MEETING AGENDA

TUALATIN PLANNING COMMISSION

May 16, 2019; 6:30 p.m.
JUANITA POHL CENTER
8513 SW TUALATIN RD
TUALATIN, OR 97062

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1. **CALL TO ORDER & ROLL CALL**
   Members: Bill Beers (Chair), Mona St. Clair, Alan Aplin, Travis Stout, and Janelle Thompson
   Staff: Steve Koper, Planning Manager; Erin Engman, Associate Planner

2. **APPROVAL OF MINUTES**

   A. Approval of April 18, 2019 TPC Minutes

3. **COMMUNICATION FROM THE PUBLIC (NOT ON THE AGENDA)**
   Limited to 3 minutes

4. **ACTION ITEMS**

   A. Tualatin Service Center Plan Text Amendment (PTA 19-0002) and Plan Map Amendment (PMA 19-0002)

5. **COMMUNICATION FROM CITY STAFF**

6. **FUTURE ACTION ITEMS**

7. **ANNOUNCEMENTS/PLANNING COMMISSION COMMUNICATION**

8. **ADJOURNMENT**

STAFF REPORT
CITY OF TUALATIN

TO: Tualatin Planning Commissioners

FROM: Lynette Sanford, Office Coordinator

DATE: 05/16/2019

SUBJECT: Approval of April 18, 2019 TPC Minutes

ISSUE BEFORE TPC:

Attachments: TPC Minutes April 18, 2019

City of Tualatin

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UNOFFICIAL

TUALATIN PLANNING COMMISSION **MINUTES OF April 18, 2019**

TPC MEMBERS PRESENT:	**STAFF PRESENT**
Bill Beers	Steve Koper
Alan Aplin	Erin Engman
Janelle Thompson	Lynette Sanford
Travis Stout	
Mona St. Clair	

TPC Member Absent: Naomi White

GUESTS: None

1. CALL TO ORDER AND ROLL CALL:

Mr. Beers called the meeting to order at 6:33 pm and reviewed the agenda. Roll call was taken.

2. ANNOUNCEMENTS/PLANNING COMMISSION COMMUNICATION:

A. Introduction of new Planning Commissioner Naomi White

Steve Koper, Planning Manager, noted that we have a new Planning Commissioner, Naomi White. She was not present.

3. APPROVAL OF MINUTES:

Mr. Beers asked for approval of the March 21, 2019 TPC minutes. MOTION by Aplin SECONDED by Beers to approve the minutes as written. MOTION PASSED 5-0.

4. COMMUNICATION FROM THE PUBLIC (NOT ON THE AGENDA)

None

5. COMMUNICATION FROM CITY STAFF:

Erin Engman, Associate Planner, asked the Planning Commission to consider potential administrative amendments to land use procedures and application criteria from the Tualatin Development Code Chapters 32 and 33. Ms. Engman stated that identified potential code changes may form the basis for the Commission to make

recommendations on future on plan text amendments to City Council.

Ms. Engman stated that the development code modernization project included outreach efforts to applicants, which revealed that we do not have the best tools to proportionally size the application process to the scope of development projects. Our code lacks common exemptions to land use review and thresholds for application procedures are not clearly defined. Potential amendments to application exemptions and procedure thresholds is a small effort that will likely improve the customer service we deliver.

Ms. Engman presented the current land use review process and exceptions. Ms. Engman noted that a Type I procedure includes modification to previous architectural review approvals, Type II includes alteration to unimproved property, and Type III encompasses large-scale alterations to unimproved properties, which also requires Architectural Review Board (ARB) approval. Mr. Aplin asked for a recent example of a Type III approval. Ms. Engman responded that the Legacy Hospital expansion and the Majestic industrial building were the last two we reviewed. Ms. Engman added that an ARB decision is required for commercial buildings over 50,000 square feet, industrial buildings over 150,000 square feet, and new multifamily housing projects with 100 or more units.

Mr. Koper added that a Type I review does not include discretionary elements, yet sometimes it involves a Type II review due to the high thresholds in the code. Ms. Thompson asked if people are not submitting for projects due to the amount of paperwork involved. Ms. Engman replied that sometimes the work completed goes unpermitted. Mr. Koper added that the fees between Type I and Type II projects are substantial, which is frustrating to the public.

Ms. Engman noted that a Type II procedure is required for small improvements to unimproved property including the removal of more than four trees, any grading activity, minimal paving, and a new shed or storage building. Our code does not have flexible setback standards for accessory structures. Mr. Aplin asked if neighbor approval is required for retaining walls. Ms. Engman replied that it does not, but if a neighbor complains, code enforcement may get involved.

Mr. Beers inquired about the threshold for grading. Ms. Engman replied that Clean Water Services mandate grading. Their standards require review if you are within 200 feet of a wetland; an erosion control permit is required if you disturb more than 500 square feet of land.

Ms. St. Clair asked how the value of a project is determined regarding building permit fees. Ms. Engman responded that it is up to the applicant to determine.

Mr. Aplin stated that he believes most of the improvements discussed should require a simple review. Ms. Thompson inquired about the enforcement of projects completed. Mr. Koper replied that there is not a lot that filters back to us. In general, it is encouraged for neighbors to work things out.

Mr. Stout inquired about the percentage of Type 1 versus 2 and 3 reviews. Mr. Koper replied that the percentage is 5 to 1.

Ms. St. Clair added that since the current code guidelines are frustrating, they should be revisited. Ms. Thompson added that she likes the idea of coming back with options and to explore comparisons with other cities.

It was determined that the direction is for staff to further explore the topic areas and return with draft code language and clarified exemptions.

5. FUTURE ACTION ITEMS

Mr. Koper stated that City Council voted to approve the Basalt Creek plan text and plan map amendments and the majority voted in favor to adopt the ordinance. Since the vote wasn't unanimous, the Council will return on April 22. A vote in favor will formally adopt the ordinance.

Mr. Koper commended Ms. St. Clair on her presentation of the TPC annual report to Council. Mr. Koper added that another part of the administrative amendment process is to increase visibility with the Council. Having a member of the Commission attend furthers the relationship.

Mr. Koper noted that we mailed Kenneth Ball a certificate to honor his service with the Planning Commission.

Mr. Koper stated that in June or July, we will be giving a formal update on the Tualatin 2040 project. Since the joint advisory meeting, we held 16 hour-long stakeholder interviews. A common theme included preference for a civic/performing arts space, a new City hall, and concerns regarding housing. Other topics of discussion were recreation, parks, trails, the downtown area, and the former Haggen's site.

Mr. Koper stated that there is an opportunity for continuing education. The Urbanism Next conference will be held on May 7-9. A session specifically for policy makers will conducted on May 7. If the Commissioners would like to attend, the City will cover the cost.

Mr. Koper noted that we have a vacancy on the Planning Commission. Our new Commission member, Naomi White, has not been attendance and we have been unsuccessful in contacting her. Ms. St. Clair offered to reach out.

8, ADJOURNMENT

MOTION by Thompson to adjourn the meeting at 7:30 pm.

_____
Lynette Sanford, Office Coordinator

STAFF REPORT
CITY OF TUALATIN

TO: Tualatin Planning Commissioners

FROM: Steve Koper, Planning Manager
Erin Engman, Associate Planner

DATE: 05/16/2019

SUBJECT: Tualatin Service Center Plan Text Amendment (PTA 19-0002) and Plan Map Amendment (PMA 19-0002)

ISSUE BEFORE TPC:

The Planning Commission is asked to make a recommendation to the City Council on the Tualatin Service Center Plan Text and Plan Map Amendment applications.

RECOMMENDATION:

Staff respectfully requests that the Planning Commission forward a recommendation of approval to the the City Council on the Tualatin Service Center Plan Text Amendment (PTA 19-0002) and Plan Map Amendment (PMA 19-0002).

EXECUTIVE SUMMARY:

Proposal

- The subject proposal is a Plan Text Amendment (PTA 19-0001) and Plan Map Amendment (PMA 19-0001), which are quasi-judical amendments.
- The proposed amendments would update the Tualatin Comprehensive Plan (Map 9-1) and Development Code (Chapter 49).
- The applicant requests approval of a Comprehensive Plan Text Amendment (PTA 19-0002) that would add Government Offices and Public Works Storage Yard and Shop as Permitted uses in the Institutional Zone (IN).
- The applicant also requests approval of a Plan Map Amendment (PMA 19-0002) to change the zoning on an approximately 8.73 acre site is located on the northeast corner of Herman Road and 108th Avenue (10699 SW Herman Road) from Light Manufacturing (ML) to Institutional (IN).
- The subject site is presently developed with approximately four buildings, surface parking areas, and landscaping. Access is provided via one driveway located on Herman Road and two gated access points on 108th Avenue. The site is presently the home of the City's Public Works Department, and also supports the Street/Sewer/Storm, Water, and portions of the Engineering Division.
- The proposed amendments would facilitate future development of a government office building which would allow for the siting of a unified permitting and development services center on City-owned property. The building would house approximately 65 staff members

and would also be the future home of the City's Community Development Department (Planning and Building Divisions). Future structural and site development would be reviewed under a subsequent Architectural Review application.

Transportation Planning Rule (TPR) Compliance

- Application of the Institutional Zone (IN) to the subject property has the theoretical potential to result in a "significant" impact as defined by Oregon Adminstrative Rules Chapter 660 Division 12 Section 0060, also known as the "Transportation Planning Rule" or TPR. The applicant proposes the addition of a "trip cap" which would limit fututure site development to not more than 80 additional PM "peak hour" trips, thereby satisfying the TPR by providing a mitigating measure that would result in the proposed amendments not having a "significant" impact. This trip cap provides more than enough trip generation for the site to accomodate the proposed service center addition.

Compliance with Applicable Criteria

- As demonstrated within the attached Findings and Analysis, the proposed amendments comply with the the applicable criteria of: the Oregon Statewide Planning Goals; Oregon Administrative Rules; Metro Code; the Tualatin Comprehensive Plan; and, the Tualatin Development Code.

Public Notice

- Notice of the proposed amendments was provided to the Oregon Department of Land Conservation and Development (DLCD), the required 35 days prior to the City Council public hearing. Notification of the upcoming City Council hearing was made consistent with Tualatin Development Code Section 32.240, which included: mailed notices to adjacent property owners, and published and posted notices.

OUTCOMES OF DECISION:

A recommendation of approval of the proposed amendments (PTA-19-0002 and PMA-19-0002) to the City Council would support:

- An amendment to Chapter 49 (Institutional Zone (IN)) of the Tualatin Development Code to add Government Offices and Public Works Storage Yard and Shop as Permittted uses and a minor revision to locational standards relative to Wireless Telecommunication Facilities, a Permitted use, as well as several other minor text updates.
- An amendment to Map 9-1 of the Tualatin Comprehensive Plan to apply the Institutional Zone (IN) designation to the subject site.
- Future development of a a unifed permitting and development services center on City-owned property.

ALTERNATIVES TO RECOMMENDATION:

The Planning Commission may alternatively:

- Recommend approval of the proposed amendments (PTA 19-0002 and PMA 19-0002) to the City Council with further amendments.
- Recommend dential of the proposed amendments (PTA 19-0002 and PMA 19-0002) to the City Council.

FINANCIAL IMPLICATIONS:

N/A

Attachments:

Findings and Analysis
Exhibit A - Proposed Amended Text - TDC Chapter 49
Exhibit B - Existing and Proposed Map 9-1
Exhibit C - Transportation Impact Analysis
Exhibit D - Transportation Planning Rule Analysis
Exhibit E - Metro Title 4 Map
Exhibit F - Metro Regional Freight Network Map

City of Tualatin
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May 16, 2019

Analysis and Findings for
PTA 19-0002 and PMA 19-0002

Case #:	PTA 19-0002 and PMA 19-0002
Project:	Tualatin Services Center
Location:	10699 SW Herman Road; Tax lots: 2S1 22AD 200 and 300
Applicant:	Clayton Reynolds, Maintenance Services Manager
Owner:	City of Tualatin

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I. INTRODUCTION

A. Applicable Criteria

Applicable Statewide Planning Goals; Divisions 9 and 12 of the Oregon Administrative Rules; Title 4 of Metro Chapter 3.07 (Urban Growth Management Functional Plan); applicable Goals and Policies from the City of Tualatin Comprehensive Plan; applicable Sections of the City of Tualatin Development Code, including Section 33.070 (Plan Amendments).

B. Project Description

The applicant also requests approval of a Comprehensive Plan Text Amendment (PTA 19-0002) that would add government offices and public works storage yard and shop as Permitted uses in the Institutional Zone (IN). The applicant also requests approval of a Plan Map Amendment (PMA 19-0002) to change the zoning on an approximately 8.73 acre site is located on the northeast corner of Herman Road and 108th Avenue (10699 SW Herman Road) from Light Manufacturing (ML) to Institutional (IN).

The subject site is presently developed with approximately four buildings, surface parking areas, and landscaping. Access is provided via one driveway located on Herman Road and two gated access points on 108th Avenue. The site is presently the home of the City's Public Works Department, and also supports the Street/Sewer/Storm, Water, and portions of the Engineering Division.

The proposed amendments would facilitate future development of a government office building which would allow for the siting of a unified permitting and development services center on City-owned property. The building would house approximately 65 staff members and would also be the future home of the City's Community Development Department (Planning and Building Divisions). Future structural and site development would be reviewed under a subsequent Architectural Review application.

C. Site Description and Surrounding Uses

Surrounding uses include a variety of industrial uses:

North: Light Manufacturing (ML)

- DOT Storage
- Ascentec Engineering

South: General Manufacturing (MG)

- Herman Road
- CFN Cardlock

West: Light Manufacturing (ML)

- 108th Avenue
- NW Metal Fab

East: Light Manufacturing (ML)

- Pacific Foods

Figure 1: Aerial view of subject site (highlighted)

D. Exhibit List

A: Draft amended Chapter 49 (Institutional Zone (IN)) text

B: Existing and proposed Community Plan (Map 9-1) excerpt

C: Transportation Impact Analysis (TIA)

D: Transportation Planning Rule (TPR) Analysis

E: Metro Title 4 – Industrial and Other Employment Areas Map

F: Metro Regional Freight Map

II. FINDINGS

A. The following Oregon Statewide Planning Goals are applicable to the proposed amendments:

Goal 1 – Citizen Involvement
To develop a citizen involvement program that insures the opportunity for citizens to be involved in all phases of the planning process.

Finding:
Notice of the proposed amendments has been provided pursuant to Sections 32.240 and 33.070. The Tualatin Planning Commission will hold a public meeting on May 16, 2019, and the City Council will hold a public hearing on the proposed amendments on June 10, 2019. The proposed amendments conform to Goal 1.

Goal 2 – Land Use Planning
To establish a land use planning process and policy framework as a basis for all decision and actions related to use of land and to assure an adequate factual base for such decisions and actions.

[…]

Finding:

The proposed amendments has been reviewed pursuant to the City's established land use planning process and procedures. The proposed amendments conform to Goal 2.

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

Finding:

Applicability of Goal 5 to post-acknowledgment plan amendments is governed by OAR 660- 023-0250. The proposed map amendments do not modify the acknowledged Goal 5 resource list, or a policy that addresses specific requirements of Goal 5. The proposed amendments do not allow uses that would conflict with a particular Goal 5 resource site on an acknowledged resource list. The proposed amendments conform to Goal 5.

Goal 6 – Air, Water and Land Resources Quality

Finding:

The proposal does not affect policies associated with Goal 6 established by the Comprehensive Plan. As reported in the previous findings for Goal 5, the proposed Comprehensive Plan/Zoning Map Amendment will continue to preserve environmentally sensitive lands. The Oregon Department of Environmental Quality (DEQ) regulates air, water and land with Clean Water Act (CWA) Section 401 Water Quality, Water Quality Certificate, State 303(d) listed waters, Hazardous Wastes, Clean Air Act (CAA), and Section 402 NPDES Construction and Stormwater Permits. The Oregon Department of State Lands and the U.S. Army Corps of Engineers regulate jurisdictional wetlands and CWA Section 404 water of the state and the country respectively. Clean Water Services (SWC) coordinates storm water

management, water quality and stream enhancement projects throughout the city. Future development will still need to comply with these state, national and regional regulations and protections for air, water and land resources. The proposed amendments conform to Goal 6.

Goal 7 – Areas Subject to Natural Disasters and Hazards

Finding:

The proposed amendments do not affect policies associated with Goal 7 established by the Comprehensive Plan. Approval of the proposed amendments will not eliminate the requirement for future development to meet the requirements of the Chapters 70 and 72 of the Tualatin Development Code. The proposed amendments conform to Goal 7.

Goal 9 – Economy of the State

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

[…]

Finding:

The proposed amendments would facilitate future development of with government offices employing approximately 65 people, which will increase economic opportunities relative to the existing site development. The proposed amendments conform to Goal 9.

Goal 11 – Public Facilities and Services

Finding:

The subject site is adequately served by public facilitates and services. The development that would be facilitated by the proposed amendments is not anticipated to result in a "significant" impact to the transportation system. No amendments to the public facilities plans are necessary in order to accommodate the proposed map amendment. The proposed amendments conform to Goal 12.

Goal 12 – Transportation

To provide and encourage a safe, convenient and economic transportation system.

[…]

Goal 12 requires the provision and encouragement of a safe, convenient, multimodal and economic transportation system. The proposed amendments are consistent with the City's acknowledged policies and strategies for the provision of transportation facilities and services as required by Goal 12 the Transportation Planning Rule (TPR), the findings for which are found under Oregon Administrative Rules Chapter 660, Division 12. The proposed amendments conform to Goal 12.

B. The following Oregon Administrative Rules (OAR) are applicable to the proposed amendments:

OAR Chapter 660, Division 9 (Economic Development)

660-009-0010

Application

[…]

(4) For a post-acknowledgement plan amendment under OAR chapter 660, division 18, that changes the plan designation of land in excess of two acres within an existing urban growth boundary from an industrial use designation to a non-industrial use designation, or another employment use designation to any other use designation, a city or county must address all applicable planning requirements, and:

(a) Demonstrate that the proposed amendment is consistent with its most recent economic opportunities analysis and the parts of its acknowledged comprehensive plan which address the requirements of this division; or

(b) Amend its comprehensive plan to incorporate the proposed amendment, consistent with the requirements of this division; or

(c) Adopt a combination of the above, consistent with the requirements of this division.

(5) The effort necessary to comply with OAR 660-009-0015 through 660-009-0030 will vary depending upon the size of the jurisdiction, the detail of previous economic development planning efforts, and the extent of new information on national, state, regional, county, and local economic trends. A jurisdiction's planning effort is adequate if it uses the best available or readily collectable information to respond to the requirements of this division.

(6) The amendments to this division are effective January 1, 2007. A city or county may voluntarily follow adopted amendments to this division prior to the effective date of the adopted amendments.

[…]

Finding:

Although the proposed amendment would change the plan designation of land in excess of two acres within an existing urban growth boundary from an industrial use designation (Light Manufacturing Zone (ML)) to a non-industrial use designation (Institutional Zone (IN)), the proposed amendments are otherwise consistent with the City's acknowledged comprehensive plan and would facilitate future development of government offices employing approximately 65 people, which will increase economic opportunities relative to the existing site development. The proposed amendments are consistent with these requirements.

OAR Chapter 660, Division 12 (Transportation Planning)

[…]

660-012-0060
Plan and Land Use Regulation Amendments

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

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

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

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

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

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

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

(2) If a local government determines that there would be a significant effect, then the local government must ensure that allowed land uses are consistent with the identified function, capacity, and performance standards of the facility measured at the end of the planning period identified in the adopted TSP through one or a combination of the remedies listed in (a) through (e) below, unless the amendment meets the balancing test in subsection (2)(e) of this section or qualifies for partial mitigation in section (11) of this rule. A local government using subsection (2)(e), section (3), section (10) or section (11) to approve an amendment recognizes that additional motor vehicle traffic congestion may result and that other facility providers would not be expected to provide additional capacity for motor vehicles in response to this congestion.

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

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

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

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

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

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

(B) The providers of facilities being improved at other locations provide written statements of approval; and

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

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

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

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

(c) The amendment does not involve property located in an interchange area as defined in paragraph (4)(d)(C); and

(d) For affected state highways, ODOT provides a written statement that the proposed funding and timing for the identified mitigation improvements or measures are, at a minimum, sufficient to avoid further degradation to the performance of the affected state highway. However, if a local government provides the appropriate ODOT regional office with written notice of a proposed amendment in a manner that provides ODOT reasonable opportunity to submit a written statement into the record of the local government proceeding, and ODOT does not provide a written statement, then the local government may proceed with applying subsections (a) through (c) of this section.

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

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

(b) Outside of interstate interchange areas, the following are considered planned facilities, improvements and services:

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

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

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

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

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

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

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

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

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

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

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

(C) Interstate interchange area means:

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

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

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

(5) The presence of a transportation facility or improvement shall not be a basis for an exception to allow residential, commercial, institutional or industrial development on rural lands under this division or OAR 660-004-0022 and 660-004-0028.

(6) In determining whether proposed land uses would affect or be consistent with planned transportation facilities as provided in sections (1) and (2), local governments shall give full credit for potential reduction in vehicle trips for uses located in mixed-use, pedestrian-friendly centers, and neighborhoods as provided in subsections (a)–(d) below;

(a) Absent adopted local standards or detailed information about the vehicle trip reduction benefits of mixed-use, pedestrian-friendly development, local governments shall assume that uses located within a mixed-use, pedestrian-friendly center, or neighborhood, will generate 10% fewer daily and peak hour trips than are specified in available published estimates, such as those provided by the Institute of Transportation Engineers (ITE) Trip Generation Manual that do not specifically account for the effects of mixed-use, pedestrian-friendly development. The 10% reduction allowed for by this section shall be available only if uses which rely solely on auto trips, such as gas stations, car washes, storage facilities, and motels are prohibited;

(b) Local governments shall use detailed or local information about the trip reduction benefits of mixed-use, pedestrian-friendly development where such information is available and presented to the local government. Local governments may, based on such information, allow reductions greater than the 10% reduction required in subsection (a) above;

(c) Where a local government assumes or estimates lower vehicle trip generation as provided in subsection (a) or (b) above, it shall assure through conditions of approval, site plans, or approval standards that subsequent development approvals support the development of a mixed-use, pedestrian-friendly center or neighborhood and provide for on-site bike and pedestrian connectivity and access to transit as provided for in OAR 660-012-0045(3) and (4). The provision of on-site bike and pedestrian connectivity and access to transit may be accomplished through application of acknowledged ordinance provisions which comply with 660-012-0045(3) and (4) or through conditions of approval or findings adopted with the plan amendment that assure compliance with these rule requirements at the time of development approval; and

(d) The purpose of this section is to provide an incentive for the designation and implementation of pedestrian-friendly, mixed-use centers and neighborhoods by lowering the regulatory barriers to plan amendments which accomplish this type of development. The actual trip reduction benefits of mixed-use, pedestrian-friendly development will vary from case to case and may be somewhat higher or lower than presumed pursuant to subsection (a) above. The Commission concludes that this assumption is warranted given general information about the expected effects of mixed-use, pedestrian-friendly development and its intent to encourage changes to plans and development

patterns. Nothing in this section is intended to affect the application of provisions in local plans or ordinances which provide for the calculation or assessment of systems development charges or in preparing conformity determinations required under the federal Clean Air Act.

(7) Amendments to acknowledged comprehensive plans and land use regulations which meet all of the criteria listed in subsections (a)–(c) below shall include an amendment to the comprehensive plan, transportation system plan the adoption of a local street plan, access management plan, future street plan or other binding local transportation plan to provide for on-site alignment of streets or accessways with existing and planned arterial, collector, and local streets surrounding the site as necessary to implement the requirements in OAR 660-012-0020(2)(b) and 660-012-0045(3):

(a) The plan or land use regulation amendment results in designation of two or more acres of land for commercial use;

(b) The local government has not adopted a TSP or local street plan which complies with OAR 660-012-0020(2)(b) or, in the Portland Metropolitan Area, has not complied with Metro's requirement for street connectivity as contained in Title 6, Section 3 of the Urban Growth Management Functional Plan; and

(c) The proposed amendment would significantly affect a transportation facility as provided in section (1).

(8) A "mixed-use, pedestrian-friendly center or neighborhood" for the purposes of this rule, means:

(a) Any one of the following:

(A) An existing central business district or downtown;

(B) An area designated as a central city, regional center, town center or main street in the Portland Metro 2040 Regional Growth Concept;

(C) An area designated in an acknowledged comprehensive plan as a transit oriented development or a pedestrian district; or

(D) An area designated as a special transportation area as provided for in the Oregon Highway Plan.

(b) An area other than those listed in subsection (a) above which includes or is planned to include the following characteristics:

(A) A concentration of a variety of land uses in a well-defined area, including the following:

(i) Medium to high density residential development (12 or more units per acre);

(ii) Offices or office buildings;

(iii) Retail stores and services;

(iv) Restaurants; and

(v) Public open space or private open space which is available for public use, such as a park or plaza.

