	Exit %
Multifamily Housing (Mid-Rise) Not Close to Rail Transit	221	Dwelling Units	0.39*	12%	0%	61%	39%
Strip Retail Plaza (<40k)	822	1,000 sqft	5.81*	18%	34%	50%	50%

*Fitted-curve equation rate

The total trip generation expected from this project is calculated by applying the unit measure for each land use category to the appropriate trip generation rate. The AM peak hour trip generation calculations are shown in **Table 4** and the PM peak hour trip generation calculations are shown in **Table 5.** All of the trip generation calculations, included daily traffic, are attached. The complete project trip generation calculations are included in **Appendix B**.

Table 4. AM Peak Hour Project Trip Generation

Land Use	Size	Total Trips	Internal Capture Trips	Pass-By Trips	New-to-Network Total	Enter %	Exit %
Apartments	624	263	3	0	260	60	200
General Commercial	27.5	65	3	0	62	37	25
Total Project Trips	**-**	**328**	**6**	**0**	**322**	**97**	**225**

Table 5. PM Peak Hour Project Trip Generation

Land Use	Size	Total Trips	Internal Capture Trips	Pass-By Trips	New-to-Network Total	Enter %	Exit %
Apartments	624	244	29	0	215	131	84
General Commercial	27.5	160	29	45	86	43	43
Total Project Trips	**-**	**404**	**58**	**45**	**301**	**174**	**127**

4.2 Site Traffic Distribution and Assignment

An estimate of trip distribution and assignment was prepared for the proposed development. The directional distribution of traffic to and from the proposed project was estimated using the regional transportation model operated and maintained by the Thurston Regional Planning Council (TRPC). This model was created in cooperation with local jurisdictions within the county using the Emme/4 software package. The model has been calibrated to represent the existing vehicle travel patterns throughout the entire county.

The Belmont Flats project is located within Transportation Analysis Zone (TAZ) 259 of the regional model. A distribution analysis was performed for this project by conducting a "Select Zone Analysis" for this TAZ. This feature of the Emme/4 software package allows all of the traffic into and out of a particular zone to be isolated and shown separately from the rest of the traffic on the network. Output from a Select Zone Analysis model run graphically shows the percentage of vehicles currently using each of the available routes into and out of the area (Interstate 5, Israel Road, Littlerock Road, etc.). From this

information, regional distribution percentages were calculated for future traffic for *The Belmont Flats* project.

The resultant traffic distribution percentages and PM peak hour traffic assignments are shown on **Figure 5.** A copy of the Emme/4 select zone analysis model plot was attached to the project Traffic Scoping letter.

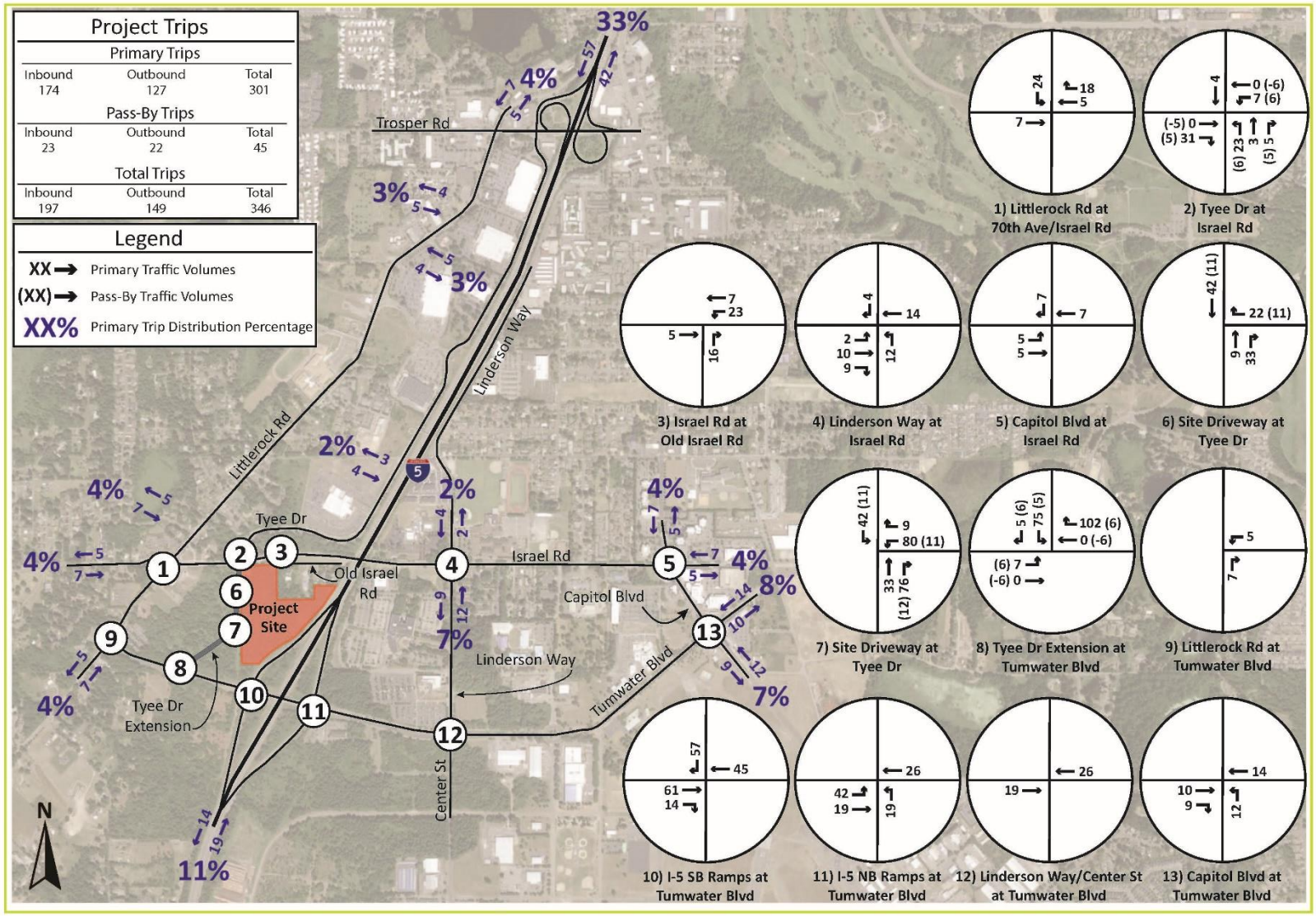

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Figure 5
Site-Generated Traffic Volumes
PM Peak Hour

5 Future Traffic Conditions

5.1 Roadway Network Improvements

There are multiple network improvements planned within the study area:

- City of Tumwater *Six-Year Transportation Improvement Program for 2021-2026*
    - Israel Road and Linderson Way - bicycle and pedestrian improvements including construction of refuge island(s), reconstruction of select sidewalk segments and curb ramps, added bike lanes, signal improvements, roadway and other improvements
- City of Tumwater *Transportation Master Plan*, 2016. This document includes projects proposed to be built between the present and the planning horizon year of 2036
    - Tyee Drive, Israel Road to Tumwater Boulevard - construct 4/5 lane extension including intersection improvements at Tumwater Boulevard.
    - Littlerock Road, Tumwater Boulevard to western city limits – widen to three lanes with setback for future widening to 4/5 lanes
    - Tumwater Boulevard at I-5 interchange – phased project with interim signal and ultimate roundabout intersection control and widen bridge. This project is being coordinated with WSDOT
    - Tumwater Boulevard, I-5 southbound ramps to Tyee Drive – widen to 4/5 lanes

The extension of Tyee Drive is assumed to be in place for the project opening year as a condition of both the proposed project and the adjacent development to the west. The Tumwater Boulevard interchange project is currently the subject of a SEPA mitigation fee but is not expected to be constructed prior to completion of the proposed project. The remaining projects will either not influence the intersection operations analysis or are not expected to be constructed prior to completion of the proposed project.

5.2 Future Traffic Volumes

Traffic volume forecasts were prepared for PM peak hour conditions for the 2024 opening year. The future traffic volume forecast includes non-specific background traffic growth, pipeline development traffic and estimated traffic generated by the proposed *Belmont Flats* project.

For the non-specific background traffic growth, a 4.0 percent annual growth rate (non-compounded) was used. Use of this growth rate was requested by the City

The City of Tumwater identified six pipeline development projects to be included in the forecast:

- Israel Road Self Storage
- Habitat Townhomes (Laura Plat)
- Kirsop Crossing
- L&I/WSDA Safety & Health Lab Training Center
- Skyview Estates
- Yorkshire

The Yorkshire mixed use development project is located immediately to the west of *The Belmont Flats* project and will include the extension of Tyee Drive north from Tumwater Boulevard.

The projected 2024 traffic volumes without *The Belmont Flats* project are shown on **Figure 6.** The projected 2024 traffic volumes with the project are shown on **Figure 7.** The traffic volume calculations for the study intersections are included in **Appendix B**.

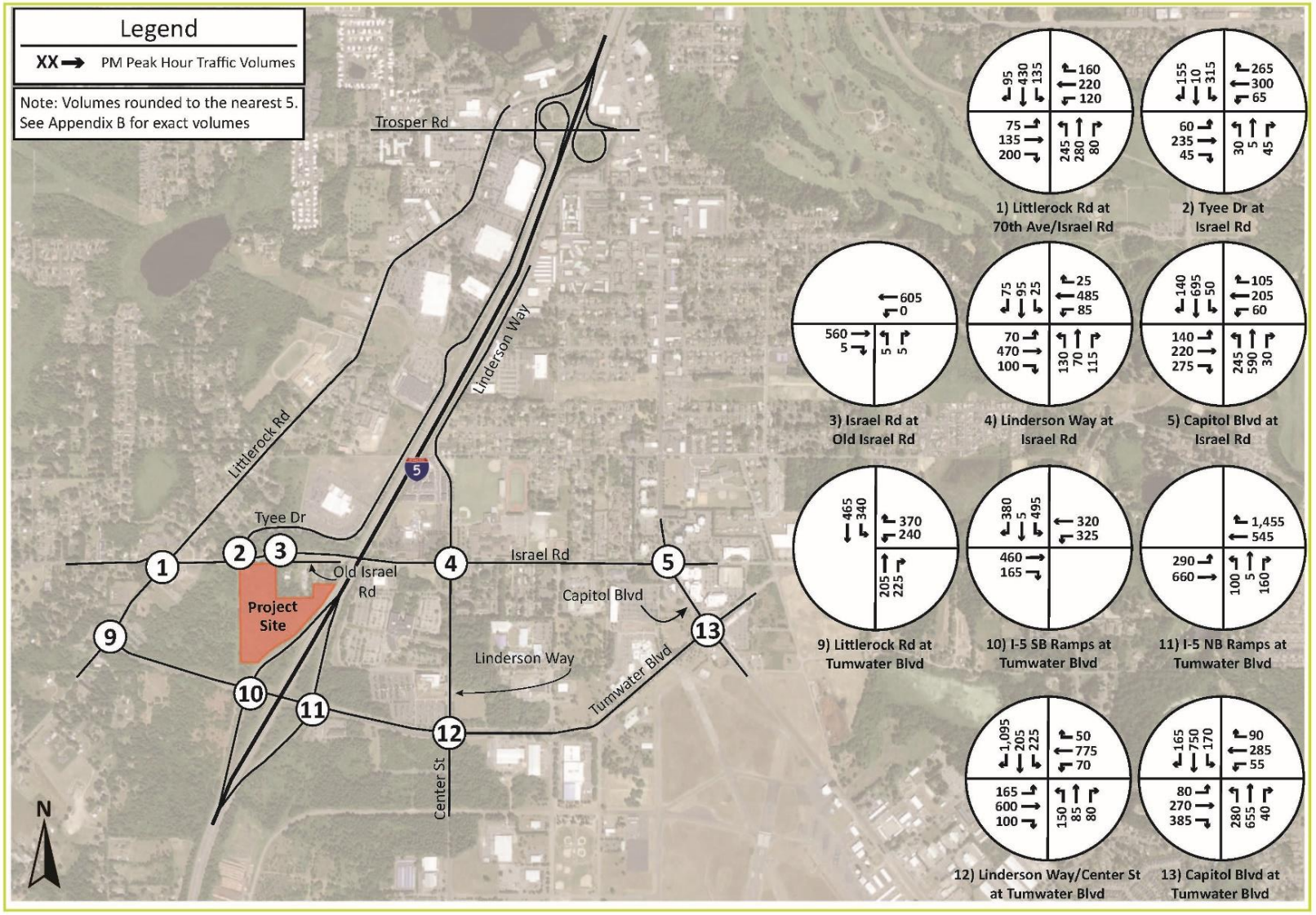

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Figure 6
Projected 2024 PM Peak Hour
Traffic Volumes Without Project

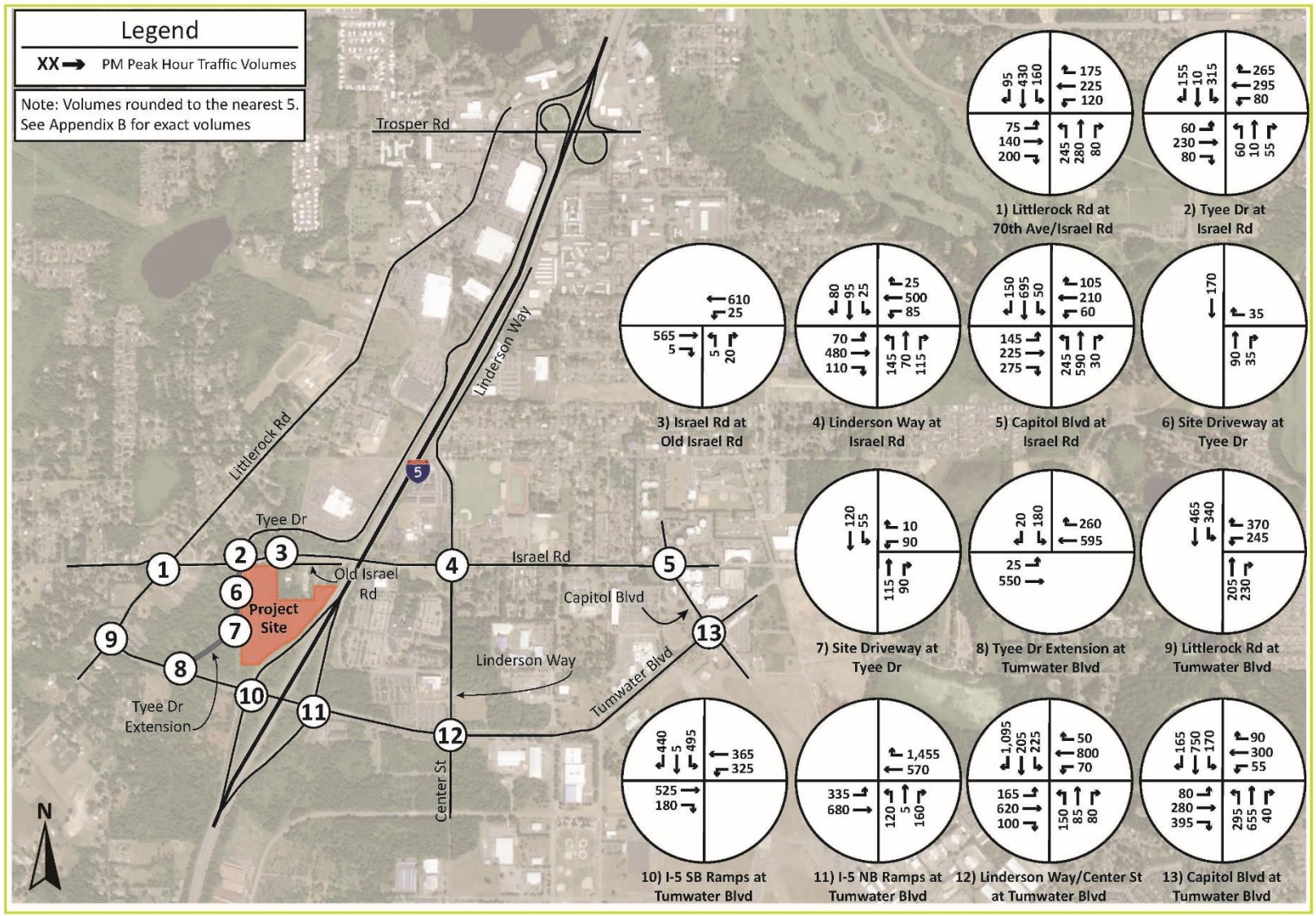

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Figure 7
Projected 2024 PM Peak Hour Traffic Volumes With Project

6 Traffic Operations Analysis

Traffic analyses were conducted to identify any deficiencies within the study area for the PM peak hour in the 2022 base year and the 2024 project opening year.

6.1 Traffic Analysis Methods and Assumptions

6.1.1 Methods and Assumptions

The acknowledged source for determining overall capacity for arterial segments and independent intersections is the current edition of the *Highway Capacity Manual* (HCM) published by the Transportation Research Board (TRB). Intersection analyses were completed for the base year and projected 2024 conditions.

Intersection analysis for signalized and stop-controlled intersections was performed using the Synchro software package, and the Sidra software for roundabouts. This software implements the methods of the 6th Edition HCM.

6.1.2 Mobility Standards

Intersection analysis results are described in terms of Level of Service (LOS). LOS is a qualitative term describing operating conditions a driver will experience while traveling on a street or highway during a specific time interval. LOS ranges from A (very little delay) to F (long delays and congestion).

For signalized intersections, the overall LOS grade represents the weighted average vehicular delay (in seconds) of all movements at the intersection. For intersections under minor street stop-sign control, the LOS of the most difficult movement (typically the minor street left turn) is used to represent the intersection's performance. The LOS/delay criteria for stop sign-controlled intersections are different than for signalized intersections because driver expectation is that a signalized intersection is designed to carry higher traffic volumes and experience greater delay. **Table 6** shows the Level of Service criteria for stop-controlled intersections and signalized intersections.

Table 6. Level of Service Criteria for Intersections

Level of Service	Signalized Intersection Average Control Delay (seconds/vehicle)	Stop-Controlled or Roundabout Intersection Average Control Delay (seconds/vehicle)
A	≤ 10	≤ 10
B	> 10-20	> 10-15
C	> 20-35	> 15-25
D	> 35-55	> 25-35
E	> 55-80	> 35-50
F	> 80	> 50

The Tumwater 2036 *Transportation Master Plan* (November 2016) identifies level of service standards for the street system within the city. Outside of "Urban Core Areas", LOS D standards apply. Two roadway segments in the study area are included in the city's list of Strategy Corridors for which

standards apply but there is an acknowledgement that they standards may be exceeded from time to time. These strategy corridors include Littlerock Road between Trosper Road and Tumwater Boulevard, and Tumwater Boulevard east of I-5 to Capitol Boulevard.

6.2 Intersection Analysis

Intersection operations analysis was conducted for the following scenarios:

- Existing 2022 traffic volumes
- Projected background traffic volumes without *The Belmont Flats* project for 2024
- Projected traffic volumes with *The Belmont Flats* project for 2024

This analysis assumes that the extension of Tyee Drive between Israel Way and Tumwater Boulevard will be constructed by the Yorkshire mixed use development project and will be available for use by *The Belmont Flats* project.

6.2.1 2022/2024 Intersection Operations Analysis

The operational analysis results of the study intersections for the PM peak hour are provided in **Table 7**. The LOS analysis worksheets are included in **Appendix C**.

Table 7. PM Peak Hour Intersection Level of Service

				Projected 2024	
		Control Type	Base Year 2022	Without Project	With Project
Intersection			LOS (delay)	LOS (delay)	LOS (delay)
1	Littlerock Road at 70th Avenue/Israel Road	RAB[1]	A (7.7)	A (8.4)	A (8.5)
2	Tyee Drive at Israel Road	RAB[1]	A (6.5)	A (7.3)	A (7.7)
3	Israel Road at Old Israel Road	TWSC[2]	C (18.1)	C (20.0)	C (16.9)
4	Linderson Way at Israel Road	Signal	C (22.1)	D (41.1)	D (46.2)
5	Capital Boulevard at Israel Road	Signal	C (30.6)	D (45.3)	D (46.8)
6	Tyee Drive at Northerly Site Driveway	TWSC[2,3]	--	--	A (9.0)
7	Tyee Drive at Southerly Site Driveway	TWSC[2,3]	--	--	B (11.8)
8	Tyee Drive Extension at Tumwater Boulevard	RAB[1,3]	--	A (5.0)	A (5.8)
9	Littlerock Road at Tumwater Boulevard	RAB[1]	A (6.8)	A (7.1)	A (7.2)
10	I-5 Southbound Ramps at Tumwater Boulevard	Signal	B (14.3)	C (21.3)	E (60.0)
11	I-5 Northbound Ramps at Tumwater Boulevard	TWSC[2]	F (138.2)	F (>200.0)	F (>200)
12	Linderson Way/Center Street at Tumwater Boulevard	Signal	C (26.6)	D (37.1)	D (37.6)
13	Capitol Boulevard at Tumwater Boulevard	Signal	C (30.9)	D (44.8)	D (48.1)

1. Roundabout
2. Two-Way Stop-Control
3. Assumed control at future intersection

As shown in Table 7, most study intersections are currently operating at or better than LOS D in the 2022 PM peak hour. One exception is the stop-controlled intersection of Tumwater Boulevard at the I-5 northbound ramps. This intersection is seeing an average delay of 138.2 seconds per vehicle and operates at LOS F. It should be noted that this finding assumes the historic traffic patterns to/from state offices in the vicinity are in place which have been significantly disrupted by the Covid 19 pandemic.

In the 2024 PM peak hour without the project all intersections would continue to operate at LOS D or better with the same exception for the I-5 northbound ramp intersection at Tumwater Boulevard. This intersection would continue to operate at LOS F with more than 200 seconds of delay per average vehicle.

Similar levels of service would be experienced in the 2024 PM peak hour with the project at all intersections except:

- Capital Boulevard at Israel Road would drop from LOS C to LOS D
- I-5 Southbound Ramps at Tumwater Boulevard would drop from LOS C to LOS E with an average of 60 seconds of delay per vehicle
- I-5 Northbound Ramps at Tumwater Boulevard would continue to operate at LOS F

A focused analysis of AM peak hour operations analysis was conducted at key intersections in the study area to determine what potential impacts might occur. This analysis focused on four intersections, three along Tumwater Boulevard and one on Israel Road. Results of this analysis are shown in **Table 8**. Operations analysis worksheets are included in **Appendix C**.

Table 8. AM Peak Hour Intersection Level of Service

				Projected 2024	
			Base Year 2022	Without Project	With Project
Intersection		Control Type	LOS (delay)	LOS (delay)	LOS (delay)
4	Linderson Way at Israel Road	Signal	B (14.2)	B (18.6)	C (21.4)
10	I-5 Southbound Ramps at Tumwater Boulevard	Signal	B (33.6)	F (90.4)	F (127.5)
11	I-5 Northbound Ramps at Tumwater Boulevard	TWSC[2]	F (>200)	F (>200)	F (>200)
12	Linderson Way at Tumwater Boulevard	Signal	C (28.0)	D (38.0)	D (38.7)

1. Roundabout
2. Two-way Stop Control

As indicated in the table, both intersections of Tumwater Boulevard with the I-5 ramps would fail during the AM peak hour for the 2024 horizon with or without the proposed project.

An operations analysis was conducted for the I-5/Tumwater Boulevard interchange to assess expected benefits of the planned improvements to roundabout intersections at the interchange. Analysis of the intersection of the I-5 southbound ramps with Tumwater Boulevard in the 2024 AM peak hour with the project indicates that it would operate at LOS C with an average delay of 22.6 seconds and LOS A with 7.7 seconds of delay in the PM peak. Analysis of the intersection of the I-5 northbound ramps with Tumwater Boulevard in the 2024 AM peak hour with the project indicates that it would operate at LOS B with an average delay of 10.4 seconds and LOS A with 6.0 seconds of delay in the PM peak. Based on this

analysis we can conclude that the City's mitigation package for the interchange will operate acceptably with all the proposed area development.

6.2.2 Intersection Sensitivity Analysis – Without Extension of Tyee Drive

As noted, the operational analysis discussed above includes the planned extension of Tyee Drive south to Tumwater Boulevard. This extension is contingent on the proposed Yorkshire development being constructed. To further understand the potential traffic impacts of *The Belmont Flats* project, a sensitivity analysis was performed for the PM peak hour traffic without the Yorkshire development and the extension of Tyee Drive. This scenario would result in a reduction in project-related traffic accessing Tumwater Boulevard and its interchange with I-5 as compared to the scenario that includes completion of Tyee Drive. This scenario would increase project-related traffic onto Israel Road and Littlerock Road. Trip distribution assumptions made for this analysis were consistent with those used for an earlier Belmont Flats traffic scoping analysis conducted by SCJ Alliance in September of 2021.

The sensitivity analysis focused on four intersections, three along Israel Road and one on Tumwater Boulevard. Analysis results are presented in **Table 9**. As indicated in the table four intersections are expected to operate at LOS D or better. It should be noted that this analysis does not include traffic attributable to the Yorkshire development project since that project would not be built without the Tyee Drive Extension. This is the reason that delay and LOS at the intersection of Linderson Way with Israel Road is less without the Tyee Drive Extension than with it.

Table 9. PM Peak Hour Intersection Level of Service Without Tyee Drive Extension Comparison

				Projected 2024	
			Base Year 2022	With Tyee/Yorkshire	Without Tyee/Yorkshire
Intersection		Control Type	LOS (delay)	LOS (delay)	LOS (delay)
1	Littlerock Road at 70th Avenue/Israel Road	RAB[1]	A (7.7)	A (8.5)	A (8.8)
2	Tyee Drive at Israel Road	RAB[1]	A (6.5)	A (7.7)	A (7.6)
4	Linderson Way at Israel Road	Signal	C (25.0)	D (46.2)	D (39.2)
9	Littlerock Road at Tumwater Boulevard	RAB[1]	A (6.8)	A (7.2)	A (7.3)

1. Roundabout
2. Two-way Stop Control

7 Summary and Mitigation

The proposed *Belmont Flats* project would construct three new mixed-use buildings providing 624 apartment units, and 27,500 square feet of general commercial space on undeveloped land in the City of Tumwater.

At full occupancy and operation, the project is estimated to generate approximately 301 net new trip ends during the PM peak hour, with 174 inbound and 127 outbound. This report has been prepared to provide the traffic analysis and project information for the City of Tumwater to use in the environmental review of the project.

Traffic operations analysis included two roadway improvement scenarios: one that includes the extension of Tyee Drive between Israel Street and Tumwater Boulevard and one without. Based on the analysis described in this report, all the study area intersections are projected to operate at or better than the established intersection level of service standards with or without the Tyee Drive Extension with the exception of the north and southbound ramps intersections on Tumwater Boulevard. No off-site roadway improvements are identified except for a SEPA mitigation for the I-5 interchange to which the project will contribute. As noted in Chapter 6, proposed improvements to the interchange include development of roundabouts at both ramp termini intersections. Analysis indicates that the proposed roundabout improvements would successfully mitigate expected traffic volumes in the interchange area.

To mitigate the traffic volumes expected with the project, the proposed *Belmont Flats* project will:

- Pay City of Tumwater Roadway Impact Fees.
- Pay a per trip Interchange improvement fee based on an expected cost of $4,219 per trip as calculated by the city. This fee would apply only to trips that pass through the interchange.

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Appendix A

Traffic Count Data

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

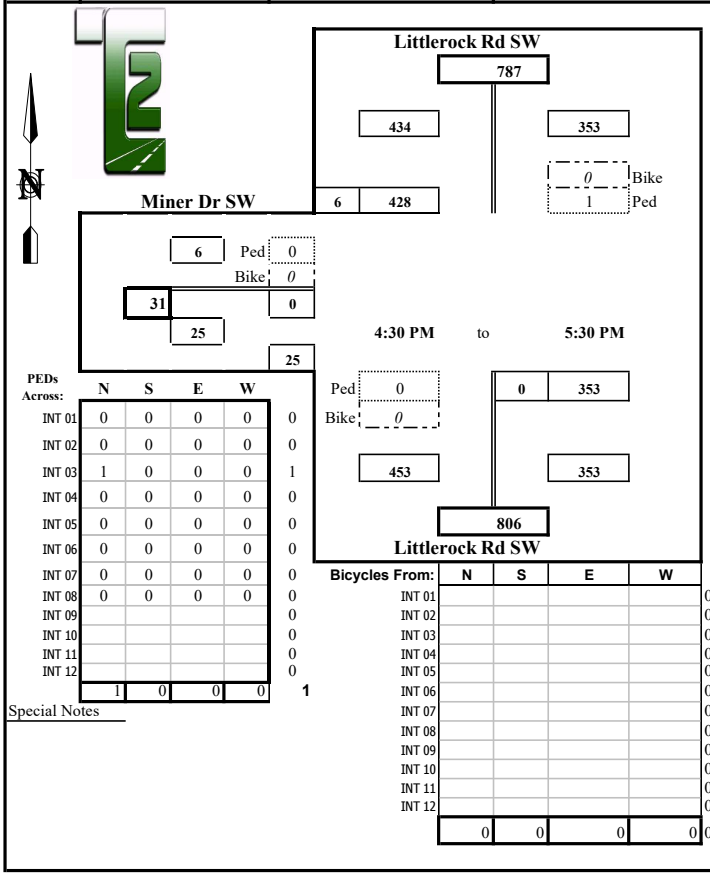
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Littlerock Rd SW & Miner Dr SW **Date of Count:** Tue 07/26/2022

Location: Tumwater, Washington **Checked By:** Jen

Time Interval	From North on (SB) Littlerock Rd SW				From South on (NB) Littlerock Rd SW				From East on (WB) 0				From West on (EB) Miner Dr SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	2	0	128	0	1	0	85	0	0	0	0	0	0	0	0	4	217
4:30 P	0	0	114	2	1	0	63	0	0	0	0	0	0	0	0	4	183
4:45 P	1	0	106	1	0	0	88	0	0	0	0	0	0	0	0	12	207
5:00 P	1	0	107	1	2	0	82	0	0	0	0	0	0	0	0	7	197
5:15 P	3	0	104	2	0	0	107	0	0	0	0	0	0	0	0	2	215
5:30 P	1	0	111	2	1	0	76	0	0	0	0	0	0	0	0	4	193
5:45 P	1	0	101	4	0	0	76	0	0	0	0	0	0	0	0	6	187
6:00 P	0	0	103	4	1	0	85	0	0	0	0	0	0	0	0	3	195
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	9	0	874	16	6	0	662	0	0	0	0	0	0	0	0	42	1594
	Peak Hour: 4:30 PM to 5:30 PM																
Total	6	0	428	6	3	0	353	0	0	0	0	0	0	0	0	25	812
Approach	434				353				0				25				812
%HV	1.4%				0.8%				n/a				n/a				1.1%
PHF	0.96				0.82				n/a				0.52				0.94



PEDs Across:	N	S	E	W	
INT 01	0	0	0	0	0
INT 02	0	0	0	0	0
INT 03	1	0	0	0	1
INT 04	0	0	0	0	0
INT 05	0	0	0	0	0
INT 06	0	0	0	0	0
INT 07	0	0	0	0	0
INT 08	0	0	0	0	0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	1	0	0	0	1

Bicycles From:	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06					0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	0	0

868 *1.0 PHF Peak Hour Volume*

			PHF	%HV
		EB	0.52	n/a
Check		WB	n/a	n/a
In:	812	NB	0.82	0.8%
Out:	812	SB	0.96	1.4%
		T Int.	0.94	1.1%

Conditions:

Special Notes

SCJ22043M_01P

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

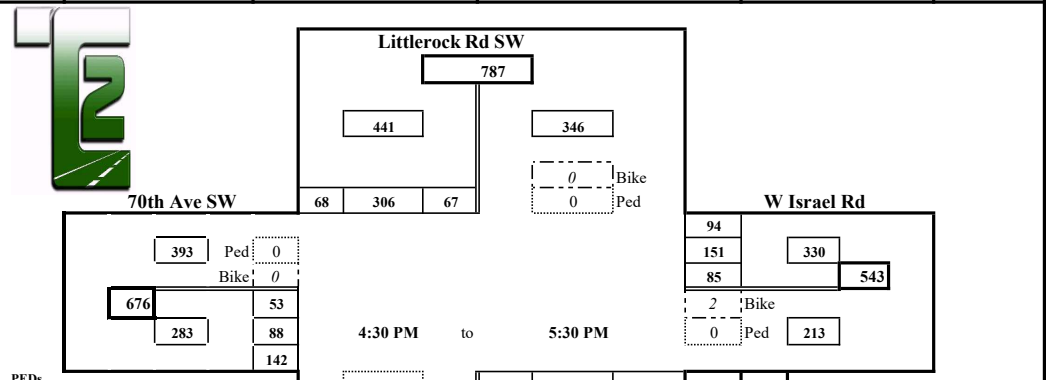
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Littlerock Rd SW & W Israel Rd/70th Ave SW **Date of Count:** Tue 07/26/2022

Location: Tumwater, Washington **Checked By:** Jen

Time Interval	From North on (SB) Littlerock Rd SW				From South on (NB) Littlerock Rd SW				From East on (WB) W Israel Rd				From West on (EB) 70th Ave SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	2	17	81	28	0	42	41	13	0	23	30	13	0	17	8	36	349
4:30 P	0	17	79	22	1	39	38	5	1	23	26	11	0	12	18	30	320
4:45 P	1	21	75	9	0	41	46	15	0	19	39	24	0	15	27	31	362
5:00 P	1	21	78	18	1	56	49	15	1	26	37	18	1	13	22	36	389
5:15 P	2	10	73	22	0	36	62	15	0	23	41	35	0	14	25	34	390
5:30 P	2	15	80	19	1	41	42	13	2	17	34	17	0	11	14	41	344
5:45 P	1	13	63	26	0	51	46	11	0	22	27	15	0	11	21	39	345
6:00 P	0	16	66	9	0	36	43	7	1	11	20	22	0	15	13	21	279
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	9	130	595	153	3	342	367	94	5	164	254	155	1	108	148	268	2778
	Peak Hour: 4:30 PM to 5:30 PM																
Total	6	67	306	68	2	174	199	58	3	85	151	94	1	53	88	142	1485
Approach	441				431				330				283				1485
%HV	1.4%				0.5%				0.9%				0.4%				0.8%
PHF	0.94				0.90				0.83				0.97				0.95



PEDs Across:	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06					0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	0	0

Special Notes

	PHF	%HV
EB	0.97	0.4%
WB	0.83	0.9%
NB	0.90	0.5%
SB	0.94	1.4%
T Int.	0.95	0.8%

Check In: 1485 Out: 1485

Bicycles From:	N	S	E	W	
INT 01	1	0	1	0	2
INT 02	1	0	0	0	1
INT 03	0	0	0	0	0
INT 04	0	0	0	0	0
INT 05	0	0	1	0	1
INT 06	0	0	1	0	1
INT 07	0	0	0	0	0
INT 08	0	0	0	0	0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	2	0	3	0	5

	N U's	S U's	E U's	W U's
INT 01	10	1	0	0
INT 02	5	5	0	0
INT 03	2	3	0	0
INT 04	3	2	0	0
INT 05	3	0	0	0
INT 06	4	0	0	1
INT 07	3	2	1	0
INT 08	4	3	1	0
	34	16	2	1

SCJ22043M_02P

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

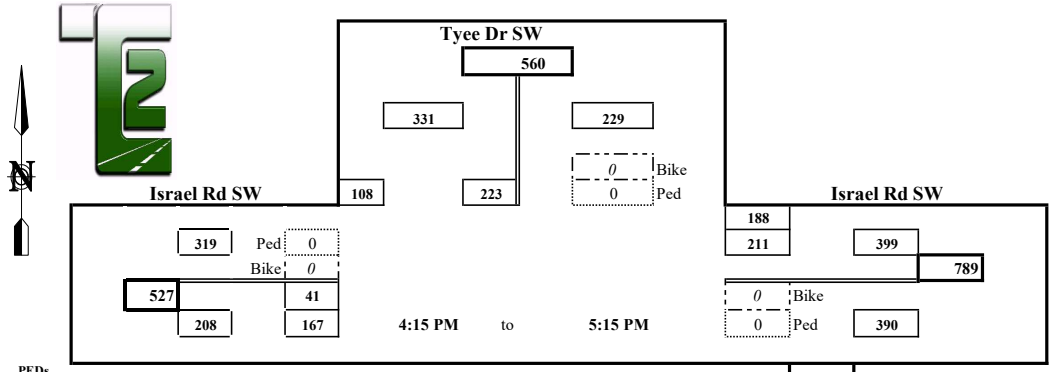
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Tyee Dr SW & Israel Rd SW **Date of Count:** Tue 07/26/2022

Location: Tumwater, Washington **Checked By:** Jen

Time Interval	From North on (SB) Tyee Dr SW				From South on (NB) 0				From East on (WB) Israel Rd SW				From West on (EB) Israel Rd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	57	0	27	0	0	0	0	1	0	44	50	1	14	24	0	216
4:30 P	1	57	0	31	0	0	0	0	3	0	32	45	0	11	33	0	209
4:45 P	0	54	0	28	0	0	0	0	0	0	63	50	1	8	52	0	255
5:00 P	0	49	0	28	0	0	0	0	1	0	50	38	3	9	47	0	221
5:15 P	2	63	0	21	0	0	0	0	0	0	66	55	1	13	35	0	253
5:30 P	0	60	0	15	0	0	0	0	2	0	48	38	1	6	37	0	204
5:45 P	0	58	0	21	0	0	0	0	0	0	38	48	1	12	32	0	209
6:00 P	0	55	0	13	0	0	0	0	1	0	40	36	0	9	28	0	181
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	3	453	0	184	0	0	0	0	8	0	381	360	8	82	288	0	1748
Peak Hour: 4:15 PM to 5:15 PM																	
Total	3	223	0	108	0	0	0	0	4	0	211	188	5	41	167	0	938
Approach	331				0				399				208				938
%HV	0.9%				n/a				1.0%				2.4%				1.3%
PHF	0.94				n/a				0.82				0.87				0.92



1020 *1.0 PHF Peak Hour Volume*

	PHF	%HV
EB	0.87	2.4%
WB	0.82	1.0%
NB	n/a	n/a
SB	0.94	0.9%
T Int.	0.92	1.3%

Check In: 938 Out: 938

Conditions:

PEDs Across:

	N	S	E	W	
INT 01	0	0	1	0	1
INT 02	0	0	0	0	0
INT 03	0	0	0	0	0
INT 04	0	0	0	0	0
INT 05	0	0	0	0	0
INT 06	0	0	0	0	0
INT 07	0	0	0	0	0
INT 08	0	0	0	0	0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	1	0	1

Bicycles From:

	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06					0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	0	0