(B) Generally include civic or cultural uses;

(C) A core commercial area where multi-story buildings are permitted;

(D) Buildings and building entrances oriented to streets;

(E) Street connections and crossings that make the center safe and conveniently accessible from adjacent areas;

(F) A network of streets and, where appropriate, accessways and major driveways that make it attractive and highly convenient for people to walk between uses within the center or neighborhood, including streets and major driveways within the center with wide sidewalks and other features, including pedestrian-oriented street crossings, street trees, pedestrian-scale lighting and on-street parking;

(G) One or more transit stops (in urban areas with fixed route transit service); and

(H) Limit or do not allow low-intensity or land extensive uses, such as most industrial uses, automobile sales and services, and drive-through services.

(9) Notwithstanding section (1) of this rule, a local government may find that an amendment to a zoning map does not significantly affect an existing or planned transportation facility if all of the following requirements are met.

(a) The proposed zoning is consistent with the existing comprehensive plan map designation and the amendment does not change the comprehensive plan map;

(b) The local government has an acknowledged TSP and the proposed zoning is consistent with the TSP; and

(c) The area subject to the zoning map amendment was not exempted from this rule at the time of an urban growth boundary amendment as permitted in OAR 660-024-0020(1)(d), or the area was exempted from this rule but the local government has a subsequently acknowledged TSP amendment that accounted for urbanization of the area.

(10) Notwithstanding sections (1) and (2) of this rule, a local government may amend a functional plan, a comprehensive plan or a land use regulation without applying performance standards related to motor vehicle traffic congestion (e.g. volume to capacity ratio or V/C), delay or travel time if the amendment meets the requirements of subsection (a) of this section. This section does not exempt a proposed amendment from other transportation performance standards or policies that may apply including, but not limited to, safety for all modes, network connectivity for all modes (e.g. sidewalks, bicycle lanes) and accessibility for freight vehicles of a size and frequency required by the development.

(a) A proposed amendment qualifies for this section if it:

(A) Is a map or text amendment affecting only land entirely within a multimodal mixed-use area (MMA); and

(B) Is consistent with the definition of an MMA and consistent with the function of the MMA as described in the findings designating the MMA.

(b) For the purpose of this rule, "multimodal mixed-use area" or "MMA" means an area:

(A) With a boundary adopted by a local government as provided in subsection (d) or (e) of this section and that has been acknowledged;

(B) Entirely within an urban growth boundary;

(C) With adopted plans and development regulations that allow the uses listed in paragraphs (8)(b)(A) through (C) of this rule and that require new development to be consistent with the characteristics listed in paragraphs (8)(b)(D) through (H) of this rule;

(D) With land use regulations that do not require the provision of off-street parking, or regulations that require lower levels of off-street parking than required in other areas and allow flexibility to meet the parking requirements (e.g. count on-street parking, allow long-term leases, allow shared parking); and

(E) Located in one or more of the categories below:

(i) At least one-quarter mile from any ramp terminal intersection of existing or planned interchanges;

(ii) Within the area of an adopted Interchange Area Management Plan (IAMP) and consistent with the IAMP; or

(iii) Within one-quarter mile of a ramp terminal intersection of an existing or planned interchange if the mainline facility provider has provided written concurrence with the MMA designation as provided in subsection (c) of this section.

(c) When a mainline facility provider reviews an MMA designation as provided in subparagraph (b)(E)(iii) of this section, the provider must consider the factors listed in paragraph (A) of this subsection.

(A) The potential for operational or safety effects to the interchange area and the mainline highway, specifically considering:

(i) Whether the interchange area has a crash rate that is higher than the statewide crash rate for similar facilities;

(ii) Whether the interchange area is in the top ten percent of locations identified by the safety priority index system (SPIS) developed by ODOT; and

(iii) Whether existing or potential future traffic queues on the interchange exit ramps extend onto the mainline highway or the portion of the ramp needed to safely accommodate deceleration.

(B) If there are operational or safety effects as described in paragraph (A) of this subsection, the effects may be addressed by an agreement between the local government and the facility provider regarding traffic management plans favoring traffic movements away from the interchange, particularly those facilitating clearing traffic queues on the interchange exit ramps.

(d) A local government may designate an MMA by adopting an amendment to the comprehensive plan or land use regulations to delineate the boundary following an existing zone, multiple existing zones, an urban renewal area, other existing boundary, or establishing a new boundary. The designation must be accompanied by findings showing how the area meets the definition of an MMA. Designation of an MMA is not subject to the requirements in sections (1) and (2) of this rule.

(e) A local government may designate an MMA on an area where comprehensive plan map designations or land use regulations do not meet the definition, if all of the other elements meet the definition, by concurrently adopting comprehensive plan or land use regulation amendments necessary to meet the definition. Such amendments are not subject to performance standards related to motor vehicle traffic congestion, delay or travel time.

(11) A local government may approve an amendment with partial mitigation as provided in section (2) of this rule if the amendment complies with subsection (a) of this section, the amendment meets the balancing test in subsection (b) of this section, and the local government coordinates as provided in subsection (c) of this section.

(a) The amendment must meet paragraphs (A) and (B) of this subsection or meet paragraph (D) of this subsection.

(A) Create direct benefits in terms of industrial or traded-sector jobs created or retained by limiting uses to industrial or traded-sector industries.

(B) Not allow retail uses, except limited retail incidental to industrial or traded sector development, not to exceed five percent of the net developable area.

(C) For the purpose of this section:

(i) "Industrial" means employment activities generating income from the production, handling or distribution of goods including, but not limited to, manufacturing, assembly, fabrication, processing, storage, logistics, warehousing, importation, distribution and transshipment and research and development.

(ii) "Traded-sector" means industries in which member firms sell their goods or services into markets for which national or international competition exists.

(D) Notwithstanding paragraphs (A) and (B) of this subsection, an amendment complies with subsection (a) if all of the following conditions are met:

(i) The amendment is within a city with a population less than 10,000 and outside of a Metropolitan Planning Organization.

(ii) The amendment would provide land for "Other Employment Use" or "Prime Industrial Land" as those terms are defined in OAR 660-009-0005.

(iii) The amendment is located outside of the Willamette Valley as defined in ORS 215.010.

(E) The provisions of paragraph (D) of this subsection are repealed on January 1, 2017.

(b) A local government may accept partial mitigation only if the local government determines that the benefits outweigh the negative effects on local transportation facilities and the local government receives from the provider of any transportation facility that would be significantly affected written concurrence that the benefits outweigh the negative effects on their transportation facilities. If the amendment significantly affects a state highway, then ODOT must coordinate with the Oregon Business Development Department regarding the economic and job creation benefits of the proposed amendment as defined in subsection (a) of this section. The requirement to obtain concurrence from a provider is satisfied if the local government provides notice as required by subsection (c) of this section and the provider does not respond in writing (either concurring or non-concurring) within forty-five days.

(c) A local government that proposes to use this section must coordinate with Oregon Business Development Department, Department of Land Conservation and Development, area commission on transportation, metropolitan planning organization, and transportation providers and local governments directly impacted by the proposal to allow opportunities for comments on whether the

proposed amendment meets the definition of economic development, how it would affect transportation facilities and the adequacy of proposed mitigation. Informal consultation is encouraged throughout the process starting with pre-application meetings. Coordination has the meaning given in ORS 197.015 and Goal 2 and must include notice at least 45 days before the first evidentiary hearing. Notice must include the following:

(A) Proposed amendment.

(B) Proposed mitigating actions from section (2) of this rule.

(C) Analysis and projections of the extent to which the proposed amendment in combination with proposed mitigating actions would fall short of being consistent with the function, capacity, and performance standards of transportation facilities.

(D) Findings showing how the proposed amendment meets the requirements of subsection (a) of this section.

(E) Findings showing that the benefits of the proposed amendment outweigh the negative effects on transportation facilities.

[…]

Finding:

As identified in the provided Transportation Planning Rule (TPR) analysis, the trip generation potential for the existing zoning (ML) and proposed zoning (IN) was calculated using site redevelopment assumptions for a reasonable worst-case use and ITE trip generation rates. Applying the reasonable worst case scenario to the subject site, the proposed Plan Map Amendment (from ML to IN) would have the potential to add an increase of approximately 155 (219-64) p.m. peak hour vehicle trips, which would potentially create a significant effect on the transportation system.

In order to mitigate for this potential effect, the applicant proposes a trip cap with the amendments that would limit site trips and not further degrade the transportation system. The provided TPR analysis indicates that a trip cap of 80 p.m. peak hour trips would result in the proposed amendment not having a significant effect on the transportation system. Subject to imposition of the aforementioned trip cap, these criteria are met.

C. The following Chapter and Titles of Metro Code are applicable to the proposed amendments:

Chapter 3.07, Urban Growth Management Functional Plan

[…]

Title 4: Industrial and Other Employment Areas

[…]

3.07.450 Employment and Industrial Areas Map

(a) The Employment and Industrial Areas Map is the official depiction of the boundaries of Regionally Significant Industrial Areas, Industrial Areas and Employment Areas.

[…]

(c) A city or county may amend its comprehensive plan or zoning regulations to change its designation of land on the Employment and Industrial Areas Map in order to allow uses not allowed by this title upon a demonstration that:

(1) The property is not surrounded by land designated on the map as Industrial Area, Regionally

Significant Industrial Area or a combination of the two;

Finding:

The subject site is adjacent to Herman Road to the south, south of which is railroad right-of-way, and 108th Avenue to the west and is therefore not "surrounding" by properties designated as Industrial or Regionally Significant Industrial Area. This criterion is met.

(2) The amendment will not reduce the employment capacity of the city or county;

Finding:

The proposed amendments would facilitate future development of government offices employing approximately 65 people, which will increase the employment capacity of the subject site and the City overall. This criterion is met.

(3) If the map designates the property as Regionally Significant Industrial Area, the subject property does not have access to specialized services, such as redundant electrical power or industrial gases, and is not proximate to freight loading and unloading facilities, such as trans-shipment facilities;

Finding:

The site is designated as Industrial not Regionally Significant Industrial Area. This criterion is not applicable.

(4) The amendment would not allow uses that would reduce off-peak performance on Main Roadway Routes and Roadway Connectors shown on the Regional Freight Network Map in the RTP below volume-to capacity standards in the plan, unless mitigating action is taken that will restore performance to RTP standards within two years after approval of uses;

[…]

Finding:

Herman Road and 108th Avenue are not designated as Main Roadway Routes or Roadway Connectors on the Regional Freight Network Map. This criterion is not applicable.

(6) If the map designates the property as Regionally Significant Industrial Area, the property subject to the amendment is ten acres or less; if designated Industrial Area, the property subject to the amendment is 20 acres or less; if designated Employment Area, the property subject to the amendment is 40 acres or less.

[…]

Finding:

The subject site is a less than 20 acre site, designated as Industrial on the Employment and Industrial Areas Map. This criterion is met.

D. The following Chapters of the Tualatin Comprehensive Plan are applicable to the proposed amendments:

Chapter 9. Plan Map

Finding:

The proposed amendments would apply the IN designation to the subject site and amend Community Plan Map 9-1. This objective is met.

Chapter 11. Transportation

Section 11.610. Transportation Goals and Objectives

(2) Goal 1: Mobility and access

Maintain and enhance the transportation system to reduce travel times, provide travel-time reliability, provide a functional and smooth transportation system, and promote access for all users.

Finding:

The proposed amendments have been determined to be in compliance with OAR Chapter 660 Division 12 and therefore, comply with the above goal. This objective is met.

(3) Goal 2: Safety, improve safety for all users, all modes, all ages, and all abilities within the City of Tualatin.

Finding:

The proposed amendments would not impact safety relative to the transportation system. The provided transportation analysis demonstrates that the government office use would not negatively impact road users in the vicinity of the subject site. This objective is met.

(4) Goal 3: Vibrant Community. Allow for a variety of alternative transportation choices for citizens of and visitors to Tualatin to support a high quality of life and community livability.

Finding:

The proposed amendments would facilitate development of a government office on the subject site, which would support alternative transportation options by providing bicycle parking areas and spaces for vanpools. This objective is met.

(5) Goal 4: Equity. Consider the distribution of benefits and impacts from potential transportation options, and work towards fair access to transportation facilities for all users, all ages, and all abilities.

Finding:

The proposed amendments do not reflect a significant change to the existing transportation system and rather have been determined to be in compliance with the City's existing TSP, which is reflective of this

goal. Further, all transportation and pedestrian facilities will comply with accessibility requirements upon construction. This objective is met.

(6) Goal 5: Economy. Support local employment, local businesses, and a prosperous community while recognizing Tualatin's role in the regional economy.

Finding:

The proposed amendments would facilitate future development of government offices employing approximately 65 people, which will increase the employment capacity of the subject site and the City overall. These employees will support local businesses as well as provide permitting services to local businesses helping to support the overall prosperity of the community. This objective is met.

(7) Goal 6: Health/Environment. Provide active transportation options to improve the health of citizens in Tualatin. Ensure that transportation does not adversely affect public health or the environment.

Finding:

The proposed amendments identify a transportation system, including streets, pedestrian and bicycle facilities. Herman Road and 108th Avenue both have both sidewalks and bike lanes. This objective is met.

(8) Goal 7: Ability to Be Implemented. Promote potential options that are able to be implemented because they have community and political support and are likely to be funded.

Finding:

The proposed amendments would facilitate future development of government offices employing approximately 65 people, for which a plan and budget have been developed. This objective is met.

E. The following Chapters of the Tualatin Development Code are applicable to the proposed amendments:

Chapter 33: Applications and Approval Criteria

Section 33.070 Plan Amendments

[...]

(2) Applicability. Quasi-judicial amendments may be initiated by the City Council, the City staff, or by a property owner or person authorized in writing by the property owner. Legislative amendments may only be initiated by the City Council.

Finding:

A Plan Text Amendment and Plan Text Amendment are proposed. This proposal is quasi-judicial in nature and therefore has been processed consistent with the Type IV-A procedures in Chapter 32. This criterion is met.

[...]

(5) Approval Criteria.

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

Finding:
The Tualatin Comprehensive Plan and Development Code implement the Oregon Statewide Planning Goals. Statewide Planning Goal 2 requires all parcels in each city and county to be designated with a planning district. The proposed amendment would rezone the subject site from Light Manufacturing (ML) to Institutional (IN) and government offices and public works yard and storage area as Permitted uses in the IN district.

The site is currently functions as the City's Public Works and Operations center. An objective of the Institutional Planning District is to accommodate campus-style development, owned and operated by governmental entities consisting of multiple structures or facilities, which may serve multiple purposes and provide multiple services to the community, per TDC 8.100.

Approval of the proposed amendments would facilitate the development government offices employing approximately 65 people, which will increase economic opportunities relative to the existing site development and provide permitting and development services in one location for the community. The proposed Plan Map Amendment to rezone the property from ML to IN and the proposed Plan Text Amendment to add government offices as a Permitted use in the Institutional District is therefore consistent with the public interest. This criterion is met.

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

Finding:
The Operations center anticipates future expansion to provide community development operations in addition to the existing public works operations. Chapter 8 addresses these semi-public and miscellaneous uses as not neatly fitting into traditional use categories, such as Industrial. The proposed Plan Map Amendment to IN provides clarity that the site provides community services. Chapter 8 of the Community Plan recognizes government offices as a use that is compatible with the Intuitional Planning District objectives. This criterion is met.

(c) The proposed amendment is in conformity with the applicable objectives of the Tualatin Community Plan.

Finding:
The City's Operations Center is recognized as a government service, in Chapter 8: Public Land Use, Section 8.020 of the Tualatin Community Plan. Additionally, the Institutional Planning District objectives of 8.100 state that, "The district may be applied to land that is able to accommodate large-scale campus-style development and operation of related uses, as follows: (a) Contiguous land one and one-half acre in size or greater; (b) Access to a collector or arterial street; and (c) Adequate public facilities are available to the property. The operations center is (a) approximately 8.73 acres in size, (b) served by two major arterial streets: Herman Road and 108th Avenue, and (c) is served by public utilities. This criterion is met.

(d) The following factors were consciously considered:

(i) The various characteristics of the areas in the City;

Finding:
The site is bordered by Light Manufacturing uses to the west, north, and east; and General Manufacturing uses to the south. The existing public works functions and operations are compatible with surrounding industrial uses. The proposed amendments would facilitate development of a government office building on the site which would be the future home to permitting and development review services for the City, which is a use that is compatible with the uses presently on the subject site as well as those on neighboring properties. This criterion is met.

(ii) The suitability of the areas for particular land uses and improvements in the areas;

Finding:
The subject site is located in Neighborhood Planning Area 7 as shown on Map 9-2. This area comprises the majority of the City's industrial land. The site is located in area designated light industrial to buffer residential uses to the north. Rezoning the land from ML to IN will preserve the campus-style development needs of the Operations Center while remaining harmonious with surround land uses. This criterion is met.

(iii) Trends in land improvement and development;

Finding:
The subject site is located in an area designated as Industrial Area by Metro's Urban Growth Management Functional Plan (TDC Map 9-4). The proposed zone change will comply with Metro's Title 4. The IN zone does not permit retail or professional services uses. This criterion is met.

(iv) Property values;

Finding:
The subject site is a City-owned property. The proposed amendments would accommodate future development of government offices on the subject site, a proposal which would be reviewed through further Architectural Review for a demonstration of compliance with applicable development standards. Overall, the nature of the existing and proposed site development are harmonious with the subject site as well as surrounding properties. This criterion is met.

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

Finding:
Rezoning the land to IN will benefit the City in capturing a more accurate Industrial land inventory. Impacts to the transportation system are addressed in (f) and (h). This criterion is met.

(vi) Natural resources of the City and the protection and conservation of said resources;

Finding:
Natural resources are identified and protected through applicable regulations of the TDC, and protection and conservation of said resources is implemented by Clean Water Services. No amendments are proposed that would affect the protection and conservation of natural resources. This criterion is not applicable.

(vii)Prospective requirements for the development of natural resources in the City;

Finding:

No development of natural resources is proposed as part of the proposed amendments. This criterion is not applicable.

(viii) The public need for healthful, safe, esthetic surroundings and conditions; and

Finding:
The proposed amendments satisfy the public need for healthful, safe, esthetic surroundings and conditions by applying a land use designation that ensures compatibility with adjoining industrial lands, implement transportation improvements, prescribe required infrastructure to serve the area and address environmental protection requirements. Further, Oregon Statewide Planning Goal 2 requires all parcels in each city and county to be designated with a planning district. Therefore, the public need for healthful, safe, aesthetic surroundings and conditions will best be served by granting the amendments at this time. This criterion is met.

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

Finding:
The proposed Plan Map amendment to IN provides clarity that the City Operations site provides community services. The proposed Plan Text amendment would correct a Scribner's error, in which public buildings, facilities, and operations where unintentionally omitted from the permitted use categories in the IN zone - Chapter 49, Table 49-1. Chapter 8 of the Community Plan recognizes government offices as a use that is compatible with the Intuitional Planning District objectives. This criterion is met.

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

Finding:
The amendment does not involve residential uses. This criterion is not applicable.

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

Finding:
Findings addressing the applicable Oregon Statewide Planning Goals and TPR have been addressed above. This criterion is met.

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

Finding:
Findings addressing the applicable Titles of the Metro Urban Growth Management Functional Plan have been addressed above. This criterion is met.

(h) Granting the amendment is consistent with Level of Service F for the p.m. peak hour and E for the one-half hour before and after the p.m. peak hour for the Town Center 2040 Design Type (TDC Map 9-4), and E/E for the rest of the 2040 Design Types in the City's planning area.

Finding:
The subject site is outside of the Town Center 2040 Design Type area. As identified Table 7 of the Transportation Impact Analysis (Exhibit C), the proposed amendment would facilitate future development of a government office building on the site. The additional trip generation from this this use would result in a LOS of D or greater for the weekday PM peak hour, at the nearby study intersections. This criterion is met.

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

[…]

Finding:
The subject site is presently served with utilities such as potable water, sanitary sewer, and stormwater management. Future structure development on the site will require approval of an Architectural Review land use application, at which time these issues will be addressed in greater detail. This criterion is met.

TDC 49: Institutional Zone (IN)

Development Code:

Chapter 49: Institutional Zone (IN)

Details

Section 49.100 – Purpose. The purpose of the Institutional (IN) Zone is to provide areas of the City that are suitable for **public,** educational, religious, recreational, and incidental support facilities to serve the community. The Zone is intended to:
(1) Be consistent with the Institutional land use designation in the Tualatin Community Plan;
(2) Support lands and facilities that are owned and operated by governmental or nonprofit entities and that serve and benefit the community; and
(3) Provide for location and development of permitted and conditionally permitted uses in a manner that is harmonious with adjacent and nearby residential, commercial, or manufacturing planning zones and uses; and protects the health, safety, and general welfare of adjacent residential, commercial, and manufacturing uses.

Section 49.200 – Use Categories.
(1) **Use Categories.** Table 49-1 lists use categories Permitted Outright (P) or Conditionally Permitted (C) in the IN zone. Use categories may also be designated as Limited (L) and subject to the limitations listed in Table 49-1 and restrictions identified in TDC 49.210. Limitations may restrict the specific type of use, location, size, or other characteristics of the use category. Use categories which are not listed are prohibited within the zone, except for uses which are found by the City Manager or appointee to be of a similar character and to meet the purpose of this zone, as provided in TDC 31.070.
(2) **Overlay Zones.** Additional uses may be allowed in a particular overlay zone. See the overlay zone Chapters for additional uses.

Table 49-1
Use Categories in the IN Zone

USE CATEGORY	STATUS	LIMITATIONS AND CODE REFERENCES
INSTITUTIONAL USE CATEGORIES		
Assembly Facilities	P (L)	Permitted uses limited to places of religious worship.
Community Services	P/C (L)	Permitted uses limited to public recreation buildings and facilities: ○ Community recreation building;

USE CATEGORY	STATUS	LIMITATIONS AND CODE REFERENCES
		○ Indoor community aquatic centers. Conditional uses limited to outdoor public community aquatic centers
Schools	P	--
Offices	**P (L)**	**Permitted uses limited to government offices.**
INFRASTRUCTURE AND UTILITIES USE CATEGORIES		
Public Safety and Utility Facilities	**P (L)**	**Permitted uses limited to public works storage yard and shop.**
Basic Utilities	P/C (L)	Permitted uses limited to water or sewage pump stations and pressure reading stations. Conditional uses limited to: ○ Water reservoirs; ○ Electrical substation; and ○ Natural gas pumping station.
Greenways and Natural Areas	P	--
Parks and Open Space	P (L)	Permitted uses limited to: ○ Government-owned parks; and ○ Sports fields and tennis courts.
Transportation Facilities	P	--
Wireless Communication Facility	P (L)	~~Must be located within 300 feet of the centerline of Interstate 5 and~~ **S**subject to **maximum height and minimum setback standards defined by** TDC Chap er 73F.

Section 49.210 – Additional Limitations on Uses.