Special Notes

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

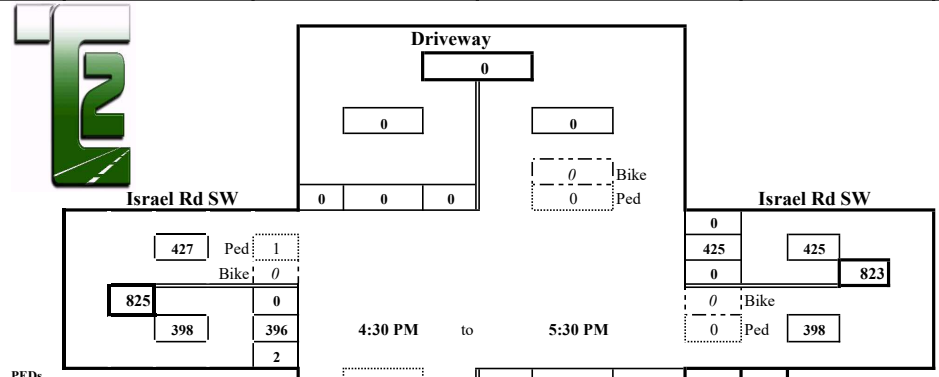
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Old Israel Rd SW & Israel Rd SW **Date of Count:** Tue 07/26/2022

Location: Tumwater, Washington **Checked By:** Jen

Time Interval	From North on (SB) Driveway				From South on (NB) Old Israel Rd SW				From East on (WB) Israel Rd SW				From West on (EB) Israel Rd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	0	0	0	0	0	0	0	1	1	89	0	1	0	79	0	169
4:30 P	0	0	0	0	0	0	0	0	1	0	74	0	1	0	87	1	162
4:45 P	0	0	0	0	0	0	0	1	0	0	115	0	1	0	104	0	220
5:00 P	0	0	0	0	0	0	0	0	1	0	89	0	2	0	90	0	179
5:15 P	0	0	0	0	0	1	0	1	0	0	129	0	3	0	103	2	236
5:30 P	0	0	0	0	0	1	0	0	2	0	92	0	1	0	99	0	192
5:45 P	0	0	0	0	0	0	0	1	0	0	82	0	1	0	83	0	166
6:00 P	0	0	0	0	0	0	0	0	1	1	72	0	0	0	81	0	154
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	0	0	0	2	0	3	6	2	742	0	10	0	726	3	1478
	Peak Hour: 4:30 PM to 5:30 PM																
Total	0	0	0	0	0	2	0	2	3	0	425	0	7	0	396	2	827
Approach	0				4				425				398				827
%HV	n/a				n/a				0.7%				1.8%				1.2%
PHF	n/a				0.50				0.82				0.95				0.88



PEDs Across:

	N	S	E	W	
INT 01	0	0	0	0	0
INT 02	0	0	0	1	1
INT 03	0	0	0	0	0
INT 04	0	0	0	0	0
INT 05	0	0	0	1	1
INT 06	0	0	0	0	0
INT 07	0	0	0	0	0
INT 08	0	0	0	0	0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	2	2

Bicycles From:

	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06					0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	0	0

944 *1.0 PHF Peak Hour Volume*

		PHF	%HV
		EB	0.95	1.8%
Check		WB	0.82	0.7%
In:	827	NB	0.50	n/a
Out:	827	SB	n/a	n/a
		T Int.	0.88	1.2%

Conditions:

Special Notes

SCJ22043M_04P

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

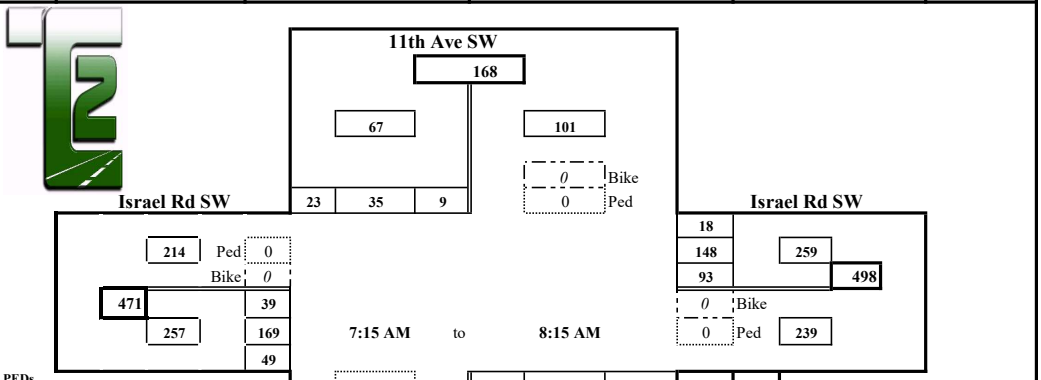
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: 11th Ave SW & Israel Rd SW **Date of Count:** Tue 07/26/2022

Location: Tumwater, Washington **Checked By:** Jen

Time Interval	From North on (SB) 11th Ave SW				From South on (NB) 11th Ave SW				From East on (WB) Israel Rd SW				From West on (EB) Israel Rd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
7:15 A	0	2	11	2	1	10	2	11	1	17	20	2	1	6	22	11	116
7:30 A	2	1	9	4	0	5	10	20	1	22	34	7	0	9	50	7	178
7:45 A	0	2	5	6	2	14	12	20	3	30	43	3	1	6	30	14	185
8:00 A	3	2	16	4	2	12	12	16	1	30	42	3	2	18	58	21	234
8:15 A	2	4	5	9	1	12	10	5	4	11	29	5	2	6	31	7	134
8:30 A	3	3	4	7	0	4	12	10	3	12	36	3	1	11	30	7	139
8:45 A	1	4	6	6	3	7	8	7	2	14	41	3	1	5	32	11	144
9:00 A	0	1	9	6	1	9	4	13	3	13	45	5	1	8	20	9	142
9:15 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	11	19	65	44	10	73	70	102	18	149	290	31	9	69	273	87	1272
Peak Hour: 7:15 AM to 8:15 AM																	
Total	7	9	35	23	5	43	44	61	9	93	148	18	5	39	169	49	731
Approach	67				148				259				257				731
%HV	10.4%				3.4%				3.5%				1.9%				3.6%
PHF	0.76				0.80				0.85				0.66				0.78



936 *1.0 PHF Peak Hour Volume*

	PHF	%HV
EB	0.66	1.9%
WB	0.85	3.5%
NB	0.80	3.4%
SB	0.76	10.4%
T Int.	0.78	3.6%

Check In: 731 Out: 731

Conditions:

PEDs Across:

	N	S	E	W	
INT 01	0	0	1	0	1
INT 02	0	0	0	0	0
INT 03	0	0	0	0	0
INT 04	0	0	0	0	0
INT 05	0	0	0	0	0
INT 06	0	0	0	0	0
INT 07	0	0	1	0	1
INT 08	0	0	0	0	0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	2	0	2

Bicycles From:

	N	S	E	W	
INT 01	0	0	0	0	0
INT 02	0	0	0	0	0
INT 03	0	0	0	0	0
INT 04	0	0	0	0	0
INT 05	0	0	0	0	0
INT 06	0	0	0	0	0
INT 07	0	0	1	0	1
INT 08	0	0	0	0	0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	1	0	1

Special Notes

SCJ22043M_05A

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

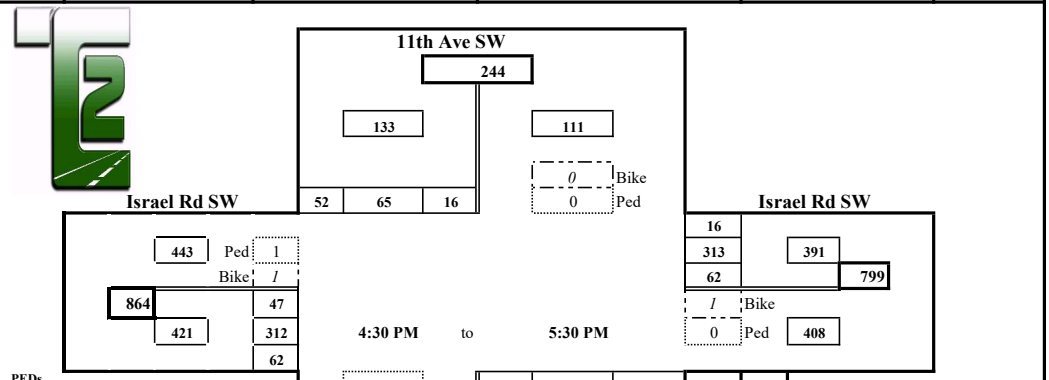
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: 11th Ave SW & Israel Rd SW **Date of Count:** Tue 07/26/2022

Location: Tumwater, Washington **Checked By:** Jen

Time Interval	From North on (SB) 11th Ave SW				From South on (NB) 11th Ave SW				From East on (WB) Israel Rd SW				From West on (EB) Israel Rd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	2	6	13	16	2	16	8	12	2	18	71	3	1	8	70	14	255
4:30 P	0	2	8	10	0	14	11	15	1	15	55	2	2	11	64	17	224
4:45 P	0	5	19	12	2	20	7	27	2	23	87	5	1	9	83	16	313
5:00 P	1	2	13	13	0	17	14	12	1	12	68	2	2	13	82	12	260
5:15 P	1	4	23	11	0	27	14	16	1	17	92	9	2	12	85	16	326
5:30 P	1	5	10	16	1	14	13	25	2	10	66	0	1	13	62	18	252
5:45 P	2	3	11	8	1	15	10	8	1	23	65	1	1	10	69	15	238
6:00 P	0	4	6	10	0	13	4	5	1	7	50	2	0	6	64	9	180
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	7	31	103	96	6	136	81	120	11	125	554	24	10	82	579	117	2048
Peak Hour: 4:30 PM to 5:30 PM																	
Total	3	16	65	52	3	78	48	80	6	62	313	16	6	47	312	62	1151
Approach	133				206				391				421				1151
%HV	2.3%				1.5%				1.5%				1.4%				1.6%
PHF	0.88				0.90				0.83				0.93				0.88



1304 *1.0 PHF Peak Hour Volume*

	PHF	%HV
EB	0.93	1.4%
WB	0.83	1.5%
NB	0.90	1.5%
SB	0.88	2.3%
T Int.	0.88	1.6%

Check In: 1151 Out: 1151

Conditions:

PEDs Across:

	N	S	E	W	
INT 01	0	0	0	0	0
INT 02	0	0	0	0	0
INT 03	0	0	0	0	0
INT 04	0	0	0	0	0
INT 05	0	0	0	0	0
INT 06	0	0	0	1	1
INT 07	0	0	0	0	0
INT 08	0	0	0	0	0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	1	1

Bicycles From:

	N	S	E	W	
INT 01	0	0	0	0	0
INT 02	1	0	0	0	1
INT 03	0	0	0	1	1
INT 04	0	0	0	0	0
INT 05	0	0	1	0	1
INT 06	0	0	0	0	0
INT 07	0	0	0	0	0
INT 08	0	0	0	0	0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	1	0	1	1	3

Special Notes

SCJ22043M_05P

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

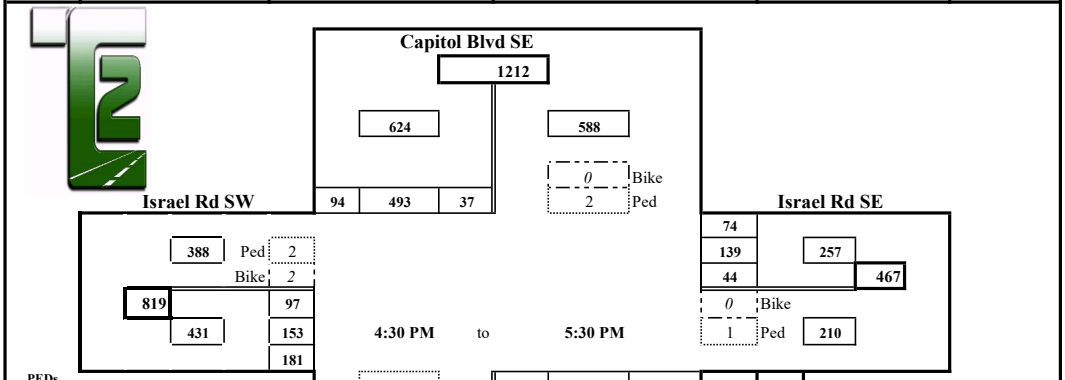
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Capitol Blvd SE & Israel Rd SE/SW **Date of Count:** Tue 07/26/2022

Location: Tumwater, Washington **Checked By:** Jen

Time Interval	From North on (SB) Capitol Blvd SE				From South on (NB) Capitol Blvd SE				From East on (WB) Israel Rd SE				From West on (EB) Israel Rd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	3	10	104	23	2	35	89	9	1	11	25	22	0	16	32	34	410
4:30 P	0	9	101	22	1	29	82	6	1	11	22	20	1	20	27	42	391
4:45 P	1	8	115	24	1	37	118	5	1	7	36	24	1	27	40	40	481
5:00 P	2	11	133	18	1	36	103	9	1	8	37	17	0	26	32	42	472
5:15 P	5	8	133	29	2	47	113	3	1	23	36	28	1	23	43	64	550
5:30 P	0	10	112	23	0	35	83	3	2	6	30	5	0	21	38	35	401
5:45 P	2	15	120	14	0	39	101	0	0	3	16	4	0	18	23	60	413
6:00 P	0	3	112	15	2	34	83	2	1	2	15	5	0	13	25	35	344
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	13	74	930	168	9	292	772	37	8	71	217	125	3	164	260	352	3462
	Peak Hour: 4:30 PM to 5:30 PM																
Total	8	37	493	94	4	155	417	20	5	44	139	74	2	97	153	181	1904
Approach	624				592				257				431				1904
%HV	1.3%				0.7%				1.9%				0.5%				1.0%
PHF	0.92				0.91				0.74				0.83				0.87



PEDs Across:	N	S	E	W	
INT 01	0	0	0	0	0
INT 02	1	0	2	0	3
INT 03	0	1	1	1	3
INT 04	0	0	0	0	0
INT 05	0	0	0	1	1
INT 06	2	0	0	0	2
INT 07	0	0	0	1	1
INT 08	0	1	0	1	2
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	3	2	3	4	12

Bicycles From:	N	S	E	W	
INT 01	0	0	0	0	0
INT 02	0	0	0	0	0
INT 03	0	0	0	0	0
INT 04	0	0	0	1	1
INT 05	0	0	0	0	0
INT 06	0	0	0	1	1
INT 07	0	0	0	1	1
INT 08	0	0	0	0	0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	3	3

2200 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	0.83	0.5%
Check	WB	0.74	1.9%
In: 1904	NB	0.91	0.7%
Out: 1904	SB	0.92	1.3%
	T Int.	0.87	1.0%

Conditions:

Special Notes

SCJ22043M_06P

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

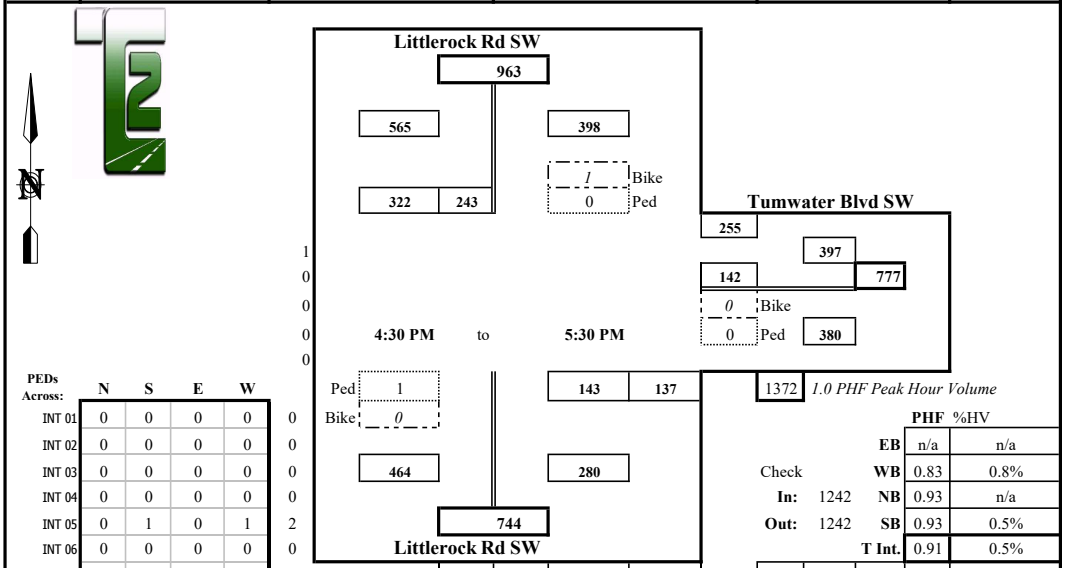
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Littlerock Rd SW & Tumwater Blvd SW **Date of Count:** Tue 07/26/2022

Location: Tumwater, Washington **Checked By:** Jen

Time Interval	From North on (SB) Littlerock Rd SW				From South on (NB) Littlerock Rd SW				From East on (WB) Tumwater Blvd SW				From West on (EB) 0				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	1	58	68	0	0	0	31	14	0	21	0	64	0	0	0	0	256
4:30 P	0	62	65	0	0	0	37	25	0	28	0	57	0	0	0	0	274
4:45 P	0	61	72	0	0	0	36	31	0	24	0	58	0	0	0	0	282
5:00 P	1	60	89	0	0	0	33	42	2	37	0	82	0	0	0	0	343
5:15 P	1	58	73	0	0	0	35	30	1	40	0	67	0	0	0	0	303
5:30 P	1	64	88	0	0	0	39	34	0	41	0	48	0	0	0	0	314
5:45 P	0	57	72	0	1	0	43	29	0	20	0	58	0	0	0	0	279
6:00 P	0	41	69	0	1	0	31	19	0	28	0	44	0	0	0	0	232
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	4	461	596	0	2	0	285	224	3	239	0	478	0	0	0	0	2283
Peak Hour: 4:30 PM to 5:30 PM																	
Total	3	243	322	0	0	0	143	137	3	142	0	255	0	0	0	0	1242
Approach	565				280				397				0				1242
%HV	0.5%				n/a				0.8%				n/a				0.5%
PHF	0.93				0.93				0.83				n/a				0.91



PEDs Across:	N	S	E	W	
INT 01	0	0	0	0	0
INT 02	0	0	0	0	0
INT 03	0	0	0	0	0
INT 04	0	0	0	0	0
INT 05	0	1	0	1	2
INT 06	0	0	0	0	0
INT 07	0	0	0	0	0
INT 08	0	0	0	0	0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	1	0	1	2

	PHF	%HV
EB	n/a	n/a
WB	0.83	0.8%
NB	0.93	n/a
SB	0.93	0.5%
T Int.	0.91	0.5%

Check In: 1242 Out: 1242

Bicycles From:	N	S	E	W	
INT 01	0	0	0	0	0
INT 02	1	0	0	0	1
INT 03	0	0	0	0	0
INT 04	0	0	0	0	0
INT 05	0	0	0	0	0
INT 06	1	0	0	0	1
INT 07	0	0	0	0	0
INT 08	2	0	0	0	2
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	4	0	0	0	4

	N U's	S U's	E U's	W U's
	7			
	6			
	4			
	2			
	3			
	1			
	2			
	1			
	26	0	0	0

Special Notes

SCJ22043M_10P

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

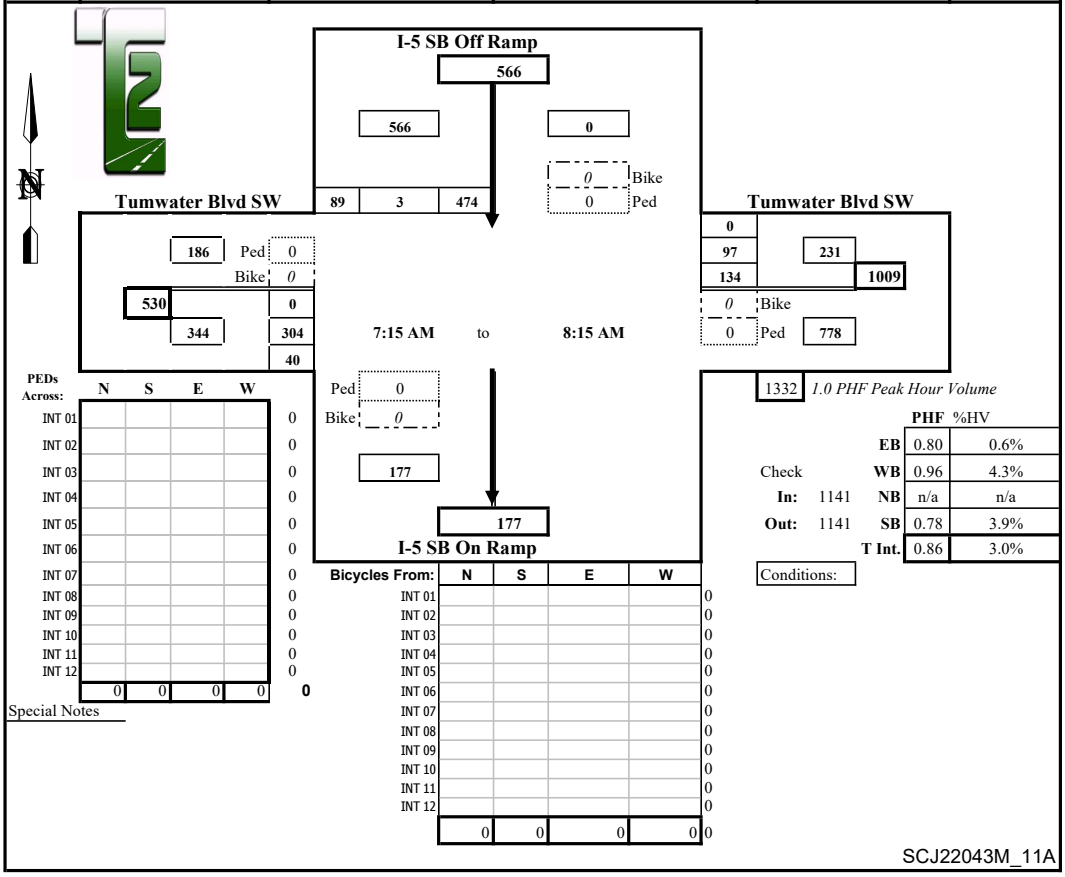
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: I-5 SB Ramps & Tumwater Blvd SW **Date of Count:** Tue 07/26/2022

Location: Tumwater, Washington **Checked By:** Jen

Time Interval Ending at	From North on (SB) I-5 SB Off Ramp				From South on (NB) I-5 SB On Ramp				From East on (WB) Tumwater Blvd SW				From West on (EB) Tumwater Blvd SW				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
7:15 A	1	68	1	13	0	0	0	0	2	28	14	0	1	0	60	10	194
7:30 A	5	87	1	17	0	0	0	0	3	41	17	0	0	0	60	7	230
7:45 A	5	135	1	21	0	0	0	0	3	39	20	0	1	0	95	12	323
8:00 A	7	153	0	28	0	0	0	0	2	28	32	0	0	0	80	12	333
8:15 A	5	99	1	23	0	0	0	0	2	26	28	0	1	0	69	9	255
8:30 A	6	73	0	22	0	0	0	0	2	24	30	0	0	0	51	7	207
8:45 A	11	70	1	17	0	0	0	0	1	34	25	0	1	0	59	8	214
9:00 A	5	74	0	22	0	0	0	0	3	31	39	0	1	0	65	6	237
9:15 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	45	759	5	163	0	0	0	0	18	251	205	0	5	0	539	71	1993
Peak Hour: 7:15 AM to 8:15 AM																	
Total	22	474	3	89	0	0	0	0	10	134	97	0	2	0	304	40	1141
Approach	566				0				231				344				1141
%HV	3.9%				n/a				4.3%				0.6%				3.0%
PHF	0.78				n/a				0.96				0.80				0.86



Special Notes

SCJ22043M_11A

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

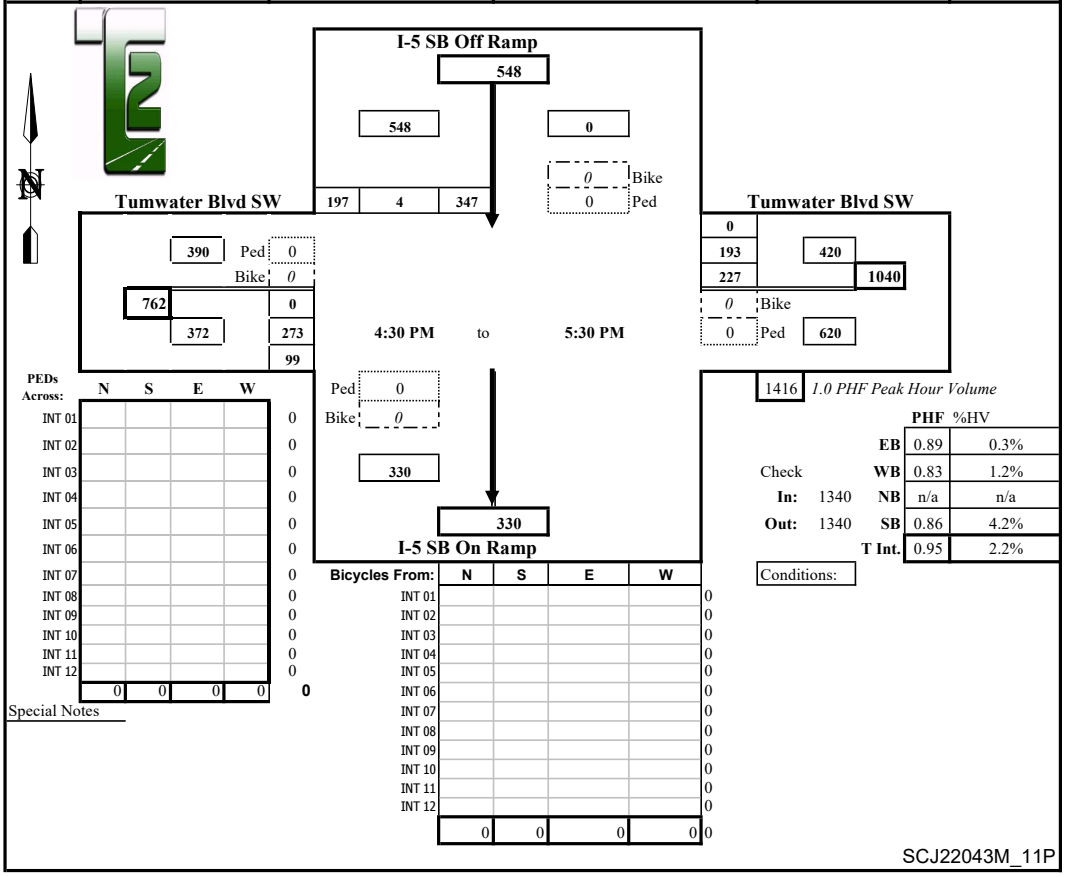
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: I-5 SB Ramps & Tumwater Blvd SW **Date of Count:** Tue 07/26/2022

Location: Tumwater, Washington **Checked By:** Jen

Time Interval Ending at	From North on (SB) I-5 SB Off Ramp				From South on (NB) I-5 SB On Ramp				From East on (WB) Tumwater Blvd SW				From West on (EB) Tumwater Blvd SW				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	2	61	0	48	0	0	0	0	0	47	38	0	2	0	46	35	275
4:30 P	5	82	2	41	0	0	0	0	0	50	40	0	0	0	51	28	294
4:45 P	5	77	2	37	0	0	0	0	1	50	45	0	0	0	71	20	302
5:00 P	11	82	2	64	0	0	0	0	1	48	60	0	0	0	68	24	348
5:15 P	3	78	0	46	0	0	0	0	2	72	55	0	1	0	54	31	336
5:30 P	4	110	0	50	0	0	0	0	1	57	33	0	0	0	80	24	354
5:45 P	5	81	0	46	0	0	0	0	1	44	42	0	1	0	64	17	294
6:00 P	6	82	0	36	0	0	0	0	1	34	43	0	1	0	55	13	263
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	41	653	6	368	0	0	0	0	7	402	356	0	5	0	489	192	2466
Peak Hour: 4:30 PM to 5:30 PM																	
Total	23	347	4	197	0	0	0	0	5	227	193	0	1	0	273	99	1340
Approach	548				0				420				372				1340
%HV	4.2%				n/a				1.2%				0.3%				2.2%
PHF	0.86				n/a				0.83				0.89				0.95



PEDs Across:

	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06					0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	0	0

Bicycles From:

	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06					0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	0	0

	PHF	%HV
EB	0.89	0.3%
WB	0.83	1.2%
NB	n/a	n/a
SB	0.86	4.2%
T Int.	0.95	2.2%

Check In: 1340 Out: 1340

Conditions:

Special Notes

SCJ22043M_11P

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

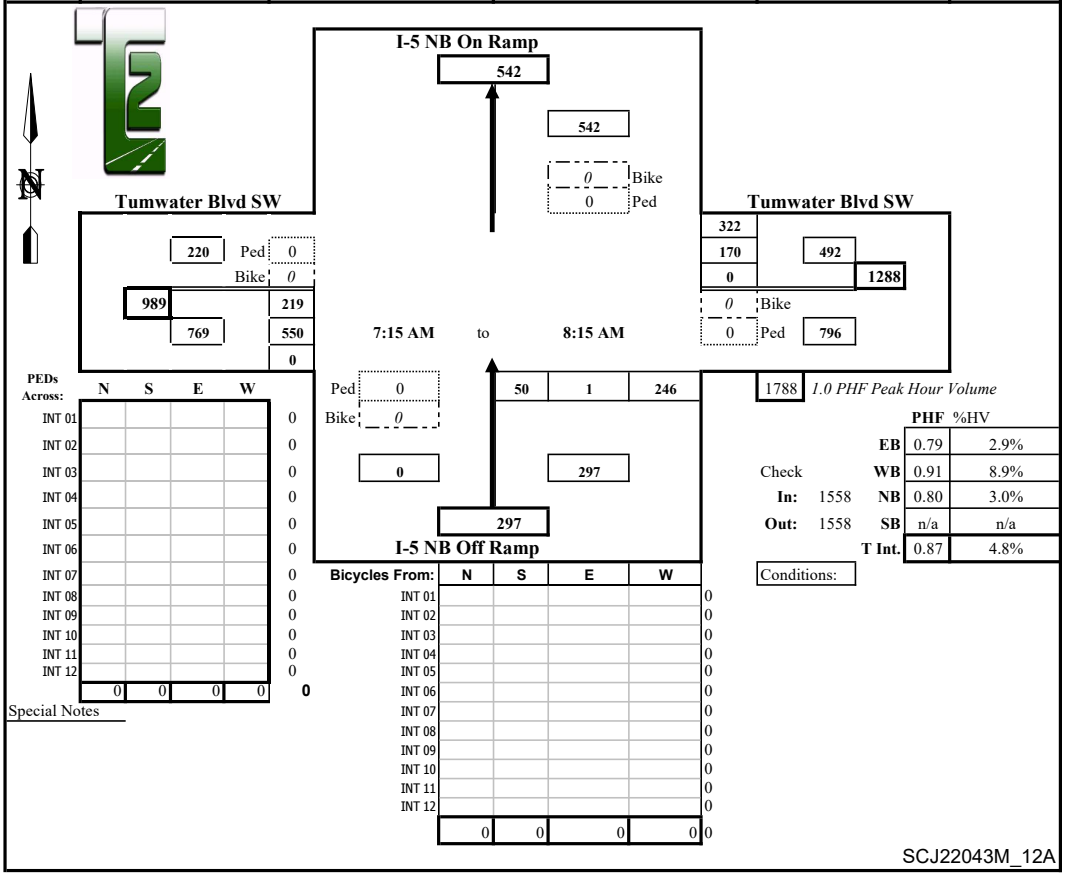
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: I-5 NB Ramps & Tumwater Blvd SW **Date of Count:** Tue 07/26/2022

Location: Tumwater, Washington **Checked By:** Jen

Time Interval	From North on (SB) I-5 NB On Ramp				From South on (NB) I-5 NB Off Ramp				From East on (WB) Tumwater Blvd SW				From West on (EB) Tumwater Blvd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
7:15 A	0	0	0	0	4	10	0	33	10	0	36	67	1	44	87	0	277
7:30 A	0	0	0	0	2	12	0	81	14	0	48	81	4	49	104	0	375
7:45 A	0	0	0	0	3	11	1	60	13	0	42	93	6	66	158	0	431
8:00 A	0	0	0	0	3	12	0	69	8	0	46	78	6	60	182	0	447
8:15 A	0	0	0	0	1	15	0	36	9	0	34	70	6	44	106	0	305
8:30 A	0	0	0	0	1	13	1	36	7	0	40	68	4	43	83	0	284
8:45 A	0	0	0	0	4	11	2	24	11	0	55	61	9	41	87	0	281
9:00 A	0	0	0	0	3	16	0	27	9	0	50	80	8	51	93	0	317
9:15 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	0	0	21	100	4	366	81	0	351	598	44	398	900	0	2717
Peak Hour: 7:15 AM to 8:15 AM																	
Total	0	0	0	0	9	50	1	246	44	0	170	322	22	219	550	0	1558
Approach	0				297				492				769				1558
%HV	n/a				3.0%				8.9%				2.9%				4.8%
PHF	n/a				0.80				0.91				0.79				0.87



SCJ22043M_12A

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

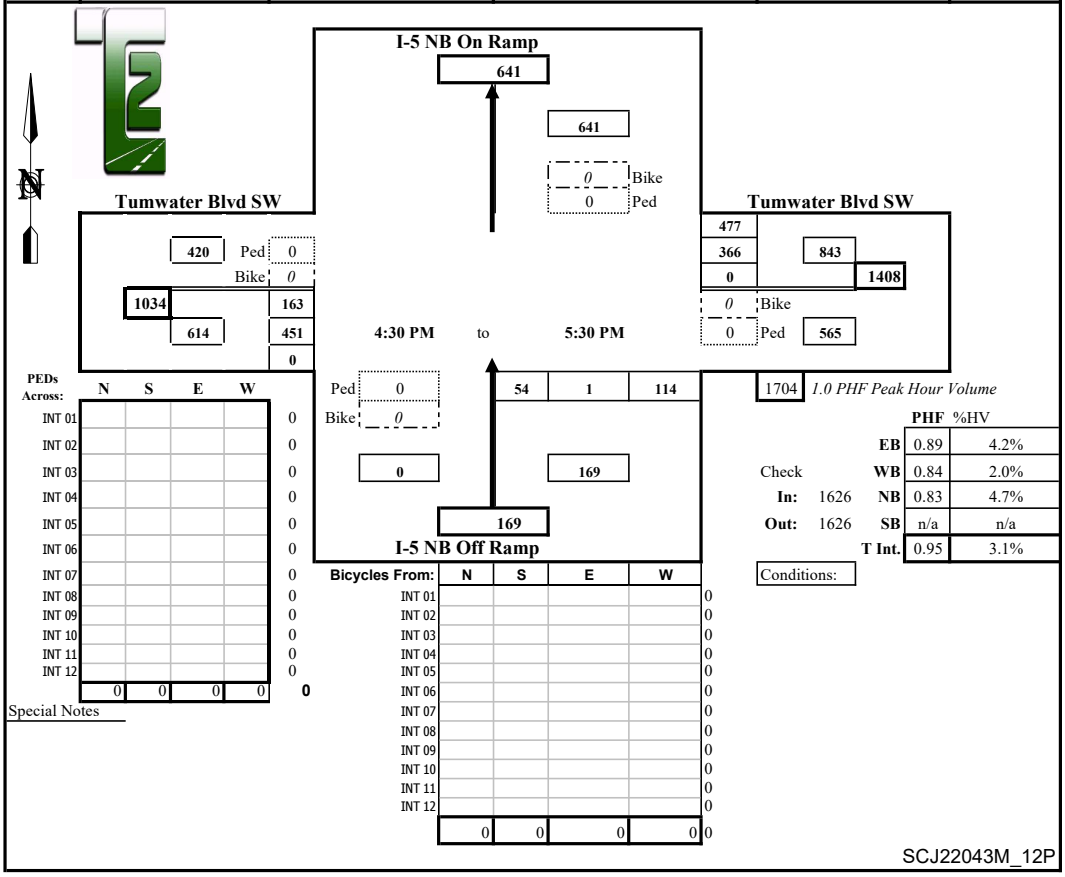
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: I-5 NB Ramps & Tumwater Blvd SW **Date of Count:** Tue 07/26/2022

Location: Tumwater, Washington **Checked By:** Jen

Time Interval	From North on (SB) I-5 NB On Ramp				From South on (NB) I-5 NB Off Ramp				From East on (WB) Tumwater Blvd SW				From West on (EB) Tumwater Blvd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	0	0	0	4	8	1	27	3	0	73	116	2	26	82	0	333
4:30 P	0	0	0	0	1	17	1	26	5	0	76	90	2	36	105	0	351
4:45 P	0	0	0	0	3	9	0	24	2	0	93	137	8	42	113	0	418
5:00 P	0	0	0	0	2	20	0	31	3	0	82	94	8	39	114	0	380
5:15 P	0	0	0	0	1	13	1	28	7	0	112	138	4	38	96	0	426
5:30 P	0	0	0	0	2	12	0	31	5	0	79	108	6	44	128	0	402
5:45 P	0	0	0	0	2	19	0	33	6	0	67	100	7	35	100	0	354
6:00 P	0	0	0	0	0	19	0	22	3	0	59	54	7	35	108	0	297
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	0	0	15	117	3	222	34	0	641	837	44	295	846	0	2961
	Peak Hour: 4:30 PM to 5:30 PM																
Total	0	0	0	0	8	54	1	114	17	0	366	477	26	163	451	0	1626
Approach	0				169				843				614				1626
%HV	n/a				4.7%				2.0%				4.2%				3.1%
PHF	n/a				0.83				0.84				0.89				0.95



Special Notes

SCJ22043M_12P

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

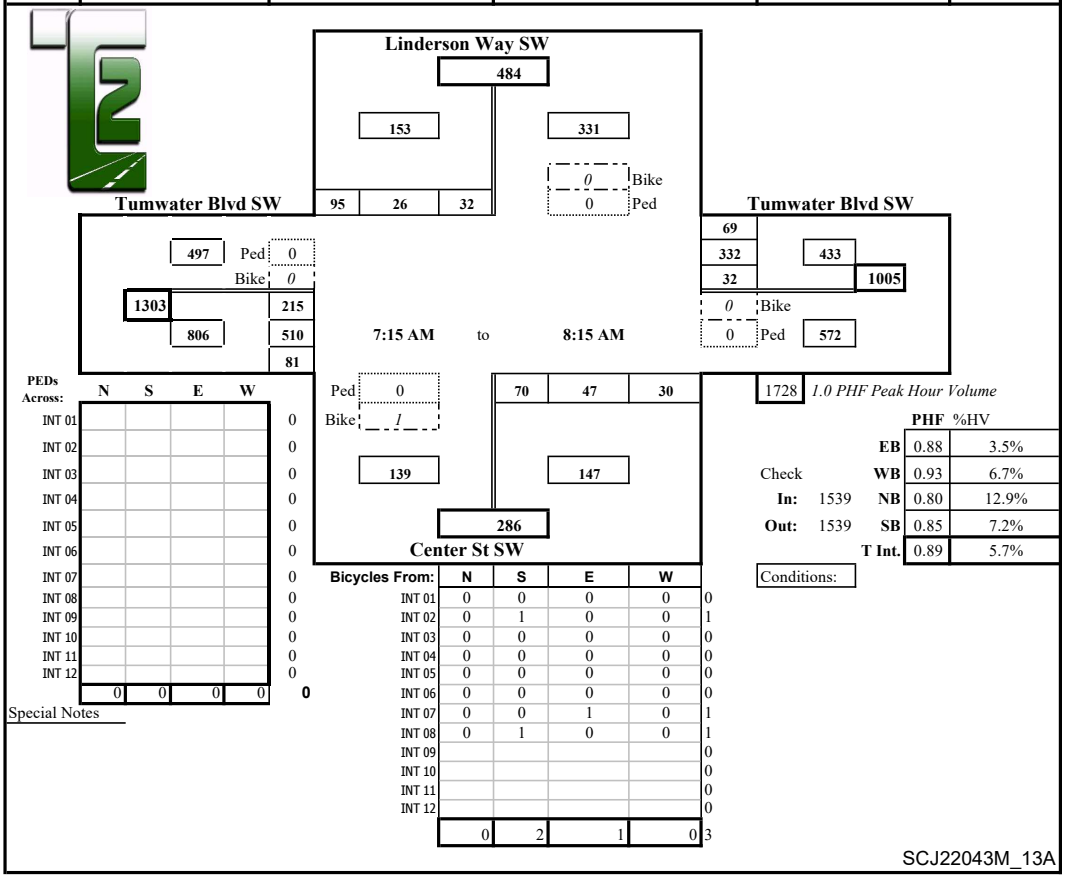
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Linderson Way SW/Center St SW & Tumwater Blvd SW **Date of Count:** Tue 07/26/2022

Location: Tumwater, Washington **Checked By:** Jen

Time Interval	From North on (SB) Linderson Way SW				From South on (NB) Center St SW				From East on (WB) Tumwater Blvd SW				From West on (EB) Tumwater Blvd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
7:15 A	4	4	5	17	4	17	12	6	7	3	68	8	4	26	57	18	241
7:30 A	1	6	7	23	7	22	14	10	9	10	83	17	5	55	112	20	379
7:45 A	3	9	7	29	7	19	13	10	5	9	91	15	8	72	134	24	432
8:00 A	1	10	8	25	3	15	10	7	8	9	84	23	8	56	152	21	420
8:15 A	6	7	4	18	2	14	10	3	7	4	74	14	7	32	112	16	308
8:30 A	0	5	7	17	6	22	12	13	5	10	75	8	5	28	91	12	300
8:45 A	3	13	5	15	3	18	10	5	7	8	78	5	10	22	74	14	267
9:00 A	0	6	4	24	5	22	13	11	5	9	81	4	8	19	78	19	290
9:15 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	18	60	47	168	37	149	94	65	53	62	634	94	55	310	810	144	2637
	Peak Hour: 7:15 AM to 8:15 AM																
Total	11	32	26	95	19	70	47	30	29	32	332	69	28	215	510	81	1539
Approach	153				147				433				806				1539
%HV	7.2%				12.9%				6.7%				3.5%				5.7%
PHF	0.85				0.80				0.93				0.88				0.89



Special Notes

SCJ22043M_13A

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

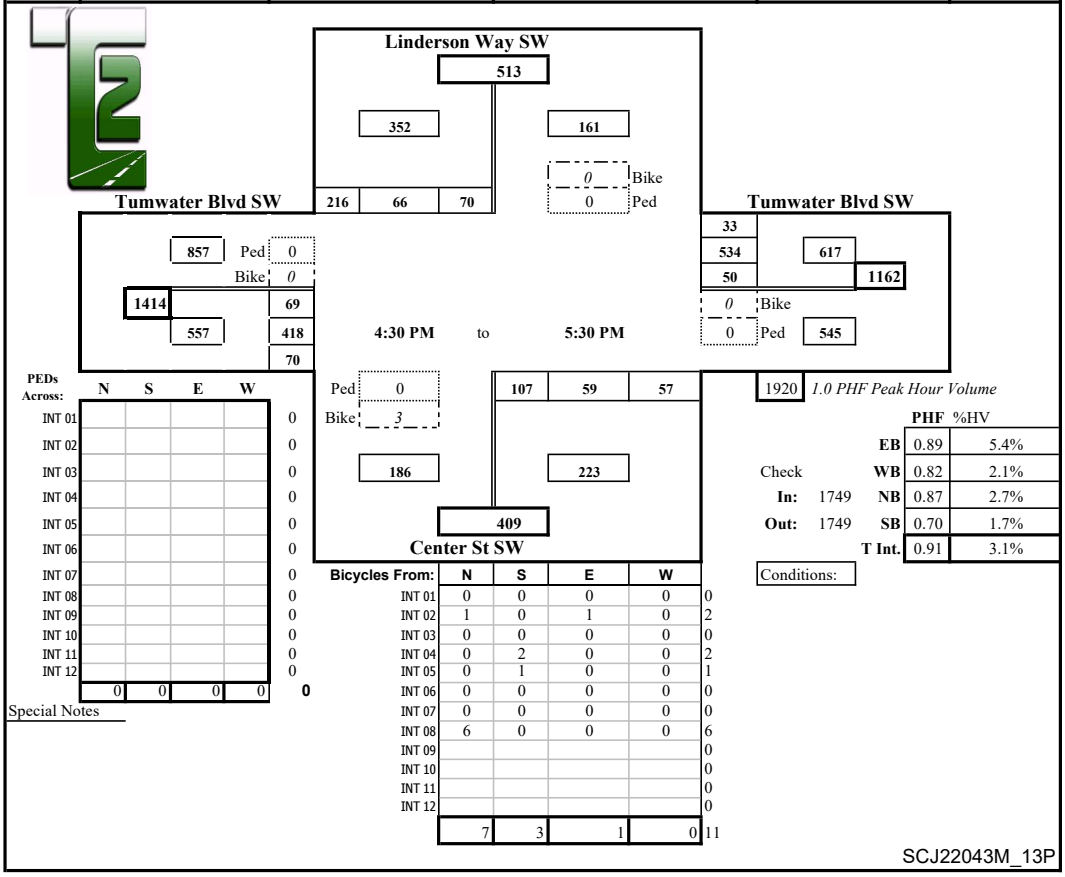
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Linderson Way SW/Center St SW & Tumwater Blvd SW **Date of Count:** Tue 07/26/2022

Location: Tumwater, Washington **Checked By:** Jen

Time Interval	From North on (SB) Linderson Way SW				From South on (NB) Center St SW				From East on (WB) Tumwater Blvd SW				From West on (EB) Tumwater Blvd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	4	18	25	51	2	35	12	7	1	5	96	4	5	16	64	15	348
4:30 P	0	8	11	34	4	27	14	13	2	8	111	8	4	21	99	20	374
4:45 P	1	27	12	87	1	29	14	14	3	18	110	7	9	11	105	17	451
5:00 P	2	11	21	29	1	21	13	14	3	7	128	9	10	20	113	15	401
5:15 P	2	23	14	71	1	28	18	18	5	12	167	9	5	12	92	16	480
5:30 P	1	9	19	29	3	29	14	11	2	13	129	8	6	26	108	22	417
5:45 P	4	9	16	28	4	14	10	18	2	10	117	4	8	19	113	15	373
6:00 P	1	4	14	13	2	15	7	7	2	10	85	7	6	11	96	22	291
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	15	109	132	342	18	198	102	102	20	83	943	56	53	136	790	142	3135
Peak Hour:	4:30 PM to 5:30 PM																
Total	6	70	66	216	6	107	59	57	13	50	534	33	30	69	418	70	1749
Approach	352				223				617				557				1749
%HV	1.7%				2.7%				2.1%				5.4%				3.1%
PHF	0.70				0.87				0.82				0.89				0.91



SCJ22043M_13P

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

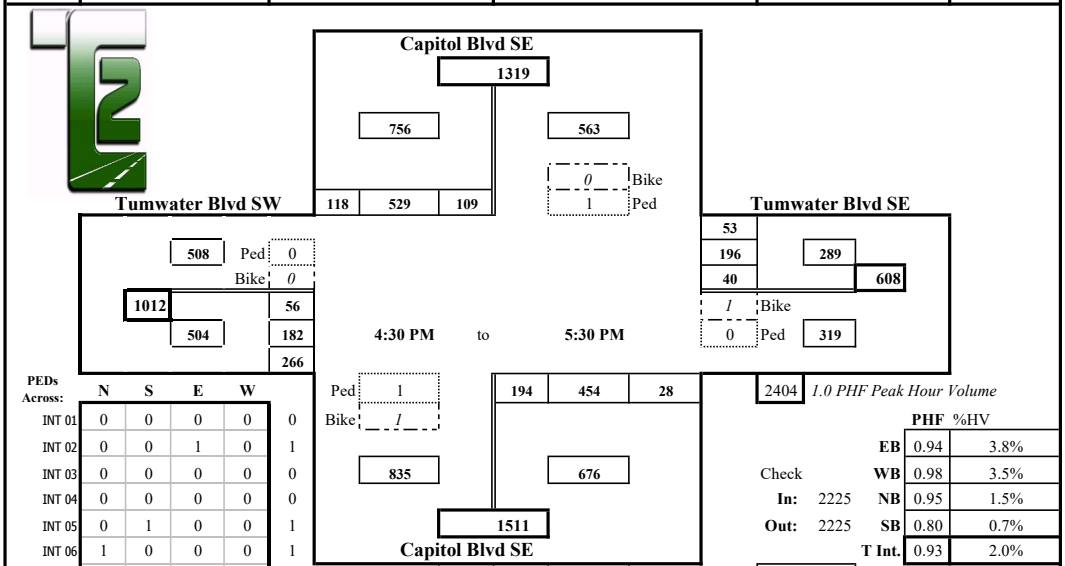
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Capitol Blvd SE & Tumwater Blvd SE/SW **Date of Count:** Tue 07/26/2022

Location: Tumwater, Washington **Checked By:** Jen

Time Interval	From North on (SB) Capitol Blvd SE				From South on (NB) Capitol Blvd SE				From East on (WB) Tumwater Blvd SE				From West on (EB) Tumwater Blvd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	2	25	106	17	3	55	93	5	1	10	33	13	3	16	44	48	465
4:30 P	1	10	128	17	5	57	102	4	1	7	46	12	3	13	46	59	501
4:45 P	0	24	124	25	2	41	125	5	4	11	47	15	8	17	41	76	551
5:00 P	2	25	140	23	2	42	113	9	1	8	53	10	2	16	43	73	555
5:15 P	2	39	151	45	5	57	117	4	1	6	47	18	3	11	49	57	601
5:30 P	1	21	114	25	1	54	99	10	4	15	49	10	6	12	49	60	518
5:45 P	1	18	147	12	3	56	111	2	0	10	40	9	2	13	68	64	550
6:00 P	0	13	121	11	1	37	75	2	2	8	45	15	4	15	35	60	437
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	9	175	1031	175	22	399	835	41	14	75	360	102	31	113	375	497	4178
Peak Hour: 4:30 PM to 5:30 PM																	
Total	5	109	529	118	10	194	454	28	10	40	196	53	19	56	182	266	2225
Approach	756				676				289				504				2225
%HV	0.7%				1.5%				3.5%				3.8%				2.0%
PHF	0.80				0.95				0.98				0.94				0.93



PEDs Across:	N	S	E	W	
INT 01	0	0	0	0	0
INT 02	0	0	1	0	1
INT 03	0	0	0	0	0
INT 04	0	0	0	0	0
INT 05	0	1	0	0	1
INT 06	1	0	0	0	1
INT 07	0	0	0	0	0
INT 08	0	0	0	1	1
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	1	1	1	1	4

Bicycles From:	N	S	E	W	
INT 01	0	0	0	0	0
INT 02	0	0	1	0	1
INT 03	0	0	0	0	0
INT 04	0	0	1	0	1
INT 05	0	0	0	0	0
INT 06	0	1	0	0	1
INT 07	1	0	0	0	1
INT 08	0	0	0	0	0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	1	1	2	0	4

		PHF	%HV
	EB	0.94	3.8%
Check	WB	0.98	3.5%
In: 2225	NB	0.95	1.5%
Out: 2225	SB	0.80	0.7%
	T Int.	0.93	2.0%

Conditions:

Special Notes

SCJ22043M_14P

Appendix B

Traffic Volume Worksheets

SCJ ALLIANCE
CONSULTING SERVICES

The Belmont Flats

PM Peak Hour Volumes

Covid Adjustment	30%
Growth Rate:	4%

Intersection	Movement		Existing 2022 Volumes	Covid Adjustments	Adjusted 2022 Volumes	Background 2024 Growth	Total Pipeline Volumes	Yorkshire Pipeline Volume	Baseline 2024 Volumes	Site Generated Pass-By	Site Generated Primary	Site Generated Total	Projected 2024 Volumes
		L	53	16	69	6	0	0	75	0	0	0	75
	EB	T	88	26	114	9	3	7	133	0	7	7	140
		R	142	43	185	15	2	0	202	0	0	0	202
1		L	85	26	111	9	1	0	121	0	0	0	121
Littlerock Rd	WB	T	151	45	196	16	5	5	222	0	5	5	227
70th Ave/Israel Rd		R	94	28	122	10	1	26	159	0	18	18	177
		L	174	52	226	18	3	0	247	0	0	0	247
TMC Date: 07/26/2022	NB	T	199	60	259	21	0	0	280	0	0	0	280
		R	58	17	75	6	1	0	82	0	0	0	82
4:30 - 5:30		L	67	20	87	7	1	39	134	0	24	24	158
PHF: 0.95	SB	T	306	92	398	32	0	0	430	0	0	0	430
		R	68	20	88	7	0	0	95	0	0	0	95
			1,485		1,931				2,181				2,235
		L	41	12	53	4	3	0	60	0	0	0	60
	EB	T	167	50	217	17	2	0	236	-5	0	-5	231
		R	0	0	0	0	0	46	46	5	31	36	82
2		L	0	0	0	0	0	65	65	6	7	13	78
Tyee Dr	WB	T	211	63	274	22	4	0	300	-6	0	-6	294
Israel Rd		R	188	56	244	20	3	0	267	0	0	0	267
		L	0	0	0	0	0	31	31	6	23	29	60
TMC Date: 07/26/2022	NB	T	0	0	0	0	0	6	6	0	3	3	9
		R	0	0	0	0	0	44	44	5	5	10	54
4:15 - 5:15		L	223	67	290	23	3	0	316	0	0	0	316
PHF: 0.92	SB	T	0	0	0	0	0	8	8	0	4	4	12
		R	108	32	140	11	3	0	154	0	0	0	154
			938		1,219				1,534				1,618
		L	0	0	0	0	0	0	0	0	0	0	0
	EB	T	396	119	515	41	5	0	561	0	5	5	566
		R	2	1	3	0	0	0	3	0	0	0	3
3		L	0	0	0	0	0	0	0	0	23	23	23
Israel Rd	WB	T	425	128	553	44	7	0	604	0	7	7	611
Old Israel Rd		R	0	0	0	0	0	0	0	0	0	0	0
		L	2	1	3	0	0	0	3	0	0	0	3
TMC Date: 07/26/2022	NB	T	0	0	0	0	0	0	0	0	0	0	0
		R	2	1	3	0	0	0	3	0	16	16	19
4:30 - 5:30		L	0	0	0	0	0	0	0	0	0	0	0
PHF: 0.88	SB	T	0	0	0	0	0	0	0	0	0	0	0
		R	0	0	0	0	0	0	0	0	0	0	0
			827		1,075				1,172				1,223
		L	47	14	61	5	1	1	68	0	2	2	70
	EB	T	312	94	406	32	2	31	471	0	10	10	481
		R	62	19	81	6	2	12	101	0	9	9	110
4		L	62	19	81	6	0	0	87	0	0	0	87
11th Ave/Linderson Way	WB	T	313	94	407	33	2	45	487	0	14	14	501
Israel Rd		R	16	5	21	2	0	0	23	0	0	0	23
		L	78	23	101	8	5	17	131	0	12	12	143
TMC Date: 07/26/2022	NB	T	48	14	62	5	4	0	71	0	0	0	71
		R	80	24	104	8	1	0	113	0	0	0	113
4:30 - 5:30		L	16	5	21	2	0	0	23	0	0	0	23
PHF: 0.88	SB	T	65	20	85	7	2	0	94	0	0	0	94
		R	52	16	68	5	0	3	76	0	4	4	80
			1,151		1,496				1,743				1,794

SCJ ALLIANCE
CONSULTING SERVICES

The Belmont Flats

PM Peak Hour Volumes

Covid Adjustment	30%
Growth Rate:	4%

Intersection	Movement		Existing 2022 Volumes	Covid Adjustments	Adjusted 2022 Volumes	Background 2024 Growth	Total Pipeline Volumes	Yorkshire Pipeline Volume	Baseline 2024 Volumes	Site Generated Pass-By	Site Generated Primary	Site Generated Total	Projected 2024 Volumes
		L	**97**	29	**126**	10	0	6	**142**	0	5	5	**147**
	EB	T	**153**	46	**199**	16	1	6	**222**	0	5	5	**227**
		R	**181**	54	**235**	19	0	19	**273**	0	0	0	**273**
5		L	**44**	13	**57**	5	0	0	**62**	0	0	0	**62**
Capitol Blvd	WB	T	**139**	42	**181**	14	0	8	**203**	0	7	7	**210**
Israel Rd		R	**74**	22	**96**	8	0	0	**104**	0	0	0	**104**
		L	**155**	47	**202**	16	1	28	**247**	0	0	0	**247**
TMC Date: 07/26/2022	NB	T	**417**	125	**542**	43	6	0	**591**	0	0	0	**591**
		R	**20**	6	**26**	2	0	0	**28**	0	0	0	**28**
4:30 - 5:30		L	**37**	11	**48**	4	0	0	**52**	0	0	0	**52**
PHF: 0.87	SB	T	**493**	148	**641**	51	2	0	**694**	0	0	0	**694**
		R	**94**	28	**122**	10	1	9	**142**	0	7	7	**149**
			1,904		**2,475**				**2,760**				**2,784**
		L	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
	EB	T	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
		R	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
6		L	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
Site Driveway	WB	T	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
Tyee Dr		R	**0**	0	**0**	0	0	0	**0**	11	22	33	**33**
		L	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
	NB	T	**0**	0	**0**	0	0	81	**81**	0	9	9	**90**
		R	**0**	0	**0**	0	0	0	**0**	0	33	33	**33**
		L	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
	SB	T	**0**	0	**0**	0	0	119	**119**	11	42	53	**172**
		R	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
			0		**0**				**200**				**328**
		L	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
	EB	T	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
		R	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
7		L	**0**	0	**0**	0	0	0	**0**	11	80	91	**91**
Site Driveway	WB	T	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
Tyee Dr		R	**0**	0	**0**	0	0	0	**0**	0	9	9	**9**
		L	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
	NB	T	**0**	0	**0**	0	0	81	**81**	0	33	33	**114**
		R	**0**	0	**0**	0	0	0	**0**	12	76	88	**88**
		L	**0**	0	**0**	0	0	0	**0**	11	42	53	**53**
	SB	T	**0**	0	**0**	0	0	119	**119**	0	0	0	**119**
		R	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
			0		**0**				**200**				**474**
		L	**0**	0	**0**	0	0	12	**12**	6	7	13	**25**
	EB	T	**380**	114	**494**	40	23	0	**557**	-6	0	-6	**551**
		R	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
8		L	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
Tyee Dr Extension	WB	T	**397**	119	**516**	41	44	0	**601**	-6	0	-6	**595**
Tumwater Blvd		R	**0**	0	**0**	0	0	151	**151**	6	102	108	**259**
		L	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
	NB	T	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
		R	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
		L	**0**	0	**0**	0	0	102	**102**	5	75	80	**182**
	SB	T	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
		R	**0**	0	**0**	0	0	8	**8**	6	5	11	**19**
			777		**1,010**				**1,431**				**1,631**

SCJ ALLIANCE
CONSULTING SERVICES

The Belmont Flats

PM Peak Hour Volumes

Covid Adjustment	30%
Growth Rate:	4%

Intersection	Movement		Existing 2022 Volumes	Covid Adjustments	Adjusted 2022 Volumes	Background 2024 Growth	Total Pipeline Volumes	Yorkshire Pipeline Volume	Baseline 2024 Volumes	Site Generated Pass-By	Site Generated Primary	Site Generated Total	Projected 2024 Volumes
		L	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
	EB	T	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
		R	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
9		L	**142**	43	**185**	15	40	0	**240**	0	5	5	**245**
Littlerock Rd	WB	T	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
Tumwater Blvd		R	**255**	77	**332**	27	2	8	**369**	0	0	0	**369**
		L	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
TMC Date: 07/26/2022	NB	T	**143**	43	**186**	15	6	0	**207**	0	0	0	**207**
		R	**137**	41	**178**	14	21	12	**225**	0	7	7	**232**
4:30 - 5:30		L	**243**	73	**316**	25	1	0	**342**	0	0	0	**342**
PHF: 0.91	SB	T	**322**	97	**419**	33	11	0	**463**	0	0	0	**463**
		R	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
			1,242		**1,615**				**1,845**				**1,857**
		L	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
	EB	T	**273**	82	**355**	28	1	78	**462**	0	61	61	**523**
		R	**99**	30	**129**	10	1	24	**164**	0	14	14	**178**
10		L	**227**	68	**295**	24	8	0	**327**	0	0	0	**327**
I-5 SB Ramps	WB	T	**193**	58	**251**	20	4	45	**320**	0	45	45	**365**
Tumwater Blvd		R	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
		L	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
TMC Date: 07/26/2022	NB	T	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
		R	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
4:30 - 5:30		L	**347**	104	**451**	36	10	0	**497**	0	0	0	**497**
PHF: 0.95	SB	T	**4**	1	**5**	0	0	0	**5**	0	0	0	**5**
		R	**197**	59	**256**	20	0	106	**382**	0	57	57	**439**
			1,340		**1,742**				**2,157**				**2,334**
		L	**163**	49	**212**	17	0	63	**292**	0	42	42	**334**
	EB	T	**451**	135	**586**	47	11	15	**659**	0	19	19	**678**
		R	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
11		L	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
I-5 NB Ramps	WB	T	**366**	110	**476**	38	10	22	**546**	0	26	26	**572**
Tumwater Blvd		R	**477**	843	**1,320**	106	28	0	**1,454**	0	0	0	**1,454**
		L	**54**	16	**70**	6	2	23	**101**	0	19	19	**120**
TMC Date: 07/26/2022	NB	T	**1**	0	**1**	0	0	0	**1**	0	0	0	**1**
		R	**114**	34	**148**	12	2	0	**162**	0	0	0	**162**
4:30 - 5:30		L	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
PHF: 0.95	SB	T	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
		R	**0**	0	**0**	0	0	0	**0**	0	0	0	**0**
			1,626		**2,814**				**3,216**				**3,322**
		L	**69**	71	**140**	11	13	0	**164**	0	0	0	**164**
	EB	T	**418**	125	**543**	43	1	15	**602**	0	19	19	**621**
12		R	**70**	21	**91**	7	0	0	**98**	0	0	0	**98**
Tumwater Blvd		L	**50**	15	**65**	5	0	0	**70**	0	0	0	**70**
Linderson Way/Center St	WB	T	**534**	160	**694**	56	1	22	**773**	0	26	26	**799**
TMC Date: 07/26/2022		R	**33**	10	**43**	3	6	0	**52**	0	0	0	**52**
		L	**107**	32	**139**	11	0	0	**150**	0	0	0	**150**
4:30 - 5:30	NB	T	**59**	18	**77**	6	1	0	**84**	0	0	0	**84**
PHF: 0.91		R	**57**	17	**74**	6	0	0	**80**	0	0	0	**80**
		L	**70**	121	**191**	15	18	0	**224**	0	0	0	**224**
	SB	T	**66**	120	**186**	15	3	0	**204**	0	0	0	**204**
		R	**216**	765	**981**	78	38	0	**1,097**	0	0	0	**1,097**
			1,749		**3,224**				**3,598**				**3,643**

SCJ ALLIANCE
CONSULTING SERVICES

The Belmont Flats

PM Peak Hour Volumes

Covid Adjustment	30%
Growth Rate:	4%

Intersection	Movement		Existing 2022 Volumes	Covid Adjustments	Adjusted 2022 Volumes	Background 2024 Growth	Total Pipeline Volumes	Yorkshire Pipeline Volume	Baseline 2024 Volumes	Site Generated Pass-By	Site Generated Primary	Site Generated Total	Projected 2024 Volumes
		L	**56**	17	**73**	6	1	0	**80**	0	0	0	**80**
	EB	T	**182**	55	**237**	19	10	5	**271**	0	10	10	**281**
		R	**266**	80	**346**	28	7	4	**385**	0	9	9	**394**
13		L	**40**	12	**52**	4	0	0	**56**	0	0	0	**56**
Capitol Blvd	WB	T	**196**	59	**255**	20	3	8	**286**	0	14	14	**300**
Tumwater Blvd		R	**53**	16	**69**	6	0	14	**89**	0	0	0	**89**
		L	**194**	58	**252**	20	4	6	**282**	0	12	12	**294**
TMC Date: 07/26/2022	NB	T	**454**	136	**590**	47	5	14	**656**	0	0	0	**656**
		R	**28**	8	**36**	3	0	0	**39**	0	0	0	**39**
4:30 - 5:30		L	**109**	33	**142**	11	8	10	**171**	0	0	0	**171**
PHF: 0.93	SB	T	**529**	159	**688**	55	0	9	**752**	0	0	0	**752**
		R	**118**	35	**153**	12	0	0	**165**	0	0	0	**165**
			2,225		**2,893**				**3,232**				**3,277**

SCJ ALLIANCE
CONSULTING SERVICES

The Belmont Flats

AM Peak Hour Volumes

Covid Adjustment	30%
Growth Rate:	4%

Intersection	Movement		Existing 2022 Volumes	Covid Adjustments	Adjusted 2022 Volumes	Background 2024 Growth	Total Pipeline Volumes	Yorkshire Pipeline Volume	Baseline 2024 Volumes	Site Generated Pass-By	Site Generated Primary	Site Generated Total	Projected 2024 Volumes
		L	39	12	51	3	0	3	57	0	4	4	61
	EB	T	169	51	220	14	1	53	288	0	18	18	306
		R	49	15	64	4	10	20	98	0	16	16	114
4		L	93	28	121	7	1	0	129	0	0	0	129
11th Ave/Linderson Way	WB	T	148	44	192	12	2	18	224	0	8	8	232
Israel Rd		R	18	5	23	1	0	0	24	0	0	0	24
		L	43	13	56	3	4	7	70	0	7	7	77
TMC Date: 07/26/2022	NB	T	44	13	57	4	3	0	64	0	0	0	64
		R	61	18	79	5	1	0	85	0	0	0	85
7:15 - 8:15		L	9	3	12	1	0	0	13	0	0	0	13
PHF: 0.78	SB	T	35	11	46	3	10	0	59	0	0	0	59
		R	23	7	30	2	0	1	33	0	2	2	35
			731		950				1,143				1,198
		L	0	0	0	0	0	0	0	0	0	0	0
	EB	T	304	91	395	24	5	136	560	0	108	108	668
		R	40	12	52	3	1	40	96	0	25	25	121
10		L	134	40	174	11	5	0	190	0	0	0	190
I-5 SB Ramps	WB	T	97	29	126	8	2	18	154	0	24	24	178
Tumwater Blvd		R	0	0	0	0	0	0	0	0	0	0	0
		L	0	0	0	0	0	0	0	0	0	0	0
TMC Date: 07/26/2022	NB	T	0	0	0	0	0	0	0	0	0	0	0
		R	0	0	0	0	0	0	0	0	0	0	0
7:15 - 8:15		L	474	1,142	1,616	38	55	0	1,709	0	0	0	1,709
PHF: 0.86	SB	T	3	1	4	0	0	0	4	0	0	0	4
		R	89	27	116	7	0	42	165	0	32	32	197
			1,141		2,483				2,878		189		3,067
		L	219	266	485	18	0	110	613	0	74	74	687
	EB	T	550	965	1,515	44	60	26	1,645	0	34	34	1,679
		R	0	0	0	0	0	0	0	0	0	0	0
11		L	0	0	0	0	0	0	0	0	0	0	0
I-5 NB Ramps	WB	T	170	51	221	14	7	9	251	0	14	14	265
Tumwater Blvd		R	322	247	569	26	19	0	614	0	0	0	614
		L	50	15	65	4	1	9	79	0	10	10	89
TMC Date: 07/26/2022	NB	T	1	0	1	0	0	0	1	0	0	0	1
		R	246	224	470	20	15	0	505	0	0	0	505
7:15 - 8:15		L	0	0	0	0	0	0	0	0	0	0	0
PHF: 0.87	SB	T	0	0	0	0	0	0	0	0	0	0	0
		R	0	0	0	0	0	0	0	0	0	0	0
			1,558		3,325				3,707		132		3,839
		L	215	1,015	1,230	17	74	0	1,321	0	0	0	1,321
	EB	T	510	153	663	41	0	26	730	0	34	34	764
		R	81	24	105	6	0	0	111	0	0	0	111
12		L	32	10	42	3	0	0	45	0	0	0	45
Linderson Way/Center St	WB	T	332	100	432	27	0	9	468	0	14	14	482
Tumwater Blvd		R	69	21	90	6	34	0	130	0	0	0	130
		L	70	21	91	6	0	0	97	0	0	0	97
TMC Date: 07/26/2022	NB	T	47	14	61	4	5	0	70	0	0	0	70
		R	30	9	39	2	0	0	41	0	0	0	41
7:15 - 8:15		L	32	10	42	3	11	0	56	0	0	0	56
PHF: 0.89	SB	T	26	8	34	2	2	0	38	0	0	0	38
		R	95	29	124	8	24	0	156	0	0	0	156
			1,539		2,951				3,261				3,309

SCJ ALLIANCE
CONSULTING SERVICES

The Belmont Flats

PM Peak Hour Volumes
Sensitivity Analysis

Covid Adjustment	30%
Growth Rate:	4%

Intersection	Movement		Existing 2022 Volumes	Covid Adjustments	Adjusted 2022 Volumes	Background 2024 Growth	Total Pipeline Volumes	Baseline 2024 Volumes	Site Generated Pass-By	Site Generated Primary	Site Generated Total	Projected 2024 Volumes
		L	53	16	69	6	0	75	0	0	0	75
	EB	T	88	26	114	9	3	126	0	7	7	133
		R	142	43	185	15	2	202	0	0	0	202
1		L	85	26	111	9	1	121	0	61	61	182
Littlerock Rd	WB	T	151	45	196	16	5	217	0	5	5	222
70th Ave/Israel Rd		R	94	28	122	10	1	133	0	18	18	151
		L	174	52	226	18	3	247	0	0	0	247
TMC Date: 07/26/2022	NB	T	199	60	259	21	0	280	0	0	0	280
		R	58	17	75	6	1	82	0	83	83	165
4:30 - 5:30		L	67	20	87	7	1	95	0	24	24	119
PHF: 0.95	SB	T	306	92	398	32	0	430	0	0	0	430
		R	68	20	88	7	0	95	0	0	0	95
			1,485		1,931			2,104				2,302
		L	41	12	53	4	3	60	0	0	0	60
	EB	T	167	50	217	17	2	236	-11	0	-11	225
		R	0	0	0	0	0	0	11	114	125	125
2		L	0	0	0	0	0	0	12	17	29	29
Tyee Dr	WB	T	211	63	274	22	4	300	-12	0	-12	288
Israel Rd		R	188	56	244	20	3	267	0	0	0	267
		L	0	0	0	0	0	0	6	84	90	90
TMC Date: 07/26/2022	NB	T	0	0	0	0	0	0	0	3	3	3
		R	0	0	0	0	0	0	5	12	17	17
4:15 - 5:15		L	223	67	290	23	3	316	0	0	0	316
PHF: 0.92	SB	T	0	0	0	0	0	0	0	4	4	4
		R	108	32	140	11	3	154	0	0	0	154
			938		1,219			1,334				1,579
		L	47	14	61	5	1	67	0	2	2	69
	EB	T	312	94	406	32	2	440	0	29	29	469
		R	62	19	81	6	2	89	0	9	9	98
4		L	62	19	81	6	0	87	0	0	0	87
11th Ave/Linderson Way	WB	T	313	94	407	33	2	442	0	40	40	482
Israel Rd		R	16	5	21	2	0	23	0	0	0	23
		L	78	23	101	8	5	114	0	12	12	126
TMC Date: 07/26/2022	NB	T	48	14	62	5	4	71	0	0	0	71
		R	80	24	104	8	1	113	0	0	0	113
4:30 - 5:30		L	16	5	21	2	0	23	0	0	0	23
PHF: 0.88	SB	T	65	20	85	7	2	94	0	0	0	94
		R	52	16	68	5	0	73	0	4	4	77
			1,151		1,496			1,634				1,730
		L	0	0	0	0	0	0	0	0	0	0
	EB	T	0	0	0	0	0	0	0	0	0	0
		R	0	0	0	0	0	0	0	0	0	0
9		L	142	43	185	15	40	240	0	0	0	240
Littlerock Rd	WB	T	0	0	0	0	0	0	0	0	0	0
Tumwater Blvd		R	255	77	332	27	2	361	0	76	76	437
		L	0	0	0	0	0	0	0	0	0	0
TMC Date: 07/26/2022	NB	T	143	43	186	15	6	207	0	7	7	214
		R	137	41	178	14	21	213	0	0	0	213
4:30 - 5:30		L	243	73	316	25	1	342	0	56	56	398
PHF: 0.91	SB	T	322	97	419	33	11	463	0	5	5	468
		R	0	0	0	0	0	0	0	0	0	0
			1,242		1,615			1,825				1,969

SCJ ALLIANCE
CONSULTING SERVICES

The Belmont Flats

Trip Generation

PM Peak Hour Trip Generation

Site Plan Description	LUC	ITE Description	Variable	Value	Trip Rate	Distribution		Total Trips			Int. Capture		Pass-By Trips		Net New Trips		
						In	Out	In	Out	Total	%	Total	%	Total	In	Out	Total
Apartments	221	Multifamily Housing (Mid-Rise) Not Close to Rail Transit	Dwelling Units	624.0	0.39	61%	39%	149	95	244	12%	29	0.0%	0	131	84	215
General Commercial	822	Strip Retail Plaza (<40k)	ksqft	27.5	5.81	50%	50%	80	80	160	18%	29	34.0%	45	43	43	86
Total								229	175	404		58		45	**174**	**127**	**301**

221 Fitted Curve Equation 0.39
822 Fitted Curve Equation 5.81

AM Peak Hour Trip Generation

Site Plan Description	LUC	ITE Description	Variable	Value	Trip Rate	Distribution		Total Trips			Int. Capture		Pass-By Trips		Net New Trips		
						In	Out	In	Out	Total	%	Total	%	Total	In	Out	Total
Apartments	221	Multifamily Housing (Mid-Rise) Not Close to Rail Transit	Dwelling Units	624.0	0.42	23%	77%	60	203	263	1%	3	0.0%	0	60	200	260
General Commercial	822	Strip Retail Plaza (<40k)	ksqft	27.5	2.36	60%	40%	39	26	65	5%	3	0.0%	0	37	25	62
Total								99	229	328		6		0	**97**	**225**	**322**

221 Fitted Curve Equation 0.42

Daily Trip Generation

Site Plan Description	LUC	ITE Description	Variable	Value	Trip Rate	Distribution		Total Trips			Int. Capture		Pass-By Trips		Net New Trips		
						In	Out	In	Out	Total	%	Total	%	Total	In	Out	Total
Apartments	221	Multifamily Housing (Mid-Rise) Not Close to Rail Transit	Dwelling Units	624.0	4.70	50%	50%	1465	1465	2930	12%	348	0.0%	0	1,291	1,291	2,582
General Commercial	822	Strip Retail Plaza (<40k)	ksqft	27.5	54.45	50%	50%	748	749	1497	18%	271	34.0%	417	404	405	809
Total								2213	2214	4427		619		417	**1,695**	**1,696**	**3,391**

221 Fitted Curve Equation 4.70

Appendix C

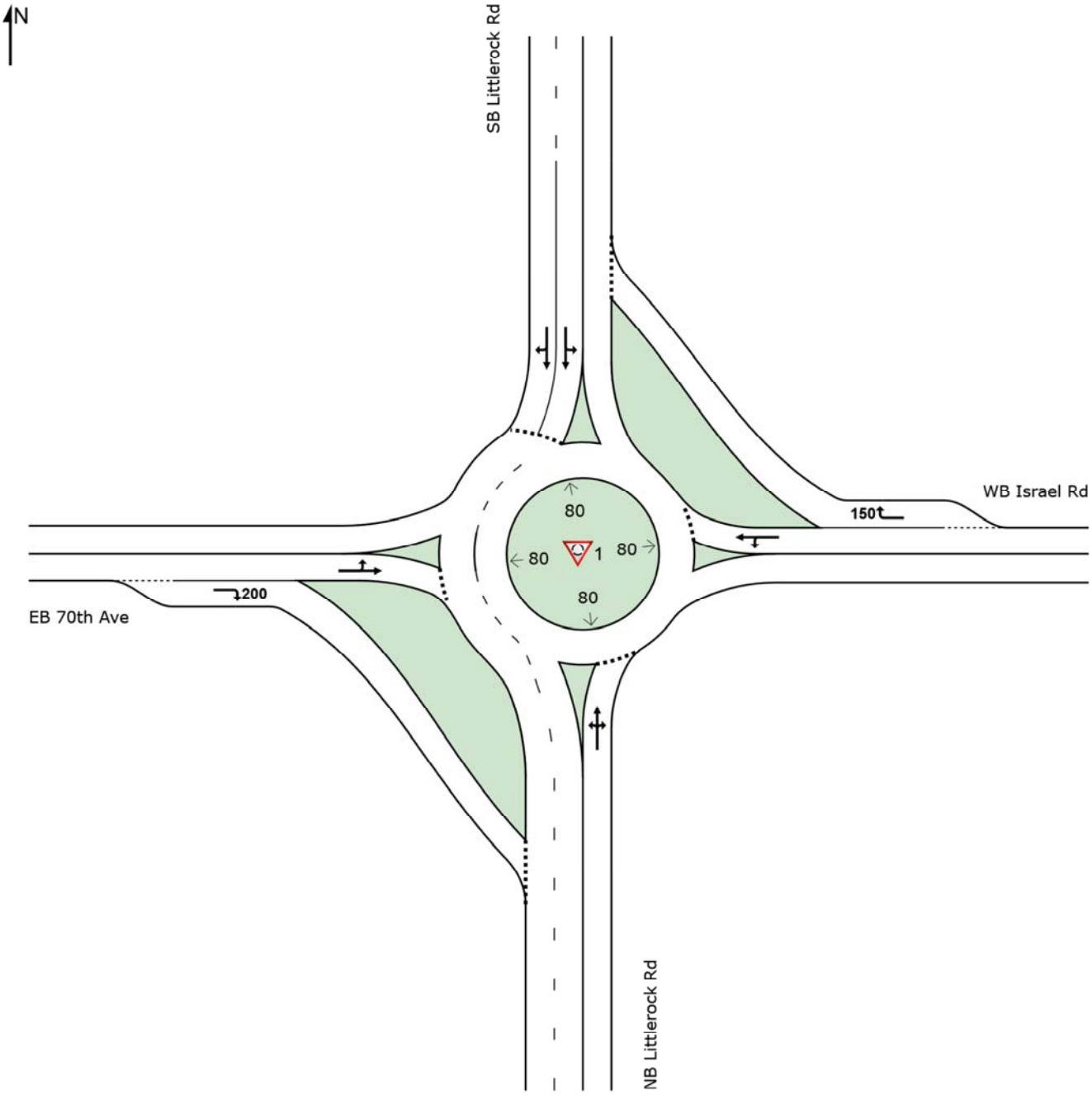
Operational Analysis Worksheets

SITE LAYOUT

Site: 1 [Littlerock Road at Israel Road (Site Folder: General)]