(1) **Accessory Uses Conditionally Permitted.** The following uses may be permitted as a conditional use when incidental and subordinate to a permitted or conditionally permitted primary use:

(a) Child day care center;

(b) Exterior lighting, if the height of the fixture or standard is greater than the tallest permitted building on the site; **and**

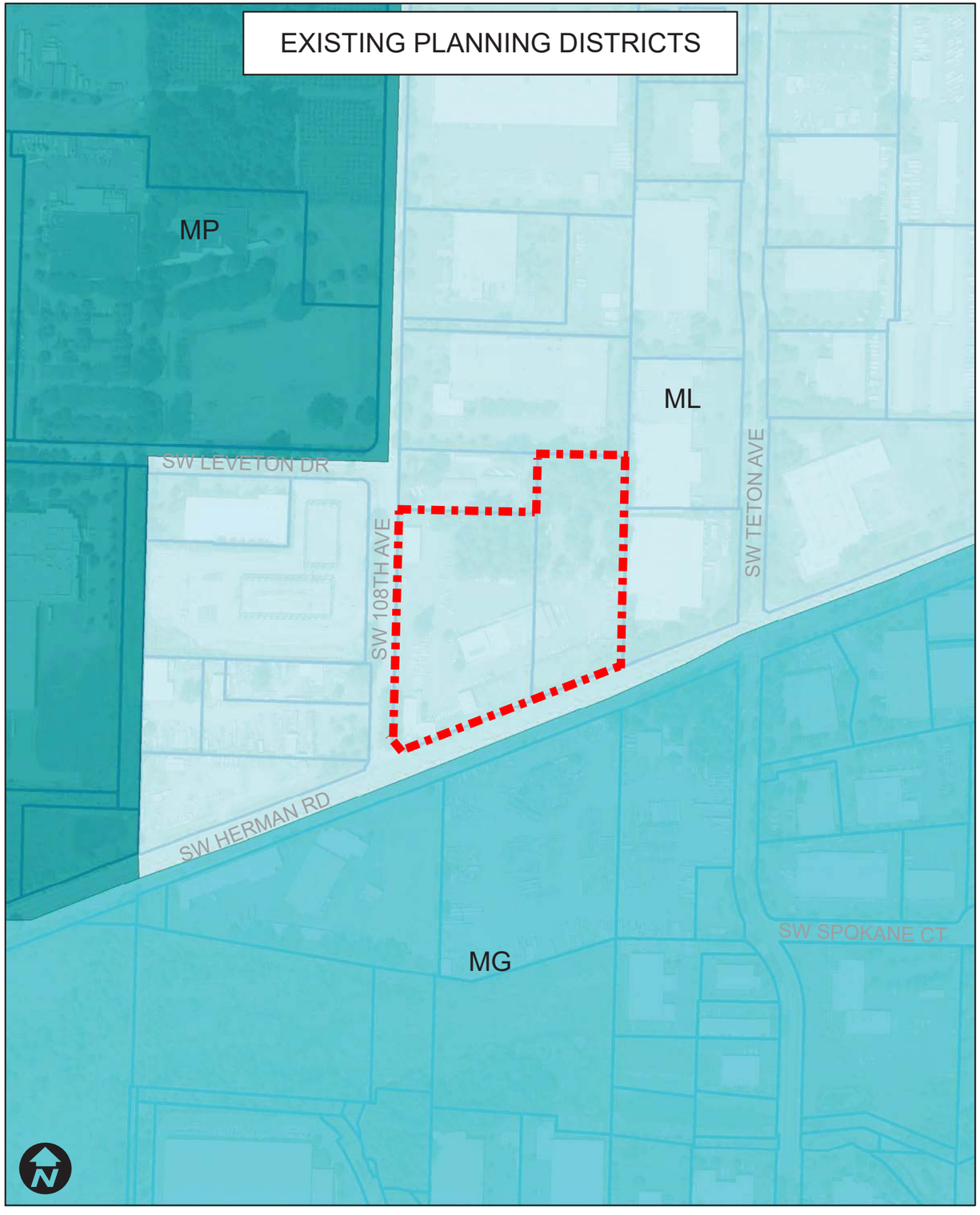
(c) Outdoor public address or audio amplification system**.**~~; and~~

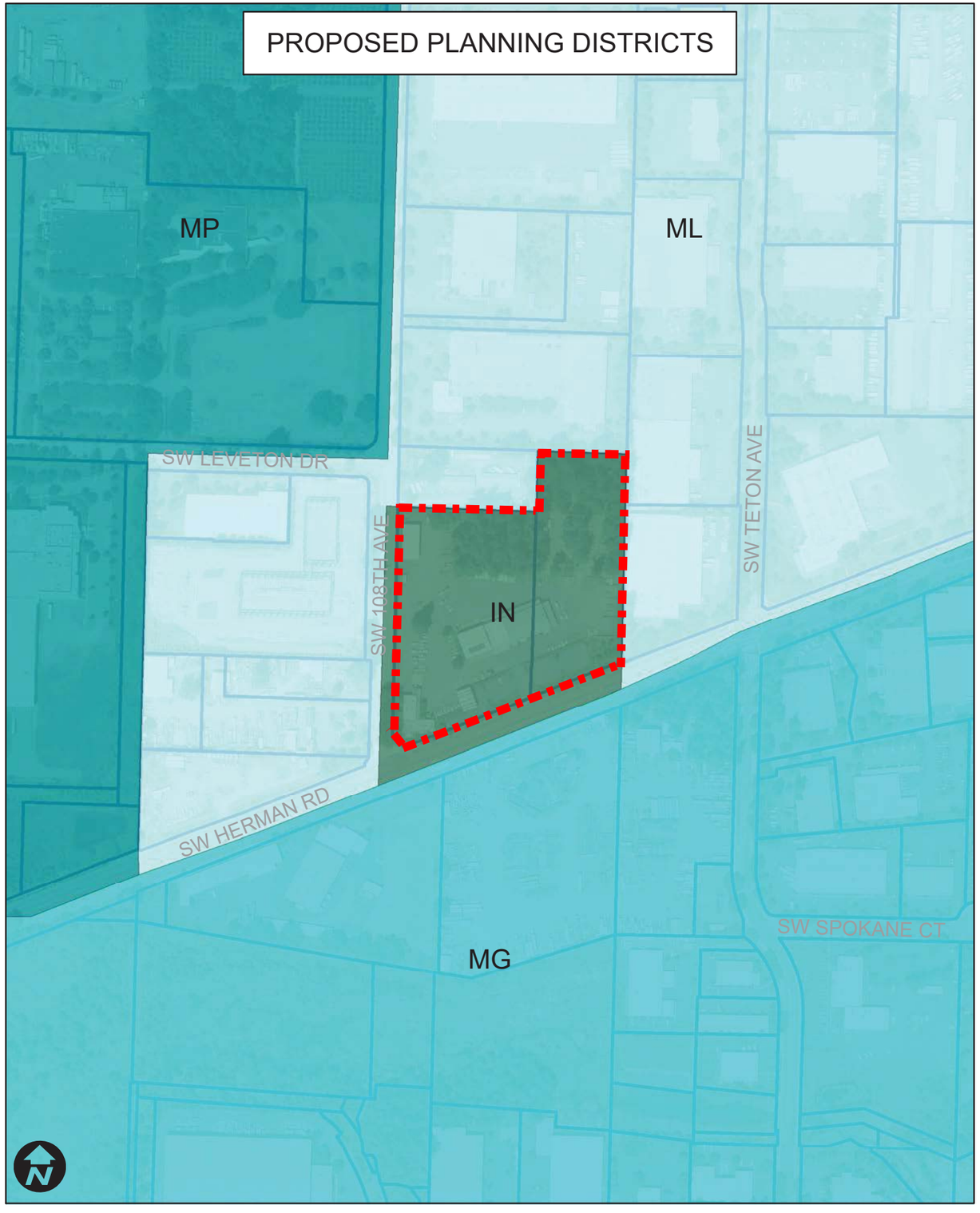
~~(d) Wireless Communication Facility.~~

[…]

Existing and Proposed Zoning Map 9-1

TUALGIS





Tualatin City Operations Site

Traffic Impact Analysis

Prepared for:

SRG Partnership, Inc.

Prepared by:

DKS Associates

December 2018

DKS

Contents

Introduction

The purpose of this study is to identify potential transportation system impacts and mitigations needed to support a proposed city operations site for the City of Tualatin. The proposed site is located at the northeast corner of Herman Road and 108th Avenue in Tualatin, Oregon. The current zoning of the site is Light Manufacturing (ML)[1], and the proposed land use is a government office building, which is similar to the existing use of the site but may vary in operational function with inclusion of visits from individuals that are not employed at the site.

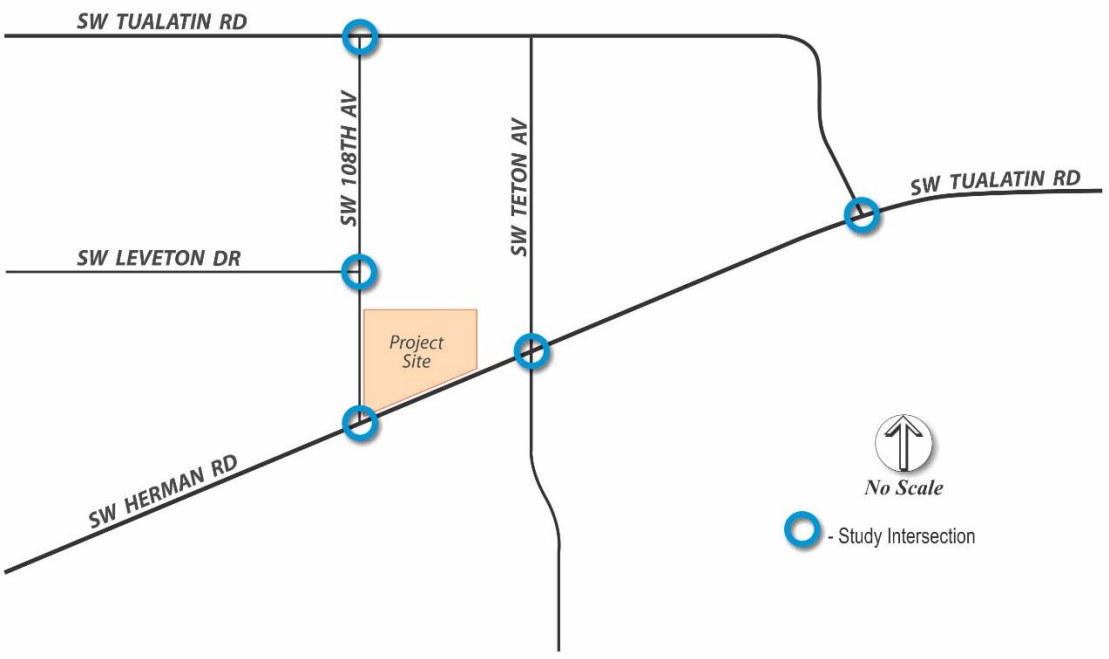
While general office buildings is allowed under the existing zoning, a government office building is not directly allowed and would ultimately require findings to address Transportation Planning Rule (TPR) requirements. The specific analysis required to address TPR requirements would vary based on the proposed action (minor modification to zoning, significant map change, or significant text change) and is not included in this analysis. The traffic analysis summarized in this TIA focuses on the direct impacts to the transportation system related to the proposed site development.

Assumptions related to the proposed site (relative to conservative vehicle trip generation assumptions) include:

- The building will have up to 20,000 square feet of gross floor area.
- The building will accommodate up to 60 employees in addition to the current employees.

Study Area

FIGURE 1: STUDY AREA



[1] Tualatin Development Code, City of Tualatin.

The study area (Figure 1) for traffic analysis was defined by reviewing the City of Tualatin Traffic Study Requirements[2], coordination with City staff, and identifying intersections that may be significantly impacted by the development of the proposed site. These intersections include:

1. SW Tualatin Road/SW 108th Avenue
2. SW Leveton Drive/SW 108th Avenue
3. SW Herman Road/SW 108th Avenue
4. SW Herman Road/SW Teton Avenue
5. SW Herman Road/SW Tualatin Road

Existing Conditions

This section summarizes current (year 2018) transportation conditions in the study area, including an inventory of the existing roadway network, identification of transit, pedestrian, and bicycle facilities, an analysis of recent study area collision history, and an operational analysis of study intersections.

Roadway Network

Table 1 summarizes the characteristics of the study area streets including functional classification, cross-section, posted speed, and presence of parking, sidewalks, and bike lanes.

TABLE 1: EXISTING ROADWAY NETWORK CHARACTERISTICS

Roadway	Functional Classification	Travel Lanes	Posted Speed (mph)	On-Street Parking	Sidewalks	Bike Lanes
SW Tualatin Road	Major Collector	3 Lanes	35	No	Yes	Yes
SW 108th Avenue[1]	Major/Minor Collector	2 Lanes	35	No	Yes	Yes
SW Leveton Drive[2]	Major Arterial	2 Lanes	40	No	Yes	Yes
SW Herman Road[3]	Major Arterial/ Major Collector	3 Lanes	45	No	Partial	Yes
SW Teton Avenue	Major Collector	2 Lanes	35	No	Partial	Yes

[1]SW 108th Avenue is classified as a minor collector between Tualatin Road and Leveton Drive, and a major collector between Leveton Drive and Herman Road.
[2]SW Leveton Drive is classified as a major arterial between 108th Avenue and 118th Avenues.
[3]SW Herman Road is classified as a major arterial between Teton Avenue and 108th Avenue, and a major collector elsewhere.

Public Transit

Currently there is one public transit line that operates in the study area. Tualatin Shuttle Blue Line provides fixed-route service linking WES Station to employment destinations along SW 124th Avenue, SW Leveton Drive, SW 108th Avenue, SW Herman Road, SW Teton Avenue, and SW Boones Ferry Road. Tualatin WES station provides commuter connections to Wilsonville Transit Center, Tigard Transit Center, and Beaverton Transit Center which provides regional connections to TriMet and SMART's transit systems in the Portland Metropolitan Area.

[2] City of Tualatin Traffic Study Requirements, 2016.

Pedestrian Environment

Sidewalks are generally available on both sides of the streets within the study area and provide connectivity for pedestrians. One larger gap in sidewalk availability exists along the south side of SW Herman Road due to the proximity to the railroad tracks. In addition, there is a lack of sidewalk for approximately 440 feet on the west side of SW Teton Avenue south of Herman Road. Sidewalks are available elsewhere within the study area.

Pedestrian crosswalks exist on all legs at the unsignalized intersections within the study area. All signalized intersections have striped pedestrian crosswalks with push button controls and pedestrian signal heads to indicate "Walk" and "Don't Walk" periods of time, with the exceptions at the following locations where crosswalks are closed with the indication of "Crosswalk Closed" signs:

- The west and east legs of SW Herman Road/SW 108th Avenue (no sidewalk present on south side of SW Herman Road due to rail proximity)
- The west and east legs of SW Herman Road/SW Tualatin Road (no sidewalk present on south side of SW Herman Road due to rail proximity)

Pedestrian activity counts for each of the legs of the study area intersections were collected during the weekday AM and PM peak hour. The heaviest utilized intersection (in aggregated pedestrian activity) was at Teton Avenue/Herman Road (4 total pedestrians during the AM peak hour).

Bicycle Environment

There are dedicated on-street bicycle facilities within most of the study area. Bicycle activity counts for each approach at study area intersections were collected during the weekday AM and PM peak hour. The heaviest utilized intersection (in aggregated bicycle activity) was at Tualatin Road/Herman Road (11 total bikes during the weekday PM peak hour), with the heaviest approach activity on the west leg (5 bikes).

Safety Analysis

Crash rates at study intersections were analyzed to identify potential safety issues. Collision history at study area intersections was obtained from ODOT spanning the most recent five-year period from October 2012 to September 2017. Table 2 summarizes the crash history at study intersections. There was a total of 17 crashes in the study area over the five years.

Crash rates at study intersections were also calculated to identify problem areas in need of further investigation. The total number of crashes experienced at an intersection is often proportional to the number of vehicles entering it. Therefore, a crash rate describing the frequency of crashes per million entering vehicles (MEV) is used to evaluate the intersection.

The observed crash rate at each site is compared to the critical crash rate, which is unique to each intersection and based on the critical crash rate procedure in the Highway Safety Manual (HSM)[3]. However, due to the small study area, there is an insufficient reference population of comparison

[3]2010 Highway Safety Manual (HSM), Chapter 4, Page 4-11: The critical crash rate is a threshold value that allows for relative comparison among sites with similar characteristics. The critical crash rate depends on the average crash rate at similar sites, traffic volume, and a statistical constant that represents a desired level of significance.

intersections from which to calculate a critical crash rate. Therefore, to broaden the field of comparison, study area crash rates were compared to 90th percentile crash rates for similar intersections in a statewide database provided in ODOT's Analysis Procedures Manual (Table 4-1). An observed crash rate greater than the 90th percentile crash rate is an indication that further investigation may be warranted. As listed in Table 2, all the study intersections have an observed crash rate less than the 90th percentile crash rates, indicating that the number of crashes experienced would be no more than expected.

TABLE 2: STUDY AREA INTERSECTION COLLISIONS (OCTOBER 2012 – SEPTEMBER 2017)

Intersection	Total Collisions	Collision Severity			Observed Crash Rate (per MEV)	90th Percentile Crash Rate (per MEV)
		Fatal	*Injury*	*Property Damage Only*		
SW Tualatin Road/ SW 108th Avenue	5	0	4	1	0.20	0.293
SW Leveton Drive/ SW 108TH Avenue	1	0	0	1	0.14	0.293
SW Herman Road/ SW 108th Avenue	2	0	1	1	0.09	0.509
SW Herman Road/ SW Teton Avenue	1	0	1	0	0.03	0.860
SW Herman Road/ SW Tualatin Road	8	0	7	1	0.23	0.509

SOURCE: Oregon Department of Transportation

Intersection Operations

This section describes the existing intersection operating conditions in the study area.

Intersection Performance Measures

All the study intersections fall under the jurisdiction of the City of Tualatin. Level of service (LOS) and volume-to-capacity (V/C) ratio are the two performance measures utilized in this analysis for determining intersection operations. A description of each is outlined below.

Level of Service

An intersection's level of service is similar to a "report card" rating (A through F), based on average vehicle delay. LOS A, B, and C indicate conditions where vehicles can move freely. LOS D and E are progressively worse. LOS F represents conditions where average vehicle delay has become excessive and demand has exceeded capacity. This condition is typically evident in long queues and delays.

V/C Ratio

A volume-to-capacity (v/c) ratio is a measure of effectiveness that takes into account the total volume entering an intersection and compares it to the overall capacity at that intersection to determine a ratio on a scale of 0.0 to 1.0 for the intersection. As an intersection's v/c ratio becomes closer to 1.0, the intersection becomes more congested and performance is reduced. If the ratio is greater than 1.00, this indicates that demand is greater than the available capacity and the turn movement, approach leg, or intersection is oversaturated and typically experiences excessive queues and long delays.

Jurisdictional Operational Standards

The City of Tualatin has adopted a level-of-service (LOS) standard that is based on the average delay calculated at intersections. The operating standard is LOS D for signalized intersections and LOS E for unsignalized intersections[4].

Existing Traffic Volumes

Intersection turn movement counts were collected in August and September of 2018 during the weekday morning peak period (7:00 to 9:00 AM) and evening peak period (4:00 to 6:00 PM). Morning counts were collected when schools were in session. Figure 2 shows the balanced existing AM and PM hour traffic volumes.

Existing Operating Conditions

The existing traffic operating conditions at the study intersections were determined for the weekday AM and PM peak hour based on the 2000 Highway Capacity Manual (HCM) methodology for all signalized intersections and based on the 2010 HCM methodologies for intersections that are unsignalized. As listed in Table 3, all study intersections are currently operating in LOS D or better. However, the intersection of SW Herman Road/SW Teton Avenue is currently approaching LOS E (achieved at 55 seconds delay) during the AM peak hour.

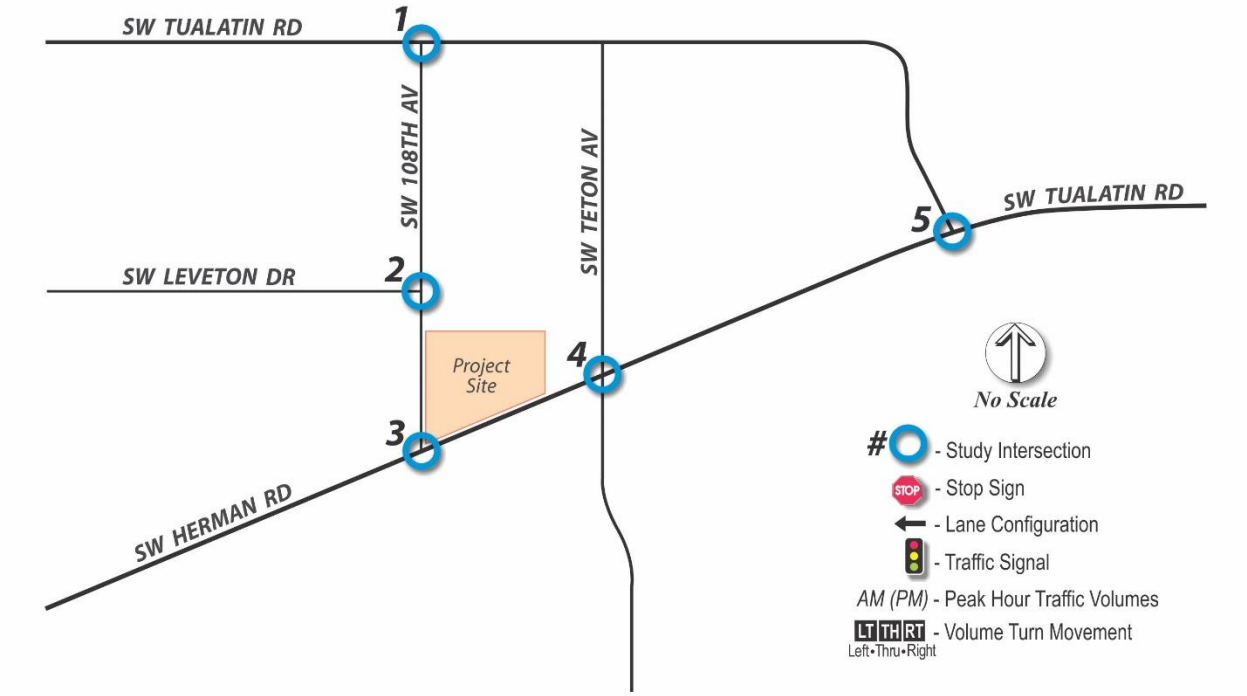
TABLE 3: 2018 EXISTING WEEKDAY AM AND PM PEAK HOUR INTERSECTION PERFORMANCE

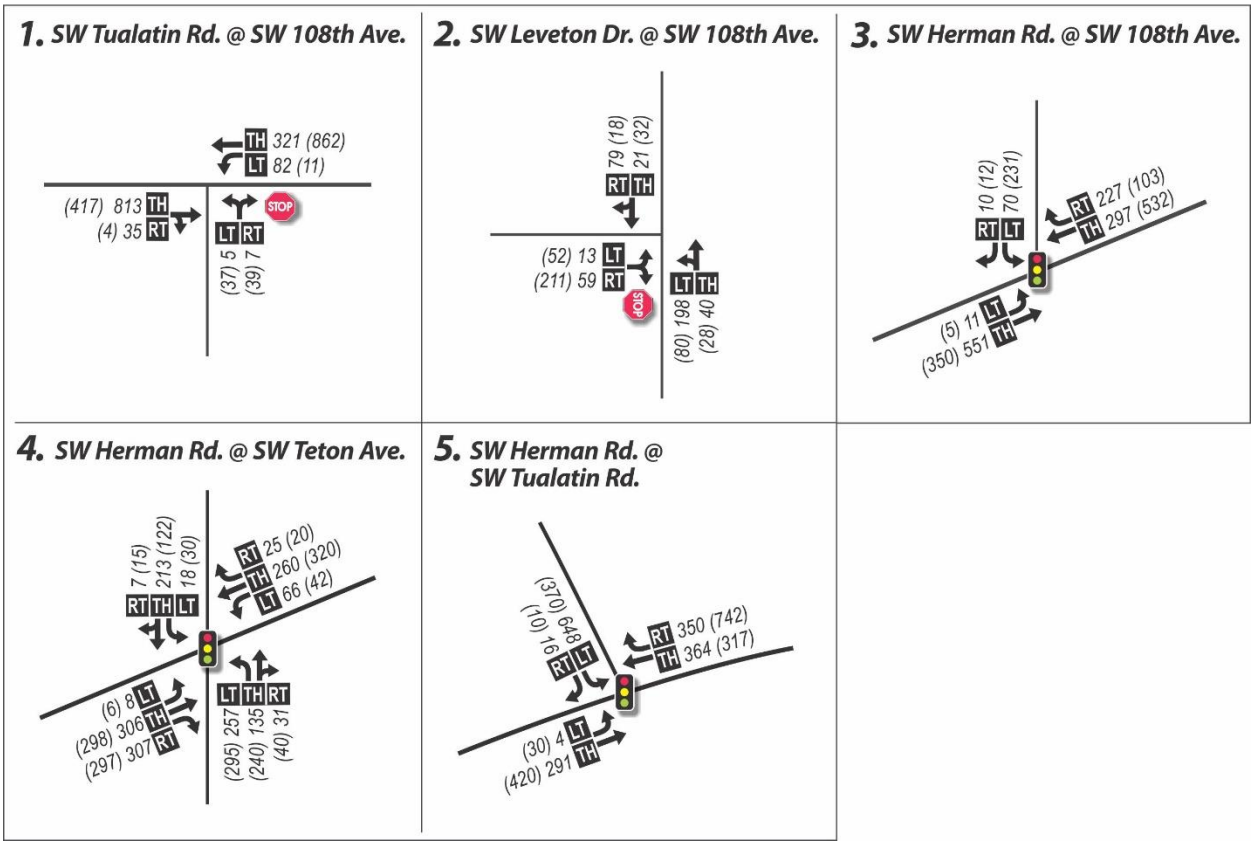
Intersection	Control Type	Intersection Performance					
		AM Peak			PM Peak		
		Delay (sec)	v/c	LOS	Delay (sec)	v/c	LOS
SW Tualatin Road/ SW 108th Avenue	Two-way stop control	30.7	0.14	D	25.6	0.32	D
SW 108th Avenue/ SW Leveton Drive	Two-way stop control	10.2	0.15	B	10.5	0.31	B
SW Herman Road/ SW 108th Avenue	Signal	8.6	0.62	A	18.4	0.79	B
SW Herman Road/ SW Teton Avenue	Signal	53.8	0.93	D	33.4	0.84	C
SW Herman/ SW Tualatin Road	Signal	25.8	0.87	C	15.1	0.66	B
Site driveway on SW Herman Road	Two-way stop control	17.7	0.05	C	24.8	0.19	C

Delay and volume-to-capacity ratio for two-way stop intersections reported for the worst movement.
LOS for two-way stop control intersection reported for the worst major street/worst minor street movements.

[4] Tualatin Development Code 74.420 (17)

FIGURE 2: 2018 EXISTING WEEKDAY AM AND PM PEAK HOUR TRAFFIC VOLUMES





The HCM methodologies used to estimate intersection delay do not account for the interaction between adjacent intersections and the potential impact of queue spillbacks. Therefore, it is necessary to evaluate how the traffic moves between intersections. Queuing analysis was conducted for the study area to provide further information regarding transportation operations. SimTraffic microsimulation analysis was used to estimate the 95th percentile vehicle queues for each of the study area intersection approach movements under the existing conditions scenario. Table 4 indicates that queues in the study area during both the weekday AM and PM peak hours generally do not spill back into adjacent intersections or through travel lanes, with single exception of the southbound approach of SW Herman Road/SW 108th Avenue. Detailed queuing reports are included in the Appendix.