Existing 2022
PM Peak Hour
Site Category: (None)
Roundabout

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



MOVEMENT SUMMARY

Site: 1 [Littlerock Road at Israel Road (Site Folder: General)]

Existing 2022
PM Peak Hour
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: NB Littlerock Rd														
3	L2	225	1.0	237	1.0	0.518	11.3	LOS B	3.7	92.2	0.58	0.66	0.58	34.9
8	T1	260	1.0	274	1.0	0.518	5.9	LOS A	3.7	92.2	0.58	0.66	0.58	35.0
18	R2	75	1.0	79	1.0	0.518	5.9	LOS A	3.7	92.2	0.58	0.66	0.58	34.0
Approach		560	1.0	589	1.0	0.518	8.1	LOS A	3.7	92.2	0.58	0.66	0.58	34.8
East: WB Israel Rd														
1	L2	110	1.0	116	1.0	0.288	12.1	LOS B	2.0	51.5	0.70	0.71	0.70	34.5
6	T1	195	1.0	205	1.0	0.288	6.7	LOS A	2.0	51.5	0.70	0.71	0.70	34.6
16	R2	120	1.0	126	1.0	0.095	5.0	LOS A	0.5	13.5	0.46	0.55	0.46	35.6
Approach		425	1.0	447	1.0	0.288	7.6	LOS A	2.0	51.5	0.64	0.66	0.64	34.8
North: SB Littlerock Rd														
7	L2	85	1.0	89	1.0	0.297	12.6	LOS B	1.9	47.3	0.68	0.75	0.68	34.3
4	T1	400	1.0	421	1.0	0.297	7.2	LOS A	2.0	51.0	0.68	0.71	0.68	34.9
14	R2	90	1.0	95	1.0	0.297	6.9	LOS A	2.0	51.0	0.67	0.67	0.67	34.2
Approach		575	1.0	605	1.0	0.297	8.0	LOS A	2.0	51.0	0.68	0.71	0.68	34.7
West: EB 70th Ave														
5	L2	70	1.0	74	1.0	0.189	11.0	LOS B	0.8	21.1	0.53	0.66	0.53	34.9
2	T1	115	1.0	121	1.0	0.189	6.0	LOS A	0.8	21.1	0.53	0.66	0.53	34.9
12	R2	185	1.0	195	1.0	0.181	5.5	LOS A	0.8	19.4	0.48	0.65	0.48	35.3
Approach		370	1.0	389	1.0	0.189	6.7	LOS A	0.8	21.1	0.50	0.65	0.50	35.1
All Vehicles		1930	1.0	2032	1.0	0.518	7.7	LOS A	3.7	92.2	0.61	0.67	0.61	34.8

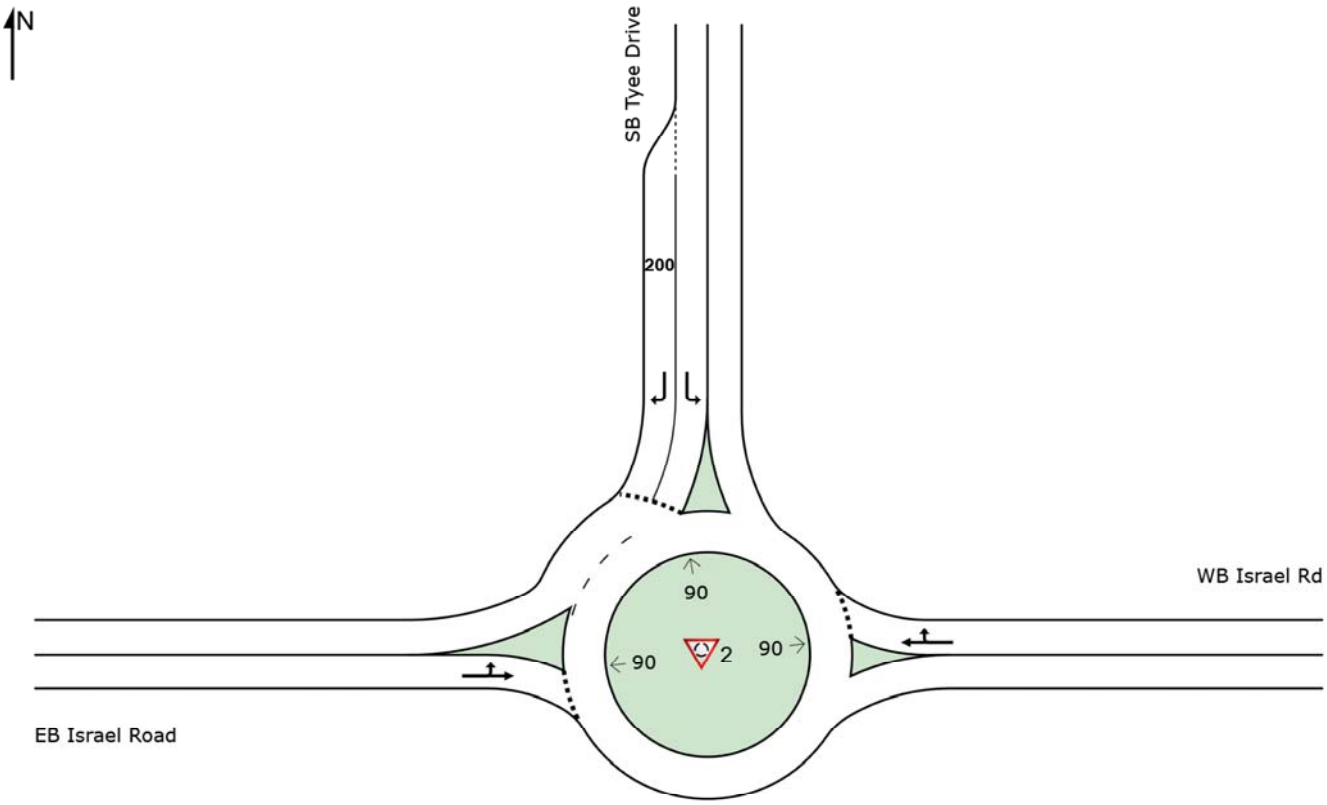
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 2 [Tyee Drive at Israel Road (Site Folder: General)]

Existing 2022
PM Peak Hour
Site Category: (None)
Roundabout

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



Organisation: SCJ ALLIANCE | Licence: PLUS / 1PC | Created: Thursday, September 1, 2022 10:41:03 AM
Project: N:\Projects\5385 Israel Investments LLC\22-000439 Updated Belmont Flats\03 - Analysis\Operations\Sidra\Existing 2022.sip9

MOVEMENT SUMMARY

Site: 2 [Tyee Drive at Israel Road (Site Folder: General)]

Existing 2022
PM Peak Hour
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
East: WB Israel Rd														
6	T1	275	1.0	299	1.0	0.414	4.3	LOS A	2.9	73.2	0.26	0.43	0.26	37.1
16	R2	245	1.0	266	1.0	0.414	4.3	LOS A	2.9	73.2	0.26	0.43	0.26	36.0
Approach		520	1.0	565	1.0	0.414	4.3	LOS A	2.9	73.2	0.26	0.43	0.26	36.5
North: SB Tyee Drive														
7	L2	290	1.0	315	1.0	0.225	10.7	LOS B	1.3	33.0	0.45	0.67	0.45	33.8
14	R2	140	1.0	152	1.0	0.140	5.6	LOS A	0.7	18.2	0.45	0.58	0.45	35.4
Approach		430	1.0	467	1.0	0.225	9.0	LOS A	1.3	33.0	0.45	0.64	0.45	34.3
West: EB Israel Road														
5	L2	55	2.0	60	2.0	0.261	11.1	LOS B	1.5	37.8	0.49	0.58	0.49	35.7
2	T1	215	2.0	234	2.0	0.261	5.5	LOS A	1.5	37.8	0.49	0.58	0.49	35.6
Approach		270	2.0	293	2.0	0.261	6.6	LOS A	1.5	37.8	0.49	0.58	0.49	35.6
All Vehicles		1220	1.2	1326	1.2	0.414	6.5	LOS A	2.9	73.2	0.38	0.54	0.38	35.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	535	5	1	575	5	5
Future Vol, veh/h	535	5	1	575	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	608	6	1	653	6	6

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	614	0	1266	611
Stage 1	-	-	-	-	611	-
Stage 2	-	-	-	-	655	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	965	-	187	494
Stage 1	-	-	-	-	542	-
Stage 2	-	-	-	-	517	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	965	-	187	494
Mov Cap-2 Maneuver	-	-	-	-	187	-
Stage 1	-	-	-	-	542	-
Stage 2	-	-	-	-	516	-

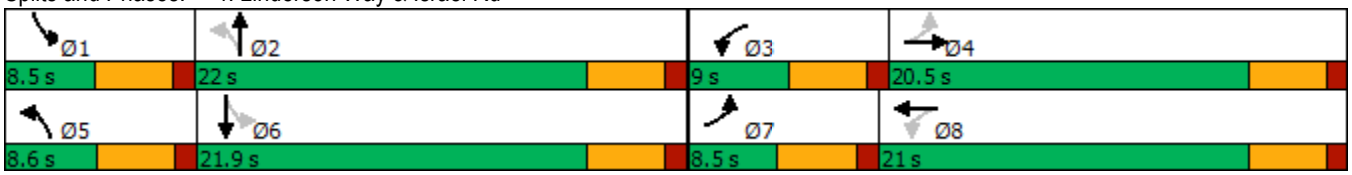
Approach	EB	WB	NB
HCM Control Delay, s	0	0	18.9
HCM LOS			C

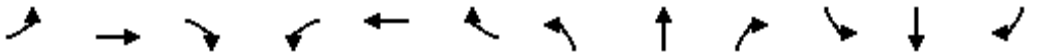
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	271	-	-	965	-
HCM Lane V/C Ratio	0.042	-	-	0.001	-
HCM Control Delay (s)	18.9	-	-	8.7	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	420	85	85	425	20	105	65	110	20	90	70
Future Volume (vph)	65	420	85	85	425	20	105	65	110	20	90	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	200		0	150		0	100		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2159			2743			2088			847	
Travel Time (s)		49.1			62.3			47.5			19.3	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	5.0		4.0	5.0		4.0	6.0		4.0	6.0	
Minimum Split (s)	8.5	20.5		8.5	20.5		8.5	21.5		8.5	21.5	
Total Split (s)	8.5	20.5		9.0	21.0		8.6	22.0		8.5	21.9	
Total Split (%)	14.2%	34.2%		15.0%	35.0%		14.3%	36.7%		14.2%	36.5%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Min		None	Min		None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 48.9	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 4: Linderson Way & Israel Rd





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	420	85	85	425	20	105	65	110	20	90	70
Future Volume (veh/h)	65	420	85	85	425	20	105	65	110	20	90	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	74	477	97	97	483	23	119	74	125	23	102	80
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	332	507	103	284	610	29	355	131	222	312	151	118
Arrive On Green	0.05	0.33	0.33	0.06	0.34	0.34	0.08	0.21	0.21	0.02	0.15	0.15
Sat Flow, veh/h	1795	1520	309	1795	1785	85	1795	630	1064	1795	979	768
Grp Volume(v), veh/h	74	0	574	97	0	506	119	0	199	23	0	182
Grp Sat Flow(s),veh/h/ln	1795	0	1830	1795	0	1870	1795	0	1694	1795	0	1747
Q Serve(g_s), s	1.3	0.0	14.6	1.7	0.0	11.7	2.6	0.0	5.1	0.5	0.0	4.7
Cycle Q Clear(g_c), s	1.3	0.0	14.6	1.7	0.0	11.7	2.6	0.0	5.1	0.5	0.0	4.7
Prop In Lane	1.00		0.17	1.00		0.05	1.00		0.63	1.00		0.44
Lane Grp Cap(c), veh/h	332	0	611	284	0	639	355	0	353	312	0	269
V/C Ratio(X)	0.22	0.00	0.94	0.34	0.00	0.79	0.34	0.00	0.56	0.07	0.00	0.68
Avail Cap(c_a), veh/h	388	0	611	343	0	644	371	0	618	423	0	634
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.9	0.0	15.5	11.8	0.0	14.2	15.4	0.0	17.0	16.6	0.0	19.2
Incr Delay (d2), s/veh	0.1	0.0	22.7	0.3	0.0	6.6	0.2	0.0	1.4	0.0	0.0	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	8.9	0.5	0.0	5.3	0.9	0.0	1.9	0.2	0.0	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.0	0.0	38.2	12.1	0.0	20.9	15.6	0.0	18.4	16.6	0.0	22.1
LnGrp LOS	B	A	D	B	A	C	B	A	B	B	A	C
Approach Vol, veh/h		648			603			318			205	
Approach Delay, s/veh		35.1			19.4			17.4			21.5	
Approach LOS		D			B			B			C	

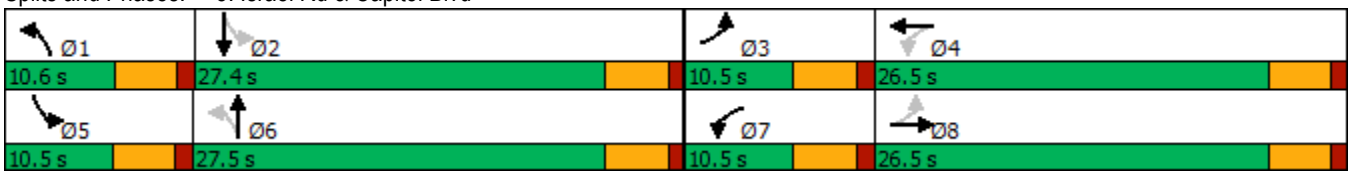
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.6	14.5	7.4	20.5	8.2	11.9	7.0	20.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	4.0	17.5	4.5	16.0	4.1	17.4	4.0	16.5
Max Q Clear Time (g_c+I1), s	2.5	7.1	3.7	16.6	4.6	6.7	3.3	13.7
Green Ext Time (p_c), s	0.0	0.8	0.0	0.0	0.0	0.7	0.0	0.9

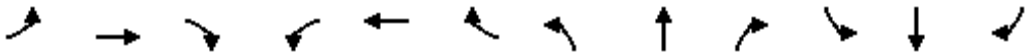
Intersection Summary	
HCM 6th Ctrl Delay	25.0
HCM 6th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	205	245	60	190	100	210	565	25	50	665	125
Future Volume (vph)	130	205	245	60	190	100	210	565	25	50	665	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	150		0	150		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2743			725			951			620	
Travel Time (s)		62.3			16.5			21.6			14.1	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	0%	0%	0%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Detector Phase	3	8		7	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	10.5	26.5		10.5	26.5		10.5	26.5		10.5	26.5	
Total Split (s)	10.5	26.5		10.5	26.5		10.6	27.5		10.5	27.4	
Total Split (%)	14.0%	35.3%		14.0%	35.3%		14.1%	36.7%		14.0%	36.5%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 70.8	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 5: Israel Rd & Capitol Blvd





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	205	245	60	190	100	210	565	25	50	665	125
Future Volume (veh/h)	130	205	245	60	190	100	210	565	25	50	665	125
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	149	236	282	69	218	115	241	649	29	57	764	144
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	0	0	0	2	2	2	1	1	1	1	1	1
Cap, veh/h	375	241	288	219	332	175	288	1135	51	333	893	168
Arrive On Green	0.08	0.31	0.31	0.06	0.29	0.29	0.08	0.32	0.32	0.06	0.30	0.30
Sat Flow, veh/h	1810	788	942	1781	1153	608	1795	3492	156	1795	3007	567
Grp Volume(v), veh/h	149	0	518	69	0	333	241	333	345	57	455	453
Grp Sat Flow(s),veh/h/ln	1810	0	1730	1781	0	1761	1795	1791	1857	1795	1791	1783
Q Serve(g_s), s	4.1	0.0	21.3	1.9	0.0	11.9	6.1	11.1	11.1	1.5	17.2	17.2
Cycle Q Clear(g_c), s	4.1	0.0	21.3	1.9	0.0	11.9	6.1	11.1	11.1	1.5	17.2	17.2
Prop In Lane	1.00		0.54	1.00		0.35	1.00		0.08	1.00		0.32
Lane Grp Cap(c), veh/h	375	0	529	219	0	507	288	582	603	333	532	529
V/C Ratio(X)	0.40	0.00	0.98	0.31	0.00	0.66	0.84	0.57	0.57	0.17	0.86	0.86
Avail Cap(c_a), veh/h	381	0	529	257	0	538	288	582	603	381	570	568
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.8	0.0	24.7	18.7	0.0	22.5	20.3	20.1	20.1	16.1	23.8	23.8
Incr Delay (d2), s/veh	0.8	0.0	33.7	1.0	0.0	2.9	19.3	1.5	1.5	0.3	11.9	12.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	13.1	0.8	0.0	5.1	4.2	4.6	4.7	0.6	8.6	8.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.6	0.0	58.4	19.7	0.0	25.4	39.6	21.6	21.6	16.4	35.7	35.8
LnGrp LOS	B	A	E	B	A	C	D	C	C	B	D	D
Approach Vol, veh/h		667			402			919			965	
Approach Delay, s/veh		49.3			24.4			26.3			34.6	
Approach LOS		D			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.6	25.9	10.3	25.2	8.6	27.9	9.0	26.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.1	22.9	6.0	22.0	6.0	23.0	6.0	22.0
Max Q Clear Time (g_c+I1), s	8.1	19.2	6.1	13.9	3.5	13.1	3.9	23.3
Green Ext Time (p_c), s	0.0	2.1	0.0	1.4	0.0	3.4	0.0	0.0

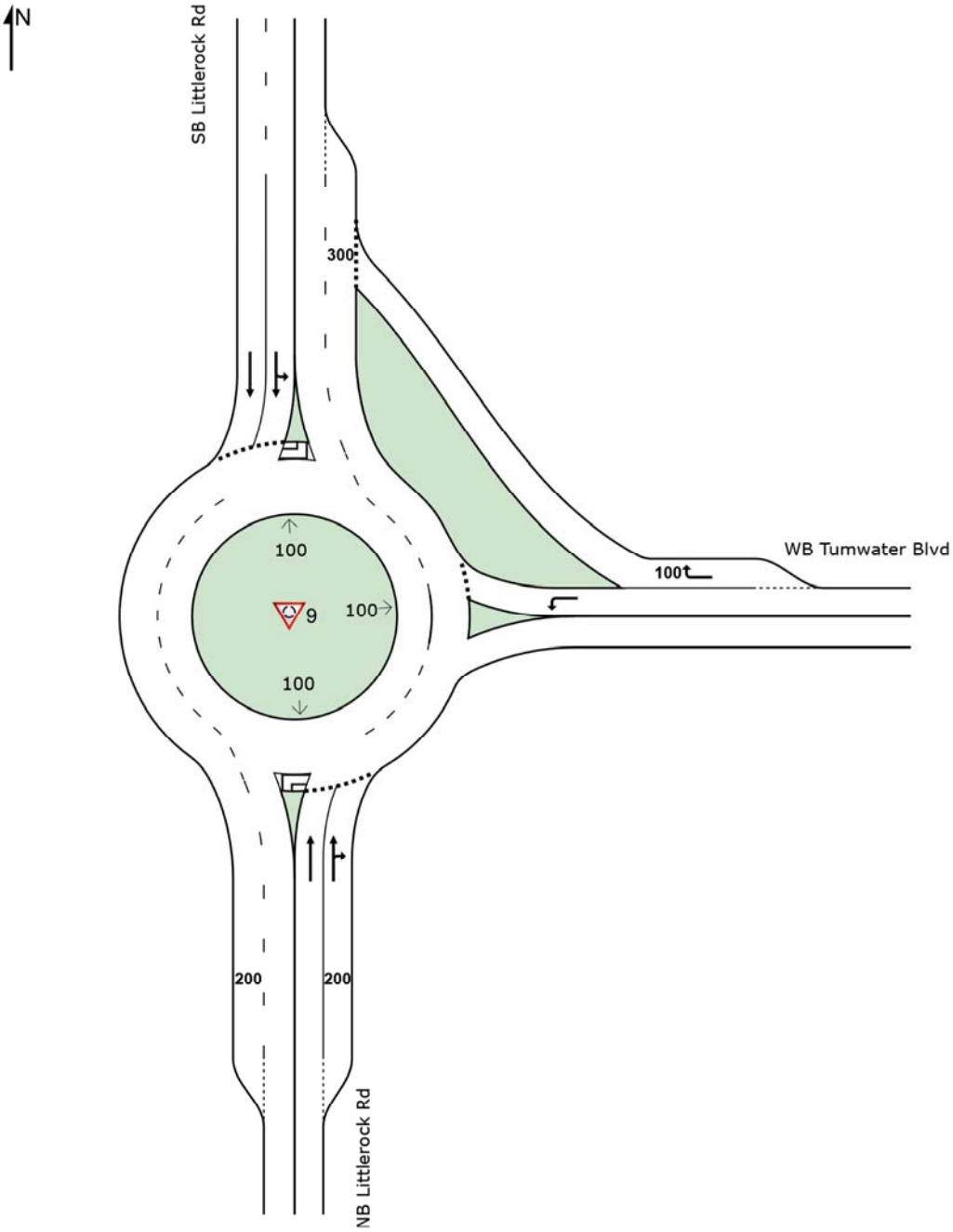
Intersection Summary	
HCM 6th Ctrl Delay	34.0
HCM 6th LOS	C

SITE LAYOUT

Site: 9 [Littlerock Road at Tumwater Blvd (Site Folder: General)]

Existing 2022
PM Peak Hour
Site Category: (None)
Roundabout

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



MOVEMENT SUMMARY

Site: 9 [Littlerock Road at Tumwater Blvd (Site Folder: General)]

Existing 2022
PM Peak Hour
Site Category: (None)
Roundabout

Vehicle Movement Performance

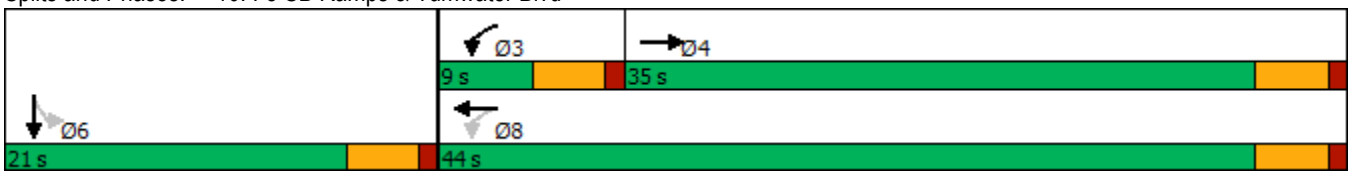
Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: NB Littlerock Rd														
8	T1	185	1.0	203	1.0	0.148	5.1	LOS A	0.9	21.9	0.47	0.49	0.47	36.4
18	R2	180	1.0	198	1.0	0.175	5.6	LOS A	1.0	24.9	0.50	0.59	0.50	35.4
Approach		365	1.0	401	1.0	0.175	5.3	LOS A	1.0	24.9	0.49	0.54	0.49	35.9
East: WB Tumwater Blvd														
1	L2	185	1.0	203	1.0	0.153	10.4	LOS B	0.7	18.1	0.32	0.64	0.32	34.3
16	R2	330	1.0	363	1.0	0.272	5.0	LOS A	1.4	36.0	0.36	0.51	0.36	36.1
Approach		515	1.0	566	1.0	0.272	6.9	LOS A	1.4	36.0	0.35	0.56	0.35	35.4
North: SB Littlerock Rd														
7	L2	315	1.0	346	1.0	0.394	10.6	LOS B	2.7	67.9	0.43	0.59	0.43	35.2
4	T1	420	1.0	462	1.0	0.394	5.2	LOS A	2.7	67.9	0.41	0.54	0.41	35.8
Approach		735	1.0	808	1.0	0.394	7.5	LOS A	2.7	67.9	0.42	0.56	0.42	35.6
All Vehicles		1615	1.0	1775	1.0	0.394	6.8	LOS A	2.7	67.9	0.41	0.56	0.41	35.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	370	135	305	260	0	0	0	0	470	5	265
Future Volume (vph)	0	370	135	305	260	0	0	0	0	470	5	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	350		0	0		0	350		0
Storage Lanes	0		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		729			789			1457			1571	
Travel Time (s)		16.6			17.9			33.1			35.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	4%	4%	4%
Shared Lane Traffic (%)										18%		
Turn Type		NA		pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases				8						6		
Detector Phase		4		3	8					6	6	
Switch Phase												
Minimum Initial (s)		4.0		4.0	4.0					4.0	4.0	
Minimum Split (s)		20.5		8.5	20.5					20.5	20.5	
Total Split (s)		35.0		9.0	44.0					21.0	21.0	
Total Split (%)		53.8%		13.8%	67.7%					32.3%	32.3%	
Yellow Time (s)		3.5		3.5	3.5					3.5	3.5	
All-Red Time (s)		1.0		1.0	1.0					1.0	1.0	
Lost Time Adjust (s)		0.0		0.0	0.0					0.0	0.0	
Total Lost Time (s)		4.5		4.5	4.5					4.5	4.5	
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?		Yes		Yes								
Recall Mode		None		None	Min					None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 65	
Actuated Cycle Length: 46.2	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 10: I-5 SB Ramps & Tumwater Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	370	135	305	260	0	0	0	0	470	5	265
Future Volume (veh/h)	0	370	135	305	260	0	0	0	0	470	5	265
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1885	1885	1885	1885	0				1841	1841	1841
Adj Flow Rate, veh/h	0	389	142	321	274	0				390	153	279
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	1	1	1	1	0				4	4	4
Cap, veh/h	0	664	239	463	879	0				570	190	346
Arrive On Green	0.00	0.26	0.26	0.10	0.47	0.00				0.32	0.32	0.32
Sat Flow, veh/h	0	2673	930	1795	1885	0				1753	584	1065
Grp Volume(v), veh/h	0	269	262	321	274	0				390	0	432
Grp Sat Flow(s),veh/h/ln	0	1791	1718	1795	1885	0				1753	0	1649
Q Serve(g_s), s	0.0	5.6	5.8	4.5	3.9	0.0				8.3	0.0	10.3
Cycle Q Clear(g_c), s	0.0	5.6	5.8	4.5	3.9	0.0				8.3	0.0	10.3
Prop In Lane	0.00		0.54	1.00		0.00				1.00		0.65
Lane Grp Cap(c), veh/h	0	461	442	463	879	0				570	0	536
V/C Ratio(X)	0.00	0.58	0.59	0.69	0.31	0.00				0.68	0.00	0.81
Avail Cap(c_a), veh/h	0	1267	1215	463	1727	0				671	0	631
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	14.0	14.0	11.7	7.2	0.0				12.6	0.0	13.3
Incr Delay (d2), s/veh	0.0	1.2	1.3	4.4	0.2	0.0				2.3	0.0	6.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.1	2.0	2.2	1.2	0.0				3.0	0.0	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	15.1	15.3	16.1	7.4	0.0				15.0	0.0	19.9
LnGrp LOS	A	B	B	B	A	A				B	A	B
Approach Vol, veh/h		531			595						822	
Approach Delay, s/veh		15.2			12.1						17.5	
Approach LOS		B			B						B	

Timer - Assigned Phs		3	4		6		8					
Phs Duration (G+Y+Rc), s		9.0	15.6		18.5		24.6					
Change Period (Y+Rc), s		4.5	4.5		4.5		4.5					
Max Green Setting (Gmax), s		4.5	30.5		16.5		39.5					
Max Q Clear Time (g_c+I1), s		6.5	7.8		12.3		5.9					
Green Ext Time (p_c), s		0.0	3.3		1.7		1.7					

Intersection Summary	
HCM 6th Ctrl Delay	15.2
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	13.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	220	610	0	0	495	1375	75	5	155	0	0	0
Future Vol, veh/h	220	610	0	0	495	1375	75	5	155	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	350	-	-	-	-	0	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	1	1	1	3	3	3	0	0	0
Mvmt Flow	232	642	0	0	521	1447	79	5	163	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	521	0	-	-	-	0	1627	1627	321
Stage 1	-	-	-	-	-	-	1106	1106	-
Stage 2	-	-	-	-	-	-	521	521	-
Critical Hdwy	4.145	-	-	-	-	-	6.645	6.545	6.945
Critical Hdwy Stg 1	-	-	-	-	-	-	5.845	5.545	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.445	5.545	-
Follow-up Hdwy	2.2285	-	-	-	-	-	3.5285	4.0285	3.3285
Pot Cap-1 Maneuver	1037	-	0	0	-	0	101	101	673
Stage 1	-	-	0	0	-	0	277	284	-
Stage 2	-	-	0	0	-	0	592	529	-
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	1037	-	-	-	-	-	~ 78	0	673
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 78	0	-
Stage 1	-	-	-	-	-	-	215	0	-
Stage 2	-	-	-	-	-	-	592	0	-

Approach	EB	WB	NB
HCM Control Delay, s	2.5	0	82.8
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT
Capacity (veh/h)	78	673	1037	-	-
HCM Lane V/C Ratio	1.08	0.242	0.223	-	-
HCM Control Delay (s)	219.9	12.1	9.5	-	-
HCM Lane LOS	F	B	A	-	-
HCM 95th %tile Q(veh)	6	0.9	0.9	-	-

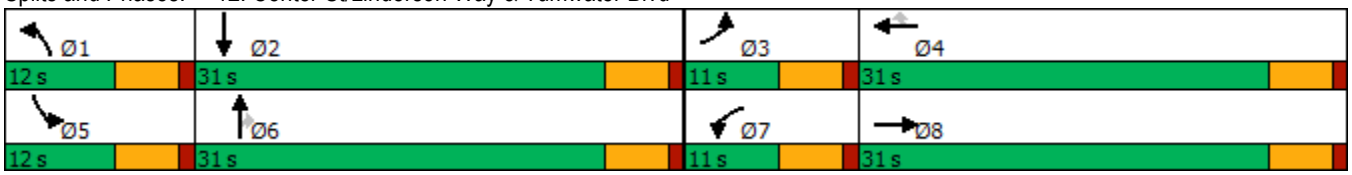
Notes

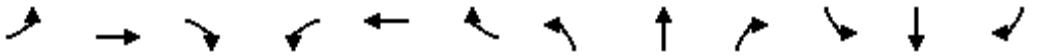
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	145	565	95	70	720	45	145	80	75	200	195	1020
Future Volume (vph)	145	565	95	70	720	45	145	80	75	200	195	1020
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		0	350		250	250		150	300		700
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		895			3726			511			2088	
Travel Time (s)		20.3			84.7			11.6			47.5	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases						4			6			Free
Detector Phase	3	8		7	4	4	1	6	6	5	2	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	11.0	31.0		11.0	31.0	31.0	11.0	31.0	31.0	11.0	31.0	
Total Split (s)	11.0	31.0		11.0	31.0	31.0	12.0	31.0	31.0	12.0	31.0	
Total Split (%)	12.9%	36.5%		12.9%	36.5%	36.5%	14.1%	36.5%	36.5%	14.1%	36.5%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Min		None	Min	Min	None	None	None	None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 85	
Actuated Cycle Length: 67.9	
Natural Cycle: 85	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 12: Center St/Linderson Way & Tumwater Blvd





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	565	95	70	720	45	145	80	75	200	195	1020
Future Volume (veh/h)	145	565	95	70	720	45	145	80	75	200	195	1020
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	159	621	104	77	791	49	159	88	82	220	214	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	1	1	1
Cap, veh/h	321	991	166	130	1092	487	200	289	245	209	299	
Arrive On Green	0.09	0.33	0.33	0.07	0.30	0.30	0.11	0.15	0.15	0.12	0.16	0.00
Sat Flow, veh/h	3456	3046	509	1795	3582	1598	1795	1885	1598	1795	1885	1598
Grp Volume(v), veh/h	159	362	363	77	791	49	159	88	82	220	214	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1779	1795	1791	1598	1795	1885	1598	1795	1885	1598
Q Serve(g_s), s	2.6	10.4	10.4	2.5	11.8	1.3	5.2	2.5	2.8	7.0	6.5	0.0
Cycle Q Clear(g_c), s	2.6	10.4	10.4	2.5	11.8	1.3	5.2	2.5	2.8	7.0	6.5	0.0
Prop In Lane	1.00		0.29	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	321	578	579	130	1092	487	200	289	245	209	299	
V/C Ratio(X)	0.50	0.63	0.63	0.59	0.72	0.10	0.80	0.30	0.33	1.05	0.72	
Avail Cap(c_a), veh/h	345	768	769	179	1549	691	209	815	691	209	815	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	25.9	17.2	17.2	27.0	18.6	15.0	26.1	22.6	22.7	26.6	24.0	0.0
Incr Delay (d2), s/veh	1.2	1.1	1.1	4.3	1.0	0.1	18.3	0.6	0.8	76.7	3.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	4.0	4.0	1.2	4.6	0.5	3.1	1.1	1.0	7.3	3.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.1	18.3	18.3	31.3	19.6	15.1	44.4	23.2	23.5	103.3	27.2	0.0
LnGrp LOS	C	B	B	C	B	B	D	C	C	F	C	
Approach Vol, veh/h		884			917			329			434	A
Approach Delay, s/veh		19.9			20.4			33.5			65.8	
Approach LOS		B			C			C			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.7	14.5	10.6	23.3	12.0	14.2	9.3	24.6
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	7.0	26.0	6.0	26.0	7.0	26.0	6.0	26.0
Max Q Clear Time (g_c+I1), s	7.2	8.5	4.6	13.8	9.0	4.8	4.5	12.4
Green Ext Time (p_c), s	0.0	1.1	0.1	4.5	0.0	0.7	0.0	3.9

Intersection Summary	
HCM 6th Ctrl Delay	29.6
HCM 6th LOS	C

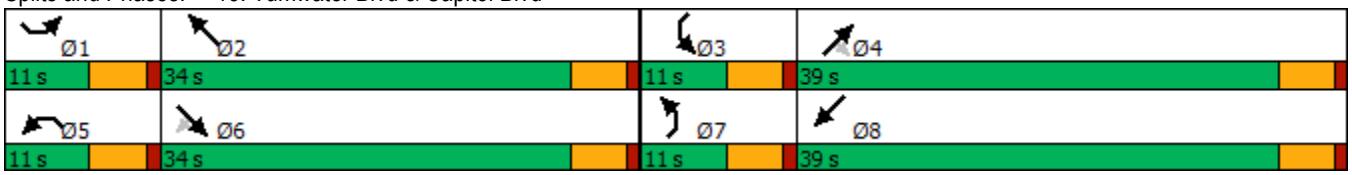
Notes

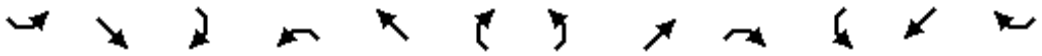
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	150	715	160	260	615	35	75	245	360	55	265	70
Future Volume (vph)	150	715	160	260	615	35	75	245	360	55	265	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		250	200		0	275		0	200		0
Storage Lanes	1		1	2		0	1		1	2		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		50			50			30			30	
Link Distance (ft)		951			1381			3726			881	
Travel Time (s)		13.0			18.8			84.7			20.0	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6						4			
Detector Phase	1	6	6	5	2		7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	11.0	34.0	34.0	11.0	34.0		11.0	39.0	39.0	11.0	39.0	
Total Split (s)	11.0	34.0	34.0	11.0	34.0		11.0	39.0	39.0	11.0	39.0	
Total Split (%)	11.6%	35.8%	35.8%	11.6%	35.8%		11.6%	41.1%	41.1%	11.6%	41.1%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Min	Min	None	Min		None	None	None	None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 95	
Actuated Cycle Length: 69.4	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 13: Tumwater Blvd & Capitol Blvd





Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	150	715	160	260	615	35	75	245	360	55	265	70
Future Volume (veh/h)	150	715	160	260	615	35	75	245	360	55	265	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	161	769	172	280	661	38	81	263	387	59	285	75
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	1	1	1	1	1	1	1	1	1
Cap, veh/h	146	1035	462	288	1011	58	119	549	465	103	795	206
Arrive On Green	0.08	0.29	0.29	0.08	0.29	0.29	0.07	0.29	0.29	0.06	0.28	0.28
Sat Flow, veh/h	1767	3526	1572	3483	3443	198	1795	1885	1598	1795	2817	728
Grp Volume(v), veh/h	161	769	172	280	344	355	81	263	387	59	179	181
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1742	1791	1850	1795	1885	1598	1795	1791	1754
Q Serve(g_s), s	6.0	14.3	6.3	5.8	12.2	12.2	3.2	8.4	16.5	2.3	5.8	6.0
Cycle Q Clear(g_c), s	6.0	14.3	6.3	5.8	12.2	12.2	3.2	8.4	16.5	2.3	5.8	6.0
Prop In Lane	1.00		1.00	1.00		0.11	1.00		1.00	1.00		0.42
Lane Grp Cap(c), veh/h	146	1035	462	288	526	543	119	549	465	103	505	495
V/C Ratio(X)	1.10	0.74	0.37	0.97	0.65	0.65	0.68	0.48	0.83	0.57	0.35	0.36
Avail Cap(c_a), veh/h	146	1407	628	288	715	738	148	882	747	148	838	821
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.3	23.2	20.4	33.3	22.4	22.4	33.2	21.2	24.1	33.4	20.8	20.9
Incr Delay (d2), s/veh	104.9	1.6	0.6	45.7	1.7	1.6	5.1	0.6	4.4	1.9	0.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.6	5.4	2.3	4.1	4.7	4.8	1.5	3.6	6.4	1.0	2.4	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	138.3	24.8	21.0	78.9	24.1	24.1	38.3	21.9	28.5	35.2	21.2	21.3
LnGrp LOS	F	C	C	E	C	C	D	C	C	D	C	C
Approach Vol, veh/h		1102			979			731			419	
Approach Delay, s/veh		40.8			39.8			27.2			23.2	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	26.3	9.2	26.2	11.0	26.3	9.8	25.5
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	6.0	29.0	6.0	34.0	6.0	29.0	6.0	34.0
Max Q Clear Time (g_c+I1), s	8.0	14.2	4.3	18.5	7.8	16.3	5.2	8.0
Green Ext Time (p_c), s	0.0	3.9	0.0	2.7	0.0	5.0	0.0	2.2