TABLE 4: 2018 EXISTING WEEKDAY AM AND PM PEAK HOUR MOTOR VEHICLE 95TH PERCENTILE QUEUEING

Intersection	Movement	Available Storage Length (ft.)	95th Percentile Queue (ft)*	
			AM Peak	PM Peak
SW Tualatin Road/ SW 108th Avenue	Westbound L	350	75	25
	Northbound L/R	>1000	50	75
SW Leveton Drive/ SW 108th Avenue	Eastbound L/R	>1000	75	100
	Northbound L/T	800	75	50
SW Herman Road/ SW 108th Avenue	Eastbound L	660	50	25
	Southbound L	170	75	**175**
SW Herman Road/ SW Teton Avenue	Westbound L	150	150	100
	Southbound L	140	50	75
SW Herman Road/ SW Tualatin Road	Eastbound L	140	50	100
	Westbound R	250	200	100
	Southbound L	>700	400	225

Note: This table only contains the movements in the study area that have potential queuing issues.
*The 95th percentile queue lengths are rounded up to the closest multiples of 25 feet.

Growth and Development Assumptions

The following section documents assumptions describing background traffic growth in future years and trip growth related to the proposed redevelopment.

Background Traffic

The amount of local and regional traffic growth independent of the project site is referred to as background traffic growth. Based on the historical traffic counts used in City of Tualatin's Transportation System Plan, the annual growth rates on the streets within the study area are in the range of 1 percent to 2 percent. The higher end of the range, a 2 percent annual growth rate, was applied to all intersection volumes within the study area to determine background traffic conditions for the 2021 future year scenarios.

There are no "in-process" trips assumed in the vicinity of the proposed site (related to approved but not yet built developments) that may impact the traffic conditions within the study area[5]. The background traffic growth was added to the 2018 existing traffic volumes to create 2021 "No Build" scenarios representing conditions that would exist if the project area did not develop as proposed. The 2021 No Build traffic volumes used in the traffic analysis are provided in Figure 3.

Trip Generation

The following section describes motor vehicle trip generations estimates for the proposed site. The trip estimate assumes the addition of a government office building with up to 20,000 square feet of gross floor area. The two access driveways to the site are assumed to be located on SW Herman Road and SW 108th Avenue.

The number of vehicle trips generated by a proposed land use is typically estimated using trip rates published in Institute of Transportation Engineers (ITE) *Trip Generation*. The ITE trip rates for Government Office (ITE land use code 730) were used to calculate the expected number of daily vehicle trips and AM peak hour vehicle trips generated with full buildout of the proposed site. The daily trip generation for the project is 452 vehicle trips. The AM peak hour trip generation is 67 vehicle trips.

In addition, a custom vehicle trip generation rate was also used to estimate the vehicle trips to and from the proposed City office during the PM peak hour. After consultation with the City of Tualatin staff, it was determined that applying the ITE trip rate alone may result in underestimating the motor vehicle trip generation potential of the site. The ITE trip rate for Government Office Building was used to calculate the baseline for expected number of vehicle trips generated with full buildout of 20,000 square feet of office space. On-site visitor (customer) arrival data was previously collected by City staff and used to supplement the ITE trip generation estimate. The custom rate adds additional 'customer' trips (based on the site survey) to 'employee' trips (based on the published ITE rate). The result is a higher vehicle trip generation estimate for the PM peak hour due to potential for "double counting" (customer trips included in the base ITE rate), which provides a conservative estimate for the potential traffic impacts at the proposed site. The estimated daily and peak hour trip generation is listed in Table 5.

[5] Per email communications with Tony Doran, Engineering Associate at City of Tualatin on August 24th, 2018.

TABLE 5: DAILY AND PEAK HOUR TRIP GENERATION ESTIMATES

Description	Land Use	Quan-tity	Units	Average Trips									
				Daily		AM Peak Hour				PM Peak Hour			
				Rate	Total	Rate	Enter	Exit	Total	Rate	Enter	Exit	Total
City of Tualatin Operations Site Custom Trip Generation Estimates	ITE Code 730 (Government Office Building)	20	KSF	22.59	452	3.34	50	17	67	1.71	9	26	35
	Customer Trips (based on site survey; 12 customer trips for 30 employees)	60	# of Added Employees	-	-	-	-	-	-	0.4	12	12	24
			Total Trips	**-**	**452**	**-**	**50**	**17**	**67**	**-**	**21**	**38**	**59**

Source: ITE Trip Generations Manual, 10th Edition

Trip Distribution

Trip distribution reflects how site generated traffic will arrive and leave the proposed site and what roads those trips will use. The trip distribution for the proposed project was estimated based on a review of the regional travel demand model, existing traffic flows, and consideration for potential employees and customers. Rounding adjustments (within 5%) were applied based on existing travel patterns and likely travel paths of expected users. The site traffic was assigned to the street network using the trip distribution patterns shown in Figure 4. These trips, also illustrated in Figure 4, were added to the base "No Build" traffic volumes to develop the "Build" scenarios for the year of 2021. The Build scenario represents conditions that would exist with the proposed development in place. The Build scenario traffic volumes are shown in Figures 5.

FIGURE 3: 2021 NO BUILD WEEKDAY AM AND PM PEAK HOUR TRAFFIC VOLUMES

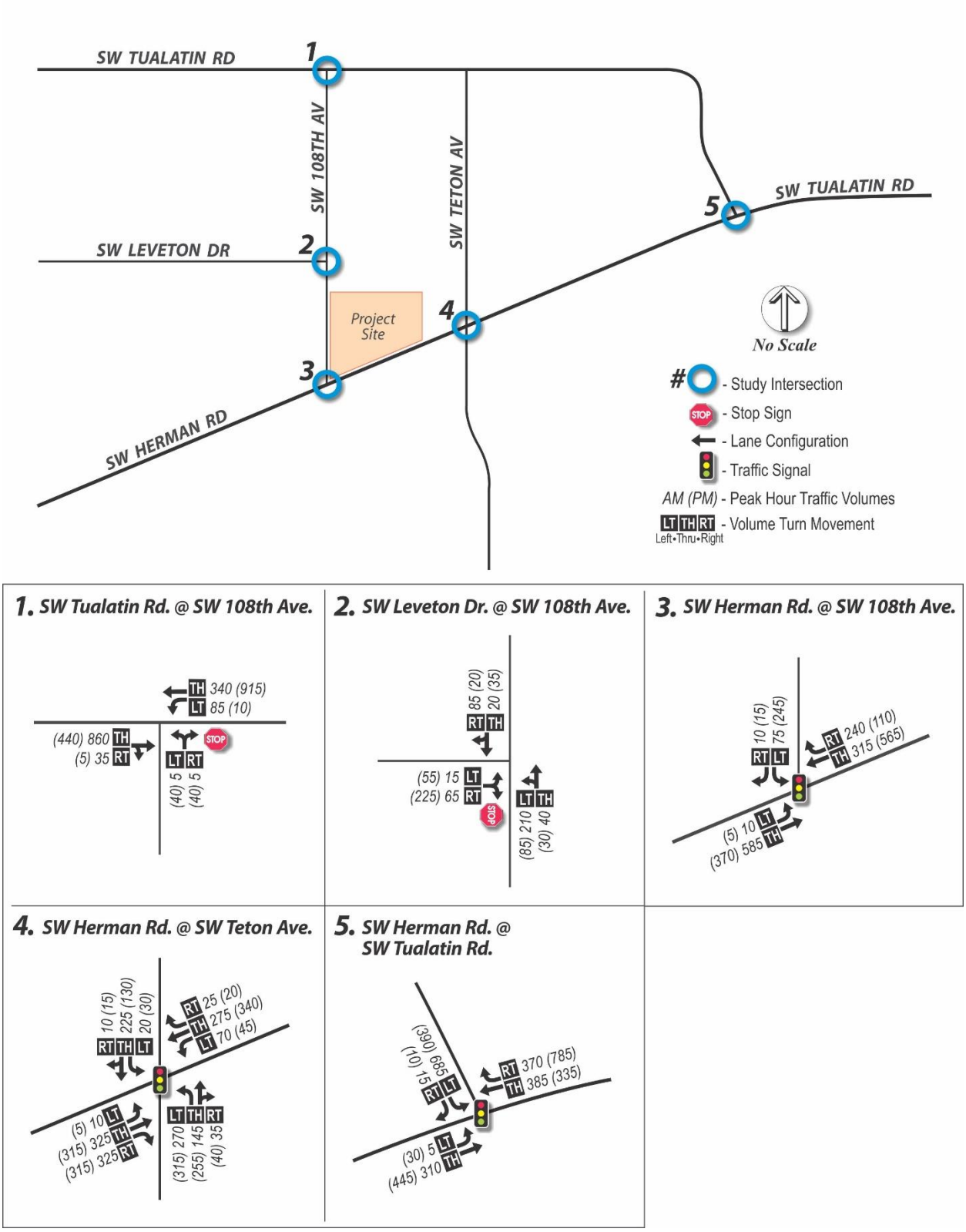


FIGURE 4: WEEKDAY AM AND PM PEAK HOUR TRIP DISTRIBUTION AND PROJECT ADDED TRIPS

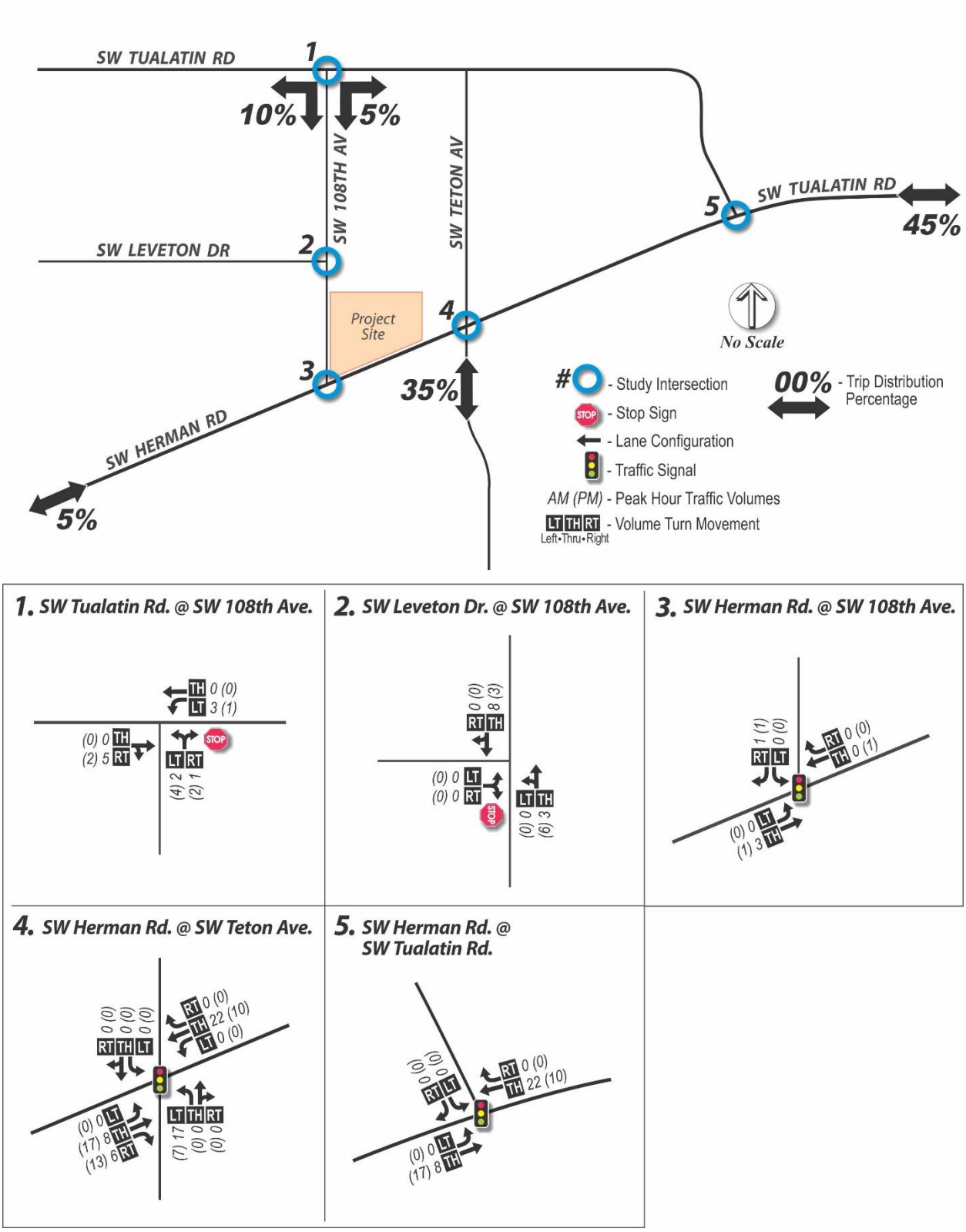
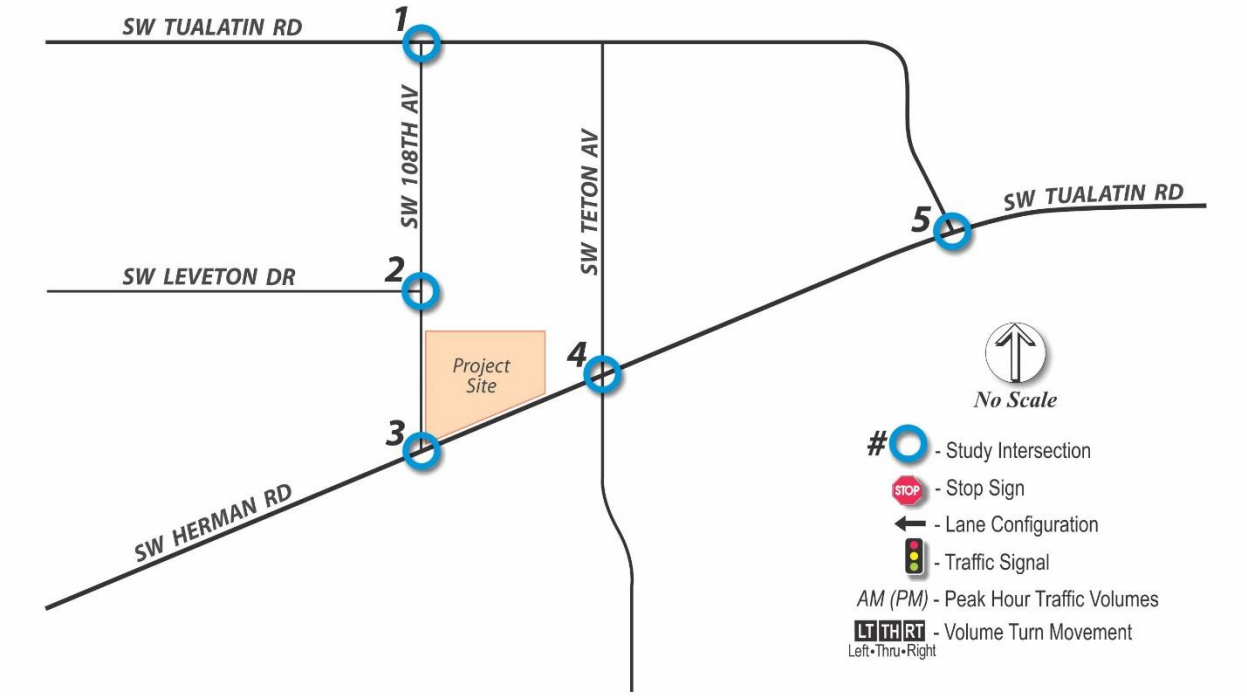
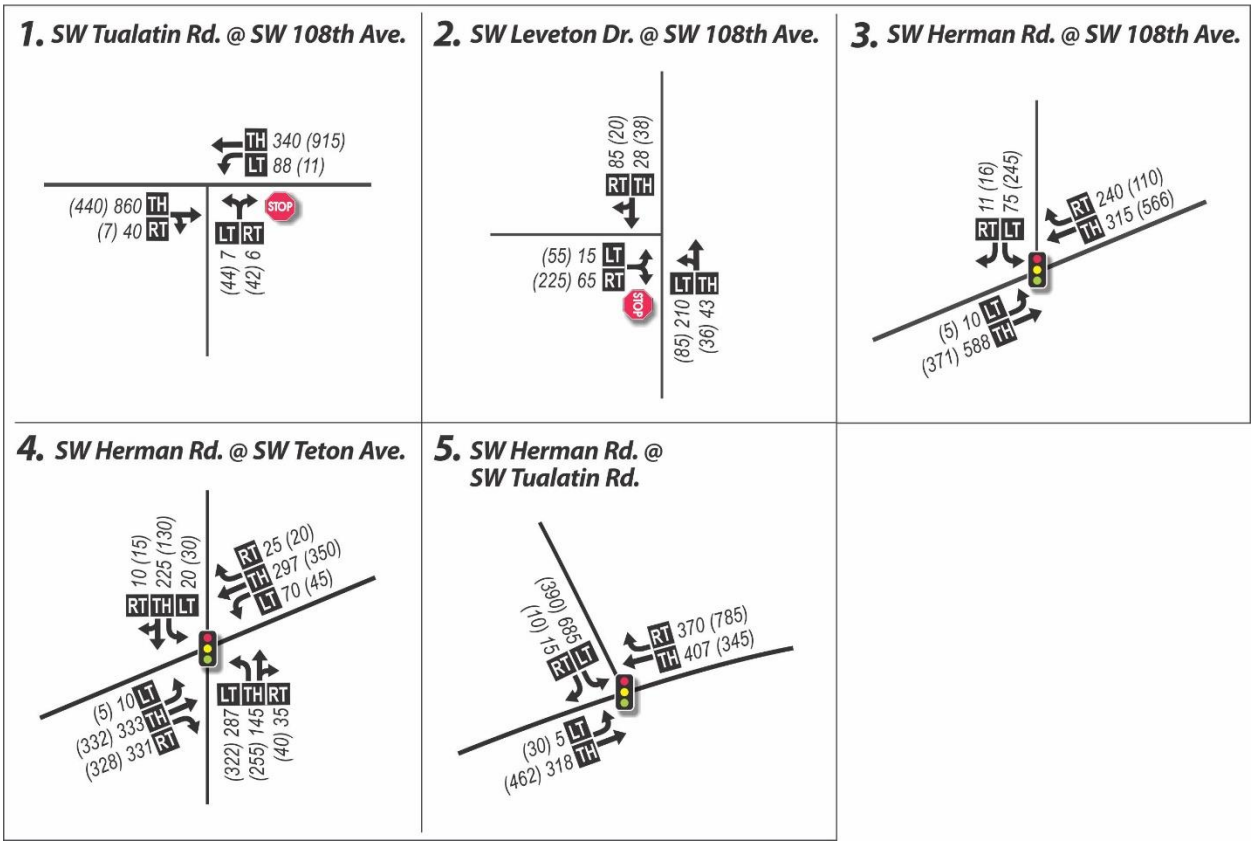


FIGURE 5: 2021 BUILD WEEKDAY AM AND PM PEAK HOUR TRAFFIC VOLUMES





Future Conditions

The following section summarizes the future weekday AM and PM peak hour traffic operating conditions for the expected year of opening (2021). Future traffic operating conditions were analyzed at the study intersections, as well as the site driveways, to determine if the transportation network can support traffic generated by the proposed development. The study area intersection operations were evaluated for both No Build and Build scenarios to determine if the proposed redevelopment would cause any intersections to not meet jurisdictional standards.

Intersection Operations

Table 6 and Table 7 list the future 2021 No Build and Build intersection performance, for the AM and PM peak hour, respectively. As listed, all intersections would operate within the acceptable mobility standards of City of Tualatin, except for the intersection of Herman Road/Teton Avenue. Under both 2021 No Build and Build scenarios, the intersection would operate at LOS E during AM peak hour and exceed the LOS D standard with existing signal timing parameters.

The intersection of Herman Road/Teton Avenue was analyzed to determine potential improvements to address performance standards. The intersection is currently approaching the performance standard[6] and would be exceeded in the 2021 No Build condition without project traffic. Based on projected traffic flows and the intersection configuration, adding an eastbound right turn lane would directly address the capacity needs at the intersection. However, this improvement would require significant cost and impact to adjacent properties to achieve given the proximity to the rail and reconfiguration required to construct the right turn lane. Therefore, this turn lane is not a recommended solution. A review of the current signal timing parameters indicated that minor adjustments to the signal timing (extending maximum duration of the eastbound phase) will help this intersection continue to meet performance standards with or without the proposed project. Given that the intersection is currently approaching the performance threshold, it is recommended that the performance continue to be monitored and signal timing adjustments made, regardless of project development.

[6] Table 4 indicates that the current intersection delay is 53.8 seconds during the AM peak hour, narrowly under the threshold of 55 seconds to maintain LOS D.

TABLE 6: 2021 WEEKDAY AM PEAK HOUR INTERSECTION PERFORMANCE

Intersection	Intersection Control	2021 No Build (AM)			2021 Build (AM)		
		Delay (sec)	v/c	LOS	Delay (sec)	v/c	LOS
SW Tualatin Road/ SW 108th Avenue	Two-way stop control	36.4	0.15	E	39.5	0.15	E
SW Leveton Drive/ SW 108th Avenue	Two-way stop control	10.4	0.16	B	10.5	0.16	B
SW Herman Road/ SW 108th Avenue	Signal	8.9	0.65	A	9.0	0.65	A
SW Herman Road/ SW Teton Avenue*	Signal	59.1 *(51.6)*	0.96 *(0.95)*	E *(D)*	57.3 *(51.4)*	0.97 *(0.96)*	E *(D)*
SW Herman Road/ SW Tualatin Road	Signal	28.7	0.91	C	30.1	0.92	C
Site driveway on SW Herman Road	Two-way stop control	20.6	0.09	C	26.2	0.18	D
Site driveway on SW 108th Avenue	Two-way stop control	-	-	-	10.0	0.01	B

Delay and volume-to-capacity ratio for two-way stop intersections reported for the worst movement.
LOS for two-way stop control intersection reported for the worst major street/worst minor street movements.
*The performance measures in parenthesis are under mitigated conditions with adjusted east/west max green.

TABLE 7: 2021 WEEKDAY PM PEAK HOUR INTERSECTION PERFORMANCE

Intersection	Intersection Control	2021 No Build (PM)			2021 Build (PM)		
		Delay (sec)	v/c	LOS	Delay (sec)	v/c	LOS
SW Tualatin Road/ SW 108th Avenue	Two-way stop control	30.1	0.37	D	31.8	0.41	D
SW Leveton Drive/ SW 108th Avenue	Two-way stop control	10.8	0.33	B	10.9	0.33	B
SW Herman Road/ SW 108th Avenue	Signal	19.8	0.81	B	19.8	0.81	B
SW Herman Road/ SW Teton Avenue	Signal	39.5	0.90	D	45.0	0.93	D
SW Herman Road/ SW Tualatin Road	Signal	16.0	0.69	B	16.1	0.70	B
Site driveway on SW Herman Road	Two-way stop control	27.4	0.21	D	39.9	0.43	E
Site driveway on SW 108th Avenue	Two-way stop control	-	-	-	9.2	0.01	A

Delay and volume-to-capacity ratio for two-way stop intersections reported for the worst movement.
LOS for two-way stop control intersection reported for the worst major street/worst minor street movements.

Queuing analysis was also conducted for the study area, with detailed reports included in the Appendix. Table 8 lists the 95th-percentile vehicle queue lengths for the study intersections. Vehicle queuing at

most locations under the No Build scenario is not substantially different than existing conditions. Build conditions also do not change significantly compared to No Build conditions, with the queue lengths generally increasing by less than two-car length (approximately 50 feet). The only location with a queue that is projected to exceed storage (by approximately one vehicle length) is the southbound left turn at the Herman Road/108th Avenue intersection. This location would experience the same 95th-percentile queue for both the No Build and Build condition and the project would not add any trips to this movement. This indicates that the proposed site does not have significant impact on the traffic conditions within the study area.

TABLE 8: 2021 WEEKDAY AM AND PM PEAK HOUR MOTOR VEHICLE 95TH PERCENTILE QUEUEING

Intersection	Movement	Available Storage (ft.)	95th Percentile Queue (ft)*			
			2021 AM Peak		2021 PM Peak	
			No Build	Build	No Build	Build
SW Tualatin Road/ SW 108th Avenue	Westbound L	350	75	100	25	25
	Northbound L/R	>1000	50	50	125	100
SW Leveton Drive/ SW 108th Avenue	Eastbound L/R	>1000	75	75	100	100
	Northbound L/T	800	75	75	50	50
SW Herman Road/ SW 108th Avenue	Eastbound L	660	100	75	50	50
	Southbound L	170	100	125	**200**	**200**
SW Herman Road/ SW Teton Avenue	Westbound L	150	150	150	125	100
	Southbound L	140	50	75	75	75
SW Herman Road/ SW Tualatin Road	Eastbound L	140	75	50	100	100
	Westbound R	250	200	250	100	125
	Southbound L	>700	400	425	250	250

Note: *The 95th percentile queue lengths are rounded up to the closest multiples of 25 feet.