Intersection Summary	
HCM 6th Ctrl Delay	35.1
HCM 6th LOS	D

MOVEMENT SUMMARY

Site: 1 [Littlerock Road at Israel Road (Site Folder: General)]

Projected 2024 Without Project
PM Peak Hour
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: NB Littlerock Rd														
3	L2	245	1.0	258	1.0	0.590	12.6	LOS B	5.0	125.1	0.69	0.77	0.75	34.4
8	T1	280	1.0	295	1.0	0.590	7.2	LOS A	5.0	125.1	0.69	0.77	0.75	34.5
18	R2	80	1.0	84	1.0	0.590	7.2	LOS A	5.0	125.1	0.69	0.77	0.75	33.5
Approach		605	1.0	637	1.0	0.590	9.4	LOS A	5.0	125.1	0.69	0.77	0.75	34.3
East: WB Israel Rd														
1	L2	120	1.0	126	1.0	0.340	12.5	LOS B	2.6	65.3	0.77	0.74	0.77	34.3
6	T1	220	1.0	232	1.0	0.340	7.1	LOS A	2.6	65.3	0.77	0.74	0.77	34.4
16	R2	160	1.0	168	1.0	0.130	5.2	LOS A	0.8	19.5	0.50	0.57	0.50	35.5
Approach		500	1.0	526	1.0	0.340	7.8	LOS A	2.6	65.3	0.69	0.69	0.69	34.7
North: SB Littlerock Rd														
7	L2	135	1.0	142	1.0	0.361	13.2	LOS B	2.4	61.0	0.75	0.81	0.75	33.8
4	T1	430	1.0	453	1.0	0.361	7.7	LOS A	2.6	66.5	0.74	0.75	0.74	34.6
14	R2	95	1.0	100	1.0	0.361	7.4	LOS A	2.6	66.5	0.74	0.72	0.74	34.0
Approach		660	1.0	695	1.0	0.361	8.8	LOS A	2.6	66.5	0.74	0.76	0.74	34.3
West: EB 70th Ave														
5	L2	75	1.0	79	1.0	0.227	11.3	LOS B	1.1	26.6	0.58	0.68	0.58	34.8
2	T1	135	1.0	142	1.0	0.227	6.2	LOS A	1.1	26.6	0.58	0.68	0.58	34.8
12	R2	200	1.0	211	1.0	0.200	5.6	LOS A	0.9	21.8	0.51	0.66	0.51	35.2
Approach		410	1.0	432	1.0	0.227	6.8	LOS A	1.1	26.6	0.54	0.67	0.54	35.0
All Vehicles		2175	1.0	2289	1.0	0.590	8.4	LOS A	5.0	125.1	0.68	0.73	0.69	34.5

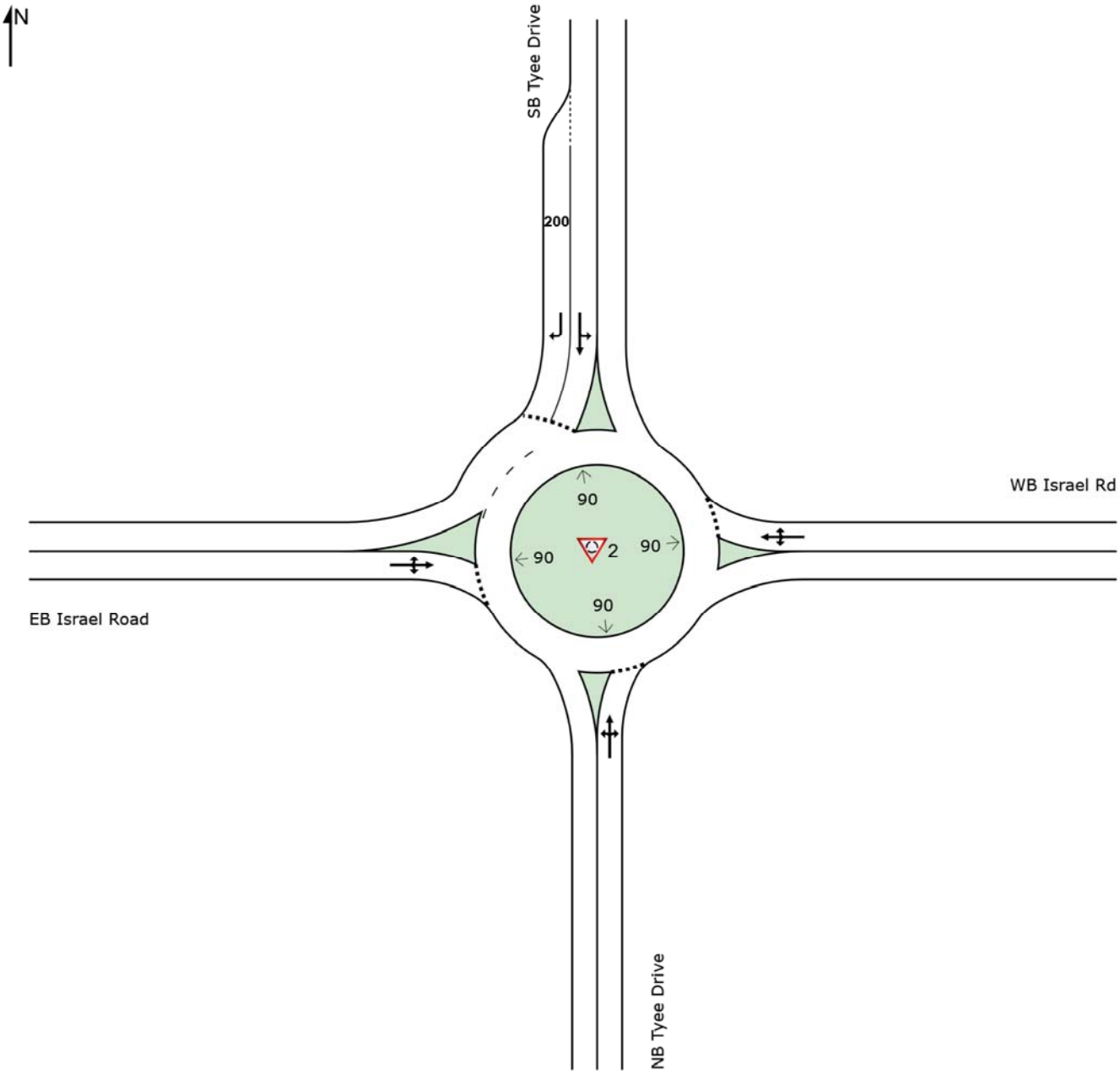
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 2 [Tyee Drive at Israel Road (Site Folder: General)]

Projected 2024 Without Project
PM Peak Hour
Site Category: (None)
Roundabout

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



MOVEMENT SUMMARY

Site: 2 [Tyee Drive at Israel Road (Site Folder: General)]

Projected 2024 Without Project
PM Peak Hour
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: NB Tyee Drive														
3	L2	30	3.0	33	3.0	0.107	13.4	LOS B	0.6	16.1	0.68	0.73	0.68	34.5
8	T1	5	3.0	5	3.0	0.107	7.8	LOS A	0.6	16.1	0.68	0.73	0.68	34.5
18	R2	45	3.0	49	3.0	0.107	7.8	LOS A	0.6	16.1	0.68	0.73	0.68	33.5
Approach		80	3.0	87	3.0	0.107	9.9	LOS A	0.6	16.1	0.68	0.73	0.68	33.9
East: WB Israel Rd														
1	L2	65	3.0	71	3.0	0.520	10.3	LOS B	4.0	100.9	0.38	0.50	0.38	36.4
6	T1	300	1.0	326	1.0	0.520	4.7	LOS A	4.0	100.9	0.38	0.50	0.38	36.4
16	R2	265	1.0	288	1.0	0.520	4.7	LOS A	4.0	100.9	0.38	0.50	0.38	35.3
Approach		630	1.2	685	1.2	0.520	5.3	LOS A	4.0	100.9	0.38	0.50	0.38	35.9
North: SB Tyee Drive														
7	L2	315	1.0	342	1.0	0.277	11.3	LOS B	1.8	44.9	0.57	0.71	0.57	33.6
4	T1	10	3.0	11	3.0	0.277	5.8	LOS A	1.8	44.9	0.57	0.71	0.57	33.5
14	R2	155	1.0	168	1.0	0.173	6.4	LOS A	1.0	24.1	0.56	0.65	0.56	35.1
Approach		480	1.0	522	1.0	0.277	9.6	LOS A	1.8	44.9	0.57	0.69	0.57	34.0
West: EB Israel Road														
5	L2	60	2.0	65	2.0	0.359	11.8	LOS B	2.3	57.4	0.61	0.66	0.61	35.4
2	T1	235	2.0	255	2.0	0.359	6.2	LOS A	2.3	57.4	0.61	0.66	0.61	35.4
12	R2	45	3.0	49	3.0	0.359	6.2	LOS A	2.3	57.4	0.61	0.66	0.61	34.3
Approach		340	2.1	370	2.1	0.359	7.2	LOS A	2.3	57.4	0.61	0.66	0.61	35.2
All Vehicles		1530	1.5	1663	1.5	0.520	7.3	LOS A	4.0	100.9	0.51	0.60	0.51	35.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	560	5	1	605	5	5
Future Vol, veh/h	560	5	1	605	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	636	6	1	688	6	6

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	642	0	1329	639
Stage 1	-	-	-	-	639	-
Stage 2	-	-	-	-	690	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	943	-	171	476
Stage 1	-	-	-	-	526	-
Stage 2	-	-	-	-	498	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	943	-	171	476
Mov Cap-2 Maneuver	-	-	-	-	171	-
Stage 1	-	-	-	-	526	-
Stage 2	-	-	-	-	497	-

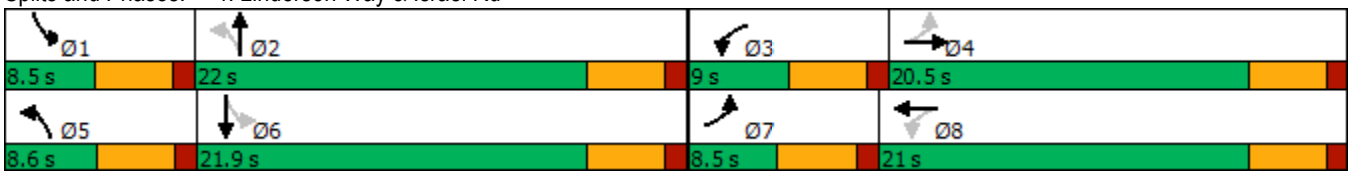
Approach	EB	WB	NB
HCM Control Delay, s	0	0	20
HCM LOS			C

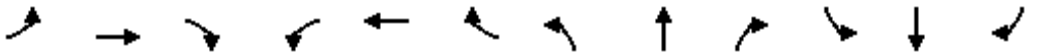
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	252	-	-	943	-
HCM Lane V/C Ratio	0.045	-	-	0.001	-
HCM Control Delay (s)	20	-	-	8.8	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	470	100	85	485	25	130	70	115	25	95	75
Future Volume (vph)	70	470	100	85	485	25	130	70	115	25	95	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	200		0	150		0	100		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2159			2743			2088			847	
Travel Time (s)		49.1			62.3			47.5			19.3	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	5.0		4.0	5.0		4.0	6.0		4.0	6.0	
Minimum Split (s)	8.5	20.5		8.5	20.5		8.5	21.5		8.5	21.5	
Total Split (s)	8.5	20.5		9.0	21.0		8.6	22.0		8.5	21.9	
Total Split (%)	14.2%	34.2%		15.0%	35.0%		14.3%	36.7%		14.2%	36.5%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Min		None	Min		None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 48.4	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 4: Linderson Way & Israel Rd





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	470	100	85	485	25	130	70	115	25	95	75
Future Volume (veh/h)	70	470	100	85	485	25	130	70	115	25	95	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	80	534	114	97	551	28	148	80	131	28	108	85
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	276	498	106	254	598	30	363	140	229	318	156	123
Arrive On Green	0.05	0.33	0.33	0.06	0.34	0.34	0.08	0.22	0.22	0.03	0.16	0.16
Sat Flow, veh/h	1795	1506	321	1795	1779	90	1795	643	1053	1795	977	769
Grp Volume(v), veh/h	80	0	648	97	0	579	148	0	211	28	0	193
Grp Sat Flow(s),veh/h/ln	1795	0	1827	1795	0	1869	1795	0	1696	1795	0	1747
Q Serve(g_s), s	1.4	0.0	16.2	1.7	0.0	14.6	3.3	0.0	5.5	0.6	0.0	5.1
Cycle Q Clear(g_c), s	1.4	0.0	16.2	1.7	0.0	14.6	3.3	0.0	5.5	0.6	0.0	5.1
Prop In Lane	1.00		0.18	1.00		0.05	1.00		0.62	1.00		0.44
Lane Grp Cap(c), veh/h	276	0	604	254	0	628	363	0	368	318	0	279
V/C Ratio(X)	0.29	0.00	1.07	0.38	0.00	0.92	0.41	0.00	0.57	0.09	0.00	0.69
Avail Cap(c_a), veh/h	325	0	604	311	0	628	363	0	605	418	0	619
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.0	0.0	16.4	12.3	0.0	15.7	15.4	0.0	17.2	16.6	0.0	19.5
Incr Delay (d2), s/veh	0.2	0.0	57.8	0.4	0.0	19.1	0.3	0.0	1.4	0.0	0.0	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	15.3	0.6	0.0	8.5	1.2	0.0	2.0	0.2	0.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.3	0.0	74.2	12.7	0.0	34.8	15.7	0.0	18.6	16.7	0.0	22.6
LnGrp LOS	B	A	F	B	A	C	B	A	B	B	A	C
Approach Vol, veh/h		728			676			359			221	
Approach Delay, s/veh		67.4			31.6			17.4			21.8	
Approach LOS		E			C			B			C	

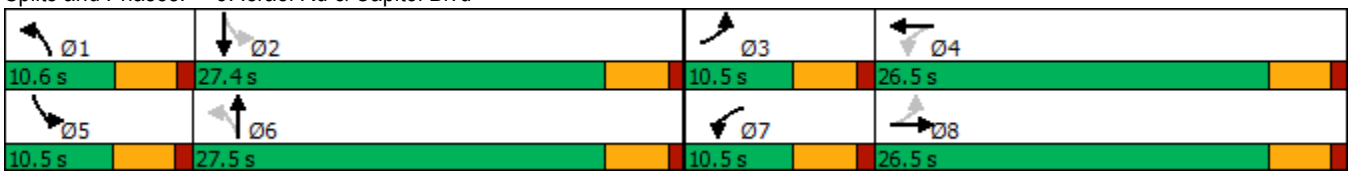
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.8	15.2	7.4	20.7	8.6	12.3	7.2	21.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	4.0	17.5	4.5	16.0	4.1	17.4	4.0	16.5
Max Q Clear Time (g_c+I1), s	2.6	7.5	3.7	18.2	5.3	7.1	3.4	16.6
Green Ext Time (p_c), s	0.0	0.8	0.0	0.0	0.0	0.7	0.0	0.0

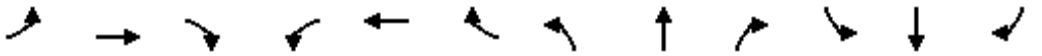
Intersection Summary	
HCM 6th Ctrl Delay	41.1
HCM 6th LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	220	175	60	205	105	245	590	30	50	695	140
Future Volume (vph)	140	220	175	60	205	105	245	590	30	50	695	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	150		0	150		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2743			725			951			620	
Travel Time (s)		62.3			16.5			21.6			14.1	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	0%	0%	0%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Detector Phase	3	8		7	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	10.5	26.5		10.5	26.5		10.5	26.5		10.5	26.5	
Total Split (s)	10.5	26.5		10.5	26.5		10.6	27.5		10.5	27.4	
Total Split (%)	14.0%	35.3%		14.0%	35.3%		14.1%	36.7%		14.0%	36.5%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 71.7	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 5: Israel Rd & Capitol Blvd





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	220	175	60	205	105	245	590	30	50	695	140
Future Volume (veh/h)	140	220	175	60	205	105	245	590	30	50	695	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	161	253	201	69	236	121	282	678	34	57	799	161
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	0	0	0	2	2	2	1	1	1	1	1	1
Cap, veh/h	338	282	224	251	310	159	289	1172	59	336	916	185
Arrive On Green	0.08	0.29	0.29	0.06	0.27	0.27	0.09	0.34	0.34	0.06	0.31	0.31
Sat Flow, veh/h	1810	981	779	1781	1165	597	1795	3471	174	1795	2970	598
Grp Volume(v), veh/h	161	0	454	69	0	357	282	350	362	57	482	478
Grp Sat Flow(s),veh/h/ln	1810	0	1760	1781	0	1763	1795	1791	1854	1795	1791	1777
Q Serve(g_s), s	4.5	0.0	17.5	1.9	0.0	13.2	6.1	11.4	11.4	1.5	18.0	18.0
Cycle Q Clear(g_c), s	4.5	0.0	17.5	1.9	0.0	13.2	6.1	11.4	11.4	1.5	18.0	18.0
Prop In Lane	1.00		0.44	1.00		0.34	1.00		0.09	1.00		0.34
Lane Grp Cap(c), veh/h	338	0	506	251	0	468	289	605	626	336	552	548
V/C Ratio(X)	0.48	0.00	0.90	0.27	0.00	0.76	0.98	0.58	0.58	0.17	0.87	0.87
Avail Cap(c_a), veh/h	338	0	548	290	0	549	289	605	626	386	580	576
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.8	0.0	24.2	18.5	0.0	23.9	21.5	19.3	19.3	15.4	23.1	23.1
Incr Delay (d2), s/veh	1.3	0.0	17.0	0.7	0.0	5.7	46.5	1.5	1.5	0.3	13.5	13.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	9.2	0.8	0.0	5.9	6.7	4.7	4.8	0.6	9.1	9.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.1	0.0	41.1	19.2	0.0	29.6	68.0	20.8	20.8	15.6	36.6	36.7
LnGrp LOS	B	A	D	B	A	C	E	C	C	B	D	D
Approach Vol, veh/h		615			426			994			1017	
Approach Delay, s/veh		35.4			27.9			34.2			35.5	
Approach LOS		D			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.6	26.3	10.5	23.3	8.5	28.4	9.0	24.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.1	22.9	6.0	22.0	6.0	23.0	6.0	22.0
Max Q Clear Time (g_c+I1), s	8.1	20.0	6.5	15.2	3.5	13.4	3.9	19.5
Green Ext Time (p_c), s	0.0	1.8	0.0	1.4	0.0	3.6	0.0	0.8

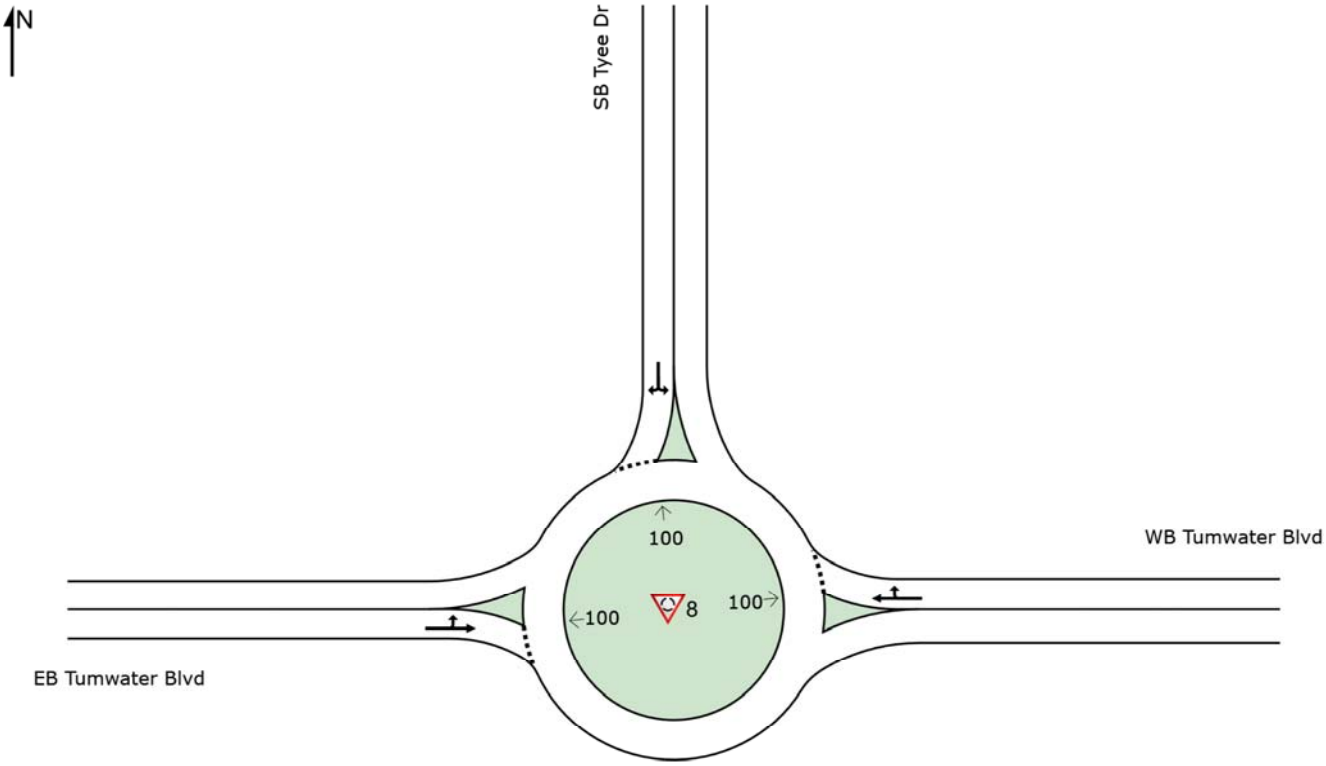
Intersection Summary	
HCM 6th Ctrl Delay	34.0
HCM 6th LOS	C

SITE LAYOUT

Site: 8 [Tyee Drive at Tumwater Blvd (Site Folder: General)]

Projected 2024 Without Project
PM Peak Hour
Site Category: (None)
Roundabout

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



Organisation: SCJ ALLIANCE | Licence: PLUS / 1PC | Created: Thursday, September 1, 2022 10:44:39 AM
Project: N:\Projects\5385 Israel Investments LLC\22-000439 Updated Belmont Flats\03 - Analysis\Operations\Sidra\Projected 2024 Without Project.sip9

MOVEMENT SUMMARY

Site: 8 [Tyee Drive at Tumwater Blvd (Site Folder: General)]

Projected 2024 Without Project
PM Peak Hour
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
East: WB Tumwater Blvd														
6	T1	600	1.0	652	1.0	0.595	3.9	LOS A	6.2	157.3	0.15	0.37	0.15	37.7
16	R2	150	1.0	165	1.0	0.595	4.0	LOS A	6.2	157.3	0.15	0.37	0.15	36.5
Approach		750	1.0	817	1.0	0.595	3.9	LOS A	6.2	157.3	0.15	0.37	0.15	37.5
North: SB Tyee Dr														
7	L2	100	1.0	110	1.0	0.140	13.3	LOS B	0.8	19.6	0.64	0.76	0.64	33.5
14	R2	10	1.0	11	1.0	0.140	7.4	LOS A	0.8	19.6	0.64	0.76	0.64	32.5
Approach		110	1.0	121	1.0	0.140	12.8	LOS B	0.8	19.6	0.64	0.76	0.64	33.4
West: EB Tumwater Blvd														
5	L2	10	1.0	11	1.0	0.502	10.7	LOS B	4.4	111.4	0.46	0.47	0.46	36.5
2	T1	555	1.0	603	1.0	0.502	4.7	LOS A	4.4	111.4	0.46	0.47	0.46	36.4
Approach		565	1.0	614	1.0	0.502	4.8	LOS A	4.4	111.4	0.46	0.47	0.46	36.4
All Vehicles		1425	1.0	1552	1.0	0.595	5.0	LOS A	6.2	157.3	0.31	0.44	0.31	36.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 9 [Littlerock Road at Tumwater Blvd (Site Folder: General)]

Projected 2024 Without Project
PM Peak Hour
Site Category: (None)
Roundabout

Vehicle Movement Performance

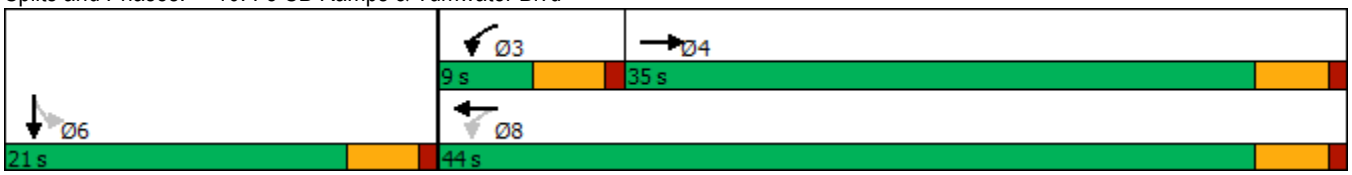
Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: NB Littlerock Rd														
8	T1	205	1.0	225	1.0	0.206	5.7	LOS A	1.2	30.8	0.54	0.54	0.54	36.1
18	R2	225	1.0	247	1.0	0.185	5.4	LOS A	1.1	29.0	0.52	0.58	0.52	35.4
Approach		430	1.0	473	1.0	0.206	5.5	LOS A	1.2	30.8	0.53	0.56	0.53	35.7
East: WB Tumwater Blvd														
1	L2	240	1.0	264	1.0	0.201	10.5	LOS B	1.0	25.6	0.36	0.65	0.36	34.2
16	R2	370	1.0	407	1.0	0.310	5.1	LOS A	1.7	43.6	0.40	0.53	0.40	36.0
Approach		610	1.0	670	1.0	0.310	7.2	LOS A	1.7	43.6	0.38	0.58	0.38	35.2
North: SB Littlerock Rd														
7	L2	340	1.0	374	1.0	0.449	11.0	LOS B	3.3	82.8	0.52	0.62	0.52	35.0
4	T1	465	1.0	511	1.0	0.449	5.7	LOS A	3.3	82.8	0.49	0.57	0.49	35.6
Approach		805	1.0	885	1.0	0.449	7.9	LOS A	3.3	82.8	0.50	0.59	0.50	35.4
All Vehicles		1845	1.0	2027	1.0	0.449	7.1	LOS A	3.3	82.8	0.47	0.58	0.47	35.4

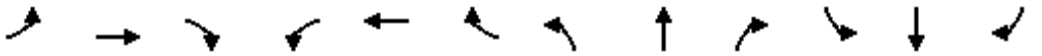
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	460	165	325	320	0	0	0	0	495	5	380
Future Volume (vph)	0	460	165	325	320	0	0	0	0	495	5	380
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	350		0	0		0	350		0
Storage Lanes	0		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		729			789			1457			1571	
Travel Time (s)		16.6			17.9			33.1			35.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	4%	4%	4%
Shared Lane Traffic (%)										10%		
Turn Type		NA		pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases				8						6		
Detector Phase		4		3	8					6	6	
Switch Phase												
Minimum Initial (s)		4.0		4.0	4.0					4.0	4.0	
Minimum Split (s)		20.5		8.5	20.5					20.5	20.5	
Total Split (s)		35.0		9.0	44.0					21.0	21.0	
Total Split (%)		53.8%		13.8%	67.7%					32.3%	32.3%	
Yellow Time (s)		3.5		3.5	3.5					3.5	3.5	
All-Red Time (s)		1.0		1.0	1.0					1.0	1.0	
Lost Time Adjust (s)		0.0		0.0	0.0					0.0	0.0	
Total Lost Time (s)		4.5		4.5	4.5					4.5	4.5	
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?		Yes		Yes								
Recall Mode		None		None	Min					None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 65	
Actuated Cycle Length: 49.3	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 10: I-5 SB Ramps & Tumwater Blvd





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	460	165	325	320	0	0	0	0	495	5	380
Future Volume (veh/h)	0	460	165	325	320	0	0	0	0	495	5	380
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1885	1885	1885	1885	0				1841	1841	1841
Adj Flow Rate, veh/h	0	484	174	342	337	0				463	86	400
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	1	1	1	1	0				4	4	4
Cap, veh/h	0	754	269	415	901	0				589	95	444
Arrive On Green	0.00	0.29	0.29	0.09	0.48	0.00				0.34	0.34	0.34
Sat Flow, veh/h	0	2680	924	1795	1885	0				1753	284	1320
Grp Volume(v), veh/h	0	334	324	342	337	0				463	0	486
Grp Sat Flow(s),veh/h/ln	0	1791	1719	1795	1885	0				1753	0	1603
Q Serve(g_s), s	0.0	7.9	8.0	4.5	5.5	0.0				11.5	0.0	14.0
Cycle Q Clear(g_c), s	0.0	7.9	8.0	4.5	5.5	0.0				11.5	0.0	14.0
Prop In Lane	0.00		0.54	1.00		0.00				1.00		0.82
Lane Grp Cap(c), veh/h	0	522	501	415	901	0				589	0	539
V/C Ratio(X)	0.00	0.64	0.65	0.82	0.37	0.00				0.79	0.00	0.90
Avail Cap(c_a), veh/h	0	1129	1084	415	1539	0				598	0	547
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	14.9	15.0	14.3	8.0	0.0				14.5	0.0	15.3
Incr Delay (d2), s/veh	0.0	1.3	1.4	12.6	0.3	0.0				6.8	0.0	18.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.9	2.8	3.5	1.8	0.0				4.9	0.0	6.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	16.2	16.4	26.9	8.3	0.0				21.2	0.0	33.3
LnGrp LOS	A	B	B	C	A	A				C	A	C
Approach Vol, veh/h		658			679						949	
Approach Delay, s/veh		16.3			17.7						27.4	
Approach LOS		B			B						C	

Timer - Assigned Phs		3	4		6		8					
Phs Duration (G+Y+Rc), s		9.0	18.6		20.8		27.6					
Change Period (Y+Rc), s		4.5	4.5		4.5		4.5					
Max Green Setting (Gmax), s		4.5	30.5		16.5		39.5					
Max Q Clear Time (g_c+I1), s		6.5	10.0		16.0		7.5					
Green Ext Time (p_c), s		0.0	4.2		0.3		2.2					

Intersection Summary	
HCM 6th Ctrl Delay	21.3
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	45.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	290	660	0	0	545	1455	100	1	160	0	0	0
Future Vol, veh/h	290	660	0	0	545	1455	100	1	160	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	350	-	-	-	-	0	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	1	1	1	3	3	3	0	0	0
Mvmt Flow	305	695	0	0	574	1532	105	1	168	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	574	0	-	-	-	0	1879	1879	348
Stage 1	-	-	-	-	-	-	1305	1305	-
Stage 2	-	-	-	-	-	-	574	574	-
Critical Hdwy	4.145	-	-	-	-	-	6.645	6.545	6.945
Critical Hdwy Stg 1	-	-	-	-	-	-	5.845	5.545	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.445	5.545	-
Follow-up Hdwy	2.2285	-	-	-	-	-	3.5285	4.0285	3.3285
Pot Cap-1 Maneuver	991	-	0	0	-	0	~ 70	70	646
Stage 1	-	-	0	0	-	0	217	228	-
Stage 2	-	-	0	0	-	0	560	500	-
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	991	-	-	-	-	-	~ 48	0	646
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 48	0	-
Stage 1	-	-	-	-	-	-	150	0	-
Stage 2	-	-	-	-	-	-	560	0	-

Approach	EB	WB	NB
HCM Control Delay, s	3.1	0	294
HCM LOS			F

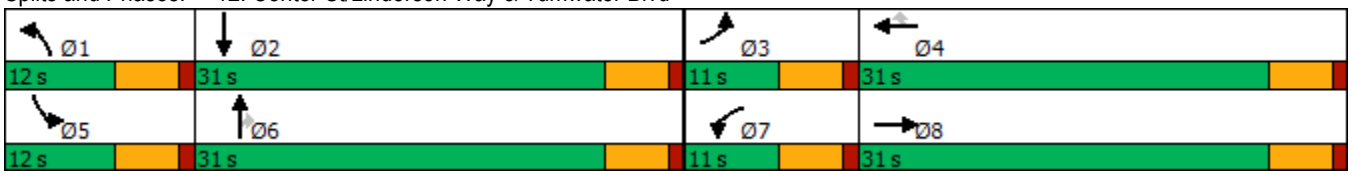
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT
Capacity (veh/h)	48	646	991	-	-
HCM Lane V/C Ratio	2.215	0.261	0.308	-	-
HCM Control Delay (s)	$ 740	12.5	10.2	-	-
HCM Lane LOS	F	B	B	-	-
HCM 95th %tile Q(veh)	10.9	1	1.3	-	-

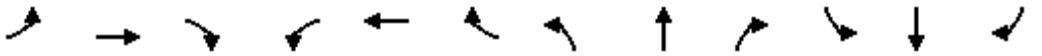
Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	600	100	70	775	50	150	85	80	225	205	1095
Future Volume (vph)	165	600	100	70	775	50	150	85	80	225	205	1095
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		0	350		250	250		150	300		700
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		895			3726			511			2088	
Travel Time (s)		20.3			84.7			11.6			47.5	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases						4			6			Free
Detector Phase	3	8		7	4	4	1	6	6	5	2	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	11.0	31.0		11.0	31.0	31.0	11.0	31.0	31.0	11.0	31.0	
Total Split (s)	11.0	31.0		11.0	31.0	31.0	12.0	31.0	31.0	12.0	31.0	
Total Split (%)	12.9%	36.5%		12.9%	36.5%	36.5%	14.1%	36.5%	36.5%	14.1%	36.5%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Min		None	Min	Min	None	None	None	None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 85	
Actuated Cycle Length: 69.6	
Natural Cycle: 85	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 12: Center St/Linderson Way & Tumwater Blvd





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	165	600	100	70	775	50	150	85	80	225	205	1095
Future Volume (veh/h)	165	600	100	70	775	50	150	85	80	225	205	1095
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	181	659	110	77	852	55	165	93	88	247	225	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	1	1	1
Cap, veh/h	316	1027	171	127	1132	505	200	307	260	200	307	
Arrive On Green	0.09	0.34	0.34	0.07	0.32	0.32	0.11	0.16	0.16	0.11	0.16	0.00
Sat Flow, veh/h	3456	3048	508	1795	3582	1598	1795	1885	1598	1795	1885	1598
Grp Volume(v), veh/h	181	384	385	77	852	55	165	93	88	247	225	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1779	1795	1791	1598	1795	1885	1598	1795	1885	1598
Q Serve(g_s), s	3.2	11.5	11.5	2.6	13.4	1.5	5.7	2.7	3.1	7.0	7.1	0.0
Cycle Q Clear(g_c), s	3.2	11.5	11.5	2.6	13.4	1.5	5.7	2.7	3.1	7.0	7.1	0.0
Prop In Lane	1.00		0.29	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	316	599	599	127	1132	505	200	307	260	200	307	
V/C Ratio(X)	0.57	0.64	0.64	0.61	0.75	0.11	0.83	0.30	0.34	1.24	0.73	
Avail Cap(c_a), veh/h	330	735	736	171	1482	661	200	780	661	200	780	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	27.4	17.6	17.6	28.4	19.3	15.2	27.3	23.2	23.3	27.9	25.0	0.0
Incr Delay (d2), s/veh	2.2	1.3	1.4	4.6	1.6	0.1	23.7	0.6	0.8	141.2	3.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	4.5	4.5	1.2	5.3	0.5	3.6	1.2	1.1	10.7	3.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.6	19.0	19.0	33.0	20.9	15.3	51.0	23.7	24.1	169.1	28.4	0.0
LnGrp LOS	C	B	B	C	C	B	D	C	C	F	C	
Approach Vol, veh/h		950			984			346			472	A
Approach Delay, s/veh		21.0			21.5			36.8			102.1	
Approach LOS		C			C			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	15.2	10.7	24.9	12.0	15.2	9.4	26.2
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	7.0	26.0	6.0	26.0	7.0	26.0	6.0	26.0
Max Q Clear Time (g_c+I1), s	7.7	9.1	5.2	15.4	9.0	5.1	4.6	13.5
Green Ext Time (p_c), s	0.0	1.1	0.0	4.5	0.0	0.7	0.0	4.0

Intersection Summary	
HCM 6th Ctrl Delay	37.1
HCM 6th LOS	D

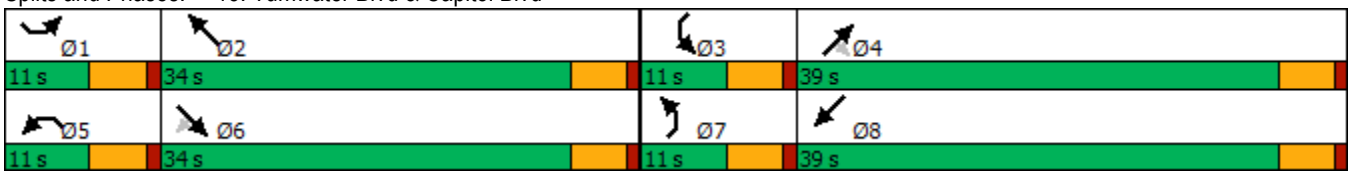
Notes

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

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	170	750	165	280	655	40	80	270	385	55	285	90
Future Volume (vph)	170	750	165	280	655	40	80	270	385	55	285	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		250	200		0	275		0	200		0
Storage Lanes	1		1	2		0	1		1	2		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		50			50			30			30	
Link Distance (ft)		951			1381			3726			881	
Travel Time (s)		13.0			18.8			84.7			20.0	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6						4			
Detector Phase	1	6	6	5	2		7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	11.0	34.0	34.0	11.0	34.0		11.0	39.0	39.0	11.0	39.0	
Total Split (s)	11.0	34.0	34.0	11.0	34.0		11.0	39.0	39.0	11.0	39.0	
Total Split (%)	11.6%	35.8%	35.8%	11.6%	35.8%		11.6%	41.1%	41.1%	11.6%	41.1%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Min	Min	None	Min		None	None	None	None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 95	
Actuated Cycle Length: 73.7	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 13: Tumwater Blvd & Capitol Blvd



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	170	750	165	280	655	40	80	270	385	55	285	90
Future Volume (veh/h)	170	750	165	280	655	40	80	270	385	55	285	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	183	806	177	301	704	43	86	290	414	59	306	97
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	1	1	1	1	1	1	1	1	1
Cap, veh/h	139	1050	468	274	1021	62	118	577	489	101	796	248
Arrive On Green	0.08	0.30	0.30	0.08	0.30	0.30	0.07	0.31	0.31	0.06	0.30	0.30
Sat Flow, veh/h	1767	3526	1572	3483	3429	209	1795	1885	1598	1795	2689	837
Grp Volume(v), veh/h	183	806	177	301	367	380	86	290	414	59	202	201
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1742	1791	1848	1795	1885	1598	1795	1791	1735
Q Serve(g_s), s	6.0	15.9	6.8	6.0	13.8	13.9	3.6	9.6	18.5	2.4	6.8	7.1
Cycle Q Clear(g_c), s	6.0	15.9	6.8	6.0	13.8	13.9	3.6	9.6	18.5	2.4	6.8	7.1
Prop In Lane	1.00		1.00	1.00		0.11	1.00		1.00	1.00		0.48
Lane Grp Cap(c), veh/h	139	1050	468	274	533	550	118	577	489	101	530	513
V/C Ratio(X)	1.32	0.77	0.38	1.10	0.69	0.69	0.73	0.50	0.85	0.59	0.38	0.39
Avail Cap(c_a), veh/h	139	1339	597	274	680	701	141	839	711	141	797	772
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.2	24.4	21.2	35.2	23.7	23.7	35.0	21.7	24.8	35.2	21.3	21.4
Incr Delay (d2), s/veh	184.8	2.3	0.6	83.9	2.4	2.3	10.5	0.7	6.4	2.0	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.5	6.1	2.5	5.5	5.5	5.7	1.9	4.2	7.5	1.1	2.8	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	220.0	26.7	21.8	119.1	26.1	26.0	45.5	22.4	31.3	37.2	21.8	21.9
LnGrp LOS	F	C	C	F	C	C	D	C	C	D	C	C
Approach Vol, veh/h		1166			1048			790			462	
Approach Delay, s/veh		56.3			52.8			29.6			23.8	
Approach LOS		E			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	27.7	9.3	28.4	11.0	27.7	10.0	27.6
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	6.0	29.0	6.0	34.0	6.0	29.0	6.0	34.0
Max Q Clear Time (g_c+I1), s	8.0	15.9	4.4	20.5	8.0	17.9	5.6	9.1
Green Ext Time (p_c), s	0.0	4.0	0.0	2.8	0.0	4.8	0.0	2.5

Intersection Summary	
HCM 6th Ctrl Delay	44.8
HCM 6th LOS	D

MOVEMENT SUMMARY

Site: 1 [Littlerock Road at Israel Road (Site Folder: General)]

Projected 2024 With Project
PM Peak Hour
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: NB Littlerock Rd														
3	L2	245	1.0	258	1.0	0.603	13.1	LOS B	5.3	132.9	0.72	0.80	0.80	34.3
8	T1	280	1.0	295	1.0	0.603	7.7	LOS A	5.3	132.9	0.72	0.80	0.80	34.3
18	R2	80	1.0	84	1.0	0.603	7.7	LOS A	5.3	132.9	0.72	0.80	0.80	33.4
Approach		605	1.0	637	1.0	0.603	9.9	LOS A	5.3	132.9	0.72	0.80	0.80	34.2
East: WB Israel Rd														
1	L2	120	1.0	126	1.0	0.347	12.5	LOS B	2.7	67.3	0.78	0.74	0.78	34.3
6	T1	225	1.0	237	1.0	0.347	7.1	LOS A	2.7	67.3	0.78	0.74	0.78	34.4
16	R2	175	1.0	184	1.0	0.142	5.2	LOS A	0.9	21.7	0.51	0.58	0.51	35.5
Approach		520	1.0	547	1.0	0.347	7.7	LOS A	2.7	67.3	0.69	0.68	0.69	34.7
North: SB Littlerock Rd														
7	L2	160	1.0	168	1.0	0.377	13.3	LOS B	2.6	64.4	0.76	0.82	0.76	33.6
4	T1	430	1.0	453	1.0	0.377	7.8	LOS A	2.8	70.4	0.76	0.76	0.76	34.5
14	R2	95	1.0	100	1.0	0.377	7.5	LOS A	2.8	70.4	0.75	0.73	0.75	34.0
Approach		685	1.0	721	1.0	0.377	9.0	LOS A	2.8	70.4	0.76	0.77	0.76	34.2
West: EB 70th Ave														
5	L2	75	1.0	79	1.0	0.236	11.3	LOS B	1.1	27.9	0.59	0.69	0.59	34.8
2	T1	140	1.0	147	1.0	0.236	6.3	LOS A	1.1	27.9	0.59	0.69	0.59	34.7
12	R2	200	1.0	211	1.0	0.200	5.6	LOS A	0.9	22.0	0.51	0.66	0.51	35.2
Approach		415	1.0	437	1.0	0.236	6.9	LOS A	1.1	27.9	0.55	0.67	0.55	35.0
All Vehicles		2225	1.0	2342	1.0	0.603	8.5	LOS A	5.3	132.9	0.69	0.74	0.71	34.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2 [Tyee Drive at Israel Road (Site Folder: General)]

Projected 2024 With Project
PM Peak Hour
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: NB Tyee Drive														
3	L2	60	1.0	65	1.0	0.162	13.4	LOS B	1.0	25.1	0.70	0.76	0.70	34.3
8	T1	10	1.0	11	1.0	0.162	7.8	LOS A	1.0	25.1	0.70	0.76	0.70	34.2
18	R2	55	1.0	60	1.0	0.162	7.7	LOS A	1.0	25.1	0.70	0.76	0.70	33.3
Approach		125	1.0	136	1.0	0.162	10.5	LOS B	1.0	25.1	0.70	0.76	0.70	33.8
East: WB Israel Rd														
1	L2	80	1.0	87	1.0	0.542	10.6	LOS B	4.2	105.5	0.45	0.53	0.45	36.2
6	T1	295	1.0	321	1.0	0.542	5.0	LOS A	4.2	105.5	0.45	0.53	0.45	36.1
16	R2	265	1.0	288	1.0	0.542	4.9	LOS A	4.2	105.5	0.45	0.53	0.45	35.1
Approach		640	1.0	696	1.0	0.542	5.7	LOS A	4.2	105.5	0.45	0.53	0.45	35.7
North: SB Tyee Drive														
7	L2	315	1.0	342	1.0	0.285	11.6	LOS B	1.9	47.7	0.61	0.73	0.61	33.5
4	T1	10	1.0	11	1.0	0.285	6.0	LOS A	1.9	47.7	0.61	0.73	0.61	33.5
14	R2	155	1.0	168	1.0	0.179	6.6	LOS A	1.0	25.6	0.59	0.67	0.59	35.1
Approach		480	1.0	522	1.0	0.285	9.9	LOS A	1.9	47.7	0.60	0.71	0.60	34.0
West: EB Israel Road														
5	L2	60	2.0	65	2.0	0.395	12.0	LOS B	2.6	65.3	0.64	0.67	0.64	35.4
2	T1	230	2.0	250	2.0	0.395	6.4	LOS A	2.6	65.3	0.64	0.67	0.64	35.3
12	R2	80	2.0	87	2.0	0.395	6.4	LOS A	2.6	65.3	0.64	0.67	0.64	34.3
Approach		370	2.0	402	2.0	0.395	7.3	LOS A	2.6	65.3	0.64	0.67	0.64	35.1
All Vehicles		1615	1.2	1755	1.2	0.542	7.7	LOS A	4.2	105.5	0.56	0.63	0.56	34.9

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	565	5	25	610	5	20
Future Vol, veh/h	565	5	25	610	5	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	1	1	0	0
Mvmt Flow	642	6	28	693	6	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	648	0	1394	645
Stage 1	-	-	-	-	645	-
Stage 2	-	-	-	-	749	-
Critical Hdwy	-	-	4.11	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.209	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	943	-	158	476
Stage 1	-	-	-	-	526	-
Stage 2	-	-	-	-	471	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	943	-	150	476
Mov Cap-2 Maneuver	-	-	-	-	150	-
Stage 1	-	-	-	-	526	-
Stage 2	-	-	-	-	448	-

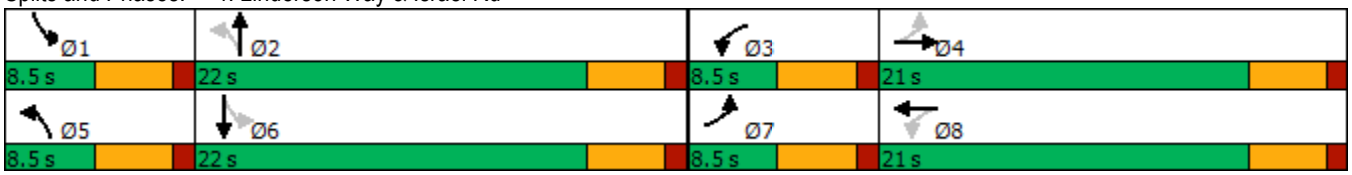
Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	16.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	332	-	-	943	-
HCM Lane V/C Ratio	0.086	-	-	0.03	-
HCM Control Delay (s)	16.9	-	-	8.9	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	480	110	85	500	25	145	70	115	25	95	80
Future Volume (vph)	70	480	110	85	500	25	145	70	115	25	95	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	200		0	150		0	100		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2159			2743			2088			847	
Travel Time (s)		49.1			62.3			47.5			19.3	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	5.0		4.0	5.0		4.0	6.0		4.0	6.0	
Minimum Split (s)	8.5	20.5		8.5	20.5		8.5	21.5		8.5	21.5	
Total Split (s)	8.5	21.0		8.5	21.0		8.5	22.0		8.5	22.0	
Total Split (%)	14.2%	35.0%		14.2%	35.0%		14.2%	36.7%		14.2%	36.7%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Min		None	Min		None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 48.2	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 4: Linderson Way & Israel Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	480	110	85	500	25	145	70	115	25	95	80
Future Volume (veh/h)	70	480	110	85	500	25	145	70	115	25	95	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	80	545	125	97	568	28	165	80	131	28	108	91
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	1	1	1	2	2	2	2	2	2	2	2	2
Cap, veh/h	263	494	113	251	598	29	354	140	228	316	154	129
Arrive On Green	0.05	0.33	0.33	0.06	0.34	0.34	0.08	0.22	0.22	0.03	0.16	0.16
Sat Flow, veh/h	1795	1484	340	1781	1768	87	1781	638	1044	1781	938	790
Grp Volume(v), veh/h	80	0	670	97	0	596	165	0	211	28	0	199
Grp Sat Flow(s),veh/h/ln	1795	0	1824	1781	0	1855	1781	0	1682	1781	0	1728
Q Serve(g_s), s	1.4	0.0	16.5	1.7	0.0	15.5	3.8	0.0	5.6	0.6	0.0	5.4
Cycle Q Clear(g_c), s	1.4	0.0	16.5	1.7	0.0	15.5	3.8	0.0	5.6	0.6	0.0	5.4
Prop In Lane	1.00		0.19	1.00		0.05	1.00		0.62	1.00		0.46
Lane Grp Cap(c), veh/h	263	0	607	251	0	628	354	0	368	316	0	283
V/C Ratio(X)	0.30	0.00	1.10	0.39	0.00	0.95	0.47	0.00	0.57	0.09	0.00	0.70
Avail Cap(c_a), veh/h	311	0	607	289	0	628	354	0	594	414	0	610
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.3	0.0	16.5	12.4	0.0	16.0	15.8	0.0	17.3	16.6	0.0	19.6
Incr Delay (d2), s/veh	0.2	0.0	68.2	0.4	0.0	24.1	0.4	0.0	1.4	0.0	0.0	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	17.2	0.6	0.0	9.7	1.4	0.0	2.0	0.2	0.0	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.6	0.0	84.7	12.8	0.0	40.1	16.1	0.0	18.7	16.7	0.0	22.8
LnGrp LOS	B	A	F	B	A	D	B	A	B	B	A	C
Approach Vol, veh/h		750			693			376			227	
Approach Delay, s/veh		77.0			36.3			17.6			22.0	
Approach LOS		E			D			B			C	

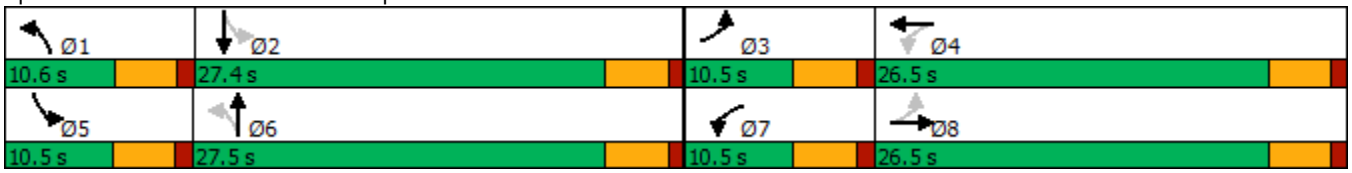
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.8	15.3	7.4	21.0	8.5	12.6	7.2	21.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	4.0	17.5	4.0	16.5	4.0	17.5	4.0	16.5
Max Q Clear Time (g_c+I1), s	2.6	7.6	3.7	18.5	5.8	7.4	3.4	17.5
Green Ext Time (p_c), s	0.0	0.8	0.0	0.0	0.0	0.7	0.0	0.0

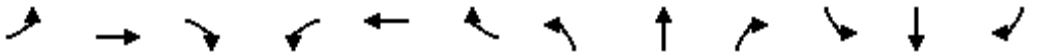
Intersection Summary	
HCM 6th Ctrl Delay	46.2
HCM 6th LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	145	225	275	60	210	105	245	590	30	50	695	150
Future Volume (vph)	145	225	275	60	210	105	245	590	30	50	695	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	150		0	150		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2743			725			951			620	
Travel Time (s)		62.3			16.5			21.6			14.1	
Confl. Peds. (#/hr)	2		1	1		2	2		1	1		2
Confl. Bikes (#/hr)									2			
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	0%	0%	0%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Detector Phase	3	8		7	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	10.5	26.5		10.5	26.5		10.5	26.5		10.5	26.5	
Total Split (s)	10.5	26.5		10.5	26.5		10.6	27.5		10.5	27.4	
Total Split (%)	14.0%	35.3%		14.0%	35.3%		14.1%	36.7%		14.0%	36.5%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 72.3	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 5: Israel Rd & Capitol Blvd





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	225	275	60	210	105	245	590	30	50	695	150
Future Volume (veh/h)	145	225	275	60	210	105	245	590	30	50	695	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	167	259	316	69	241	121	282	678	34	57	799	172
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	0	0	0	2	2	2	1	1	1	1	1	1
Cap, veh/h	347	235	287	209	331	166	275	1152	58	326	894	192
Arrive On Green	0.08	0.30	0.30	0.06	0.28	0.28	0.08	0.33	0.33	0.06	0.31	0.31
Sat Flow, veh/h	1810	778	949	1781	1174	589	1795	3466	174	1795	2930	631
Grp Volume(v), veh/h	167	0	575	69	0	362	282	350	362	57	488	483
Grp Sat Flow(s),veh/h/ln	1810	0	1727	1781	0	1763	1795	1791	1849	1795	1791	1769
Q Serve(g_s), s	4.7	0.0	22.0	1.9	0.0	13.5	6.1	11.8	11.8	1.5	19.0	19.0
Cycle Q Clear(g_c), s	4.7	0.0	22.0	1.9	0.0	13.5	6.1	11.8	11.8	1.5	19.0	19.0
Prop In Lane	1.00		0.55	1.00		0.33	1.00		0.09	1.00		0.36
Lane Grp Cap(c), veh/h	347	0	522	209	0	496	275	596	615	326	547	540
V/C Ratio(X)	0.48	0.00	1.10	0.33	0.00	0.73	1.02	0.59	0.59	0.17	0.89	0.89
Avail Cap(c_a), veh/h	347	0	522	246	0	532	275	596	615	373	563	556
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.7	0.0	25.4	19.2	0.0	23.7	22.5	20.2	20.2	16.1	24.2	24.2
Incr Delay (d2), s/veh	1.2	0.0	70.4	1.1	0.0	4.9	60.8	1.7	1.6	0.3	16.6	16.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	18.6	0.8	0.0	6.0	6.4	4.9	5.1	0.6	10.0	9.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.0	0.0	95.8	20.3	0.0	28.6	83.2	21.8	21.8	16.4	40.7	40.9
LnGrp LOS	B	A	F	C	A	C	F	C	C	B	D	D
Approach Vol, veh/h		742			431			994			1028	
Approach Delay, s/veh		78.5			27.3			39.2			39.5	
Approach LOS		E			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.6	26.7	10.5	25.0	8.6	28.7	9.0	26.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.1	22.9	6.0	22.0	6.0	23.0	6.0	22.0
Max Q Clear Time (g_c+I1), s	8.1	21.0	6.7	15.5	3.5	13.8	3.9	24.0
Green Ext Time (p_c), s	0.0	1.2	0.0	1.4	0.0	3.4	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	46.8
HCM 6th LOS	D

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	35	90	35	0	170
Future Vol, veh/h	0	35	90	35	0	170
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	38	98	38	0	185

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	117	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	935	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	935	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	935	-
HCM Lane V/C Ratio	-	-	0.041	-
HCM Control Delay (s)	-	-	9	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	0.1	-

Intersection	
Int Delay, s/veh	3.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	90	10	115	90	55	120
Future Vol, veh/h	90	10	115	90	55	120
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	98	11	125	98	60	130

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	424	174	0	0	223	0
Stage 1	174	-	-	-	-	-
Stage 2	250	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	587	869	-	-	1346	-
Stage 1	856	-	-	-	-	-
Stage 2	792	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	561	869	-	-	1346	-
Mov Cap-2 Maneuver	619	-	-	-	-	-
Stage 1	856	-	-	-	-	-
Stage 2	756	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.8	0	2.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	637	1346	-
HCM Lane V/C Ratio	-	-	0.171	0.044	-
HCM Control Delay (s)	-	-	11.8	7.8	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.6	0.1	-

MOVEMENT SUMMARY

Site: 8 [Tyee Drive at Tumwater Blvd (Site Folder: General)]

Projected 2024 With Project
PM Peak Hour
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
East: WB Tumwater Blvd														
6	T1	595	1.0	647	1.0	0.691	4.1	LOS A	9.2	233.0	0.32	0.38	0.32	37.1
16	R2	260	1.0	286	1.0	0.691	4.2	LOS A	9.2	233.0	0.32	0.38	0.32	36.0
Approach		855	1.0	932	1.0	0.691	4.2	LOS A	9.2	233.0	0.32	0.38	0.32	36.7
North: SB Tyee Dr														
7	L2	180	1.0	198	1.0	0.265	13.6	LOS B	1.6	40.9	0.70	0.81	0.70	33.3
14	R2	20	1.0	22	1.0	0.265	7.7	LOS A	1.6	40.9	0.70	0.81	0.70	32.4
Approach		200	1.0	220	1.0	0.265	13.0	LOS B	1.6	40.9	0.70	0.81	0.70	33.2
West: EB Tumwater Blvd														
5	L2	25	1.0	27	1.0	0.559	11.5	LOS B	5.0	125.4	0.63	0.56	0.63	35.9
2	T1	550	1.0	598	1.0	0.559	5.5	LOS A	5.0	125.4	0.63	0.56	0.63	35.8
Approach		575	1.0	625	1.0	0.559	5.8	LOS A	5.0	125.4	0.63	0.56	0.63	35.8
All Vehicles		1630	1.0	1777	1.0	0.691	5.8	LOS A	9.2	233.0	0.47	0.50	0.47	35.9

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 9 [Littlerock Road at Tumwater Blvd (Site Folder: General)]

Projected 2024 With Project
PM Peak Hour
Site Category: (None)
Roundabout

Vehicle Movement Performance

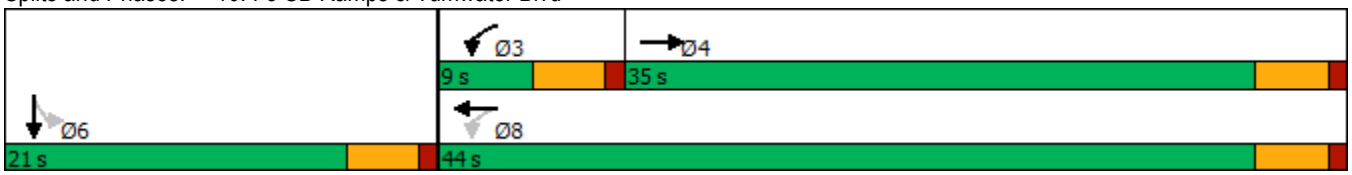
Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: NB Littlerock Rd														
8	T1	205	1.0	225	1.0	0.206	5.7	LOS A	1.2	30.9	0.54	0.54	0.54	36.1
18	R2	230	1.0	253	1.0	0.189	5.4	LOS A	1.2	29.8	0.52	0.59	0.52	35.4
Approach		435	1.0	478	1.0	0.206	5.5	LOS A	1.2	30.9	0.53	0.56	0.53	35.7
East: WB Tumwater Blvd														
1	L2	245	1.0	269	1.0	0.205	10.5	LOS B	1.0	26.2	0.36	0.65	0.36	34.2
16	R2	370	1.0	407	1.0	0.310	5.1	LOS A	1.7	43.6	0.40	0.53	0.40	36.0
Approach		615	1.0	676	1.0	0.310	7.3	LOS A	1.7	43.6	0.39	0.58	0.39	35.2
North: SB Littlerock Rd														
7	L2	340	1.0	374	1.0	0.451	11.0	LOS B	3.3	83.3	0.53	0.62	0.53	35.0
4	T1	465	1.0	511	1.0	0.451	5.7	LOS A	3.3	83.3	0.50	0.57	0.50	35.6
Approach		805	1.0	885	1.0	0.451	7.9	LOS A	3.3	83.3	0.51	0.59	0.51	35.4
All Vehicles		1855	1.0	2038	1.0	0.451	7.2	LOS A	3.3	83.3	0.47	0.58	0.47	35.4

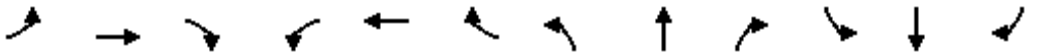
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	525	180	325	365	0	0	0	0	495	5	440
Future Volume (vph)	0	525	180	325	365	0	0	0	0	495	5	440
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	350		0	0		0	350		0
Storage Lanes	0		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		546			789			1457			1571	
Travel Time (s)		12.4			17.9			33.1			35.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	4%	4%	4%
Shared Lane Traffic (%)										10%		
Turn Type		NA		pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases				8						6		
Detector Phase		4		3	8					6	6	
Switch Phase												
Minimum Initial (s)		4.0		4.0	4.0					4.0	4.0	
Minimum Split (s)		20.5		8.5	20.5					20.5	20.5	
Total Split (s)		35.0		9.0	44.0					21.0	21.0	
Total Split (%)		53.8%		13.8%	67.7%					32.3%	32.3%	
Yellow Time (s)		3.5		3.5	3.5					3.5	3.5	
All-Red Time (s)		1.0		1.0	1.0					1.0	1.0	
Lost Time Adjust (s)		0.0		0.0	0.0					0.0	0.0	
Total Lost Time (s)		4.5		4.5	4.5					4.5	4.5	
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?		Yes		Yes								
Recall Mode		None		None	Max					None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 65	
Actuated Cycle Length: 65	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 10: I-5 SB Ramps & Tumwater Blvd





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	525	180	325	365	0	0	0	0	495	5	440
Future Volume (veh/h)	0	525	180	325	365	0	0	0	0	495	5	440
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1885	1885	1885	1885	0				1841	1841	1841
Adj Flow Rate, veh/h	0	553	189	342	384	0				494	42	463
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	1	1	1	1	0				4	4	4
Cap, veh/h	0	1230	419	471	1146	0				445	33	368
Arrive On Green	0.00	0.47	0.47	0.07	0.61	0.00				0.25	0.25	0.25
Sat Flow, veh/h	0	2716	893	1795	1885	0				1753	131	1449
Grp Volume(v), veh/h	0	377	365	342	384	0				494	0	505
Grp Sat Flow(s),veh/h/ln	0	1791	1724	1795	1885	0				1753	0	1580
Q Serve(g_s), s	0.0	9.2	9.3	4.5	6.5	0.0				16.5	0.0	16.5
Cycle Q Clear(g_c), s	0.0	9.2	9.3	4.5	6.5	0.0				16.5	0.0	16.5
Prop In Lane	0.00		0.52	1.00		0.00				1.00		0.92
Lane Grp Cap(c), veh/h	0	840	809	471	1146	0				445	0	401
V/C Ratio(X)	0.00	0.45	0.45	0.73	0.34	0.00				1.11	0.00	1.26
Avail Cap(c_a), veh/h	0	840	809	471	1146	0				445	0	401
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	11.6	11.6	12.6	6.3	0.0				24.2	0.0	24.3
Incr Delay (d2), s/veh	0.0	0.4	0.4	5.5	0.8	0.0				76.1	0.0	135.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.3	3.2	2.8	2.3	0.0				15.7	0.0	20.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	12.0	12.0	18.1	7.1	0.0				100.3	0.0	159.6
LnGrp LOS	A	B	B	B	A	A				F	A	F
Approach Vol, veh/h		742			726						999	
Approach Delay, s/veh		12.0			12.3						130.3	
Approach LOS		B			B						F	

Timer - Assigned Phs		3	4		6		8					
Phs Duration (G+Y+Rc), s		9.0	35.0		21.0		44.0					
Change Period (Y+Rc), s		4.5	4.5		4.5		4.5					
Max Green Setting (Gmax), s		4.5	30.5		16.5		39.5					
Max Q Clear Time (g_c+I1), s		6.5	11.3		18.5		8.5					
Green Ext Time (p_c), s		0.0	4.7		0.0		2.5					

Intersection Summary	
HCM 6th Ctrl Delay	60.0
HCM 6th LOS	E

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	92.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	335	680	0	0	570	1455	120	1	160	0	0	0
Future Vol, veh/h	335	680	0	0	570	1455	120	1	160	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	350	-	-	-	-	0	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	1	1	1	3	3	3	0	0	0
Mvmt Flow	353	716	0	0	600	1532	126	1	168	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	600	0	-	-	-	0	2022	2022	358
Stage 1	-	-	-	-	-	-	1422	1422	-
Stage 2	-	-	-	-	-	-	600	600	-
Critical Hdwy	4.145	-	-	-	-	-	6.645	6.545	6.945
Critical Hdwy Stg 1	-	-	-	-	-	-	5.845	5.545	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.445	5.545	-
Follow-up Hdwy	2.2285	-	-	-	-	-	3.5285	4.0285	3.3285
Pot Cap-1 Maneuver	969	-	0	0	-	0	~ 56	57	637
Stage 1	-	-	0	0	-	0	188	200	-
Stage 2	-	-	0	0	-	0	545	487	-
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	969	-	-	-	-	-	~ 36	0	637
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 36	0	-
Stage 1	-	-	-	-	-	-	~ 120	0	-
Stage 2	-	-	-	-	-	-	545	0	-

Approach	EB	WB	NB
HCM Control Delay, s	3.6	0	$ 598.3
HCM LOS			F

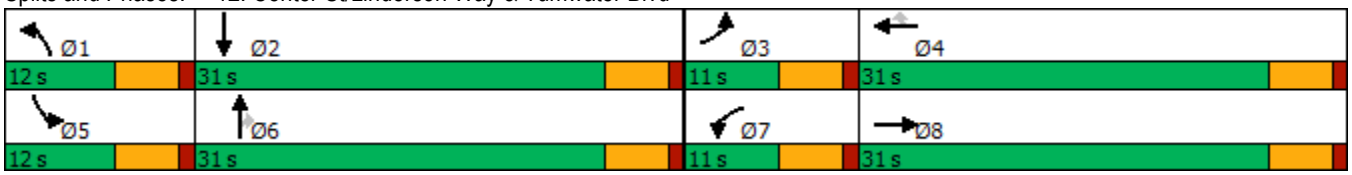
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT
Capacity (veh/h)	36	637	969	-	-
HCM Lane V/C Ratio	3.538	0.264	0.364	-	-
HCM Control Delay (s)	$ 1372.7	12.7	10.8	-	-
HCM Lane LOS	F	B	B	-	-
HCM 95th %tile Q(veh)	14.7	1.1	1.7	-	-

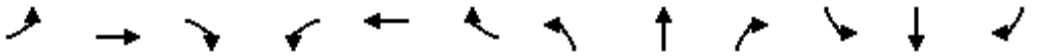
Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	620	100	70	800	50	150	85	80	225	205	1095
Future Volume (vph)	165	620	100	70	800	50	150	85	80	225	205	1095
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		0	350		250	250		150	300		700
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		895			3726			511			2088	
Travel Time (s)		20.3			84.7			11.6			47.5	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases						4			6			Free
Detector Phase	3	8		7	4	4	1	6	6	5	2	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	11.0	31.0		11.0	31.0	31.0	11.0	31.0	31.0	11.0	31.0	
Total Split (s)	11.0	31.0		11.0	31.0	31.0	12.0	31.0	31.0	12.0	31.0	
Total Split (%)	12.9%	36.5%		12.9%	36.5%	36.5%	14.1%	36.5%	36.5%	14.1%	36.5%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Min		None	Min	Min	None	None	None	None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 85	
Actuated Cycle Length: 70.1	
Natural Cycle: 85	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 12: Center St/Linderson Way & Tumwater Blvd





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	165	620	100	70	800	50	150	85	80	225	205	1095
Future Volume (veh/h)	165	620	100	70	800	50	150	85	80	225	205	1095
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	181	681	110	77	879	55	165	93	88	247	225	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	1	1	1
Cap, veh/h	313	1048	169	126	1153	514	198	306	259	198	306	
Arrive On Green	0.09	0.34	0.34	0.07	0.32	0.32	0.11	0.16	0.16	0.11	0.16	0.00
Sat Flow, veh/h	3456	3064	494	1795	3582	1598	1795	1885	1598	1795	1885	1598
Grp Volume(v), veh/h	181	395	396	77	879	55	165	93	88	247	225	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1781	1795	1791	1598	1795	1885	1598	1795	1885	1598
Q Serve(g_s), s	3.2	11.9	12.0	2.6	14.0	1.5	5.7	2.8	3.1	7.0	7.2	0.0
Cycle Q Clear(g_c), s	3.2	11.9	12.0	2.6	14.0	1.5	5.7	2.8	3.1	7.0	7.2	0.0
Prop In Lane	1.00		0.28	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	313	608	610	126	1153	514	198	306	259	198	306	
V/C Ratio(X)	0.58	0.65	0.65	0.61	0.76	0.11	0.83	0.30	0.34	1.25	0.74	
Avail Cap(c_a), veh/h	327	728	730	170	1467	654	198	772	654	198	772	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	27.7	17.7	17.7	28.7	19.4	15.1	27.7	23.4	23.6	28.2	25.3	0.0
Incr Delay (d2), s/veh	2.3	1.5	1.5	4.7	1.8	0.1	25.2	0.6	0.8	146.4	3.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	4.7	4.7	1.3	5.6	0.5	3.7	1.2	1.2	10.9	3.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.0	19.2	19.2	33.4	21.2	15.2	52.9	24.0	24.3	174.6	28.7	0.0
LnGrp LOS	C	B	B	C	C	B	D	C	C	F	C	
Approach Vol, veh/h		972			1011			346			472	A
Approach Delay, s/veh		21.2			21.8			37.8			105.1	
Approach LOS		C			C			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	15.3	10.8	25.4	12.0	15.3	9.5	26.7
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	7.0	26.0	6.0	26.0	7.0	26.0	6.0	26.0
Max Q Clear Time (g_c+I1), s	7.7	9.2	5.2	16.0	9.0	5.1	4.6	14.0
Green Ext Time (p_c), s	0.0	1.1	0.0	4.4	0.0	0.7	0.0	4.0

Intersection Summary	
HCM 6th Ctrl Delay	37.6
HCM 6th LOS	D

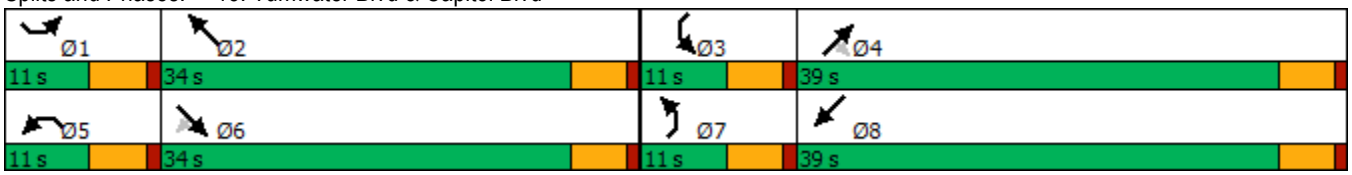
Notes

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

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	165	725	160	285	635	35	80	280	395	55	300	85
Future Volume (vph)	165	725	160	285	635	35	80	280	395	55	300	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		250	200		0	275		0	200		0
Storage Lanes	1		1	2		0	1		1	2		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		50			50			30			30	
Link Distance (ft)		951			1381			3726			881	
Travel Time (s)		13.0			18.8			84.7			20.0	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6						4			
Detector Phase	1	6	6	5	2		7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	11.0	34.0	34.0	11.0	34.0		11.0	39.0	39.0	11.0	39.0	
Total Split (s)	11.0	34.0	34.0	11.0	34.0		11.0	39.0	39.0	11.0	39.0	
Total Split (%)	11.6%	35.8%	35.8%	11.6%	35.8%		11.6%	41.1%	41.1%	11.6%	41.1%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Min	Min	None	Min		None	None	None	None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 95	
Actuated Cycle Length: 72.7	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 13: Tumwater Blvd & Capitol Blvd



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	165	725	160	285	635	35	80	280	395	55	300	85
Future Volume (veh/h)	165	725	160	285	635	35	80	280	395	55	300	85
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	177	780	172	306	683	38	86	301	425	59	323	91
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	1	1	1	1	1	1	1	1	1
Cap, veh/h	139	1025	457	274	1003	56	118	590	500	101	839	233
Arrive On Green	0.08	0.29	0.29	0.08	0.29	0.29	0.07	0.31	0.31	0.06	0.30	0.30
Sat Flow, veh/h	1767	3526	1572	3483	3450	192	1795	1885	1598	1795	2770	768
Grp Volume(v), veh/h	177	780	172	306	354	367	86	301	425	59	207	207
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1742	1791	1851	1795	1885	1598	1795	1791	1747
Q Serve(g_s), s	6.0	15.4	6.7	6.0	13.4	13.4	3.6	10.0	19.0	2.5	7.0	7.2
Cycle Q Clear(g_c), s	6.0	15.4	6.7	6.0	13.4	13.4	3.6	10.0	19.0	2.5	7.0	7.2
Prop In Lane	1.00		1.00	1.00		0.10	1.00		1.00	1.00		0.44
Lane Grp Cap(c), veh/h	139	1025	457	274	521	538	118	590	500	101	543	529
V/C Ratio(X)	1.28	0.76	0.38	1.12	0.68	0.68	0.73	0.51	0.85	0.59	0.38	0.39
Avail Cap(c_a), veh/h	139	1338	597	274	680	703	141	839	711	141	797	778
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.2	24.7	21.6	35.2	24.0	24.0	35.0	21.5	24.6	35.2	21.0	21.0
Incr Delay (d2), s/veh	168.1	2.1	0.6	90.1	2.1	2.1	10.5	0.7	6.9	2.0	0.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.9	5.9	2.4	5.8	5.3	5.5	1.9	4.3	7.7	1.1	2.9	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	203.3	26.8	22.2	125.3	26.1	26.0	45.5	22.1	31.4	37.2	21.4	21.5
LnGrp LOS	F	C	C	F	C	C	D	C	C	D	C	C
Approach Vol, veh/h		1129			1027			812			473	
Approach Delay, s/veh		53.8			55.6			29.5			23.4	
Approach LOS		D			E			C			C	

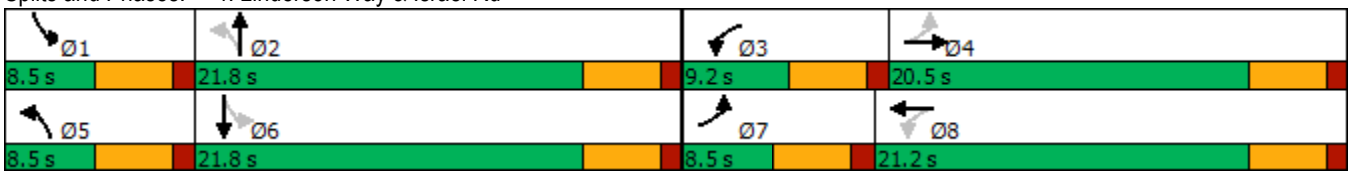
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	27.2	9.3	28.9	11.0	27.2	10.0	28.2
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	6.0	29.0	6.0	34.0	6.0	29.0	6.0	34.0
Max Q Clear Time (g_c+I1), s	8.0	15.4	4.5	21.0	8.0	17.4	5.6	9.2
Green Ext Time (p_c), s	0.0	3.9	0.0	2.9	0.0	4.8	0.0	2.5

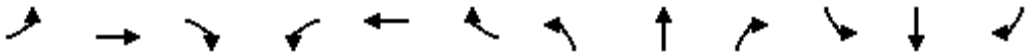
Intersection Summary	
HCM 6th Ctrl Delay	44.4
HCM 6th LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	220	65	120	190	25	55	55	80	10	45	30
Future Volume (vph)	50	220	65	120	190	25	55	55	80	10	45	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	200		0	150		0	100		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1079			1372			2088			847	
Travel Time (s)		24.5			31.2			47.5			19.3	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	10%	10%	10%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	5.0		4.0	5.0		4.0	6.0		4.0	6.0	
Minimum Split (s)	8.5	20.5		8.5	20.5		8.5	21.5		8.5	21.5	
Total Split (s)	8.5	20.5		9.2	21.2		8.5	21.8		8.5	21.8	
Total Split (%)	14.2%	34.2%		15.3%	35.3%		14.2%	36.3%		14.2%	36.3%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Min		None	Min		None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 43.1	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 4: Linderson Way & Israel Rd