Driveway Interaction

The site is assumed to continue using the existing driveways on both Herman Road and 108th Avenue. The southern site driveway located on the east side of SW 108th Avenue is within 100 feet of the closest opposing driveway on the west side of 108th Avenue. The proximity and configuration of these driveways have the potential to create vehicle interaction between the opposing driveways if there are left turning vehicles exiting from each driveway simultaneously. However, the existing site driveways on 108th Avenue are gated and during the data collection on weekday AM and PM peak hours, no driveway use was observed. Assuming the driveways on 108th Avenue remain gated and the access remain unchanged after the proposed city operations building is completed, the potential interaction with opposing driveways on 108th Avenue will remain minimal. Further, if the gate is removed from the driveway on 108th, the vehicle activity (and potential for conflicts) is anticipated to remain minimal due to the distribution of site trips and minimal use of the driveway (primarily entry/exit to/from the north on 108th Avenue).

Findings and Recommendations

Based on the analysis of existing transportation conditions and potential site traffic, no improvements were identified to mitigate the site development impacts. However, one traffic mobility need was noted

at the intersection of SW Herman Road/SW Teton Avenue. This traffic mobility item is not related to site development and should be monitored/addressed separately (regardless) of the proposed development. The intersection of SW 108th Avenue/SW Teton Avenue is currently approaching intersection performance standards during the AM peak hour and is projected to exceed standards by the 2021 No Build condition with minimal added growth. Continue to monitor the operations of the intersection and consider optimizing the existing signal timing parameters to reduce delay for the eastbound approach. Increasing the maximum green duration for these approaches would likely address performance needs at this intersection.

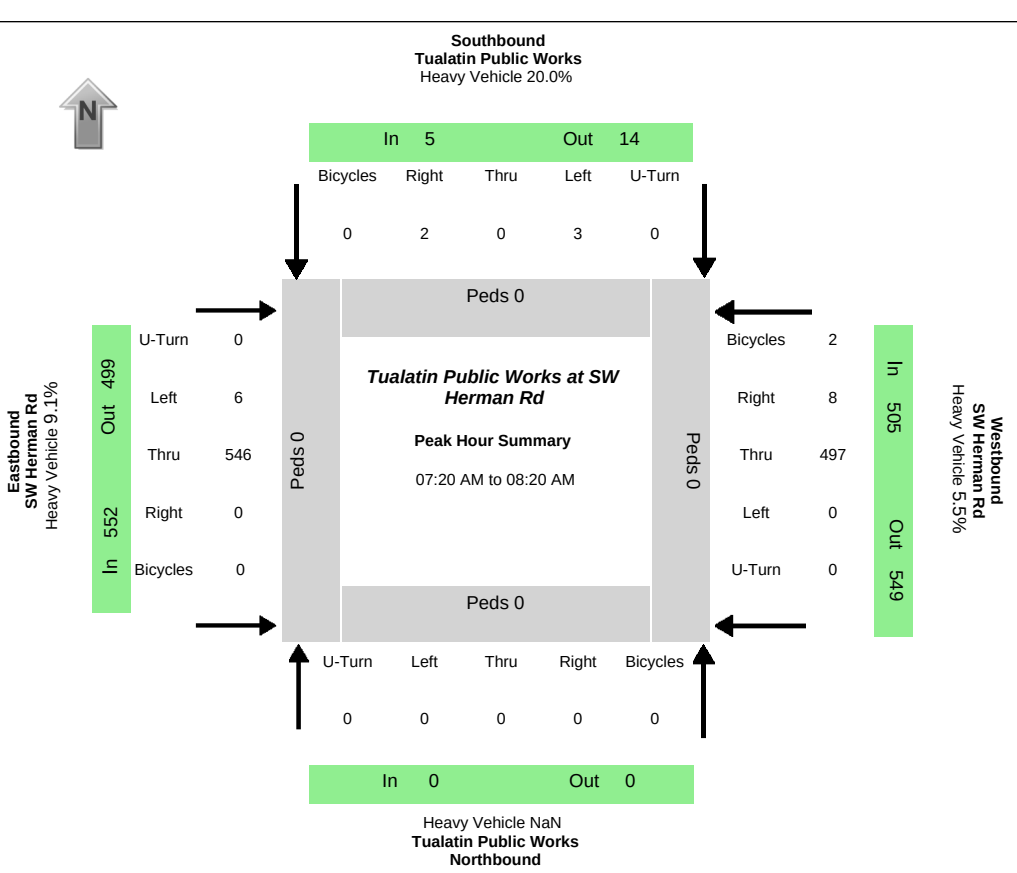
Appendix

The following items are included in the Appendix:

- Traffic Counts
- Intersection Operations Worksheets
- Intersection Queuing Worksheets

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*Tualatin Public Works*
E/W street	*SW Herman Rd*
City, State	Tualatin OR
Site Notes	
Location	45.384202 - -122.786072
Start Date	Wednesday, October 10, 2018
Start Time	07:00:00 AM
Weather	
Study ID #	
Peak Hour Start	07:20:00 AM
Peak 15 Min Start	07:45:00 AM
PHF (15-Min Int)	0.89



Peak-Hour Volumes (PHV)

Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
0	0	0	0	3	0	2	0	6	546	0	0	0	497	8	0	0	5	552	505	0	14	499	549

Percent Heavy Vehicles

0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%	9.2%	0.0%	0.0%	0.0%	5.6%	0.0%	0.0%	NaN	20.0%	9.1%	5.5%	NaN	0.0%	5.8%	9.1%

PHV- Bicycles

Northbound				Southbound				Eastbound				Westbound				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**
0	0	0	0	0	0	0	0	0	0	0		0	2	0	0	2

PHV - Pedestrians

in Crosswalk				
NB	SB	EB	WB	**Sum**
0	0	0	0	0

All Vehicle Volumes

	Northbound Tualatin Public Works				Southbound Tualatin Public Works				Eastbound SW Herman Rd				Westbound SW Herman Rd				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
07:00:00 AM	0	0	0	0	0	0	0	0	0	32	0	0	0	49	0	0		
07:05:00 AM	0	0	0	0	2	0	0	0	1	42	0	0	0	46	2	0		
07:10:00 AM	0	0	0	0	0	0	0	0	1	20	0	0	0	23	1	0	219	
07:15:00 AM	0	0	0	0	0	0	0	0	1	44	0	0	0	35	3	0	221	
07:20:00 AM	0	0	0	0	1	0	0	0	1	52	0	0	0	32	1	0	215	
07:25:00 AM	0	0	0	0	0	0	0	0	2	40	0	0	0	44	1	0	257	
07:30:00 AM	0	0	0	0	0	0	0	0	1	66	0	0	0	38	0	0	279	
07:35:00 AM	0	0	0	0	0	0	0	0	1	56	0	0	0	39	0	0	288	
07:40:00 AM	0	0	0	0	0	0	0	0	0	46	0	0	0	36	0	0	283	
07:45:00 AM	0	0	0	0	0	0	0	0	0	55	0	0	0	43	0	0	276	
07:50:00 AM	0	0	0	0	0	0	0	0	0	44	0	0	0	56	0	0	280	
07:55:00 AM	0	0	0	0	0	0	0	0	0	47	0	0	0	52	1	0	298	1057
08:00:00 AM	0	0	0	0	0	0	0	0	1	29	0	0	0	26	1	0	257	1033
08:05:00 AM	0	0	0	0	0	0	1	0	0	43	0	0	0	50	4	0	255	1038
08:10:00 AM	0	0	0	0	0	0	1	0	0	24	0	0	0	38	0	0	218	1056
08:15:00 AM	0	0	0	0	2	0	0	0	0	44	0	0	0	43	0	0	250	1062
08:20:00 AM	0	0	0	0	0	0	0	0	0	24	0	0	0	32	2	0	210	1033
08:25:00 AM	0	0	0	0	4	0	0	0	0	37	0	0	0	47	0	0	235	1034
08:30:00 AM	0	0	0	0	2	0	0	0	0	21	0	0	0	17	0	0	186	969
08:35:00 AM	0	0	0	0	4	0	0	0	1	26	0	0	0	35	1	0	195	940
08:40:00 AM	0	0	0	0	1	0	0	0	1	35	0	0	0	35	0	0	179	930
08:45:00 AM	0	0	0	0	1	0	0	0	0	19	0	0	0	26	0	0	185	878
08:50:00 AM	0	0	0	0	0	0	0	0	0	14	0	0	0	42	0	0	174	834
08:55:00 AM	0	0	0	0	2	0	0	0	0	18	0	0	0	28	0	0	150	782

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: SW 108th Ave -- SW Tualatin Rd

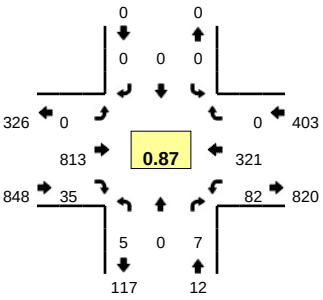
CITY/STATE: Tualatin, OR

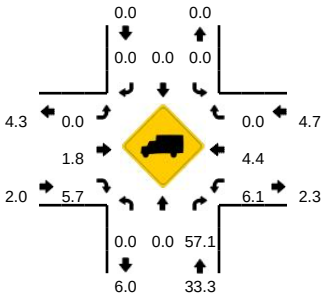
QC JOB #: 14768943

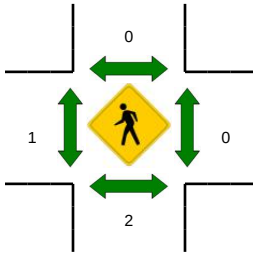
DATE: Tue, Sep 11 2018

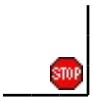
Peak-Hour: 7:25 AM -- 8:25 AM

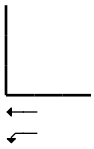
Peak 15-Min: 7:45 AM -- 8:00 AM

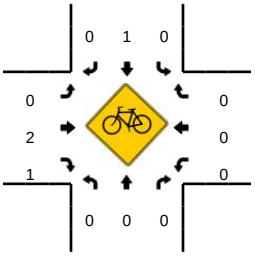


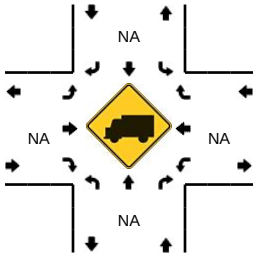


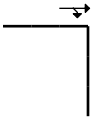


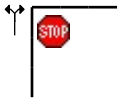


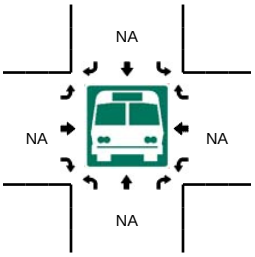












5-Min Count Period Beginning At	SW 108th Ave (Northbound)				SW 108th Ave (Southbound)				SW Tualatin Rd (Eastbound)				SW Tualatin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	2	0	0	0	0	0	0	49	4	0	4	13	0	0	72	
7:05 AM	1	0	1	0	0	0	0	0	0	57	1	0	2	12	0	0	74	
7:10 AM	0	0	0	0	0	0	0	0	0	50	3	0	4	17	0	0	74	
7:15 AM	1	0	0	0	0	0	0	0	0	59	2	0	1	14	0	0	77	
7:20 AM	1	0	1	0	0	0	0	0	0	50	3	0	5	22	0	0	82	
7:25 AM	0	0	1	0	0	0	0	0	0	61	2	0	7	26	0	0	97	
7:30 AM	1	0	1	0	0	0	0	0	0	78	4	0	1	21	0	0	106	
7:35 AM	0	0	1	0	0	0	0	0	0	74	1	0	6	28	0	0	110	
7:40 AM	0	0	0	0	0	0	0	0	0	78	1	0	6	19	0	0	104	
7:45 AM	0	0	0	0	0	0	0	0	0	94	2	0	10	20	0	0	126	
7:50 AM	2	0	1	0	0	0	0	0	0	73	4	0	10	35	0	0	125	
7:55 AM	1	0	0	0	0	0	0	0	0	75	2	0	10	26	0	0	114	1161
8:00 AM	0	0	0	0	0	0	0	0	0	58	3	0	7	37	0	0	105	1194
8:05 AM	0	0	1	0	0	0	0	0	0	63	7	0	9	30	0	0	110	1230
8:10 AM	0	0	1	0	0	0	0	0	0	52	4	0	4	28	0	0	89	1245
8:15 AM	1	0	0	0	0	0	0	0	0	55	2	0	5	19	0	0	82	1250
8:20 AM	0	0	1	0	0	0	0	0	0	52	3	0	7	32	0	0	95	1263
8:25 AM	0	0	2	0	0	0	0	0	0	50	3	0	5	19	0	0	79	1245
8:30 AM	0	0	1	0	0	0	0	0	0	48	1	0	4	17	0	0	71	1210
8:35 AM	2	0	0	0	0	0	0	0	0	38	3	0	13	30	0	0	86	1186
8:40 AM	3	0	1	0	0	0	0	0	0	30	3	0	6	29	0	0	72	1154
8:45 AM	0	0	1	0	0	0	0	0	0	42	2	0	4	26	0	0	75	1103
8:50 AM	1	0	0	0	0	0	0	0	0	40	1	0	5	36	0	0	83	1061
8:55 AM	0	0	2	0	0	0	0	0	0	23	0	0	5	29	0	0	59	1006

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	12	0	4	0	0	0	0	0	0	968	32	0	120	324	0	0	1460
Heavy Trucks	0	0	0		0	0	0		0	20	0		4	8	0		32
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	1	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/17/2018 5:02 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

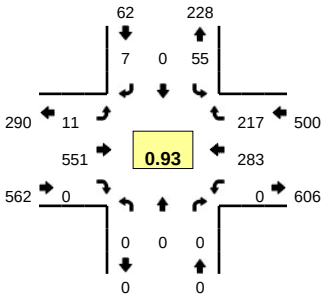
Method for determining peak hour: Total Entering Volume

LOCATION: SW 108th Ave -- SW Herman Rd

CITY/STATE: Tualatin, OR

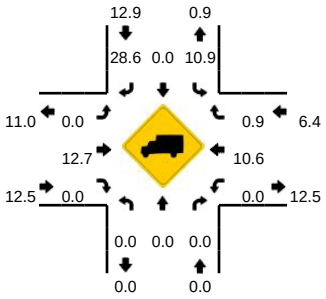
QC JOB #: 14768944

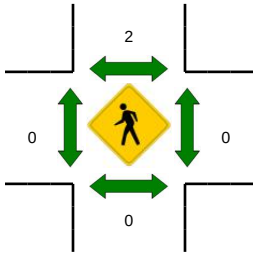
DATE: Tue, Sep 11 2018

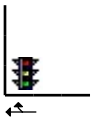


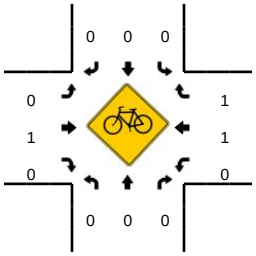
Peak-Hour: 7:15 AM -- 8:15 AM

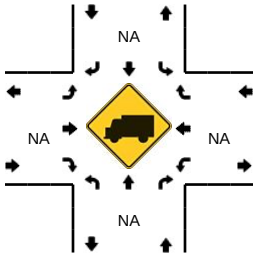
Peak 15-Min: 7:50 AM -- 8:05 AM

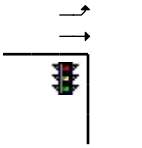


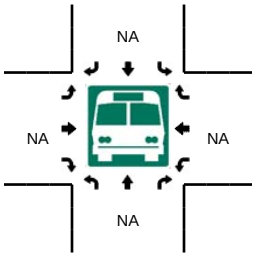












5-Min Count Period Beginning At	SW 108th Ave (Northbound)				SW 108th Ave (Southbound)				SW Herman Rd (Eastbound)				SW Herman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	3	0	0	0	1	37	0	0	0	29	6	0	76	
7:05 AM	0	0	0	0	4	0	1	0	0	38	0	0	0	32	18	0	93	
7:10 AM	0	0	0	0	6	0	1	0	1	29	0	0	0	22	12	0	71	
7:15 AM	0	0	0	0	2	0	0	0	0	34	0	0	0	21	13	0	70	
7:20 AM	0	0	0	0	7	0	1	0	0	44	0	0	0	20	14	0	86	
7:25 AM	0	0	0	0	6	0	1	0	0	50	0	0	0	34	17	0	108	
7:30 AM	0	0	0	0	8	0	0	0	1	39	0	0	0	18	14	0	80	
7:35 AM	0	0	0	0	5	0	0	0	1	62	0	0	0	20	20	0	108	
7:40 AM	0	0	0	0	3	0	1	0	0	37	0	0	0	19	24	0	84	
7:45 AM	0	0	0	0	7	0	0	0	3	55	0	0	0	18	16	0	99	
7:50 AM	0	0	0	0	6	0	1	0	3	59	0	0	0	27	15	0	111	
7:55 AM	0	0	0	0	3	0	0	0	0	35	0	0	0	32	17	0	87	1073
8:00 AM	0	0	0	0	3	0	0	0	0	50	0	0	0	25	25	0	103	1100
8:05 AM	0	0	0	0	1	0	0	0	3	41	0	0	0	27	24	0	96	1103
8:10 AM	0	0	0	0	4	0	3	0	0	45	0	0	0	22	18	0	92	1124
8:15 AM	0	0	0	0	4	0	0	0	0	19	0	0	0	27	9	0	59	1113
8:20 AM	0	0	0	0	6	0	1	0	1	37	0	0	0	16	22	0	83	1110
8:25 AM	0	0	0	0	4	0	0	0	1	30	0	0	0	13	22	0	70	1072
8:30 AM	0	0	0	0	6	0	0	0	0	26	0	0	0	17	24	0	73	1065
8:35 AM	0	0	0	0	2	0	0	0	0	17	0	0	0	14	22	0	55	1012
8:40 AM	0	0	0	0	2	0	1	0	3	16	0	0	0	21	20	0	63	991
8:45 AM	0	0	0	0	2	0	1	0	1	18	0	0	0	20	19	0	61	953
8:50 AM	0	0	0	0	0	0	0	0	5	12	0	0	0	22	17	0	56	898
8:55 AM	0	0	0	0	0	0	0	0	1	23	0	0	0	20	21	0	65	876

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	48	0	4	0	12	576	0	0	0	336	228	0	1204
Heavy Trucks	0	0	0		8	0	0		0	60	0		0	28	4		100
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/17/2018 5:02 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: SW 108th Ave -- Leveton Dr

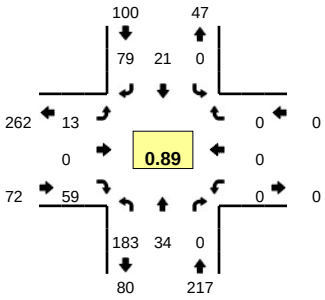
CITY/STATE: Tualatin, OR

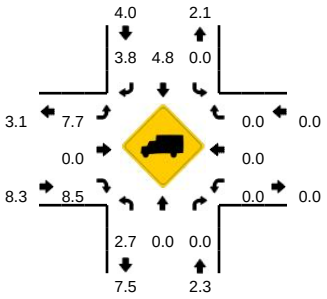
QC JOB #: 14768945

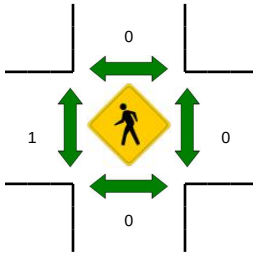
DATE: Tue, Sep 11 2018

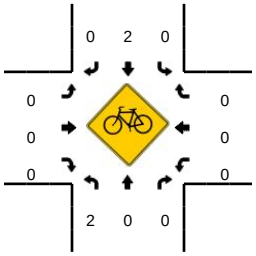
Peak-Hour: 7:40 AM -- 8:40 AM

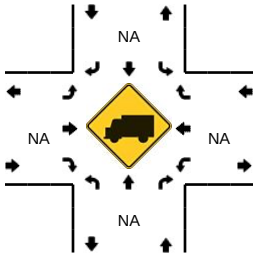
Peak 15-Min: 8:25 AM -- 8:40 AM

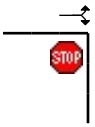


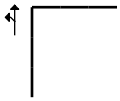


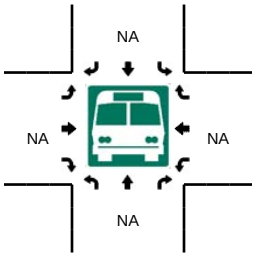












5-Min Count Period Beginning At	SW 108th Ave (Northbound)				SW 108th Ave (Southbound)				Leveton Dr (Eastbound)				Leveton Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	4	2	0	0	0	1	2	0	4	0	3	0	0	0	0	0	16	
7:05 AM	11	5	0	0	0	1	2	0	1	0	3	0	0	0	0	0	23	
7:10 AM	7	5	0	0	0	2	2	0	0	0	4	0	0	0	0	0	20	
7:15 AM	10	3	0	0	0	1	2	0	1	0	3	0	0	0	0	0	20	
7:20 AM	7	0	0	0	0	2	6	0	3	0	6	0	0	0	0	0	24	
7:25 AM	10	6	0	0	0	2	4	0	0	0	9	0	0	0	0	0	31	
7:30 AM	8	0	0	0	0	1	2	0	2	0	7	0	0	0	0	0	20	
7:35 AM	16	1	0	0	0	3	2	0	2	0	4	0	0	0	0	0	28	
7:40 AM	19	3	0	0	0	1	3	0	0	0	8	0	0	0	0	0	34	
7:45 AM	11	3	0	0	0	2	7	0	1	0	7	0	0	0	0	0	31	
7:50 AM	8	4	0	0	0	0	10	0	1	0	13	0	0	0	0	0	36	
7:55 AM	13	2	0	0	0	2	10	0	6	0	3	0	0	0	0	0	36	319
8:00 AM	12	7	0	0	0	1	7	0	2	0	6	0	0	0	0	0	35	338
8:05 AM	20	3	0	0	0	2	5	0	0	0	1	0	0	0	0	0	31	346
8:10 AM	13	1	0	0	0	1	4	0	1	0	6	0	0	0	0	0	26	352
8:15 AM	12	1	0	0	0	0	6	0	0	0	4	0	0	0	0	0	23	355
8:20 AM	15	1	0	0	0	2	6	0	0	0	4	0	0	0	0	0	28	359
8:25 AM	22	2	0	0	0	7	6	0	2	0	2	0	0	0	0	0	41	369
8:30 AM	20	4	0	0	0	2	2	0	0	0	3	0	0	0	0	0	31	380
8:35 AM	18	3	0	0	0	1	13	0	0	0	2	0	0	0	0	0	37	389
8:40 AM	10	4	0	0	0	1	8	0	1	0	2	0	0	0	0	0	26	381
8:45 AM	17	5	0	0	0	2	6	0	1	0	1	0	0	0	0	0	32	382
8:50 AM	15	1	0	0	0	0	4	0	1	0	4	0	0	0	0	0	25	371
8:55 AM	15	2	0	0	0	0	4	0	0	0	1	0	0	0	0	0	22	357

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	240	36	0	0	0	40	84	0	8	0	28	0	0	0	0	0	436
Heavy Trucks	8	0	0		0	0	0		0	0	0		0	0	0		8
Pedestrians		0				0				0				0			0
Bicycles	1	0	0		0	0	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/17/2018 5:02 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: SW Teton Ave -- SW Herman Rd