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	220	65	120	190	25	55	55	80	10	45	30
Future Volume (veh/h)	50	220	65	120	190	25	55	55	80	10	45	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1841	1841	1841	1856	1856	1856	1752	1752	1752
Adj Flow Rate, veh/h	64	282	83	154	244	32	71	71	103	13	58	38
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	2	2	2	4	4	4	3	3	3	10	10	10
Cap, veh/h	469	369	109	418	489	64	389	125	182	301	141	92
Arrive On Green	0.05	0.27	0.27	0.09	0.31	0.31	0.05	0.18	0.18	0.01	0.14	0.14
Sat Flow, veh/h	1781	1388	409	1753	1594	209	1767	684	993	1668	988	647
Grp Volume(v), veh/h	64	0	365	154	0	276	71	0	174	13	0	96
Grp Sat Flow(s),veh/h/ln	1781	0	1797	1753	0	1803	1767	0	1677	1668	0	1635
Q Serve(g_s), s	1.0	0.0	7.6	2.5	0.0	5.1	1.4	0.0	3.8	0.3	0.0	2.2
Cycle Q Clear(g_c), s	1.0	0.0	7.6	2.5	0.0	5.1	1.4	0.0	3.8	0.3	0.0	2.2
Prop In Lane	1.00		0.23	1.00		0.12	1.00		0.59	1.00		0.40
Lane Grp Cap(c), veh/h	469	0	478	418	0	553	389	0	307	301	0	233
V/C Ratio(X)	0.14	0.00	0.76	0.37	0.00	0.50	0.18	0.00	0.57	0.04	0.00	0.41
Avail Cap(c_a), veh/h	555	0	712	461	0	746	468	0	718	444	0	701
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.9	0.0	13.7	10.0	0.0	11.5	13.6	0.0	15.0	14.6	0.0	15.8
Incr Delay (d2), s/veh	0.0	0.0	2.8	0.2	0.0	0.7	0.1	0.0	1.6	0.0	0.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	2.8	0.7	0.0	1.7	0.5	0.0	1.4	0.1	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.0	0.0	16.5	10.2	0.0	12.2	13.7	0.0	16.7	14.6	0.0	16.9
LnGrp LOS	A	A	B	B	A	B	B	A	B	B	A	B
Approach Vol, veh/h		429			430			245			109	
Approach Delay, s/veh		15.5			11.4			15.8			16.7	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.0	11.9	8.2	15.2	6.7	10.2	6.5	16.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	4.0	17.3	4.7	16.0	4.0	17.3	4.0	16.7
Max Q Clear Time (g_c+I1), s	2.3	5.8	4.5	9.6	3.4	4.2	3.0	7.1
Green Ext Time (p_c), s	0.0	0.7	0.0	1.2	0.0	0.3	0.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	14.2
HCM 6th LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	395	50	175	130	0	0	0	0	1615	5	115
Future Volume (vph)	0	395	50	175	130	0	0	0	0	1615	5	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	350		0	0		0	350		0
Storage Lanes	0		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		729			789			1457			1571	
Travel Time (s)		16.6			17.9			33.1			35.7	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	0%	0%	0%	4%	4%	4%
Shared Lane Traffic (%)										46%		
Turn Type		NA		pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases				8						6		
Detector Phase		4		3	8					6	6	
Switch Phase												
Minimum Initial (s)		4.0		4.0	4.0					4.0	4.0	
Minimum Split (s)		20.5		8.5	20.5					20.5	20.5	
Total Split (s)		20.5		12.4	32.9					67.1	67.1	
Total Split (%)		20.5%		12.4%	32.9%					67.1%	67.1%	
Yellow Time (s)		3.5		3.5	3.5					3.5	3.5	
All-Red Time (s)		1.0		1.0	1.0					1.0	1.0	
Lost Time Adjust (s)		0.0		0.0	0.0					0.0	0.0	
Total Lost Time (s)		4.5		4.5	4.5					4.5	4.5	
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?		Yes		Yes								
Recall Mode		None		None	Min					None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 10: I-5 SB Ramps & Tumwater Blvd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	395	50	175	130	0	0	0	0	1615	5	115
Future Volume (veh/h)	0	395	50	175	130	0	0	0	0	1615	5	115
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1885	1885	1841	1841	0				1841	1841	1841
Adj Flow Rate, veh/h	0	459	58	203	151	0				2007	0	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86				0.86	0.86	0.86
Percent Heavy Veh, %	0	1	1	4	4	0				4	4	4
Cap, veh/h	0	523	66	239	539	0				2150	1129	0
Arrive On Green	0.00	0.16	0.16	0.08	0.29	0.00				0.61	0.00	0.00
Sat Flow, veh/h	0	3295	403	1753	1841	0				3506	1841	0
Grp Volume(v), veh/h	0	256	261	203	151	0				2007	0	0
Grp Sat Flow(s),veh/h/ln	0	1791	1813	1753	1841	0				1753	1841	0
Q Serve(g_s), s	0.0	13.4	13.5	7.9	6.1	0.0				49.6	0.0	0.0
Cycle Q Clear(g_c), s	0.0	13.4	13.5	7.9	6.1	0.0				49.6	0.0	0.0
Prop In Lane	0.00		0.22	1.00		0.00				1.00		0.00
Lane Grp Cap(c), veh/h	0	293	296	239	539	0				2150	1129	0
V/C Ratio(X)	0.00	0.87	0.88	0.85	0.28	0.00				0.93	0.00	0.00
Avail Cap(c_a), veh/h	0	299	303	239	546	0				2291	1203	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	39.1	39.2	32.4	26.1	0.0				16.8	0.0	0.0
Incr Delay (d2), s/veh	0.0	23.3	24.3	23.7	0.3	0.0				7.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.7	7.9	5.4	2.7	0.0				19.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	62.4	63.5	56.1	26.4	0.0				24.3	0.0	0.0
LnGrp LOS	A	E	E	E	C	A				C	A	A
Approach Vol, veh/h		517			354						2007	
Approach Delay, s/veh		62.9			43.4						24.3	
Approach LOS		E			D						C	

Timer - Assigned Phs		3	4		6		8					
Phs Duration (G+Y+Rc), s		12.4	20.2		63.2		32.6					
Change Period (Y+Rc), s		4.5	4.5		4.5		4.5					
Max Green Setting (Gmax), s		7.9	16.0		62.6		28.4					
Max Q Clear Time (g_c+I1), s		9.9	15.5		51.6		8.1					
Green Ext Time (p_c), s		0.0	0.2		7.1		0.7					

Intersection Summary	
HCM 6th Ctrl Delay	33.6
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	245.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	485	1515	0	0	220	570	65	5	470	0	0	0
Future Vol, veh/h	485	1515	0	0	220	570	65	5	470	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	350	-	-	-	-	0	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	3	3	3	9	9	9	3	3	3	0	0	0
Mvmt Flow	557	1741	0	0	253	655	75	6	540	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	253	0	-	-	-	0	3108	3108	871
Stage 1	-	-	-	-	-	-	2855	2855	-
Stage 2	-	-	-	-	-	-	253	253	-
Critical Hdwy	4.145	-	-	-	-	-	6.645	6.545	6.945
Critical Hdwy Stg 1	-	-	-	-	-	-	5.845	5.545	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.445	5.545	-
Follow-up Hdwy	2.2285	-	-	-	-	-	3.5285	4.0285	3.3285
Pot Cap-1 Maneuver	1304	-	0	0	-	0	~ 11	11	~ 293
Stage 1	-	-	0	0	-	0	~ 29	37	-
Stage 2	-	-	0	0	-	0	786	695	-
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	1304	-	-	-	-	-	~ 6	0	~ 293
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 6	0	-
Stage 1	-	-	-	-	-	-	~ 17	0	-
Stage 2	-	-	-	-	-	-	786	0	-

Approach	EB	WB	NB
HCM Control Delay, s	2.4	0	$ 1245.9
HCM LOS			F

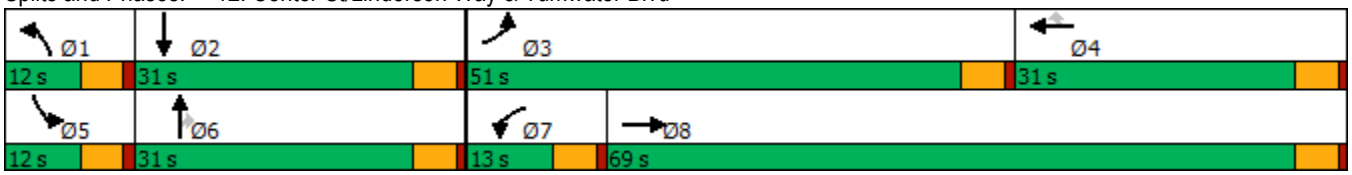
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT
Capacity (veh/h)	6	293	1304	-	-
HCM Lane V/C Ratio	13.41	1.844	0.428	-	-
HCM Control Delay (s)	$ 6776.2	$ 422.2	9.8	-	-
HCM Lane LOS	F	F	A	-	-
HCM 95th %tile Q(veh)	11.9	36.5	2.2	-	-

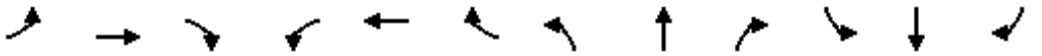
Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1230	665	105	40	430	90	90	60	40	40	35	125
Future Volume (vph)	1230	665	105	40	430	90	90	60	40	40	35	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		0	350		250	250		150	300		700
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		895			1336			511			2088	
Travel Time (s)		20.3			30.4			11.6			47.5	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	4%	4%	4%	7%	7%	7%	13%	13%	13%	7%	7%	7%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases						4			6			Free
Detector Phase	3	8		7	4	4	1	6	6	5	2	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	11.0	31.0		11.0	31.0	31.0	11.0	31.0	31.0	11.0	31.0	
Total Split (s)	51.0	69.0		13.0	31.0	31.0	12.0	31.0	31.0	12.0	31.0	
Total Split (%)	40.8%	55.2%		10.4%	24.8%	24.8%	9.6%	24.8%	24.8%	9.6%	24.8%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Min		None	Min	Min	None	None	None	None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 125	
Actuated Cycle Length: 100.9	
Natural Cycle: 135	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 12: Center St/Linderson Way & Tumwater Blvd





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1230	665	105	40	430	90	90	60	40	40	35	125
Future Volume (veh/h)	1230	665	105	40	430	90	90	60	40	40	35	125
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1796	1796	1796	1707	1707	1707	1796	1796	1796
Adj Flow Rate, veh/h	1382	747	118	45	483	101	101	67	45	45	39	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	4	4	4	7	7	7	13	13	13	7	7	7
Cap, veh/h	1526	1788	282	77	639	285	125	167	141	77	118	
Arrive On Green	0.45	0.59	0.59	0.04	0.19	0.19	0.08	0.10	0.10	0.04	0.07	0.00
Sat Flow, veh/h	3401	3026	478	1711	3413	1522	1626	1707	1447	1711	1796	1522
Grp Volume(v), veh/h	1382	432	433	45	483	101	101	67	45	45	39	0
Grp Sat Flow(s),veh/h/ln	1700	1749	1755	1711	1706	1522	1626	1707	1447	1711	1796	1522
Q Serve(g_s), s	34.1	12.1	12.1	2.3	12.1	5.2	5.5	3.3	2.6	2.3	1.9	0.0
Cycle Q Clear(g_c), s	34.1	12.1	12.1	2.3	12.1	5.2	5.5	3.3	2.6	2.3	1.9	0.0
Prop In Lane	1.00		0.27	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1526	1034	1037	77	639	285	125	167	141	77	118	
V/C Ratio(X)	0.91	0.42	0.42	0.59	0.76	0.35	0.81	0.40	0.32	0.59	0.33	
Avail Cap(c_a), veh/h	1732	1239	1243	151	982	438	126	491	416	133	517	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.1	10.0	10.0	42.3	34.8	32.0	41.1	38.3	38.0	42.3	40.3	0.0
Incr Delay (d2), s/veh	6.7	0.3	0.3	6.9	1.9	0.7	31.1	1.6	1.3	6.9	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.2	4.3	4.3	1.1	5.1	2.0	3.3	1.5	1.0	1.1	0.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.8	10.3	10.3	49.2	36.6	32.7	72.2	39.8	39.2	49.2	41.9	0.0
LnGrp LOS	C	B	B	D	D	C	E	D	D	D	D	
Approach Vol, veh/h		2247			629			213			84	A
Approach Delay, s/veh		22.3			36.9			55.0			45.8	
Approach LOS		C			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.9	11.0	45.5	21.9	9.1	13.8	9.1	58.4
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	7.0	26.0	46.0	26.0	7.0	26.0	8.0	64.0
Max Q Clear Time (g_c+I1), s	7.5	3.9	36.1	14.1	4.3	5.3	4.3	14.1
Green Ext Time (p_c), s	0.0	0.1	4.5	2.8	0.0	0.4	0.0	6.8

Intersection Summary	
HCM 6th Ctrl Delay	28.0
HCM 6th LOS	C

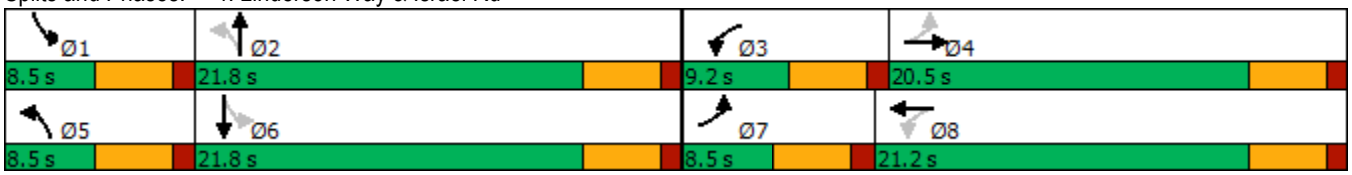
Notes

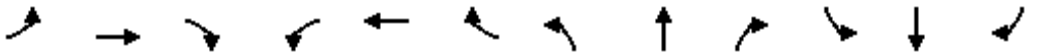
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	290	100	130	225	25	70	65	85	15	60	35
Future Volume (vph)	55	290	100	130	225	25	70	65	85	15	60	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	200		0	150		0	100		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1079			1372			2088			847	
Travel Time (s)		24.5			31.2			47.5			19.3	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	10%	10%	10%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	5.0		4.0	5.0		4.0	6.0		4.0	6.0	
Minimum Split (s)	8.5	20.5		8.5	20.5		8.5	21.5		8.5	21.5	
Total Split (s)	8.5	20.5		9.2	21.2		8.5	21.8		8.5	21.8	
Total Split (%)	14.2%	34.2%		15.3%	35.3%		14.2%	36.3%		14.2%	36.3%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Min		None	Min		None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 46.8	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 4: Linderson Way & Israel Rd





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	290	100	130	225	25	70	65	85	15	60	35
Future Volume (veh/h)	55	290	100	130	225	25	70	65	85	15	60	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1841	1841	1841	1856	1856	1856	1752	1752	1752
Adj Flow Rate, veh/h	71	372	128	167	288	32	90	83	109	19	77	45
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	2	2	2	4	4	4	3	3	3	10	10	10
Cap, veh/h	490	428	147	373	590	66	340	124	163	261	135	79
Arrive On Green	0.05	0.32	0.32	0.09	0.36	0.36	0.06	0.17	0.17	0.02	0.13	0.13
Sat Flow, veh/h	1781	1330	458	1753	1627	181	1767	728	956	1668	1037	606
Grp Volume(v), veh/h	71	0	500	167	0	320	90	0	192	19	0	122
Grp Sat Flow(s),veh/h/ln	1781	0	1788	1753	0	1808	1767	0	1684	1668	0	1643
Q Serve(g_s), s	1.2	0.0	12.0	2.8	0.0	6.2	2.0	0.0	4.9	0.4	0.0	3.2
Cycle Q Clear(g_c), s	1.2	0.0	12.0	2.8	0.0	6.2	2.0	0.0	4.9	0.4	0.0	3.2
Prop In Lane	1.00		0.26	1.00		0.10	1.00		0.57	1.00		0.37
Lane Grp Cap(c), veh/h	490	0	575	373	0	656	340	0	288	261	0	213
V/C Ratio(X)	0.14	0.00	0.87	0.45	0.00	0.49	0.27	0.00	0.67	0.07	0.00	0.57
Avail Cap(c_a), veh/h	554	0	629	391	0	664	389	0	640	377	0	625
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.5	0.0	14.5	10.6	0.0	11.2	15.9	0.0	17.6	16.8	0.0	18.6
Incr Delay (d2), s/veh	0.0	0.0	11.7	0.3	0.0	0.6	0.2	0.0	2.7	0.0	0.0	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	5.8	0.9	0.0	2.1	0.7	0.0	1.9	0.2	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.6	0.0	26.3	10.9	0.0	11.8	16.0	0.0	20.3	16.8	0.0	21.0
LnGrp LOS	A	A	C	B	A	B	B	A	C	B	A	C
Approach Vol, veh/h		571			487			282			141	
Approach Delay, s/veh		24.2			11.5			18.9			20.4	
Approach LOS		C			B			B			C	

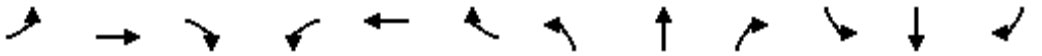
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.4	12.3	8.7	19.1	7.2	10.4	6.9	21.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	4.0	17.3	4.7	16.0	4.0	17.3	4.0	16.7
Max Q Clear Time (g_c+I1), s	2.4	6.9	4.8	14.0	4.0	5.2	3.2	8.2
Green Ext Time (p_c), s	0.0	0.7	0.0	0.7	0.0	0.4	0.0	1.2

Intersection Summary	
HCM 6th Ctrl Delay	18.6
HCM 6th LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	560	95	190	155	0	0	0	0	1710	5	165
Future Volume (vph)	0	560	95	190	155	0	0	0	0	1710	5	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	350		0	0		0	350		0
Storage Lanes	0		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		729			789			1457			1571	
Travel Time (s)		16.6			17.9			33.1			35.7	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	0%	0%	0%	4%	4%	4%
Shared Lane Traffic (%)										44%		
Turn Type		NA		pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases				8						6		
Detector Phase		4		3	8					6	6	
Switch Phase												
Minimum Initial (s)		4.0		4.0	4.0					4.0	4.0	
Minimum Split (s)		20.5		8.5	20.5					20.5	20.5	
Total Split (s)		20.5		12.4	32.9					67.1	67.1	
Total Split (%)		20.5%		12.4%	32.9%					67.1%	67.1%	
Yellow Time (s)		3.5		3.5	3.5					3.5	3.5	
All-Red Time (s)		1.0		1.0	1.0					1.0	1.0	
Lost Time Adjust (s)		0.0		0.0	0.0					0.0	0.0	
Total Lost Time (s)		4.5		4.5	4.5					4.5	4.5	
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?		Yes		Yes								
Recall Mode		None		None	Min					None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Natural Cycle: 130	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 10: I-5 SB Ramps & Tumwater Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	560	95	190	155	0	0	0	0	1710	5	165
Future Volume (veh/h)	0	560	95	190	155	0	0	0	0	1710	5	165
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1885	1885	1841	1841	0				1841	1841	1841
Adj Flow Rate, veh/h	0	651	110	221	180	0				2171	0	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86				0.86	0.86	0.86
Percent Heavy Veh, %	0	1	1	4	4	0				4	4	4
Cap, veh/h	0	491	83	210	523	0				2195	1152	0
Arrive On Green	0.00	0.16	0.16	0.08	0.28	0.00				0.63	0.00	0.00
Sat Flow, veh/h	0	3160	517	1753	1841	0				3506	1841	0
Grp Volume(v), veh/h	0	380	381	221	180	0				2171	0	0
Grp Sat Flow(s),veh/h/ln	0	1791	1792	1753	1841	0				1753	1841	0
Q Serve(g_s), s	0.0	16.0	16.0	7.9	7.8	0.0				60.8	0.0	0.0
Cycle Q Clear(g_c), s	0.0	16.0	16.0	7.9	7.8	0.0				60.8	0.0	0.0
Prop In Lane	0.00		0.29	1.00		0.00				1.00		0.00
Lane Grp Cap(c), veh/h	0	287	287	210	523	0				2195	1152	0
V/C Ratio(X)	0.00	1.33	1.33	1.05	0.34	0.00				0.99	0.00	0.00
Avail Cap(c_a), veh/h	0	287	287	210	523	0				2195	1152	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	42.0	42.0	35.6	28.4	0.0				18.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	168.9	170.1	75.8	0.4	0.0				16.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	20.4	20.5	5.8	3.4	0.0				26.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	210.9	212.1	111.3	28.8	0.0				35.0	0.0	0.0
LnGrp LOS	A	F	F	F	C	A				D	A	A
Approach Vol, veh/h		761			401						2171	
Approach Delay, s/veh		211.5			74.3						35.0	
Approach LOS		F			E						D	

Timer - Assigned Phs		3	4		6		8					
Phs Duration (G+Y+Rc), s		12.4	20.5		67.1		32.9					
Change Period (Y+Rc), s		4.5	4.5		4.5		4.5					
Max Green Setting (Gmax), s		7.9	16.0		62.6		28.4					
Max Q Clear Time (g_c+I1), s		9.9	18.0		62.8		9.8					
Green Ext Time (p_c), s		0.0	0.0		0.0		0.9					

Intersection Summary	
HCM 6th Ctrl Delay	80.0
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	784.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	615	1645	0	0	250	615	80	5	505	0	0	0
Future Vol, veh/h	615	1645	0	0	250	615	80	5	505	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	350	-	-	-	-	0	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	3	3	3	9	9	9	3	3	3	0	0	0
Mvmt Flow	707	1891	0	0	287	707	92	6	580	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	287	0	-	-	-	0	3592	3592	946
Stage 1	-	-	-	-	-	-	3305	3305	-
Stage 2	-	-	-	-	-	-	287	287	-
Critical Hdwy	4.145	-	-	-	-	-	6.645	6.545	6.945
Critical Hdwy Stg 1	-	-	-	-	-	-	5.845	5.545	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.445	5.545	-
Follow-up Hdwy	2.2285	-	-	-	-	-	3.5285	4.0285	3.3285
Pot Cap-1 Maneuver	1267	-	0	0	-	0	~ 5	~ 5	~ 262
Stage 1	-	-	0	0	-	0	~ 16	21	-
Stage 2	-	-	0	0	-	0	758	672	-
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	1267	-	-	-	-	-	~ 2	0	~ 262
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 2	0	-
Stage 1	-	-	-	-	-	-	~ 7	0	-
Stage 2	-	-	-	-	-	-	758	0	-

Approach	EB	WB	NB
HCM Control Delay, s	3.1	0	$ 4112.3
HCM LOS			F

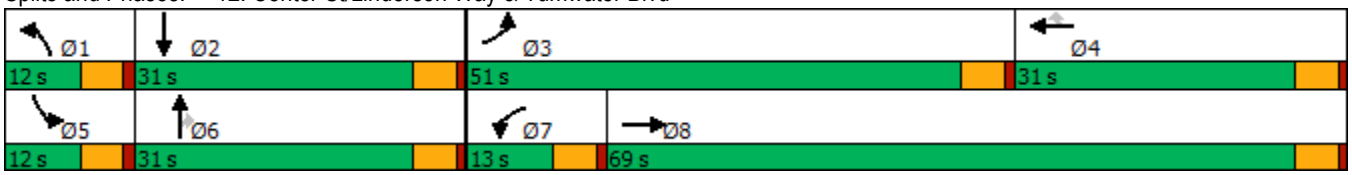
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT
Capacity (veh/h)	2	262	1267	-	-
HCM Lane V/C Ratio	48.851	2.215	0.558	-	-
HCM Control Delay (s)	$ 25040.7	$ 589.7	11.4	-	-
HCM Lane LOS	F	F	B	-	-
HCM 95th %tile Q(veh)	14.5	44.7	3.6	-	-

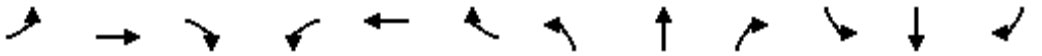
Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1320	730	110	45	470	130	95	70	40	55	40	155
Future Volume (vph)	1320	730	110	45	470	130	95	70	40	55	40	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		0	350		250	250		150	300		700
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		895			1336			511			2088	
Travel Time (s)		20.3			30.4			11.6			47.5	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	4%	4%	4%	7%	7%	7%	13%	13%	13%	7%	7%	7%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases						4			6			Free
Detector Phase	3	8		7	4	4	1	6	6	5	2	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	11.0	31.0		11.0	31.0	31.0	11.0	31.0	31.0	11.0	31.0	
Total Split (s)	51.0	69.0		13.0	31.0	31.0	12.0	31.0	31.0	12.0	31.0	
Total Split (%)	40.8%	55.2%		10.4%	24.8%	24.8%	9.6%	24.8%	24.8%	9.6%	24.8%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Min		None	Min	Min	None	None	None	None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 125	
Actuated Cycle Length: 103.1	
Natural Cycle: 145	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 12: Center St/Linderson Way & Tumwater Blvd





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1320	730	110	45	470	130	95	70	40	55	40	155
Future Volume (veh/h)	1320	730	110	45	470	130	95	70	40	55	40	155
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1796	1796	1796	1707	1707	1707	1796	1796	1796
Adj Flow Rate, veh/h	1483	820	124	51	528	146	107	79	45	62	45	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	4	4	4	7	7	7	13	13	13	7	7	7
Cap, veh/h	1569	1865	282	79	674	300	118	144	122	86	111	
Arrive On Green	0.46	0.61	0.61	0.05	0.20	0.20	0.07	0.08	0.08	0.05	0.06	0.00
Sat Flow, veh/h	3401	3046	461	1711	3413	1522	1626	1707	1447	1711	1796	1522
Grp Volume(v), veh/h	1483	471	473	51	528	146	107	79	45	62	45	0
Grp Sat Flow(s),veh/h/ln	1700	1749	1758	1711	1706	1522	1626	1707	1447	1711	1796	1522
Q Serve(g_s), s	40.3	13.8	13.8	2.8	14.2	8.2	6.3	4.3	2.8	3.5	2.3	0.0
Cycle Q Clear(g_c), s	40.3	13.8	13.8	2.8	14.2	8.2	6.3	4.3	2.8	3.5	2.3	0.0
Prop In Lane	1.00		0.26	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1569	1071	1076	79	674	300	118	144	122	86	111	
V/C Ratio(X)	0.95	0.44	0.44	0.64	0.78	0.49	0.91	0.55	0.37	0.72	0.40	
Avail Cap(c_a), veh/h	1619	1158	1164	142	918	410	118	459	389	124	483	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.9	9.9	9.9	45.3	36.8	34.4	44.5	42.5	41.8	45.2	43.6	0.0
Incr Delay (d2), s/veh	11.7	0.3	0.3	8.4	3.1	1.2	55.4	3.3	1.9	10.7	2.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.8	4.9	4.9	1.4	6.1	3.1	4.3	1.9	1.1	1.7	1.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.6	10.2	10.2	53.7	40.0	35.6	99.9	45.8	43.7	55.9	46.0	0.0
LnGrp LOS	D	B	B	D	D	D	F	D	D	E	D	
Approach Vol, veh/h		2427			725			231			107	A
Approach Delay, s/veh		26.3			40.1			70.4			51.7	
Approach LOS		C			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	11.0	49.6	24.1	9.9	13.1	9.5	64.2
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	7.0	26.0	46.0	26.0	7.0	26.0	8.0	64.0
Max Q Clear Time (g_c+I1), s	8.3	4.3	42.3	16.2	5.5	6.3	4.8	15.8
Green Ext Time (p_c), s	0.0	0.1	2.3	2.9	0.0	0.5	0.0	7.7

Intersection Summary	
HCM 6th Ctrl Delay	32.9
HCM 6th LOS	C

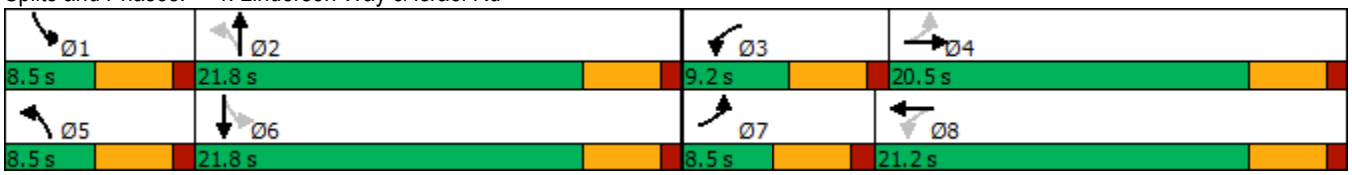
Notes

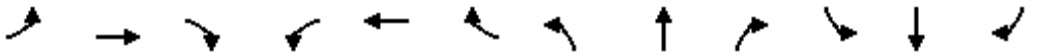
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	305	115	130	230	25	75	65	85	15	60	35
Future Volume (vph)	60	305	115	130	230	25	75	65	85	15	60	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	200		0	150		0	100		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1079			1372			2088			847	
Travel Time (s)		24.5			31.2			47.5			19.3	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	10%	10%	10%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	5.0		4.0	5.0		4.0	6.0		4.0	6.0	
Minimum Split (s)	8.5	20.5		8.5	20.5		8.5	21.5		8.5	21.5	
Total Split (s)	8.5	20.5		9.2	21.2		8.5	21.8		8.5	21.8	
Total Split (%)	14.2%	34.2%		15.3%	35.3%		14.2%	36.3%		14.2%	36.3%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Min		None	Min		None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 48.5	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 4: Linderson Way & Israel Rd





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	305	115	130	230	25	75	65	85	15	60	35
Future Volume (veh/h)	60	305	115	130	230	25	75	65	85	15	60	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1841	1841	1841	1856	1856	1856	1752	1752	1752
Adj Flow Rate, veh/h	77	391	147	167	295	32	96	83	109	19	77	45
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	2	2	2	4	4	4	3	3	3	10	10	10
Cap, veh/h	496	433	163	354	607	66	337	125	164	257	131	77
Arrive On Green	0.05	0.33	0.33	0.09	0.37	0.37	0.06	0.17	0.17	0.02	0.13	0.13
Sat Flow, veh/h	1781	1296	487	1753	1632	177	1767	728	956	1668	1037	606
Grp Volume(v), veh/h	77	0	538	167	0	327	96	0	192	19	0	122
Grp Sat Flow(s),veh/h/ln	1781	0	1783	1753	0	1809	1767	0	1684	1668	0	1643
Q Serve(g_s), s	1.3	0.0	13.5	2.8	0.0	6.5	2.2	0.0	5.0	0.5	0.0	3.3
Cycle Q Clear(g_c), s	1.3	0.0	13.5	2.8	0.0	6.5	2.2	0.0	5.0	0.5	0.0	3.3
Prop In Lane	1.00		0.27	1.00		0.10	1.00		0.57	1.00		0.37
Lane Grp Cap(c), veh/h	496	0	596	354	0	673	337	0	288	257	0	208
V/C Ratio(X)	0.16	0.00	0.90	0.47	0.00	0.49	0.28	0.00	0.67	0.07	0.00	0.59
Avail Cap(c_a), veh/h	551	0	609	369	0	673	375	0	621	368	0	606
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.4	0.0	14.9	10.9	0.0	11.3	16.4	0.0	18.2	17.4	0.0	19.3
Incr Delay (d2), s/veh	0.1	0.0	16.5	0.4	0.0	0.5	0.2	0.0	2.6	0.0	0.0	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	7.2	0.9	0.0	2.2	0.8	0.0	1.9	0.2	0.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.5	0.0	31.4	11.3	0.0	11.8	16.6	0.0	20.8	17.5	0.0	22.0
LnGrp LOS	A	A	C	B	A	B	B	A	C	B	A	C
Approach Vol, veh/h		615			494			288			141	
Approach Delay, s/veh		28.7			11.6			19.4			21.4	
Approach LOS		C			B			B			C	

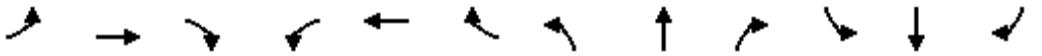
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.4	12.5	8.8	20.2	7.5	10.4	7.0	21.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	4.0	17.3	4.7	16.0	4.0	17.3	4.0	16.7
Max Q Clear Time (g_c+I1), s	2.5	7.0	4.8	15.5	4.2	5.3	3.3	8.5
Green Ext Time (p_c), s	0.0	0.7	0.0	0.2	0.0	0.4	0.0	1.2

Intersection Summary	
HCM 6th Ctrl Delay	20.8
HCM 6th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	670	120	190	180	0	0	0	0	1710	5	195
Future Volume (vph)	0	670	120	190	180	0	0	0	0	1710	5	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	350		0	0		0	350		0
Storage Lanes	0		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		729			789			1457			1571	
Travel Time (s)		16.6			17.9			33.1			35.7	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	0%	0%	0%	4%	4%	4%
Shared Lane Traffic (%)										43%		
Turn Type		NA		pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases				8						6		
Detector Phase		4		3	8					6	6	
Switch Phase												
Minimum Initial (s)		4.0		4.0	4.0					4.0	4.0	
Minimum Split (s)		20.5		8.5	20.5					20.5	20.5	
Total Split (s)		20.5		12.4	32.9					67.1	67.1	
Total Split (%)		20.5%		12.4%	32.9%					67.1%	67.1%	
Yellow Time (s)		3.5		3.5	3.5					3.5	3.5	
All-Red Time (s)		1.0		1.0	1.0					1.0	1.0	
Lost Time Adjust (s)		0.0		0.0	0.0					0.0	0.0	
Total Lost Time (s)		4.5		4.5	4.5					4.5	4.5	
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?		Yes		Yes								
Recall Mode		None		None	Min					None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Natural Cycle: 150	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 10: I-5 SB Ramps & Tumwater Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	670	120	190	180	0	0	0	0	1710	5	195
Future Volume (veh/h)	0	670	120	190	180	0	0	0	0	1710	5	195
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1885	1885	1841	1841	0				1841	1841	1841
Adj Flow Rate, veh/h	0	779	140	221	209	0				2204	0	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86				0.86	0.86	0.86
Percent Heavy Veh, %	0	1	1	4	4	0				4	4	4
Cap, veh/h	0	485	87	210	523	0				2195	1152	0
Arrive On Green	0.00	0.16	0.16	0.08	0.28	0.00				0.63	0.00	0.00
Sat Flow, veh/h	0	3127	545	1753	1841	0				3506	1841	0
Grp Volume(v), veh/h	0	460	459	221	209	0				2204	0	0
Grp Sat Flow(s),veh/h/ln	0	1791	1787	1753	1841	0				1753	1841	0
Q Serve(g_s), s	0.0	16.0	16.0	7.9	9.2	0.0				62.6	0.0	0.0
Cycle Q Clear(g_c), s	0.0	16.0	16.0	7.9	9.2	0.0				62.6	0.0	0.0
Prop In Lane	0.00		0.30	1.00		0.00				1.00		0.00
Lane Grp Cap(c), veh/h	0	287	286	210	523	0				2195	1152	0
V/C Ratio(X)	0.00	1.61	1.61	1.05	0.40	0.00				1.00	0.00	0.00
Avail Cap(c_a), veh/h	0	287	286	210	523	0				2195	1152	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	42.0	42.0	35.6	28.9	0.0				18.7	0.0	0.0
Incr Delay (d2), s/veh	0.0	288.1	288.2	75.8	0.5	0.0				20.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	29.9	29.8	5.8	4.1	0.0				28.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	330.1	330.2	111.3	29.4	0.0				38.9	0.0	0.0
LnGrp LOS	A	F	F	F	C	A				F	A	A
Approach Vol, veh/h		919			430						2204	
Approach Delay, s/veh		330.1			71.5						38.9	
Approach LOS		F			E						D	

Timer - Assigned Phs		3	4		6		8					
Phs Duration (G+Y+Rc), s		12.4	20.5		67.1		32.9					
Change Period (Y+Rc), s		4.5	4.5		4.5		4.5					
Max Green Setting (Gmax), s		7.9	16.0		62.6		28.4					
Max Q Clear Time (g_c+I1), s		9.9	18.0		64.6		11.2					
Green Ext Time (p_c), s		0.0	0.0		0.0		1.0					

Intersection Summary	
HCM 6th Ctrl Delay	118.2
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	1612.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	685	1680	0	0	265	615	90	1	505	0	0	0
Future Vol, veh/h	685	1680	0	0	265	615	90	1	505	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	350	-	-	-	-	0	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	3	3	3	9	9	9	3	3	3	0	0	0
Mvmt Flow	787	1931	0	0	305	707	103	1	580	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	305	0	-	-	-	0	3810	3810	966
Stage 1	-	-	-	-	-	-	3505	3505	-
Stage 2	-	-	-	-	-	-	305	305	-
Critical Hdwy	4.145	-	-	-	-	-	6.645	6.545	6.945
Critical Hdwy Stg 1	-	-	-	-	-	-	5.845	5.545	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.445	5.545	-
Follow-up Hdwy	2.2285	-	-	-	-	-	3.5285	4.0285	3.3285
Pot Cap-1 Maneuver	1248	-	0	0	-	0	~ 3	4	~ 254
Stage 1	-	-	0	0	-	0	~ 12	16	-
Stage 2	-	-	0	0	-	0	744	659	-
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	1248	-	-	-	-	-	~ 1	0	~ 254
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 1	0	-
Stage 1	-	-	-	-	-	-	~ 4	0	-
Stage 2	-	-	-	-	-	-	744	0	-

Approach	EB	WB	NB
HCM Control Delay, s	3.7	0	$ 8712.6
HCM LOS			F

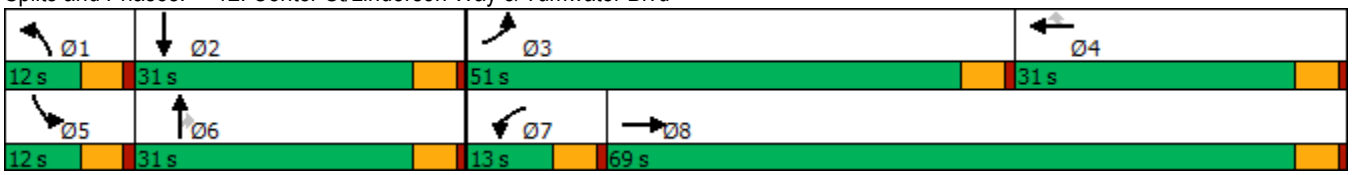
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT
Capacity (veh/h)	1	254	1248	-	-
HCM Lane V/C Ratio	104.598	2.285	0.631	-	-
HCM Control Delay (s)	$ 53612.4	$ 621.7	12.7	-	-
HCM Lane LOS	F	F	B	-	-
HCM 95th %tile Q(veh)	15.5	45.6	4.7	-	-