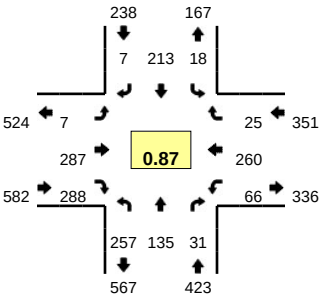
CITY/STATE: Tualatin, OR

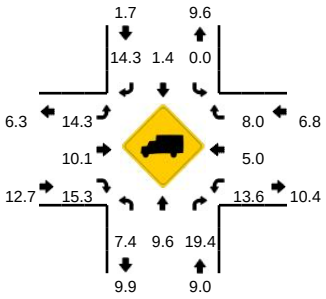
QC JOB #: 14768946

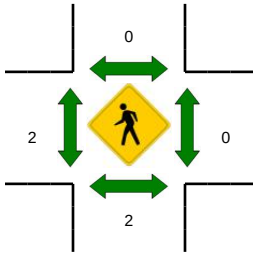
DATE: Tue, Sep 11 2018

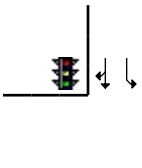
Peak-Hour: 7:20 AM -- 8:20 AM

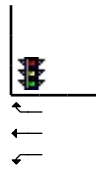
Peak 15-Min: 7:50 AM -- 8:05 AM

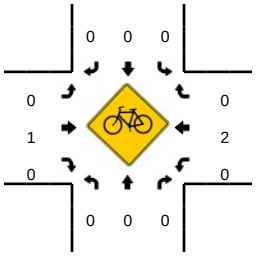


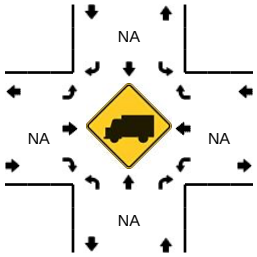


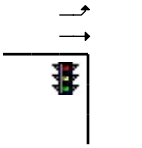


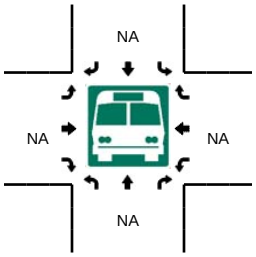












5-Min Count Period Beginning At	SW Teton Ave (Northbound)				SW Teton Ave (Southbound)				SW Herman Rd (Eastbound)				SW Herman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	23	6	0	0	2	8	0	0	0	19	21	0	1	17	1	0	98	
7:05 AM	29	5	3	0	0	13	0	0	0	25	20	0	1	24	0	0	120	
7:10 AM	20	5	1	0	1	17	0	0	1	11	12	0	2	17	0	0	87	
7:15 AM	18	9	2	0	1	16	0	0	2	20	22	0	0	18	0	0	108	
7:20 AM	15	9	1	0	0	9	0	0	0	21	23	0	5	26	1	0	110	
7:25 AM	21	11	3	0	3	13	0	0	0	27	26	0	3	27	2	0	136	
7:30 AM	14	6	1	0	1	26	0	0	0	27	22	0	2	17	0	0	116	
7:35 AM	20	12	4	0	3	18	0	0	2	21	33	0	5	27	1	0	146	
7:40 AM	27	7	5	0	1	24	0	0	0	27	20	0	2	18	1	0	132	
7:45 AM	15	10	3	0	0	23	3	0	2	20	26	0	6	16	2	0	126	
7:50 AM	21	16	0	0	1	21	0	0	0	37	35	0	7	21	7	0	166	
7:55 AM	29	12	5	0	4	23	0	0	0	16	19	0	10	25	1	0	144	1489
8:00 AM	26	13	4	0	1	17	0	0	0	23	27	0	10	25	4	0	150	1541
8:05 AM	26	11	3	0	0	18	2	0	1	22	22	0	6	23	3	0	137	1558
8:10 AM	22	11	1	0	3	13	1	0	1	26	20	0	4	17	1	0	120	1591
8:15 AM	21	17	1	0	1	8	1	0	1	20	15	0	6	18	2	0	111	1594
8:20 AM	15	11	0	0	0	13	0	0	1	20	23	0	2	20	2	0	107	1591
8:25 AM	20	17	2	0	0	13	1	0	0	26	16	0	2	15	1	0	113	1568
8:30 AM	24	12	2	0	0	10	0	0	0	25	7	0	3	16	1	0	100	1552
8:35 AM	22	23	5	0	2	7	1	0	0	16	6	0	0	24	0	0	106	1512
8:40 AM	19	31	6	0	0	13	1	0	0	10	4	0	2	17	0	0	103	1483
8:45 AM	16	15	3	0	2	19	0	0	1	13	8	0	4	19	0	0	100	1457
8:50 AM	22	21	2	0	5	15	0	0	0	18	7	0	3	18	0	0	111	1402
8:55 AM	21	6	4	0	1	7	0	0	1	16	8	0	3	22	3	0	92	1350

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	304	164	36	0	24	244	0	0	0	304	324	0	108	284	48	0	1840
Heavy Trucks	16	4	8		0	4	0		0	24	52		12	20	4		144
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/17/2018 5:02 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

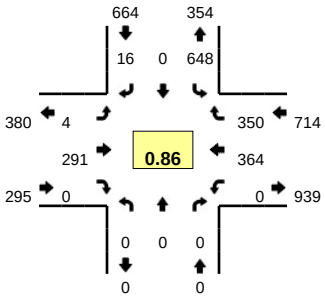
LOCATION: SW Tualatin Rd -- SW Herman Rd

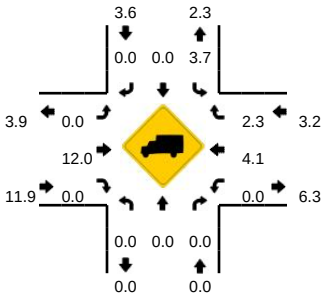
CITY/STATE: Washington, OR

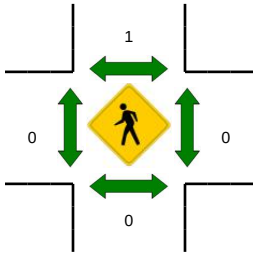
QC JOB #: 14768947

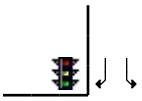
DATE: Tue, Sep 11 2018

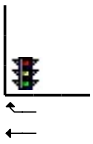
Peak-Hour: 7:25 AM -- 8:25 AM
Peak 15-Min: 7:55 AM -- 8:10 AM

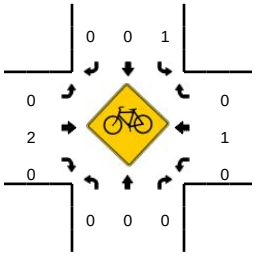


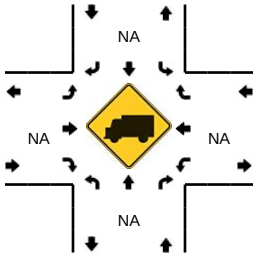


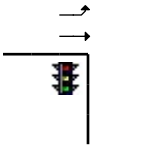


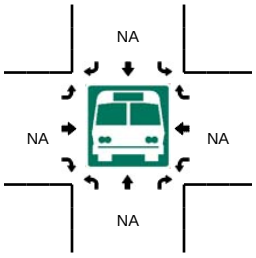












5-Min Count Period Beginning At	SW Tualatin Rd (Northbound)				SW Tualatin Rd (Southbound)				SW Herman Rd (Eastbound)				SW Herman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	28	0	0	0	0	15	0	0	0	22	18	0	83	
7:05 AM	0	0	0	0	47	0	1	0	0	29	0	0	0	33	9	0	119	
7:10 AM	0	0	0	0	52	0	0	0	1	18	0	0	0	21	16	0	108	
7:15 AM	0	0	0	0	45	0	2	0	1	21	0	0	0	18	14	0	101	
7:20 AM	0	0	0	0	37	0	3	0	0	19	0	0	0	41	27	0	127	
7:25 AM	0	0	0	0	52	0	0	0	0	23	0	0	0	34	19	0	128	
7:30 AM	0	0	0	0	61	0	3	0	2	24	0	0	0	19	20	0	129	
7:35 AM	0	0	0	0	65	0	1	0	0	24	0	0	0	33	26	0	149	
7:40 AM	0	0	0	0	47	0	1	0	0	19	0	0	0	29	16	0	112	
7:45 AM	0	0	0	0	54	0	2	0	1	29	0	0	0	29	33	0	148	
7:50 AM	0	0	0	0	61	0	1	0	0	21	0	0	0	35	33	0	151	
7:55 AM	0	0	0	0	61	0	3	0	0	23	0	0	0	43	39	0	169	1524
8:00 AM	0	0	0	0	55	0	2	0	0	33	0	0	0	37	40	0	167	1608
8:05 AM	0	0	0	0	54	0	0	0	0	37	0	0	0	26	35	0	152	1641
8:10 AM	0	0	0	0	41	0	3	0	0	24	0	0	0	28	32	0	128	1661
8:15 AM	0	0	0	0	47	0	0	0	0	17	0	0	0	23	16	0	103	1663
8:20 AM	0	0	0	0	50	0	0	0	1	17	0	0	0	28	41	0	137	1673
8:25 AM	0	0	0	0	40	0	0	0	0	34	0	0	0	24	23	0	121	1666
8:30 AM	0	0	0	0	58	0	3	0	0	22	0	0	0	22	27	0	132	1669
8:35 AM	0	0	0	0	53	0	0	0	0	32	0	0	0	28	35	0	148	1668
8:40 AM	0	0	0	0	35	0	0	0	0	20	0	0	0	22	36	0	113	1669
8:45 AM	0	0	0	0	48	0	1	0	0	18	0	0	0	19	34	0	120	1641
8:50 AM	0	0	0	0	52	0	0	0	0	21	0	0	0	19	30	0	122	1612
8:55 AM	0	0	0	0	29	0	2	0	0	18	0	0	0	29	28	0	106	1549

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	680	0	20	0	0	372	0	0	0	424	456	0	1952
Heavy Trucks	0	0	0		24	0	0		0	44	0		0	16	12		96
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	1	0		1
Railroad																	
Stopped Buses																	

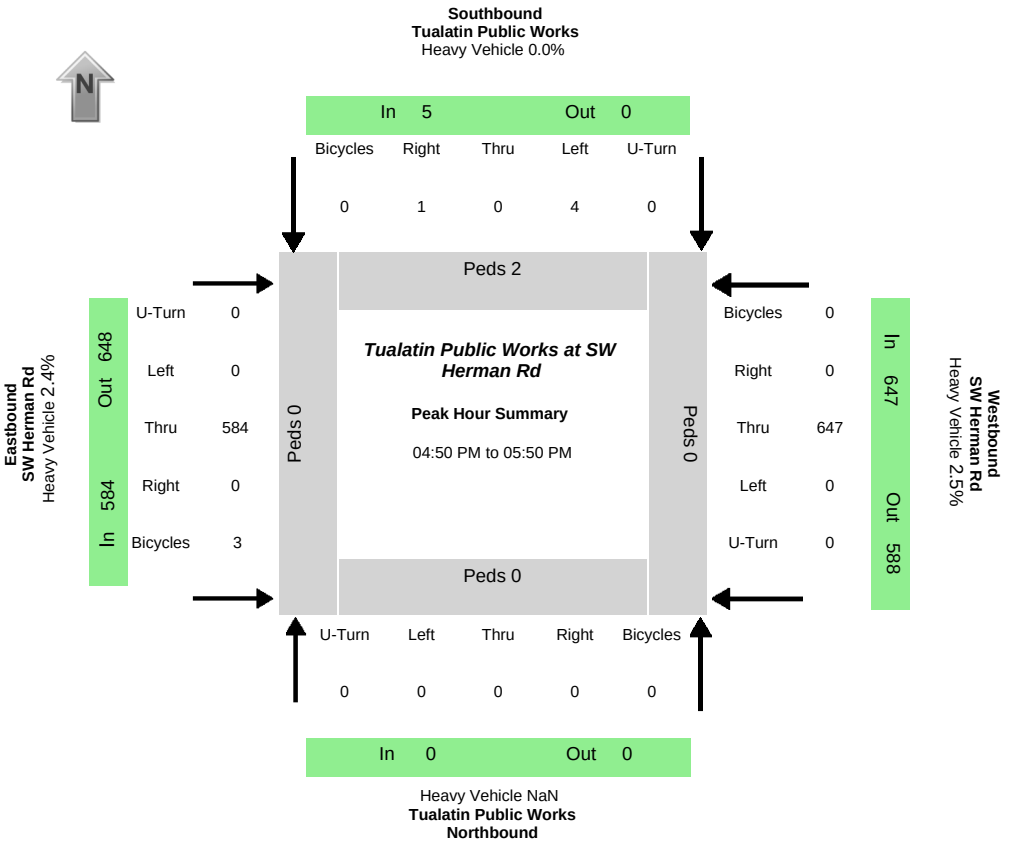
Comments:

Report generated on 9/17/2018 5:02 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

K-D-N
KEY DATA NETWORK

Data Provided by K-D-N.com 503-594-4224	
N/S street	*Tualatin Public Works*
E/W street	*SW Herman Rd*
City, State	Tualatin OR
Site Notes	
Location	45.384202 - -122.786072
Start Date	Wednesday, October 10, 2018
Start Time	04:00:00 PM
Weather	
Study ID #	
Peak Hour Start	04:50:00 PM
Peak 15 Min Start	05:05:00 PM
PHF (15-Min Int)	0.85



Peak-Hour Volumes (PHV)

Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
0	0	0	0	4	0	1	0	0	584	0	0	0	647	0	0	0	5	584	647	0	0	648	588

Percent Heavy Vehicles

0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.4%	0.0%	0.0%	0.0%	2.5%	0.0%	0.0%	NaN	0.0%	2.4%	2.5%	NaN	0.0%	2.5%	2.4%

PHV- Bicycles

Northbound				Southbound				Eastbound				Westbound				
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	**Sum**
0	0	0	0	0	0	0	0	0	3	0		0	0	0	0	3

PHV - Pedestrians

in Crosswalk				
NB	SB	EB	WB	**Sum**
0	2	0	0	2

All Vehicle Volumes

	Northbound Tualatin Public Works				Southbound Tualatin Public Works				Eastbound SW Herman Rd				Westbound SW Herman Rd				15 Min	1 HR
Time	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	Sum
04:00:00 PM	0	0	0	0	18	0	10	0	1	38	0	0	0	40	1	0		
04:05:00 PM	0	0	0	0	5	0	3	0	0	32	0	0	0	45	1	0		
04:10:00 PM	0	0	0	0	0	0	0	0	0	29	0	0	0	41	1	0	265	
04:15:00 PM	0	0	0	0	0	0	0	0	0	31	0	0	0	38	0	0	226	
04:20:00 PM	0	0	0	0	0	0	1	0	0	48	0	0	0	60	1	0	250	
04:25:00 PM	0	0	0	0	1	0	1	0	0	32	0	0	0	29	0	0	242	
04:30:00 PM	0	0	0	0	0	0	0	0	0	35	0	0	0	37	0	0	245	
04:35:00 PM	0	0	0	0	0	0	0	0	0	53	0	0	0	57	0	0	245	
04:40:00 PM	0	0	0	0	0	0	0	0	0	29	0	0	0	31	0	0	242	
04:45:00 PM	0	0	0	0	0	0	0	0	0	49	0	0	0	40	0	0	259	
04:50:00 PM	0	0	0	0	3	0	0	0	0	45	0	0	0	46	0	0	243	
04:55:00 PM	0	0	0	0	0	0	0	0	0	44	0	0	0	50	0	0	277	1026
05:00:00 PM	0	0	0	0	1	0	0	0	0	50	0	0	0	60	0	0	299	1029
05:05:00 PM	0	0	0	0	0	0	1	0	0	71	0	0	0	55	0	0	332	1070
05:10:00 PM	0	0	0	0	0	0	0	0	0	65	0	0	0	56	0	0	359	1120
05:15:00 PM	0	0	0	0	0	0	0	0	0	52	0	0	0	64	0	0	364	1167
05:20:00 PM	0	0	0	0	0	0	0	0	0	49	0	0	0	55	0	0	341	1161
05:25:00 PM	0	0	0	0	0	0	0	0	0	36	0	0	0	57	0	0	313	1191
05:30:00 PM	0	0	0	0	0	0	0	0	0	41	0	0	0	49	0	0	287	1209
05:35:00 PM	0	0	0	0	0	0	0	0	0	41	0	0	0	56	0	0	280	1196
05:40:00 PM	0	0	0	0	0	0	0	0	0	51	0	0	0	43	0	0	281	1230
05:45:00 PM	0	0	0	0	0	0	0	0	0	39	0	0	0	56	0	0	286	1236
05:50:00 PM	0	0	0	0	0	0	0	0	0	37	0	0	0	35	0	0	261	1214
05:55:00 PM	0	0	0	0	0	0	0	0	0	33	0	0	0	32	0	0	232	1185

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: SW 108th Ave -- SW Tualatin Rd

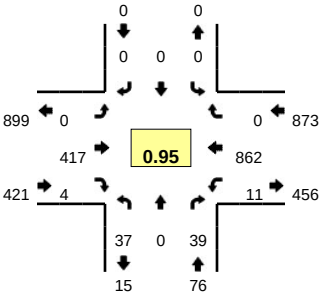
CITY/STATE: Tualatin, OR

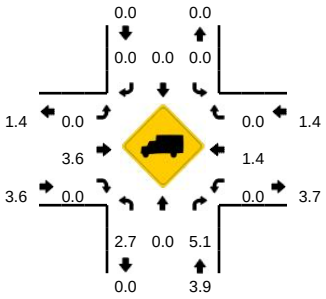
QC JOB #: 14768914

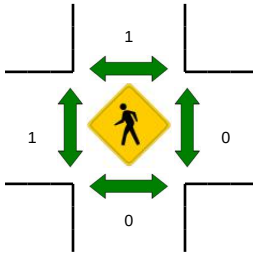
DATE: Thu, Aug 16 2018

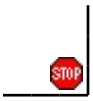
Peak-Hour: 4:20 PM -- 5:20 PM

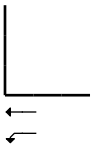
Peak 15-Min: 4:50 PM -- 5:05 PM

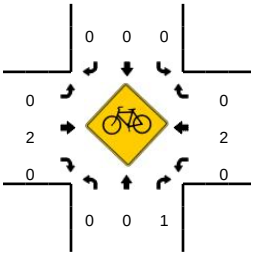


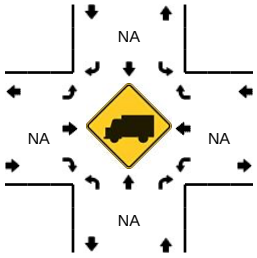


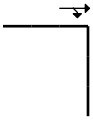


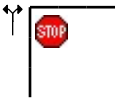


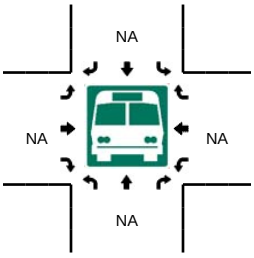












5-Min Count Period Beginning At	SW 108th Ave (Northbound)				SW 108th Ave (Southbound)				SW Tualatin Rd (Eastbound)				SW Tualatin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	8	0	2	0	0	0	0	0	0	33	0	0	0	62	0	0	105	
4:05 PM	6	0	4	0	0	0	0	0	0	45	0	0	2	60	0	0	117	
4:10 PM	2	0	1	0	0	0	0	0	0	24	0	0	0	73	0	0	100	
4:15 PM	0	0	1	0	0	0	0	0	0	19	1	0	1	57	0	0	79	
4:20 PM	1	0	3	0	0	0	0	0	0	32	1	0	0	67	0	0	104	
4:25 PM	0	0	3	0	0	0	0	0	0	35	0	0	0	71	0	0	109	
4:30 PM	3	0	2	0	0	0	0	0	0	36	1	0	1	72	0	0	115	
4:35 PM	3	0	3	0	0	0	0	0	0	29	0	0	0	77	0	0	112	
4:40 PM	5	0	4	0	0	0	0	0	0	32	0	0	2	77	0	0	120	
4:45 PM	3	0	0	0	0	0	0	0	0	40	0	0	1	70	0	0	114	
4:50 PM	1	0	6	0	0	0	0	0	0	40	0	0	1	68	0	0	116	
4:55 PM	2	0	3	0	0	0	0	0	0	42	0	0	2	70	0	0	119	1310
5:00 PM	6	0	4	0	0	0	0	0	0	36	0	0	2	77	0	0	125	1330
5:05 PM	6	0	5	0	0	0	0	0	0	25	1	0	1	63	0	0	101	1314
5:10 PM	2	0	1	0	0	0	0	0	0	38	0	0	0	76	0	0	117	1331
5:15 PM	5	0	5	0	0	0	0	0	0	32	1	0	1	74	0	0	118	1370
5:20 PM	3	0	8	0	0	0	0	0	0	20	0	0	0	61	0	0	92	1358
5:25 PM	1	0	4	0	0	0	0	0	0	24	0	0	1	69	0	0	99	1348
5:30 PM	2	0	4	0	0	0	0	0	0	29	0	0	0	61	0	0	96	1329
5:35 PM	2	0	3	0	0	0	0	0	0	21	1	0	0	70	0	0	97	1314
5:40 PM	1	0	5	1	0	0	0	0	0	34	0	0	0	53	0	0	94	1288
5:45 PM	1	0	3	0	0	0	0	0	0	31	1	0	1	44	0	0	81	1255
5:50 PM	4	0	3	0	0	0	0	0	0	28	3	0	0	50	0	0	88	1227
5:55 PM	1	0	4	0	0	0	0	0	0	28	1	0	1	62	0	0	97	1205

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	36	0	52	0	0	0	0	0	0	472	0	0	20	860	0	0	1440
Heavy Trucks	4	0	4		0	0	0		0	8	0		0	8	0		24
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 8/24/2018 11:44 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

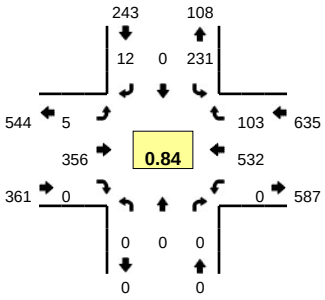
Method for determining peak hour: Total Entering Volume

LOCATION: SW 108th Ave -- SW Herman Rd

CITY/STATE: Tualatin, OR

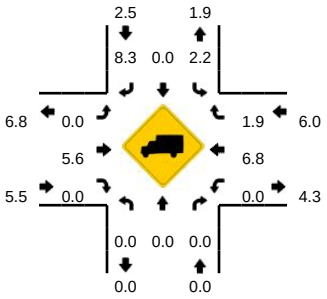
QC JOB #: 14768926

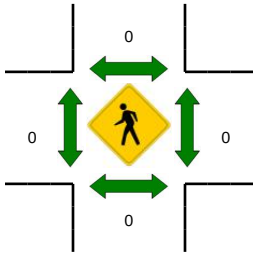
DATE: Thu, Aug 16 2018

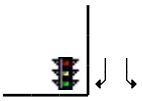


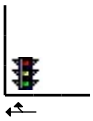
Peak-Hour: 4:25 PM -- 5:25 PM

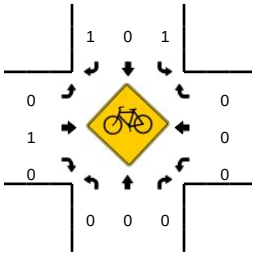
Peak 15-Min: 4:30 PM -- 4:45 PM

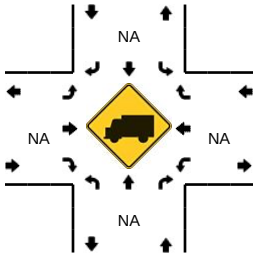


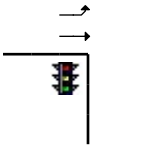


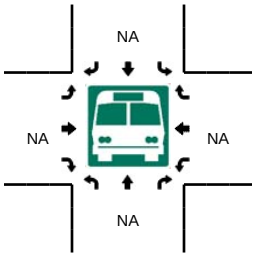












5-Min Count Period Beginning At	SW 108th Ave (Northbound)				SW 108th Ave (Southbound)				SW Herman Rd (Eastbound)				SW Herman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	9	0	2	0	0	38	0	0	0	32	8	0	89	
4:05 PM	0	0	0	0	12	0	0	0	1	37	0	0	0	35	10	0	95	
4:10 PM	0	0	0	0	15	0	2	0	0	32	0	0	0	53	6	0	108	
4:15 PM	0	0	0	0	10	0	4	0	0	29	0	0	0	37	8	0	88	
4:20 PM	0	0	0	0	5	0	1	0	1	23	0	0	0	42	9	0	81	
4:25 PM	0	0	0	0	21	0	0	0	0	30	0	0	0	31	5	0	87	
4:30 PM	0	0	0	0	19	0	1	0	1	39	0	0	0	54	10	0	124	
4:35 PM	0	0	0	0	19	0	2	0	0	30	0	0	0	58	12	0	121	
4:40 PM	0	0	0	0	34	0	1	0	1	28	0	0	0	51	8	0	123	
4:45 PM	0	0	0	0	13	0	0	0	1	25	0	0	0	24	9	0	72	
4:50 PM	0	0	0	0	8	0	1	0	0	19	0	0	0	52	14	0	94	
4:55 PM	0	0	0	0	15	0	1	0	0	32	0	0	0	47	8	0	103	1185
5:00 PM	0	0	0	0	21	0	1	0	1	26	0	0	0	44	11	0	104	1200
5:05 PM	0	0	0	0	18	0	0	0	0	37	0	0	0	48	8	0	111	1216
5:10 PM	0	0	0	0	14	0	0	0	0	28	0	0	0	46	5	0	93	1201
5:15 PM	0	0	0	0	20	0	3	0	0	35	0	0	0	47	9	0	114	1227
5:20 PM	0	0	0	0	29	0	2	0	1	27	0	0	0	30	4	0	93	1239
5:25 PM	0	0	0	0	19	0	3	0	0	16	0	0	0	38	3	0	79	1231
5:30 PM	0	0	0	0	31	0	2	0	0	17	0	0	0	39	1	0	90	1197
5:35 PM	0	0	0	0	20	0	0	0	0	18	0	0	0	34	1	0	73	1149
5:40 PM	0	0	0	0	23	0	2	0	0	20	0	0	0	32	4	0	81	1107
5:45 PM	0	0	0	0	24	0	2	0	0	18	0	0	0	22	2	0	68	1103
5:50 PM	0	0	0	0	16	0	1	0	0	19	0	0	0	22	5	0	63	1072
5:55 PM	0	0	0	0	17	0	2	0	0	16	0	0	0	29	8	0	72	1041

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	288	0	16	0	8	388	0	0	0	652	120	0	1472
Heavy Trucks	0	0	0		0	0	4		0	16	0		0	44	0		64
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 8/24/2018 11:44 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

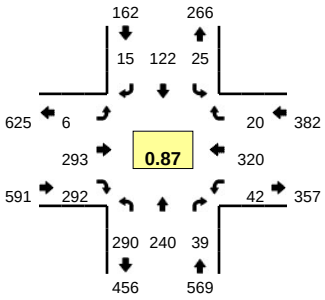
LOCATION: SW Teton Ave -- SW Herman Rd

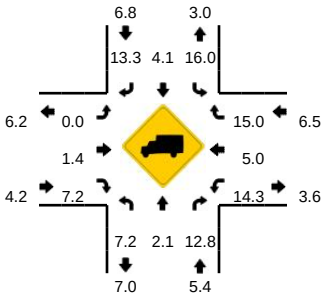
CITY/STATE: Tualatin, OR

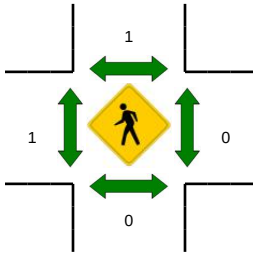
QC JOB #: 14768932

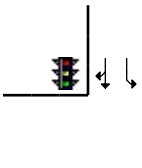
DATE: Thu, Aug 16 2018

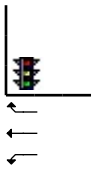
Peak-Hour: 4:25 PM -- 5:25 PM
Peak 15-Min: 4:30 PM -- 4:45 PM

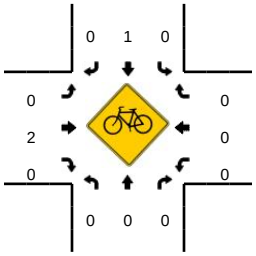


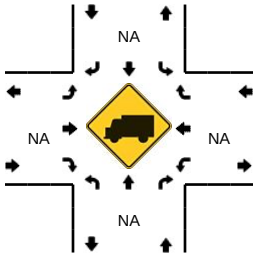


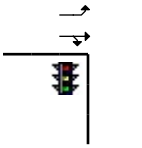


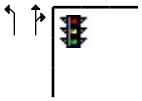


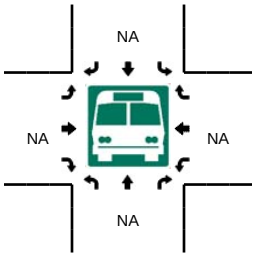












5-Min Count Period Beginning At	SW Teton Ave (Northbound)				SW Teton Ave (Southbound)				SW Herman Rd (Eastbound)				SW Herman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	18	16	3	0	3	7	2	0	0	28	19	0	1	16	1	0	114	
4:05 PM	17	15	1	0	1	16	1	0	2	30	21	0	3	19	0	0	126	
4:10 PM	35	25	3	0	3	9	0	0	1	29	23	0	1	29	6	0	164	
4:15 PM	23	16	3	0	1	2	0	0	0	22	19	0	2	20	0	0	108	
4:20 PM	17	12	5	0	0	4	2	0	1	16	13	0	5	23	1	0	99	
4:25 PM	19	13	5	0	0	7	0	0	0	14	28	0	2	28	0	0	116	
4:30 PM	19	13	2	0	2	6	1	0	0	36	23	0	2	40	2	0	146	
4:35 PM	37	31	8	0	0	17	2	0	1	24	24	0	6	24	6	0	180	
4:40 PM	22	12	3	0	1	9	2	0	2	35	30	0	8	37	1	0	162	
4:45 PM	17	24	1	0	6	15	2	0	0	12	23	0	5	14	1	0	120	
4:50 PM	33	19	6	0	1	10	2	0	1	17	15	0	3	31	1	0	139	
4:55 PM	18	19	5	0	1	13	0	0	1	24	20	0	2	38	0	0	141	1615
5:00 PM	31	22	2	0	5	10	1	0	0	16	23	0	0	23	2	0	135	1636
5:05 PM	31	18	2	0	3	12	4	0	0	30	25	0	5	15	1	0	146	1656
5:10 PM	26	24	2	0	1	6	0	0	0	31	25	0	5	25	1	0	146	1638
5:15 PM	19	23	2	0	3	10	0	0	1	22	27	0	2	32	2	0	143	1673
5:20 PM	18	22	1	0	2	7	1	0	0	32	29	0	2	13	3	0	130	1704
5:25 PM	12	8	2	0	2	4	0	0	0	14	23	0	2	23	0	0	90	1678
5:30 PM	15	20	1	0	1	7	3	0	0	25	22	0	4	20	0	0	118	1650
5:35 PM	14	14	3	0	1	5	3	0	1	23	15	0	0	23	0	0	102	1572
5:40 PM	15	7	5	0	2	9	0	0	1	20	17	0	4	16	0	0	96	1506
5:45 PM	9	13	2	0	2	12	0	0	0	19	23	0	6	19	1	0	106	1492
5:50 PM	9	16	3	0	0	10	0	0	0	17	23	0	2	15	3	0	98	1451
5:55 PM	12	16	1	0	0	3	1	0	0	15	16	0	1	20	1	0	86	1396

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	312	224	52	0	12	128	20	0	12	380	308	0	64	404	36	0	1952
Heavy Trucks	24	12	12		8	8	4		0	4	8		8	20	4		112
Pedestrians		0				4				4				0			8
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 8/24/2018 11:44 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: SW Tualatin Rd -- SW Herman Rd

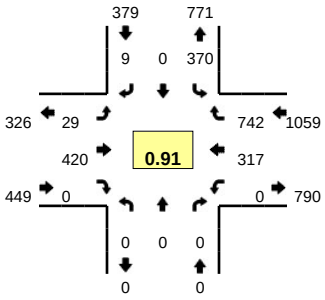
CITY/STATE: Tualatin, OR

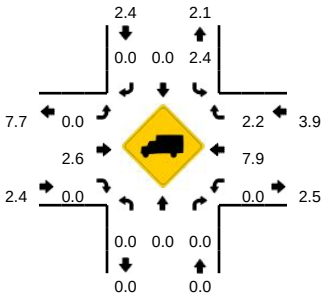
QC JOB #: 14768938

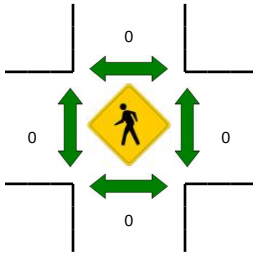
DATE: Thu, Aug 16 2018

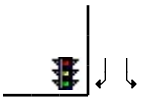
Peak-Hour: 4:20 PM -- 5:20 PM

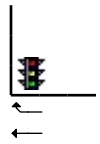
Peak 15-Min: 4:30 PM -- 4:45 PM

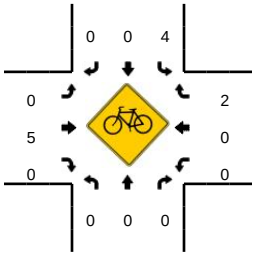


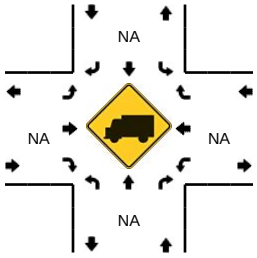


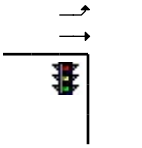


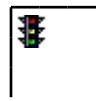


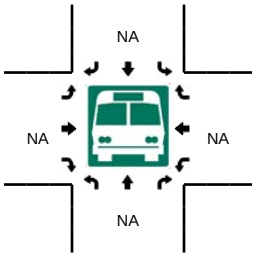












5-Min Count Period Beginning At	SW Tualatin Rd (Northbound)				SW Tualatin Rd (Southbound)				SW Herman Rd (Eastbound)				SW Herman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	26	0	0	0	2	42	0	0	0	22	60	0	152	
4:05 PM	0	0	0	0	44	0	0	0	0	32	0	0	0	18	39	0	133	
4:10 PM	0	0	0	0	21	0	0	0	2	39	0	0	0	33	57	0	152	
4:15 PM	0	0	0	0	24	0	1	0	2	29	0	0	0	20	43	0	119	
4:20 PM	0	0	0	0	30	0	1	0	1	27	0	0	0	19	64	0	142	
4:25 PM	0	0	0	0	31	0	1	0	2	22	0	0	0	32	63	0	151	
4:30 PM	0	0	0	0	29	0	1	0	4	53	0	0	0	33	63	0	183	
4:35 PM	0	0	0	0	24	0	0	0	6	54	0	0	0	30	56	0	170	
4:40 PM	0	0	0	0	24	0	3	0	3	43	0	0	0	25	68	0	166	
4:45 PM	0	0	0	0	31	0	1	0	4	32	0	0	0	17	59	0	144	
4:50 PM	0	0	0	0	29	0	0	0	2	33	0	0	0	31	58	0	153	
4:55 PM	0	0	0	0	37	0	0	0	1	33	0	0	0	38	58	0	167	1832
5:00 PM	0	0	0	0	39	0	0	0	1	22	0	0	0	19	66	0	147	1827
5:05 PM	0	0	0	0	36	0	0	0	3	40	0	0	0	21	58	0	158	1852
5:10 PM	0	0	0	0	24	0	1	0	2	29	0	0	0	27	73	0	156	1856
5:15 PM	0	0	0	0	36	0	1	0	0	32	0	0	0	25	56	0	150	1887
5:20 PM	0	0	0	0	24	0	0	0	2	37	0	0	0	20	54	0	137	1882
5:25 PM	0	0	0	0	29	0	0	0	0	21	0	0	0	19	61	0	130	1861
5:30 PM	0	0	0	0	30	0	0	0	0	26	0	0	0	24	62	0	142	1820
5:35 PM	0	0	0	0	33	0	0	0	1	28	0	0	0	22	66	0	150	1800
5:40 PM	0	0	0	0	20	0	1	0	0	25	0	0	0	18	50	0	114	1748
5:45 PM	0	0	0	0	35	0	0	0	0	26	0	0	0	23	50	0	134	1738
5:50 PM	0	0	0	0	24	0	0	0	0	20	0	0	0	18	44	0	106	1691
5:55 PM	0	0	0	0	28	0	1	0	0	19	0	0	0	22	52	0	122	1646

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	308	0	16	0	52	600	0	0	0	352	748	0	2076
Heavy Trucks	0	0	0		4	0	0		0	12	0		0	32	28		76
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	3	0		0	0	0		3
Railroad																	
Stopped Buses																	

Comments:

Report generated on 8/24/2018 11:44 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

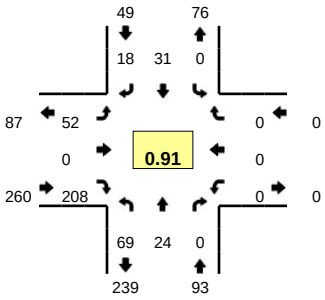
Method for determining peak hour: Total Entering Volume

LOCATION: SW 108th Ave -- Leveton Dr

CITY/STATE: Tualatin, OR

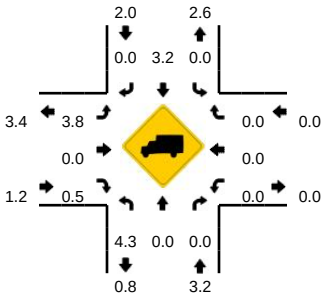
QC JOB #: 14768948

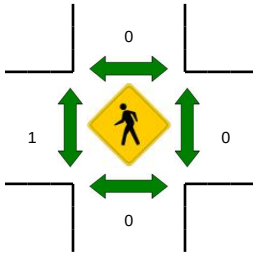
DATE: Tue, Sep 11 2018

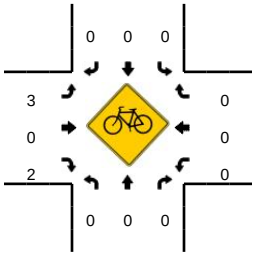


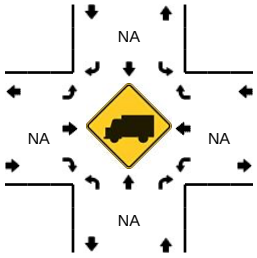
Peak-Hour: 4:40 PM -- 5:40 PM

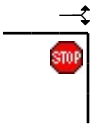
Peak 15-Min: 5:25 PM -- 5:40 PM

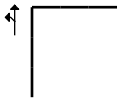


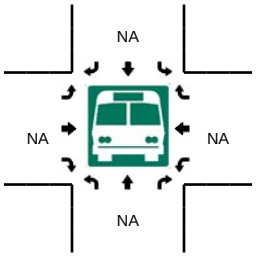












5-Min Count Period Beginning At	SW 108th Ave (Northbound)				SW 108th Ave (Southbound)				Leveton Dr (Eastbound)				Leveton Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	10	3	0	0	0	2	1	0	8	0	14	0	0	0	0	0	38	
4:05 PM	6	3	0	0	0	4	0	0	3	0	10	0	0	0	0	0	26	
4:10 PM	3	1	0	0	0	4	0	0	3	0	8	0	0	0	0	0	19	
4:15 PM	4	3	0	0	0	1	0	0	0	0	9	0	0	0	0	0	17	
4:20 PM	8	2	0	0	0	3	0	0	5	0	8	0	0	0	0	0	26	
4:25 PM	10	2	0	0	0	3	1	0	2	0	5	0	0	0	0	0	23	
4:30 PM	8	4	0	0	0	4	1	0	1	0	12	0	0	0	0	0	30	
4:35 PM	9	2	0	0	0	5	2	0	3	0	12	0	0	0	0	0	33	
4:40 PM	9	5	0	0	0	4	4	0	7	0	11	0	0	0	0	0	40	
4:45 PM	8	1	0	0	0	6	0	0	2	0	8	0	0	0	0	0	25	
4:50 PM	13	1	0	0	0	0	0	0	3	0	8	0	0	0	0	0	25	
4:55 PM	7	1	0	0	0	3	0	0	4	0	17	0	0	0	0	0	32	334
5:00 PM	13	0	0	0	0	3	2	0	3	0	15	0	0	0	0	0	36	332
5:05 PM	3	2	0	0	0	2	2	0	4	0	19	0	0	0	0	0	32	338
5:10 PM	4	2	0	0	0	2	3	0	3	0	18	0	0	0	0	0	32	351
5:15 PM	2	6	0	0	0	4	3	0	7	0	19	0	0	0	0	0	41	375
5:20 PM	5	1	0	0	0	4	0	0	2	0	16	0	0	0	0	0	28	377
5:25 PM	1	1	0	0	0	0	1	0	8	0	21	0	0	0	0	0	32	386
5:30 PM	2	4	0	0	0	2	0	0	3	0	31	0	0	0	0	0	42	398
5:35 PM	2	0	0	0	0	1	3	0	6	0	25	0	0	0	0	0	37	402
5:40 PM	2	0	0	0	0	1	0	0	3	0	18	0	0	0	0	0	24	386
5:45 PM	4	3	0	0	0	1	2	0	3	0	15	0	0	0	0	0	28	389
5:50 PM	4	1	0	0	0	2	1	0	3	0	15	0	0	0	0	0	26	390
5:55 PM	1	0	0	0	0	2	1	0	5	0	15	0	0	0	0	0	24	382

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	20	20	0	0	0	12	16	0	68	0	308	0	0	0	0	0	444
Heavy Trucks	0	0	0		0	0	0		0	0	4		0	0	0		4
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		2	0	1		0	0	0		3
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/17/2018 5:02 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	813	35	82	321	5	7
Future Vol, veh/h	813	35	82	321	5	7
Conflicting Peds, #/hr	0	2	2	0	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	300	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	5	5	33	33
Mvmt Flow	934	40	94	369	6	8

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	976	0	1514	956
Stage 1	-	-	-	-	956	-
Stage 2	-	-	-	-	558	-
Critical Hdwy	-	-	4.15	-	6.73	6.53
Critical Hdwy Stg 1	-	-	-	-	5.73	-
Critical Hdwy Stg 2	-	-	-	-	5.73	-
Follow-up Hdwy	-	-	2.245	-	3.797	3.597
Pot Cap-1 Maneuver	-	-	695	-	112	274
Stage 1	-	-	-	-	329	-
Stage 2	-	-	-	-	516	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	693	-	96	273
Mov Cap-2 Maneuver	-	-	-	-	96	-
Stage 1	-	-	-	-	328	-
Stage 2	-	-	-	-	445	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.2	30.7
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	154	-	-	693	-
HCM Lane V/C Ratio	0.09	-	-	0.136	-
HCM Control Delay (s)	30.7	-	-	11	-
HCM Lane LOS	D	-	-	B	-
HCM 95th %tile Q(veh)	0.3	-	-	0.5	-

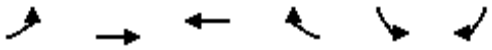
Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	13	59	198	40	21	79
Future Vol, veh/h	13	59	198	40	21	79
Conflicting Peds, #/hr	0	0	1	0	0	1
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	89	89	89	89	89	89
Heavy Vehicles, %	8	8	2	2	4	4
Mvmt Flow	15	66	222	45	24	89

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	559	70	114	0	-	0
Stage 1	70	-	-	-	-	-
Stage 2	489	-	-	-	-	-
Critical Hdwy	6.48	6.28	4.12	-	-	-
Critical Hdwy Stg 1	5.48	-	-	-	-	-
Critical Hdwy Stg 2	5.48	-	-	-	-	-
Follow-up Hdwy	3.572	3.372	2.218	-	-	-
Pot Cap-1 Maneuver	480	976	1475	-	-	-
Stage 1	938	-	-	-	-	-
Stage 2	604	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	405	975	1474	-	-	-
Mov Cap-2 Maneuver	405	-	-	-	-	-
Stage 1	793	-	-	-	-	-
Stage 2	603	-	-	-	-	-

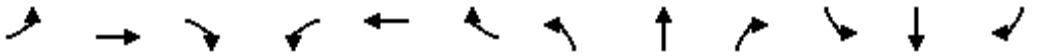
Approach	EB	NB	SB
HCM Control Delay, s	10.2	6.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1474	-	777	-	-
HCM Lane V/C Ratio	0.151	-	0.104	-	-
HCM Control Delay (s)	7.9	0	10.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.5	-	0.3	-	-



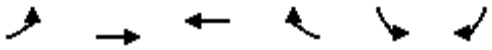
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	11	551	297	227	70	10
Future Volume (vph)	11	551	297	227	70	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	5.4	5.4		6.5	6.5
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.94		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1702	1792	1566		1597	1429
Flt Permitted	0.38	1.00	1.00		0.95	1.00
Satd. Flow (perm)	675	1792	1566		1597	1429
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	12	592	319	244	75	11
RTOR Reduction (vph)	0	0	22	0	0	10
Lane Group Flow (vph)	12	592	541	0	75	1
Confl. Peds. (#/hr)	2			2		
Confl. Bikes (#/hr)				2		
Heavy Vehicles (%)	6%	6%	13%	13%	13%	13%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	35.1	35.1	29.0		6.6	6.6
Effective Green, g (s)	35.1	35.1	29.0		6.6	6.6
Actuated g/C Ratio	0.65	0.65	0.54		0.12	0.12
Clearance Time (s)	5.4	5.4	5.4		6.5	6.5
Vehicle Extension (s)	2.0	3.1	3.1		2.6	2.6
Lane Grp Cap (vph)	455	1173	847		196	175
v/s Ratio Prot	0.00	c0.33	c0.35		c0.05	
v/s Ratio Perm	0.02					0.00
v/c Ratio	0.03	0.50	0.64		0.38	0.01
Uniform Delay, d1	5.6	4.8	8.6		21.6	20.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	0.4	1.6		1.0	0.0
Delay (s)	5.6	5.1	10.2		22.6	20.6
Level of Service	A	A	B		C	C
Approach Delay (s)		5.1	10.2		22.4	
Approach LOS		A	B		C	

Intersection Summary			
HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	53.6	Sum of lost time (s)	17.3
Intersection Capacity Utilization	43.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	306	307	66	260	25	257	135	31	18	213	7
Future Volume (vph)	8	306	307	66	260	25	257	135	31	18	213	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5		4.0	5.5		4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	0.99		1.00	0.97		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1597	1533		1687	1749		1655	1694		1770	1852	
Flt Permitted	0.53	1.00		0.08	1.00		0.30	1.00		0.64	1.00	
Satd. Flow (perm)	887	1533		151	1749		531	1694		1187	1852	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	9	352	353	76	299	29	295	155	36	21	245	8
RTOR Reduction (vph)	0	22	0	0	2	0	0	5	0	0	1	0
Lane Group Flow (vph)	9	683	0	76	326	0	295	186	0	21	252	0
Confl. Peds. (#/hr)			2	2			2					2
Confl. Bikes (#/hr)			1			2						
Heavy Vehicles (%)	13%	13%	13%	7%	7%	7%	9%	9%	9%	2%	2%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	44.2	43.1		52.9	47.8		42.1	36.0		23.8	21.7	
Effective Green, g (s)	44.2	43.1		52.9	47.8		42.1	36.0		23.8	21.7	
Actuated g/C Ratio	0.42	0.41		0.50	0.45		0.40	0.34		0.23	0.21	
Clearance Time (s)	4.0	5.5		4.0	5.5		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.2		2.0	3.2		2.0	3.2		2.0	3.2	
Lane Grp Cap (vph)	379	626		160	792		386	578		279	380	
v/s Ratio Prot	0.00	c0.45		c0.03	0.19		c0.12	0.11		0.00	0.14	
v/s Ratio Perm	0.01			0.21			c0.19			0.02		
v/c Ratio	0.02	1.09		0.47	0.41		0.76	0.32		0.08	0.66	
Uniform Delay, d1	17.9	31.2		21.5	19.4		24.2	25.7		32.0	38.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	63.3		0.8	0.4		7.9	0.3		0.0	4.4	
Delay (s)	18.0	94.5		22.3	19.8		32.1	26.1		32.1	42.9	
Level of Service	B	F		C	B		C	C		C	D	
Approach Delay (s)		93.6			20.3			29.7			42.1	
Approach LOS		F			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	53.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	105.5	Sum of lost time (s)	18.5
Intersection Capacity Utilization	80.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	4	291	364	350	648	16
Future Volume (vph)	4	291	364	350	648	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1612	1696	1845	1532	1736	1553
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1612	1696	1845	1532	1736	1553
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	5	338	423	407	753	19
RTOR Reduction (vph)	0	0	0	285	0	10
Lane Group Flow (vph)	5	338	423	122	753	9
Confl. Peds. (#/hr)	1			1		
Confl. Bikes (#/hr)				1		1
Heavy Vehicles (%)	12%	12%	3%	3%	4%	4%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	5	2	6		4	4
Permitted Phases				6		
Actuated Green, G (s)	1.1	28.1	22.0	22.0	35.2	35.2
Effective Green, g (s)	1.1	28.1	22.0	22.0	35.2	35.2
Actuated g/C Ratio	0.02	0.38	0.30	0.30	0.48	0.48
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	24	650	553	459	833	745
v/s Ratio Prot	0.00	c0.20	c0.23		c0.43	0.01
v/s Ratio Perm				0.08		
v/c Ratio	0.21	0.52	0.76	0.27	0.90	0.01
Uniform Delay, d1	35.7	17.4	23.3	19.5	17.5	10.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.3	0.8	6.2	0.3	13.1	0.0
Delay (s)	40.0	18.2	29.5	19.8	30.6	10.0
Level of Service	D	B	C	B	C	A
Approach Delay (s)		18.5	24.8		30.1	
Approach LOS		B	C		C	

Intersection Summary			
HCM 2000 Control Delay	25.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	73.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	615	516	8	6	8
Future Vol, veh/h	6	615	516	8	6	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	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	7	668	561	9	7	9

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	570	0	-	0	1248	566
Stage 1	-	-	-	-	566	-
Stage 2	-	-	-	-	682	-
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	1002	-	-	-	191	524
Stage 1	-	-	-	-	568	-
Stage 2	-	-	-	-	502	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1002	-	-	-	190	524
Mov Cap-2 Maneuver	-	-	-	-	190	-
Stage 1	-	-	-	-	564	-
Stage 2	-	-	-	-	502	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	17.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1002	-	-	-	299
HCM Lane V/C Ratio	0.007	-	-	-	0.051
HCM Control Delay (s)	8.6	-	-	-	17.7
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection	
Int Delay, s/veh	1.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	417	4	11	862	37	39
Future Vol, veh/h	417	4	11	862	37	39
Conflicting Peds, #/hr	0	0	0	0	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	300	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	4	4	1	1	4	4
Mvmt Flow	439	4	12	907	39	41