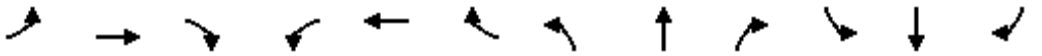
Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1320	765	110	45	480	130	95	70	40	55	40	155
Future Volume (vph)	1320	765	110	45	480	130	95	70	40	55	40	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		0	350		250	250		150	300		700
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		895			1336			511			2088	
Travel Time (s)		20.3			30.4			11.6			47.5	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	4%	4%	4%	7%	7%	7%	13%	13%	13%	7%	7%	7%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases						4			6			Free
Detector Phase	3	8		7	4	4	1	6	6	5	2	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	11.0	31.0		11.0	31.0	31.0	11.0	31.0	31.0	11.0	31.0	
Total Split (s)	51.0	69.0		13.0	31.0	31.0	12.0	31.0	31.0	12.0	31.0	
Total Split (%)	40.8%	55.2%		10.4%	24.8%	24.8%	9.6%	24.8%	24.8%	9.6%	24.8%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Min		None	Min	Min	None	None	None	None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 125	
Actuated Cycle Length: 103.3	
Natural Cycle: 145	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 12: Center St/Linderson Way & Tumwater Blvd





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1320	765	110	45	480	130	95	70	40	55	40	155
Future Volume (veh/h)	1320	765	110	45	480	130	95	70	40	55	40	155
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1796	1796	1796	1707	1707	1707	1796	1796	1796
Adj Flow Rate, veh/h	1483	860	124	51	539	146	107	79	45	62	45	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	4	4	4	7	7	7	13	13	13	7	7	7
Cap, veh/h	1565	1884	272	79	683	305	117	143	121	86	111	
Arrive On Green	0.46	0.61	0.61	0.05	0.20	0.20	0.07	0.08	0.08	0.05	0.06	0.00
Sat Flow, veh/h	3401	3068	442	1711	3413	1522	1626	1707	1447	1711	1796	1522
Grp Volume(v), veh/h	1483	490	494	51	539	146	107	79	45	62	45	0
Grp Sat Flow(s),veh/h/ln	1700	1749	1761	1711	1706	1522	1626	1707	1447	1711	1796	1522
Q Serve(g_s), s	40.5	14.6	14.6	2.8	14.6	8.2	6.3	4.3	2.9	3.5	2.3	0.0
Cycle Q Clear(g_c), s	40.5	14.6	14.6	2.8	14.6	8.2	6.3	4.3	2.9	3.5	2.3	0.0
Prop In Lane	1.00		0.25	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1565	1074	1082	79	683	305	117	143	121	86	111	
V/C Ratio(X)	0.95	0.46	0.46	0.65	0.79	0.48	0.91	0.55	0.37	0.72	0.41	
Avail Cap(c_a), veh/h	1611	1152	1160	141	914	407	117	457	387	123	481	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	25.1	10.0	10.0	45.5	36.9	34.4	44.8	42.8	42.1	45.5	43.9	0.0
Incr Delay (d2), s/veh	12.0	0.3	0.3	8.5	3.4	1.2	56.8	3.3	1.9	11.1	2.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.0	5.2	5.2	1.4	6.3	3.1	4.4	1.9	1.1	1.7	1.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.1	10.3	10.3	54.1	40.3	35.5	101.6	46.1	44.0	56.5	46.2	0.0
LnGrp LOS	D	B	B	D	D	D	F	D	D	E	D	
Approach Vol, veh/h		2467			736			231			107	A
Approach Delay, s/veh		26.4			40.3			71.4			52.2	
Approach LOS		C			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	11.0	49.7	24.4	9.9	13.1	9.5	64.7
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	7.0	26.0	46.0	26.0	7.0	26.0	8.0	64.0
Max Q Clear Time (g_c+I1), s	8.3	4.3	42.5	16.6	5.5	6.3	4.8	16.6
Green Ext Time (p_c), s	0.0	0.1	2.2	2.9	0.0	0.5	0.0	8.2

Intersection Summary	
HCM 6th Ctrl Delay	33.0
HCM 6th LOS	C

Notes

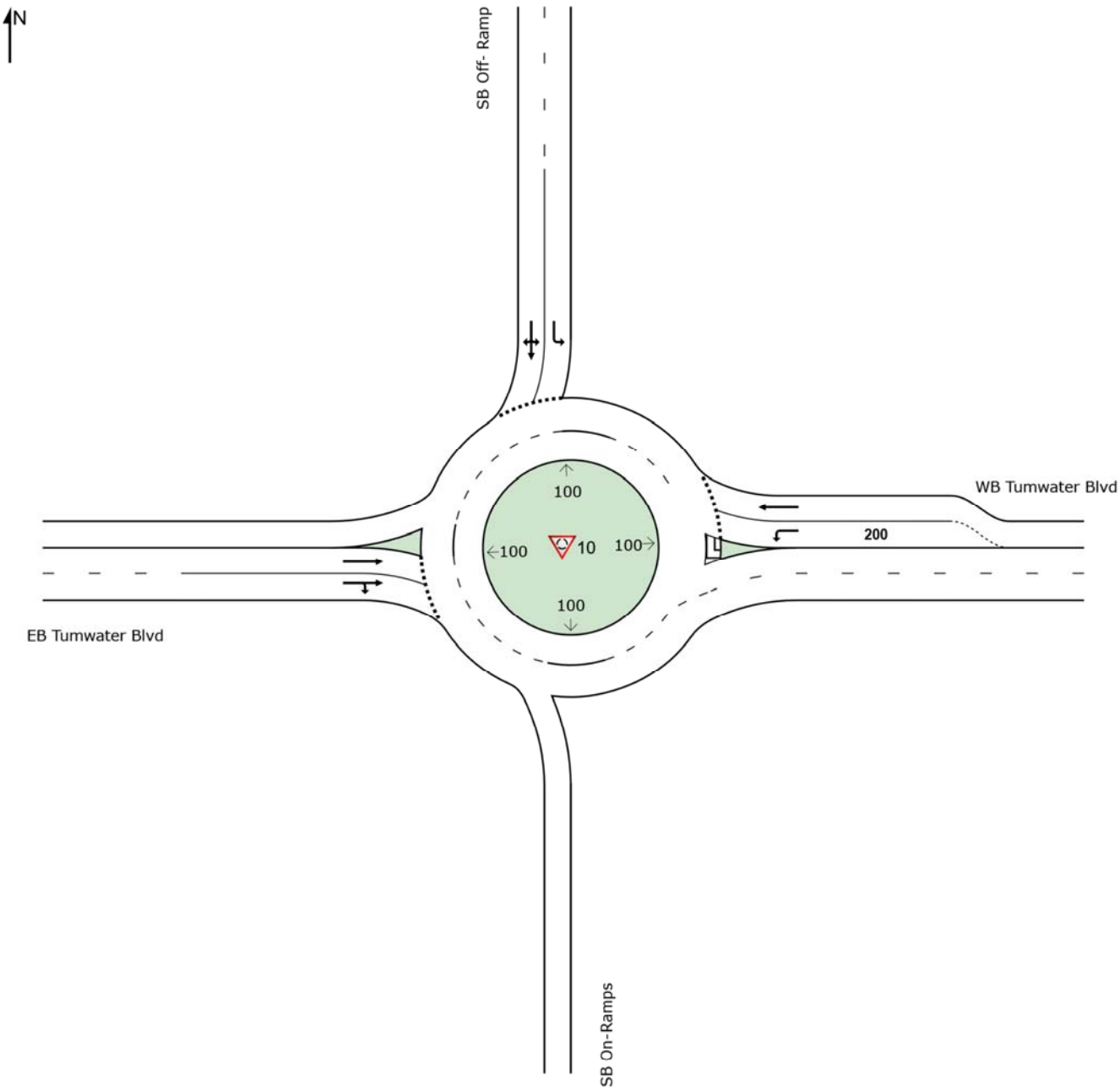
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

SITE LAYOUT

Site: 10 [Projected 2024 SB Ramps (Site Folder: General)]

AM Peak Hour
Site Category: (None)
Roundabout

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



MOVEMENT SUMMARY

Site: 10 [Projected 2024 SB Ramps (Site Folder: General)]

AM Peak Hour
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
East: WB Tumwater Blvd														
1	L2	190	2.0	200	2.0	0.116	9.8	LOS A	0.0	0.0	0.00	0.67	0.00	35.1
6	T1	180	2.0	189	2.0	0.125	3.9	LOS A	0.0	0.0	0.00	0.37	0.00	38.4
Approach		370	2.0	389	2.0	0.125	6.9	LOS A	0.0	0.0	0.00	0.52	0.00	36.6
North: SB Off- Ramp														
7	L2	1710	2.0	1800	2.0	0.823	14.2	LOS B	8.7	221.9	0.71	0.93	0.93	33.1
4	T1	5	2.0	5	2.0	0.823	8.1	LOS A	8.7	220.7	0.69	0.90	0.90	33.4
14	R2	195	2.0	205	2.0	0.823	8.1	LOS A	8.7	220.7	0.69	0.90	0.90	32.5
Approach		1910	2.0	2011	2.0	0.823	13.6	LOS B	8.7	221.9	0.71	0.92	0.93	33.0
West: EB Tumwater Blvd														
2	T1	670	2.0	705	2.0	0.871	26.8	LOS D	9.6	242.8	0.98	1.32	2.04	27.6
12	R2	120	2.0	126	2.0	0.871	25.7	LOS D	9.6	242.8	0.99	1.35	2.08	27.2
Approach		790	2.0	832	2.0	0.871	26.7	LOS C	9.6	242.8	0.98	1.32	2.05	27.5
All Vehicles		3070	2.0	3232	2.0	0.871	16.1	LOS B	9.6	242.8	0.69	0.98	1.11	31.8

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 10 [Projected 2024 SB Ramps (Site Folder: General)]

PM Peak Hour
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
East: WB Tumwater Blvd														
1	L2	325	2.0	342	2.0	0.227	9.8	LOS A	0.0	0.0	0.00	0.67	0.00	35.1
6	T1	365	2.0	384	2.0	0.222	3.9	LOS A	0.0	0.0	0.00	0.37	0.00	38.4
Approach		690	2.0	726	2.0	0.227	6.7	LOS A	0.0	0.0	0.00	0.51	0.00	36.7
North: SB Off- Ramp														
7	L2	495	2.0	521	2.0	0.448	12.3	LOS B	2.0	50.3	0.53	0.85	0.59	34.1
4	T1	5	2.0	5	2.0	0.448	6.1	LOS A	2.0	50.3	0.51	0.73	0.55	36.2
14	R2	440	2.0	463	2.0	0.448	6.1	LOS A	2.0	50.3	0.51	0.73	0.55	35.0
Approach		940	2.0	989	2.0	0.448	9.4	LOS A	2.0	50.3	0.52	0.79	0.57	34.5
West: EB Tumwater Blvd														
2	T1	525	2.0	553	2.0	0.385	6.5	LOS A	1.8	44.5	0.60	0.64	0.63	35.9
12	R2	180	2.0	189	2.0	0.385	6.3	LOS A	1.8	44.5	0.59	0.65	0.61	34.8
Approach		705	2.0	742	2.0	0.385	6.4	LOS A	1.8	44.5	0.59	0.64	0.62	35.6
All Vehicles		2335	2.0	2458	2.0	0.448	7.7	LOS A	2.0	50.3	0.39	0.66	0.42	35.5

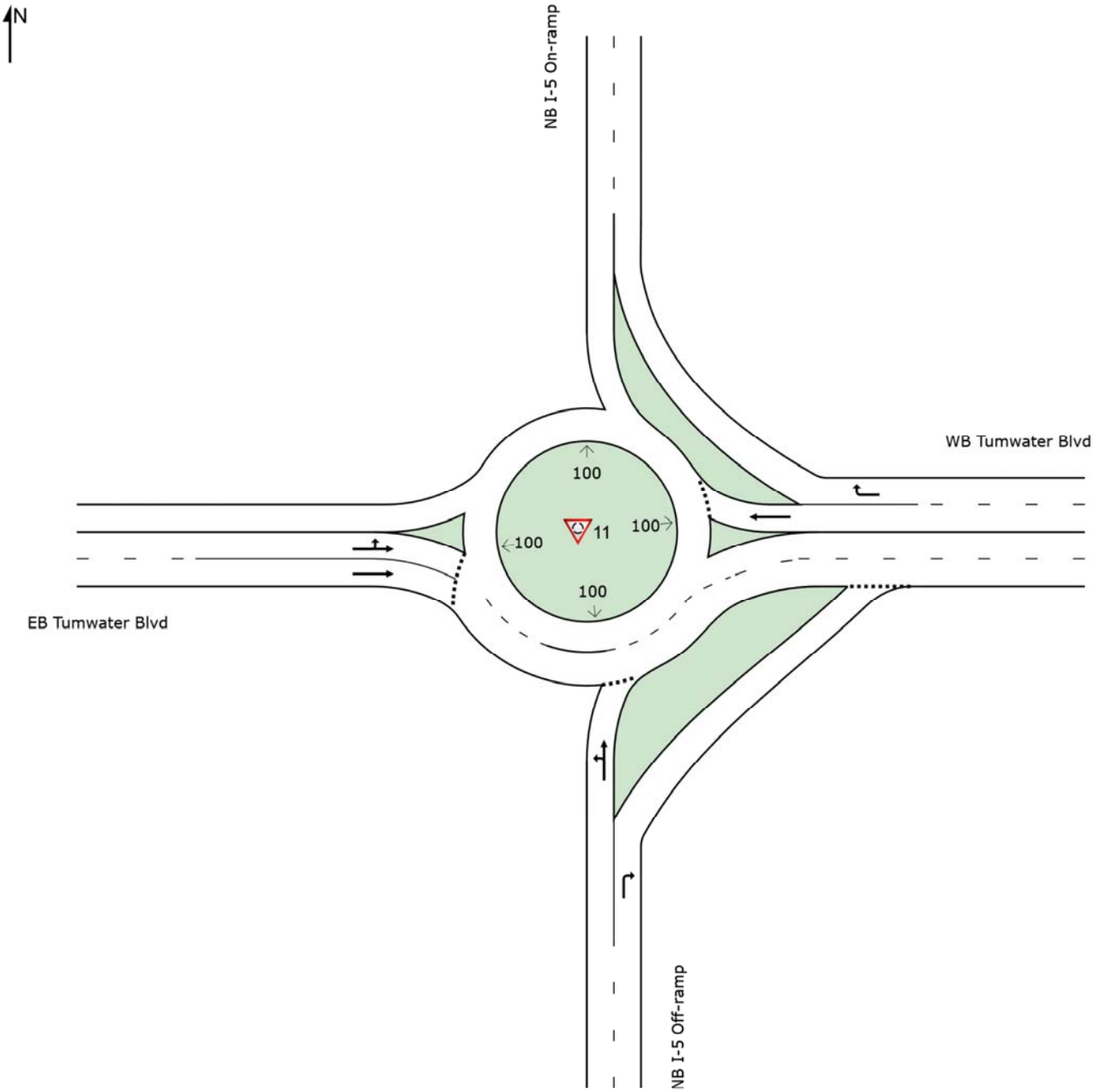
Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 11 [Projected 2024 NB Ramps (Site Folder: General)]

AM Peak Hour
Site Category: (None)
Roundabout

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



MOVEMENT SUMMARY

Site: 11 [Projected 2024 NB Ramps (Site Folder: General)]

AM Peak Hour
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: NB I-5 Off-ramp														
3	L2	90	2.0	95	2.0	0.175	20.3	LOS C	1.0	24.6	0.87	0.95	0.87	30.4
8	T1	5	2.0	5	2.0	0.175	14.6	LOS B	1.0	24.6	0.87	0.95	0.87	30.2
18	R2	505	2.0	532	2.0	0.769	26.4	LOS C	9.4	239.2	0.95	1.37	2.13	26.9
Approach		600	2.0	632	2.0	0.769	25.4	LOS C	9.4	239.2	0.94	1.31	1.93	27.4
East: WB Tumwater Blvd														
6	T1	265	2.0	279	2.0	0.265	7.8	LOS A	1.8	45.5	0.74	0.72	0.74	35.6
16	R2	615	2.0	647	2.0	0.394	3.7	LOS A	0.0	0.0	0.00	0.45	0.00	37.0
Approach		880	2.0	926	2.0	0.394	5.0	LOS A	1.8	45.5	0.22	0.53	0.22	36.6
West: EB Tumwater Blvd														
5	L2	685	2.0	721	2.0	0.781	9.7	LOS A	0.0	0.0	0.00	0.60	0.00	36.1
2	T1	1680	2.0	1768	2.0	0.781	4.0	LOS A	0.0	0.0	0.00	0.44	0.00	37.5
Approach		2365	2.0	2489	2.0	0.781	5.7	LOS A	0.0	0.0	0.00	0.49	0.00	37.1
All Vehicles		3845	2.0	4047	2.0	0.781	8.6	LOS A	9.4	239.2	0.20	0.62	0.35	35.1

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 11 [Projected 2024 NB Ramps (Site Folder: General)]

PM Peak Hour
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: NB I-5 Off-ramp														
3	L2	120	2.0	126	2.0	0.119	11.6	LOS B	0.4	10.1	0.47	0.78	0.47	34.0
8	T1	5	2.0	5	2.0	0.119	5.9	LOS A	0.4	10.1	0.47	0.78	0.47	33.8
18	R2	160	2.0	168	2.0	0.148	5.7	LOS A	0.6	14.0	0.45	0.64	0.45	35.6
Approach		285	2.0	300	2.0	0.148	8.2	LOS A	0.6	14.0	0.46	0.70	0.46	34.9
East: WB Tumwater Blvd														
6	T1	570	2.0	600	2.0	0.456	6.0	LOS A	3.1	79.5	0.63	0.59	0.63	36.0
16	R2	1455	2.0	1532	2.0	0.933	5.7	LOS D	0.0	0.0	0.00	0.41	0.00	34.7
Approach		2025	2.0	2132	2.0	0.933	5.8	LOS A	3.1	79.5	0.18	0.46	0.18	35.1
West: EB Tumwater Blvd														
5	L2	335	2.0	353	2.0	0.335	9.7	LOS A	0.0	0.0	0.00	0.62	0.00	35.8
2	T1	680	2.0	716	2.0	0.335	4.0	LOS A	0.0	0.0	0.00	0.43	0.00	37.6
Approach		1015	2.0	1068	2.0	0.335	5.9	LOS A	0.0	0.0	0.00	0.49	0.00	37.0
All Vehicles		3325	2.0	3500	2.0	0.933	6.0	LOS A	3.1	79.5	0.15	0.49	0.15	35.6

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 1 [Littlerock Road at Israel Road (Site Folder: General)]

Projected 2024 With Project Sensitivity
PM Peak Hour
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: NB Littlerock Rd														
3	L2	245	1.0	258	1.0	0.669	13.3	LOS B	6.7	169.7	0.75	0.80	0.85	34.3
8	T1	280	1.0	295	1.0	0.669	7.9	LOS A	6.7	169.7	0.75	0.80	0.85	34.3
18	R2	165	1.0	174	1.0	0.669	7.9	LOS A	6.7	169.7	0.75	0.80	0.85	33.4
Approach		690	1.0	726	1.0	0.669	9.9	LOS A	6.7	169.7	0.75	0.80	0.85	34.1
East: WB Israel Rd														
1	L2	180	1.0	189	1.0	0.406	12.6	LOS B	3.2	81.5	0.81	0.76	0.81	34.1
6	T1	220	1.0	232	1.0	0.406	7.2	LOS A	3.2	81.5	0.81	0.76	0.81	34.1
16	R2	150	1.0	158	1.0	0.123	5.2	LOS A	0.7	18.5	0.51	0.57	0.51	35.5
Approach		550	1.0	579	1.0	0.406	8.4	LOS A	3.2	81.5	0.73	0.71	0.73	34.5
North: SB Littlerock Rd														
7	L2	120	1.0	126	1.0	0.380	13.8	LOS B	2.6	66.0	0.80	0.84	0.80	33.7
4	T1	430	1.0	453	1.0	0.380	8.3	LOS A	2.9	72.9	0.80	0.79	0.80	34.4
14	R2	95	1.0	100	1.0	0.380	7.9	LOS A	2.9	72.9	0.80	0.76	0.80	33.8
Approach		645	1.0	679	1.0	0.380	9.2	LOS A	2.9	72.9	0.80	0.80	0.80	34.2
West: EB 70th Ave														
5	L2	75	1.0	79	1.0	0.234	11.4	LOS B	1.1	28.0	0.60	0.70	0.60	34.7
2	T1	135	1.0	142	1.0	0.234	6.4	LOS A	1.1	28.0	0.60	0.70	0.60	34.7
12	R2	200	1.0	211	1.0	0.207	5.8	LOS A	0.9	23.1	0.54	0.68	0.54	35.2
Approach		410	1.0	432	1.0	0.234	7.0	LOS A	1.1	28.0	0.57	0.69	0.57	34.9
All Vehicles		2295	1.0	2416	1.0	0.669	8.8	LOS A	6.7	169.7	0.72	0.76	0.76	34.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2 [Tyee Drive at Israel Road (Site Folder: General)]

Projected 2024 With Project Sensitivity
PM Peak Hour
Site Category: (None)
Roundabout

Vehicle Movement Performance

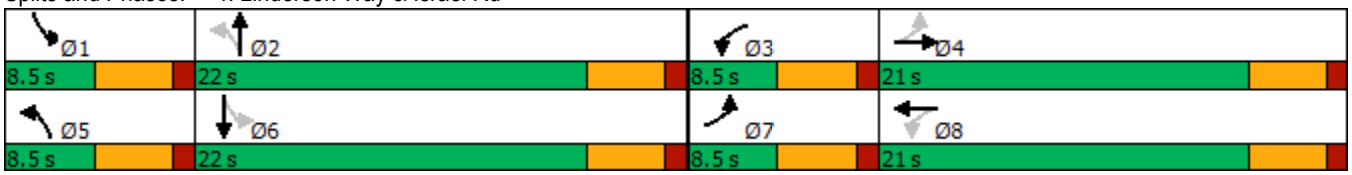
Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: NB Tyee Drive														
3	L2	90	1.0	98	1.0	0.141	13.3	LOS B	0.9	21.6	0.69	0.76	0.69	33.4
8	T1	5	1.0	5	1.0	0.141	7.7	LOS A	0.9	21.6	0.69	0.76	0.69	33.4
18	R2	15	1.0	16	1.0	0.141	7.6	LOS A	0.9	21.6	0.69	0.76	0.69	32.5
Approach		110	1.0	120	1.0	0.141	12.3	LOS B	0.9	21.6	0.69	0.76	0.69	33.3
East: WB Israel Rd														
1	L2	30	1.0	33	1.0	0.506	10.7	LOS B	3.7	93.7	0.47	0.53	0.47	36.3
6	T1	290	1.0	315	1.0	0.506	5.1	LOS A	3.7	93.7	0.47	0.53	0.47	36.3
16	R2	265	1.0	288	1.0	0.506	5.0	LOS A	3.7	93.7	0.47	0.53	0.47	35.2
Approach		585	1.0	636	1.0	0.506	5.3	LOS A	3.7	93.7	0.47	0.53	0.47	35.8
North: SB Tyee Drive														
7	L2	315	1.0	342	1.0	0.275	11.4	LOS B	1.8	45.0	0.58	0.72	0.58	33.5
4	T1	5	1.0	5	1.0	0.275	5.8	LOS A	1.8	45.0	0.58	0.72	0.58	33.5
14	R2	155	1.0	168	1.0	0.175	6.5	LOS A	1.0	24.6	0.57	0.65	0.57	35.1
Approach		475	1.0	516	1.0	0.275	9.7	LOS A	1.8	45.0	0.58	0.70	0.58	34.0
West: EB Israel Road														
5	L2	60	2.0	65	2.0	0.420	11.7	LOS B	2.8	71.2	0.62	0.65	0.62	35.5
2	T1	225	2.0	245	2.0	0.420	6.1	LOS A	2.8	71.2	0.62	0.65	0.62	35.5
12	R2	125	2.0	136	2.0	0.420	6.1	LOS A	2.8	71.2	0.62	0.65	0.62	34.5
Approach		410	2.0	446	2.0	0.420	6.9	LOS A	2.8	71.2	0.62	0.65	0.62	35.2
All Vehicles		1580	1.3	1717	1.3	0.506	7.6	LOS A	3.7	93.7	0.56	0.63	0.56	34.9

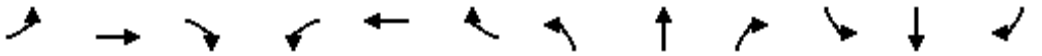
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	470	100	85	480	25	125	70	115	25	95	75
Future Volume (vph)	70	470	100	85	480	25	125	70	115	25	95	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	200		0	150		0	100		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1079			1372			1044			847	
Travel Time (s)		24.5			31.2			23.7			19.3	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	5.0		4.0	5.0		4.0	6.0		4.0	6.0	
Minimum Split (s)	8.5	20.5		8.5	20.5		8.5	21.5		8.5	21.5	
Total Split (s)	8.5	21.0		8.5	21.0		8.5	22.0		8.5	22.0	
Total Split (%)	14.2%	35.0%		14.2%	35.0%		14.2%	36.7%		14.2%	36.7%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Min		None	Min		None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 48.5	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 4: Linderson Way & Israel Rd





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	470	100	85	480	25	125	70	115	25	95	75
Future Volume (veh/h)	70	470	100	85	480	25	125	70	115	25	95	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	80	534	114	97	545	28	142	80	131	28	108	85
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	1	1	1	2	2	2	2	2	2	2	2	2
Cap, veh/h	281	504	108	252	600	31	356	137	225	312	155	122
Arrive On Green	0.05	0.33	0.33	0.06	0.34	0.34	0.08	0.22	0.22	0.03	0.16	0.16
Sat Flow, veh/h	1795	1506	321	1781	1763	91	1781	638	1044	1781	970	763
Grp Volume(v), veh/h	80	0	648	97	0	573	142	0	211	28	0	193
Grp Sat Flow(s),veh/h/ln	1795	0	1827	1781	0	1854	1781	0	1682	1781	0	1733
Q Serve(g_s), s	1.4	0.0	16.5	1.7	0.0	14.6	3.2	0.0	5.6	0.6	0.0	5.2
Cycle Q Clear(g_c), s	1.4	0.0	16.5	1.7	0.0	14.6	3.2	0.0	5.6	0.6	0.0	5.2
Prop In Lane	1.00		0.18	1.00		0.05	1.00		0.62	1.00		0.44
Lane Grp Cap(c), veh/h	281	0	611	252	0	630	356	0	362	312	0	277
V/C Ratio(X)	0.28	0.00	1.06	0.38	0.00	0.91	0.40	0.00	0.58	0.09	0.00	0.70
Avail Cap(c_a), veh/h	329	0	611	290	0	630	356	0	597	411	0	615
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.9	0.0	16.4	12.3	0.0	15.6	15.6	0.0	17.4	16.7	0.0	19.6
Incr Delay (d2), s/veh	0.2	0.0	53.5	0.4	0.0	17.2	0.3	0.0	1.5	0.0	0.0	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	14.8	0.6	0.0	8.1	1.2	0.0	2.0	0.2	0.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.1	0.0	69.9	12.7	0.0	32.7	15.9	0.0	18.9	16.7	0.0	22.7
LnGrp LOS	B	A	F	B	A	C	B	A	B	B	A	C
Approach Vol, veh/h		728			670			353			221	
Approach Delay, s/veh		63.5			29.8			17.6			22.0	
Approach LOS		E			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.8	15.1	7.4	21.0	8.5	12.4	7.2	21.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	4.0	17.5	4.0	16.5	4.0	17.5	4.0	16.5
Max Q Clear Time (g_c+I1), s	2.6	7.6	3.7	18.5	5.2	7.2	3.4	16.6
Green Ext Time (p_c), s	0.0	0.8	0.0	0.0	0.0	0.7	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	39.2
HCM 6th LOS	D

MOVEMENT SUMMARY

Site: 9 [Littlerock Road at Tumwater Blvd (Site Folder: General)]

Projected 2024 With Project Sensitivity
PM Peak Hour
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: NB Littlerock Rd														
8	T1	215	1.0	236	1.0	0.228	6.0	LOS A	1.4	35.4	0.60	0.58	0.60	35.9
18	R2	215	1.0	236	1.0	0.185	5.6	LOS A	1.2	29.9	0.57	0.61	0.57	35.3
Approach		430	1.0	473	1.0	0.228	5.8	LOS A	1.4	35.4	0.58	0.60	0.58	35.6
East: WB Tumwater Blvd														
1	L2	240	1.0	264	1.0	0.203	10.5	LOS B	1.0	26.4	0.38	0.65	0.38	34.1
16	R2	435	1.0	478	1.0	0.368	5.3	LOS A	2.2	55.7	0.44	0.55	0.44	35.9
Approach		675	1.0	742	1.0	0.368	7.2	LOS A	2.2	55.7	0.42	0.59	0.42	35.2
North: SB Littlerock Rd														
7	L2	400	1.0	440	1.0	0.486	11.0	LOS B	3.7	93.5	0.54	0.63	0.54	34.8
4	T1	470	1.0	516	1.0	0.486	5.8	LOS A	3.7	93.5	0.50	0.57	0.50	35.6
Approach		870	1.0	956	1.0	0.486	8.2	LOS A	3.7	93.5	0.52	0.60	0.52	35.2
All Vehicles		1975	1.0	2170	1.0	0.486	7.3	LOS A	3.7	93.5	0.50	0.59	0.50	35.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

City Hall
555 Israel Road SW
Tumwater, WA 98501-6515
Phone: 360-754-4140
Fax: 360-754-4142

Memo

To: Alex Baruch, Associate Planner
Tami Merriman, Permit Manager

From: Mary Heather Ames, Transportation Manager

Date: June 9, 2023

Re: Transportation Concurrency – Belmont Flats

Based on the Transportation Impact Analysis prepared for the Belmont Flats project, dated February of 2023 and the City of Tumwater Capital Facilities Plan, the City finds that the Kingswood Commercial project is concurrent in regards to Transportation conditioned as follows:

1. Shall pay Transportation Impact Fees per the Fee Resolution current at time of permit application.
2. Shall construct transportation improvements as shown on the formal site plan.
3. A recent study of the I-5 interchange at Tumwater Boulevard indicates improvements are needed in order to meet established safety and level of service standards. This project shall either:
    a. Construct a roundabout at the northbound Interstate 5 On/Off Ramp and Tumwater Boulevard intersection;
    b. Voluntarily pay a mitigation fee of $4,219 per peak trip generated by this project under RCW 82.02.020 to be used as described herein:
    Tumwater Boulevard/I-5 Interchange: The City's planned transportation improvements at the Tumwater Boulevard/I-5 interchange include converting the interchange to a roundabout diamond interchange by replacing the southbound on/off ramp signal and northbound stop controlled intersections with roundabouts. If the subject development has trips to the interchange before the roundabout is constructed, a temporary signal will be required.
4. Prior to any Certificate of Occupancy for the Belmont Flats project the extension of Tyee Drive to Tumwater Boulevard shall be constructed and accepted by the City of Tumwater as referenced in section 5.1 of the traffic study.

Local Planning Solutions
Knowledge, Experience, Results

June 22, 2021

To:	Brandon Johnson, Principal - SCJ Alliance Consulting
FROM:	Gary Cooper
Re:	Mazama Pocket Gopher Screening
Parcel Numbers:	82700800401; 82700800401; 82700800401; 82700800401; 82700800300; 82700800201; 82700800202; 82700800202; 82700800202; 82700700500; 82700702100
Total Acreage:	16.69 acres

I have performed both a desk review and site visit for the above-referenced property to determine whether a full gopher review is required. Below are my findings and conclusions.

Gopher Review

The soil type which covers all eleven parcels is Cagey loamy sand (#020), which is categorized as a "More Preferred" soil for Mazama Pocket Gophers. However, after conducting a field review of these parcels, I find that they meet the criteria for an exemption, based on the fact that they are heavily forested and have a dense mixture of herbaceous and fern understory. The City of Tumwater's July 25, 2018 Administrative Determination regarding Mazama Pocket Gopher screening provides for the following exemption:

> "Vegetative Cover – Project sites, parcels, or portions of these sites with 30% or greater forested cover have not required CAO review, although where there are adjacent unforested and undeveloped lots exceeding 7,600 square feet, CAO review may be needed."

The lots surround three developed residential lots, but otherwise are bounded by Israel Road, Interstate 5, and Tumwater Boulevard on the north, east and south. To the west the lots are bounded by large undeveloped, but forested parcels.

Below are representative photos taken of the properties during the field visit::

3113 28th Ave SE Olympia WA ◆ 360.791.0453 ◆ garyc@localplanningsolutions.com

Photo 1 – Northern border of property, looking south

Photo 2 – Example of interior of parcel

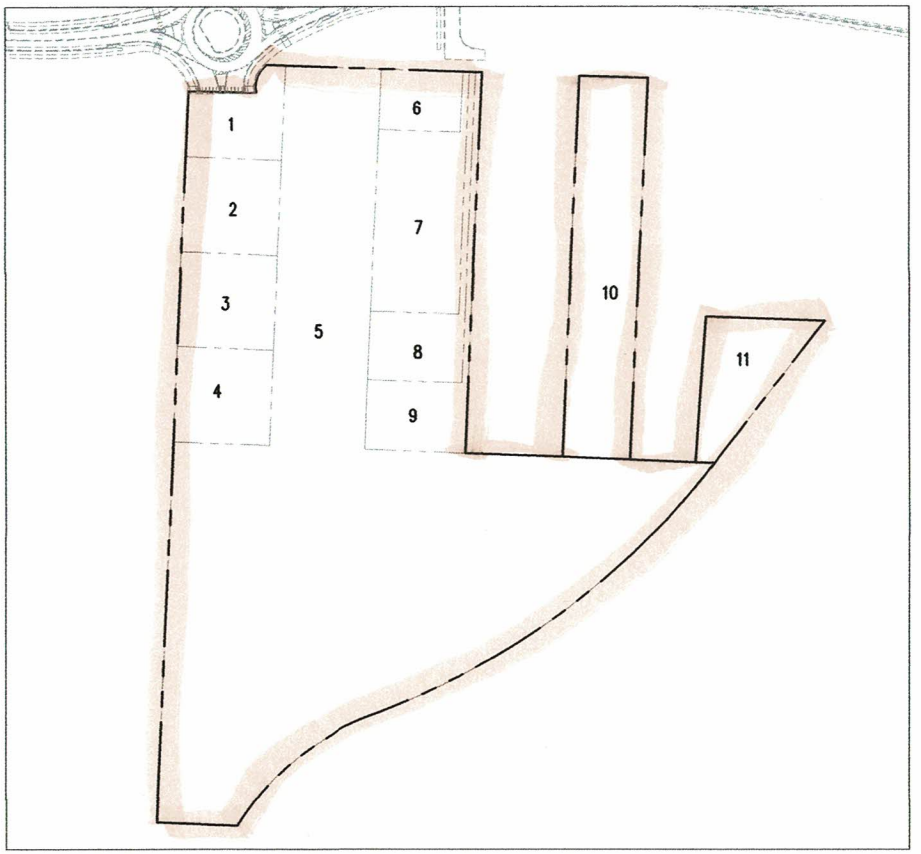
Conclusion

Per my field visit observations and desk review, these parcels meet the criteria for an exclusion from a gopher review, based on the City of Tumwater's exclusion criteria.

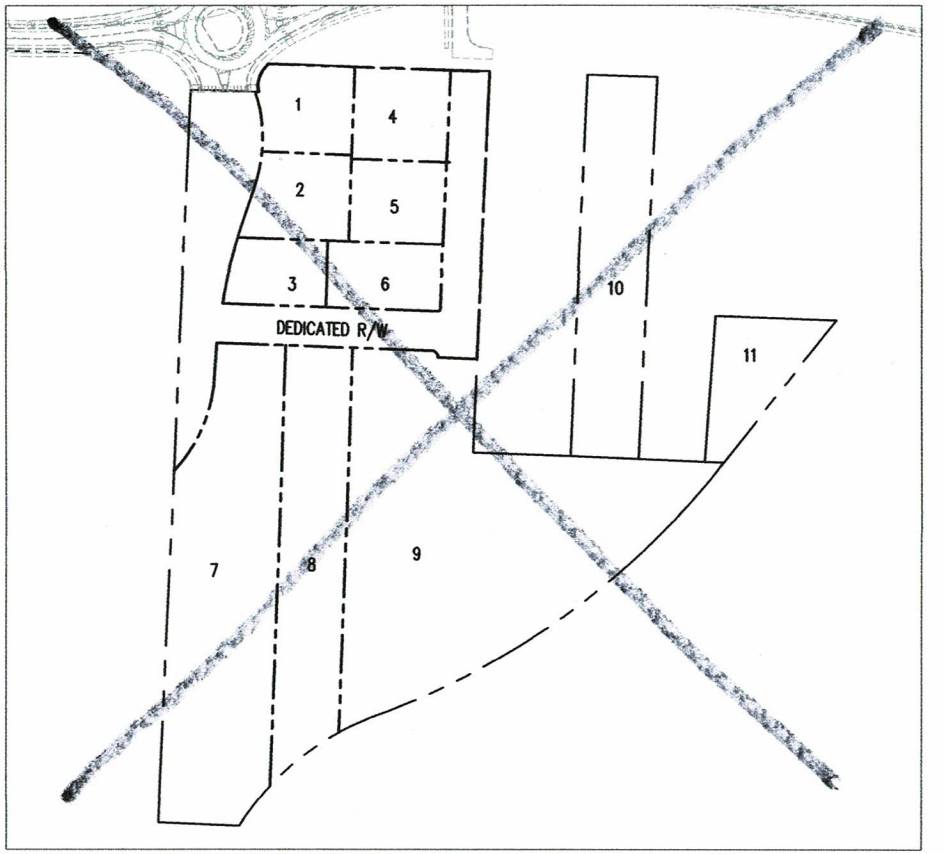
Signed: Gary Cooper

Gary Cooper, Local Planning Solutions

Date: June 22, 2021



EXISTING LOT LAYOUT



PROPOSED LOT LAYOUT

PARCEL LIST:

1- TPN 82700800401
2- TPN 82700800401
3- TPN 82700800401
4- TPN 82700800401
5- TPN 82700800300
6- TPN 82700800201
7- TPN 82700800202
8- TPN 82700800202
9- TPN 82700800202
10- TPN 82700700500
11- TPN 82700702100

Hanson Properties

Legend

- Parcel Boundaries
- Roads - Major
  - Major Roads
  - Ramp
  - I 5; US 101
- Roads (Large Scale)
- Railroads
- County Border

Scale 1: 6,949

0 300 600

Feet

Map Created Using GeoData Public Website

Published: 6/17/2021

Note:

THURSTON COUNTY
WASHINGTON
SINCE 1852

Thurston County GeoData Center