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	443	0	1373	441
Stage 1	-	-	-	-	441	-
Stage 2	-	-	-	-	932	-
Critical Hdwy	-	-	4.11	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	-	-	2.209	-	3.536	3.336
Pot Cap-1 Maneuver	-	-	1122	-	159	612
Stage 1	-	-	-	-	644	-
Stage 2	-	-	-	-	380	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1122	-	157	612
Mov Cap-2 Maneuver	-	-	-	-	157	-
Stage 1	-	-	-	-	644	-
Stage 2	-	-	-	-	375	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	25.6
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	254	-	-	1122	-
HCM Lane V/C Ratio	0.315	-	-	0.01	-
HCM Control Delay (s)	25.6	-	-	8.2	-
HCM Lane LOS	D	-	-	A	-
HCM 95th %tile Q(veh)	1.3	-	-	0	-

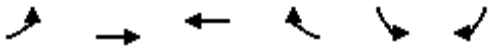
Intersection	
Int Delay, s/veh	8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	52	211	80	28	32	18
Future Vol, veh/h	52	211	80	28	32	18
Conflicting Peds, #/hr	0	0	0	0	0	1
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	91	91	91	91	91	91
Heavy Vehicles, %	1	1	3	3	2	2
Mvmt Flow	57	232	88	31	35	20

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	253	46	56	0	-	0
Stage 1	46	-	-	-	-	-
Stage 2	207	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.13	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.227	-	-	-
Pot Cap-1 Maneuver	738	1026	1542	-	-	-
Stage 1	979	-	-	-	-	-
Stage 2	830	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	694	1025	1541	-	-	-
Mov Cap-2 Maneuver	694	-	-	-	-	-
Stage 1	921	-	-	-	-	-
Stage 2	829	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.5	5.5	0
HCM LOS	B		

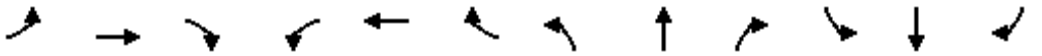
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1541	-	937	-	-
HCM Lane V/C Ratio	0.057	-	0.308	-	-
HCM Control Delay (s)	7.5	0	10.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.2	-	1.3	-	-



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	5	350	532	103	231	12
Future Volume (vph)	5	350	532	103	231	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	5.4	5.4		6.5	6.5
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1703	1792	1753		1752	1534
Flt Permitted	0.21	1.00	1.00		0.95	1.00
Satd. Flow (perm)	376	1792	1753		1752	1534
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	6	417	633	123	275	14
RTOR Reduction (vph)	0	0	6	0	0	11
Lane Group Flow (vph)	6	417	750	0	275	3
Confl. Bikes (#/hr)						1
Heavy Vehicles (%)	6%	6%	6%	6%	3%	3%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	44.7	44.7	38.6		16.6	16.6
Effective Green, g (s)	44.7	44.7	38.6		16.6	16.6
Actuated g/C Ratio	0.61	0.61	0.53		0.23	0.23
Clearance Time (s)	5.4	5.4	5.4		6.5	6.5
Vehicle Extension (s)	2.0	3.1	3.1		2.6	2.6
Lane Grp Cap (vph)	242	1094	924		397	347
v/s Ratio Prot	0.00	c0.23	c0.43		c0.16	
v/s Ratio Perm	0.01					0.00
v/c Ratio	0.02	0.38	0.81		0.69	0.01
Uniform Delay, d1	16.0	7.2	14.3		26.0	21.9
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	0.2	5.5		4.8	0.0
Delay (s)	16.0	7.5	19.8		30.8	21.9
Level of Service	B	A	B		C	C
Approach Delay (s)		7.6	19.8		30.4	
Approach LOS		A	B		C	

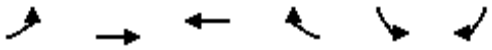
Intersection Summary			
HCM 2000 Control Delay	18.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	73.2	Sum of lost time (s)	17.3
Intersection Capacity Utilization	57.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	298	297	42	320	20	295	240	40	30	122	15
Future Volume (vph)	6	298	297	42	320	20	295	240	40	30	122	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5		4.0	5.5		4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.99		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1672		1687	1758		1719	1771		1687	1742	
Flt Permitted	0.46	1.00		0.12	1.00		0.43	1.00		0.57	1.00	
Satd. Flow (perm)	847	1672		212	1758		772	1771		1004	1742	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	7	343	341	48	368	23	339	276	46	34	140	17
RTOR Reduction (vph)	0	20	0	0	1	0	0	4	0	0	3	0
Lane Group Flow (vph)	7	664	0	48	390	0	339	318	0	34	154	0
Confl. Peds. (#/hr)						1						1
Confl. Bikes (#/hr)			2									1
Heavy Vehicles (%)	4%	4%	4%	7%	7%	7%	5%	5%	5%	7%	7%	7%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	44.0	42.9		51.4	46.6		37.2	29.6		19.5	15.9	
Effective Green, g (s)	44.0	42.9		51.4	46.6		37.2	29.6		19.5	15.9	
Actuated g/C Ratio	0.44	0.43		0.52	0.47		0.37	0.30		0.20	0.16	
Clearance Time (s)	4.0	5.5		4.0	5.5		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.2		2.0	3.2		2.0	3.2		2.0	3.2	
Lane Grp Cap (vph)	384	721		180	824		453	527		221	278	
v/s Ratio Prot	0.00	c0.40		c0.01	0.22		c0.13	0.18		0.01	0.09	
v/s Ratio Perm	0.01			0.12			c0.15			0.02		
v/c Ratio	0.02	0.92		0.27	0.47		0.75	0.60		0.15	0.55	
Uniform Delay, d1	15.7	26.6		17.7	18.0		24.6	29.9		32.8	38.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	17.1		0.3	0.5		5.8	2.0		0.1	2.5	
Delay (s)	15.7	43.8		18.0	18.5		30.4	31.9		32.9	40.9	
Level of Service	B	D		B	B		C	C		C	D	
Approach Delay (s)		43.5			18.4			31.1			39.5	
Approach LOS		D			B			C			D	

Intersection Summary			
HCM 2000 Control Delay	33.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	99.4	Sum of lost time (s)	18.5
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	30	420	317	742	370	10
Future Volume (vph)	30	420	317	742	370	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1863	1827	1553	1770	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1863	1827	1553	1770	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.92
Adj. Flow (vph)	33	462	348	815	407	11
RTOR Reduction (vph)	0	0	0	530	0	7
Lane Group Flow (vph)	33	462	348	285	407	4
Heavy Vehicles (%)	2%	2%	4%	4%	2%	2%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	5	2	6		4	4
Permitted Phases				6		
Actuated Green, G (s)	2.4	26.7	19.3	19.3	18.5	18.5
Effective Green, g (s)	2.4	26.7	19.3	19.3	18.5	18.5
Actuated g/C Ratio	0.04	0.48	0.35	0.35	0.34	0.34
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	76	901	638	542	593	530
v/s Ratio Prot	0.02	c0.25	0.19		c0.23	0.00
v/s Ratio Perm				0.18		
v/c Ratio	0.43	0.51	0.55	0.53	0.69	0.01
Uniform Delay, d1	25.7	9.8	14.4	14.3	15.8	12.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.9	0.5	1.0	0.9	3.3	0.0
Delay (s)	29.7	10.3	15.4	15.2	19.1	12.2
Level of Service	C	B	B	B	B	B
Approach Delay (s)		11.6	15.3		19.0	
Approach LOS		B	B		B	

Intersection Summary			
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	55.2	Sum of lost time (s)	15.0
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	576	620	10	25	15
Future Vol, veh/h	5	576	620	10	25	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	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	5	626	674	11	27	16

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	685	0	-	0	1316	680
Stage 1	-	-	-	-	680	-
Stage 2	-	-	-	-	636	-
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	908	-	-	-	174	451
Stage 1	-	-	-	-	503	-
Stage 2	-	-	-	-	527	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	908	-	-	-	173	451
Mov Cap-2 Maneuver	-	-	-	-	173	-
Stage 1	-	-	-	-	500	-
Stage 2	-	-	-	-	527	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	24.8
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	908	-	-	-	225
HCM Lane V/C Ratio	0.006	-	-	-	0.193
HCM Control Delay (s)	9	-	-	-	24.8
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.7

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	860	35	85	340	5	5
Future Vol, veh/h	860	35	85	340	5	5
Conflicting Peds, #/hr	0	2	2	0	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	300	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	5	5	33	33
Mvmt Flow	989	40	98	391	6	6

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1031	0	1599	1011
Stage 1	-	-	-	-	1011	-
Stage 2	-	-	-	-	588	-
Critical Hdwy	-	-	4.15	-	6.73	6.53
Critical Hdwy Stg 1	-	-	-	-	5.73	-
Critical Hdwy Stg 2	-	-	-	-	5.73	-
Follow-up Hdwy	-	-	2.245	-	3.797	3.597
Pot Cap-1 Maneuver	-	-	662	-	99	254
Stage 1	-	-	-	-	308	-
Stage 2	-	-	-	-	499	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	660	-	84	253
Mov Cap-2 Maneuver	-	-	-	-	84	-
Stage 1	-	-	-	-	307	-
Stage 2	-	-	-	-	425	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.3	36.4
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	126	-	-	660	-
HCM Lane V/C Ratio	0.091	-	-	0.148	-
HCM Control Delay (s)	36.4	-	-	11.4	-
HCM Lane LOS	E	-	-	B	-
HCM 95th %tile Q(veh)	0.3	-	-	0.5	-

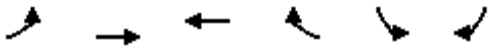
Intersection	
Int Delay, s/veh	5.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	15	65	210	40	20	85
Future Vol, veh/h	15	65	210	40	20	85
Conflicting Peds, #/hr	0	0	1	0	0	1
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	89	89	89	89	89	89
Heavy Vehicles, %	8	8	2	2	4	4
Mvmt Flow	17	73	236	45	22	96

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	588	71	119	0	-	0
Stage 1	71	-	-	-	-	-
Stage 2	517	-	-	-	-	-
Critical Hdwy	6.48	6.28	4.12	-	-	-
Critical Hdwy Stg 1	5.48	-	-	-	-	-
Critical Hdwy Stg 2	5.48	-	-	-	-	-
Follow-up Hdwy	3.572	3.372	2.218	-	-	-
Pot Cap-1 Maneuver	462	975	1469	-	-	-
Stage 1	937	-	-	-	-	-
Stage 2	586	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	385	974	1468	-	-	-
Mov Cap-2 Maneuver	385	-	-	-	-	-
Stage 1	781	-	-	-	-	-
Stage 2	585	-	-	-	-	-

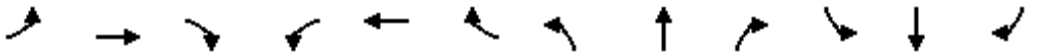
Approach	EB	NB	SB
HCM Control Delay, s	10.4	6.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1468	-	757	-	-
HCM Lane V/C Ratio	0.161	-	0.119	-	-
HCM Control Delay (s)	7.9	0	10.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.6	-	0.4	-	-



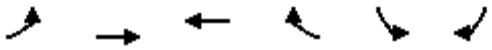
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	10	585	315	240	75	10
Future Volume (vph)	10	585	315	240	75	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	5.4	5.4		6.5	6.5
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.94		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1702	1792	1567		1597	1429
Flt Permitted	0.36	1.00	1.00		0.95	1.00
Satd. Flow (perm)	638	1792	1567		1597	1429
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	11	629	339	258	81	11
RTOR Reduction (vph)	0	0	21	0	0	10
Lane Group Flow (vph)	11	629	576	0	81	1
Confl. Peds. (#/hr)	2			2		
Confl. Bikes (#/hr)				2		
Heavy Vehicles (%)	6%	6%	13%	13%	13%	13%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	37.2	37.2	31.1		6.8	6.8
Effective Green, g (s)	37.2	37.2	31.1		6.8	6.8
Actuated g/C Ratio	0.67	0.67	0.56		0.12	0.12
Clearance Time (s)	5.4	5.4	5.4		6.5	6.5
Vehicle Extension (s)	2.0	3.1	3.1		2.6	2.6
Lane Grp Cap (vph)	437	1192	871		194	173
v/s Ratio Prot	0.00	c0.35	c0.37		c0.05	
v/s Ratio Perm	0.02					0.00
v/c Ratio	0.03	0.53	0.66		0.42	0.01
Uniform Delay, d1	5.9	4.8	8.7		22.7	21.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	0.4	1.9		1.1	0.0
Delay (s)	6.0	5.3	10.6		23.9	21.6
Level of Service	A	A	B		C	C
Approach Delay (s)		5.3	10.6		23.6	
Approach LOS		A	B		C	

Intersection Summary			
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	55.9	Sum of lost time (s)	17.3
Intersection Capacity Utilization	45.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	325	325	70	275	25	270	145	35	20	225	10
Future Volume (vph)	10	325	325	70	275	25	270	145	35	20	225	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5		4.0	5.5		4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.99		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1597	1533		1687	1750		1655	1693		1770	1849	
Flt Permitted	0.50	1.00		0.08	1.00		0.29	1.00		0.63	1.00	
Satd. Flow (perm)	848	1533		151	1750		503	1693		1170	1849	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	11	374	374	80	316	29	310	167	40	23	259	11
RTOR Reduction (vph)	0	60	0	0	2	0	0	6	0	0	2	0
Lane Group Flow (vph)	11	688	0	80	343	0	310	201	0	23	268	0
Confl. Peds. (#/hr)			2	2			2					2
Confl. Bikes (#/hr)			1			2						
Heavy Vehicles (%)	13%	13%	13%	7%	7%	7%	9%	9%	9%	2%	2%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	44.3	43.1		53.1	47.9		44.0	37.8		25.3	23.1	
Effective Green, g (s)	44.3	43.1		53.1	47.9		44.0	37.8		25.3	23.1	
Actuated g/C Ratio	0.41	0.40		0.49	0.45		0.41	0.35		0.24	0.21	
Clearance Time (s)	4.0	5.5		4.0	5.5		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.2		2.0	3.2		2.0	3.2		2.0	3.2	
Lane Grp Cap (vph)	357	614		160	779		386	594		287	396	
v/s Ratio Prot	0.00	c0.45		c0.03	0.20		c0.13	0.12		0.00	0.15	
v/s Ratio Perm	0.01			0.22			c0.20			0.02		
v/c Ratio	0.03	1.12		0.50	0.44		0.80	0.34		0.08	0.68	
Uniform Delay, d1	18.8	32.2		23.5	20.6		24.4	25.7		31.9	38.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	74.2		0.9	0.4		10.8	0.4		0.0	4.6	
Delay (s)	18.9	106.4		24.4	21.0		35.3	26.1		31.9	43.5	
Level of Service	B	F		C	C		D	C		C	D	
Approach Delay (s)		105.2			21.7			31.6			42.6	
Approach LOS		F			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	59.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	107.6	Sum of lost time (s)	18.5
Intersection Capacity Utilization	84.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	5	310	385	370	685	15
Future Volume (vph)	5	310	385	370	685	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1612	1696	1845	1532	1736	1553
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1612	1696	1845	1532	1736	1553
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	6	360	448	430	797	17
RTOR Reduction (vph)	0	0	0	307	0	8
Lane Group Flow (vph)	6	360	448	123	797	9
Confl. Peds. (#/hr)	1			1		
Confl. Bikes (#/hr)				1		1
Heavy Vehicles (%)	12%	12%	3%	3%	4%	4%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	5	2	6		4	4
Permitted Phases				6		
Actuated Green, G (s)	1.1	28.2	22.1	22.1	38.9	38.9
Effective Green, g (s)	1.1	28.2	22.1	22.1	38.9	38.9
Actuated g/C Ratio	0.01	0.37	0.29	0.29	0.50	0.50
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	22	620	528	439	875	783
v/s Ratio Prot	0.00	c0.21	c0.24		c0.46	0.01
v/s Ratio Perm				0.08		
v/c Ratio	0.27	0.58	0.85	0.28	0.91	0.01
Uniform Delay, d1	37.6	19.7	25.9	21.3	17.5	9.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.6	1.4	12.1	0.4	13.5	0.0
Delay (s)	44.2	21.1	38.0	21.7	31.0	9.5
Level of Service	D	C	D	C	C	A
Approach Delay (s)		21.5	30.0		30.5	
Approach LOS		C	C		C	

Intersection Summary			
HCM 2000 Control Delay	28.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	77.1	Sum of lost time (s)	15.0
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

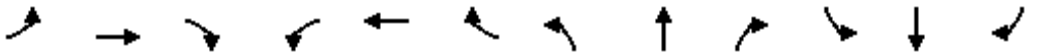
Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	650	545	10	10	10
Future Vol, veh/h	10	650	545	10	10	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	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	11	707	592	11	11	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	603	0	-	0	1327	598
Stage 1	-	-	-	-	598	-
Stage 2	-	-	-	-	729	-
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	975	-	-	-	171	502
Stage 1	-	-	-	-	549	-
Stage 2	-	-	-	-	477	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	975	-	-	-	169	502
Mov Cap-2 Maneuver	-	-	-	-	169	-
Stage 1	-	-	-	-	543	-
Stage 2	-	-	-	-	477	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	20.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	975	-	-	-	253
HCM Lane V/C Ratio	0.011	-	-	-	0.086
HCM Control Delay (s)	8.7	-	-	-	20.6
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.3



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	325	325	70	275	25	270	145	35	20	225	10
Future Volume (vph)	10	325	325	70	275	25	270	145	35	20	225	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5		4.0	5.5		4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.99		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1597	1532		1687	1750		1656	1693		1770	1849	
Flt Permitted	0.51	1.00		0.07	1.00		0.25	1.00		0.63	1.00	
Satd. Flow (perm)	852	1532		123	1750		437	1693		1170	1849	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	11	374	374	80	316	29	310	167	40	23	259	11
RTOR Reduction (vph)	0	56	0	0	2	0	0	5	0	0	1	0
Lane Group Flow (vph)	11	692	0	80	343	0	310	202	0	23	269	0
Confl. Peds. (#/hr)			2	2			2					2
Confl. Bikes (#/hr)			1			2						
Heavy Vehicles (%)	13%	13%	13%	7%	7%	7%	9%	9%	9%	2%	2%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	54.8	53.6		63.8	58.6		47.8	40.4		27.6	24.2	
Effective Green, g (s)	54.8	53.6		63.8	58.6		47.8	40.4		27.6	24.2	
Actuated g/C Ratio	0.45	0.44		0.52	0.48		0.39	0.33		0.23	0.20	
Clearance Time (s)	4.0	5.5		4.0	5.5		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.2		2.0	3.2		2.0	3.2		2.0	3.2	
Lane Grp Cap (vph)	389	672		143	839		366	560		281	366	
v/s Ratio Prot	0.00	c0.45		c0.03	0.20		c0.14	0.12		0.00	0.15	
v/s Ratio Perm	0.01			0.26			c0.20			0.02		
v/c Ratio	0.03	1.03		0.56	0.41		0.85	0.36		0.08	0.74	
Uniform Delay, d1	18.8	34.2		24.9	20.5		29.4	31.0		37.1	45.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	42.5		2.7	0.3		15.8	0.4		0.0	7.6	
Delay (s)	18.8	76.8		27.6	20.9		45.1	31.5		37.1	53.5	
Level of Service	B	E		C	C		D	C		D	D	
Approach Delay (s)		75.9			22.2			39.7			52.2	
Approach LOS		E			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	51.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	122.1	Sum of lost time (s)	18.5
Intersection Capacity Utilization	84.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	1.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	440	5	10	915	40	40
Future Vol, veh/h	440	5	10	915	40	40
Conflicting Peds, #/hr	0	0	0	0	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	300	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	4	4	1	1	4	4
Mvmt Flow	463	5	11	963	42	42

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	468	0	1452	466
Stage 1	-	-	-	-	466	-
Stage 2	-	-	-	-	986	-
Critical Hdwy	-	-	4.11	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	-	-	2.209	-	3.536	3.336
Pot Cap-1 Maneuver	-	-	1099	-	142	592
Stage 1	-	-	-	-	627	-
Stage 2	-	-	-	-	358	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1099	-	140	592
Mov Cap-2 Maneuver	-	-	-	-	140	-
Stage 1	-	-	-	-	627	-
Stage 2	-	-	-	-	354	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	30.1
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	226	-	-	1099	-
HCM Lane V/C Ratio	0.373	-	-	0.01	-
HCM Control Delay (s)	30.1	-	-	8.3	-
HCM Lane LOS	D	-	-	A	-
HCM 95th %tile Q(veh)	1.6	-	-	0	-

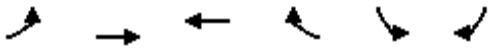
Intersection	
Int Delay, s/veh	8.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	55	225	85	30	35	20
Future Vol, veh/h	55	225	85	30	35	20
Conflicting Peds, #/hr	0	0	0	0	0	1
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	91	91	91	91	91	91
Heavy Vehicles, %	1	1	3	3	2	2
Mvmt Flow	60	247	93	33	38	22

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	269	50	61	0	-	0
Stage 1	50	-	-	-	-	-
Stage 2	219	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.13	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.227	-	-	-
Pot Cap-1 Maneuver	722	1021	1536	-	-	-
Stage 1	975	-	-	-	-	-
Stage 2	820	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	676	1020	1535	-	-	-
Mov Cap-2 Maneuver	676	-	-	-	-	-
Stage 1	914	-	-	-	-	-
Stage 2	819	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.8	5.5	0
HCM LOS	B		

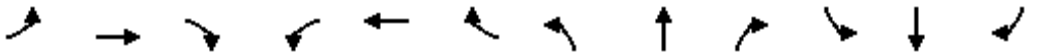
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1535	-	927	-	-
HCM Lane V/C Ratio	0.061	-	0.332	-	-
HCM Control Delay (s)	7.5	0	10.8	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.2	-	1.5	-	-



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	5	370	565	110	245	15
Future Volume (vph)	5	370	565	110	245	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	5.4	5.4		6.5	6.5
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1703	1792	1753		1752	1534
Flt Permitted	0.20	1.00	1.00		0.95	1.00
Satd. Flow (perm)	352	1792	1753		1752	1534
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	6	440	673	131	292	18
RTOR Reduction (vph)	0	0	5	0	0	14
Lane Group Flow (vph)	6	440	799	0	292	4
Confl. Bikes (#/hr)						1
Heavy Vehicles (%)	6%	6%	6%	6%	3%	3%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	51.8	51.8	45.6		17.5	17.5
Effective Green, g (s)	51.8	51.8	45.6		17.5	17.5
Actuated g/C Ratio	0.64	0.64	0.56		0.22	0.22
Clearance Time (s)	5.4	5.4	5.4		6.5	6.5
Vehicle Extension (s)	2.0	3.1	3.1		2.6	2.6
Lane Grp Cap (vph)	237	1143	984		377	330
v/s Ratio Prot	0.00	c0.25	c0.46		c0.17	
v/s Ratio Perm	0.02					0.00
v/c Ratio	0.03	0.38	0.81		0.77	0.01
Uniform Delay, d1	17.3	7.1	14.3		30.0	25.0
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	0.2	5.2		9.3	0.0
Delay (s)	17.3	7.3	19.5		39.3	25.1
Level of Service	B	A	B		D	C
Approach Delay (s)		7.4	19.5		38.4	
Approach LOS		A	B		D	

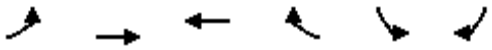
Intersection Summary			
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	81.2	Sum of lost time (s)	17.3
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	315	315	45	340	20	315	255	40	30	130	15
Future Volume (vph)	5	315	315	45	340	20	315	255	40	30	130	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5		4.0	5.5		4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.99		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1672		1687	1759		1719	1773		1687	1744	
Flt Permitted	0.44	1.00		0.09	1.00		0.41	1.00		0.56	1.00	
Satd. Flow (perm)	801	1672		152	1759		745	1773		989	1744	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	6	362	362	52	391	23	362	293	46	34	149	17
RTOR Reduction (vph)	0	21	0	0	1	0	0	4	0	0	3	0
Lane Group Flow (vph)	6	703	0	52	413	0	362	335	0	34	163	0
Confl. Peds. (#/hr)						1						1
Confl. Bikes (#/hr)			2									1
Heavy Vehicles (%)	4%	4%	4%	7%	7%	7%	5%	5%	5%	7%	7%	7%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	44.0	42.9		51.8	46.8		38.3	30.7		20.1	16.5	
Effective Green, g (s)	44.0	42.9		51.8	46.8		38.3	30.7		20.1	16.5	
Actuated g/C Ratio	0.44	0.43		0.51	0.46		0.38	0.30		0.20	0.16	
Clearance Time (s)	4.0	5.5		4.0	5.5		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.2		2.0	3.2		2.0	3.2		2.0	3.2	
Lane Grp Cap (vph)	360	712		154	817		455	540		222	285	
v/s Ratio Prot	0.00	c0.42		c0.02	0.23		c0.14	0.19		0.01	0.09	
v/s Ratio Perm	0.01			0.16			c0.16			0.03		
v/c Ratio	0.02	0.99		0.34	0.51		0.80	0.62		0.15	0.57	
Uniform Delay, d1	16.2	28.6		19.7	18.9		24.9	30.0		32.9	38.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	30.2		0.5	0.5		8.7	2.3		0.1	2.8	
Delay (s)	16.3	58.8		20.1	19.4		33.6	32.3		33.0	41.7	
Level of Service	B	E		C	B		C	C		C	D	
Approach Delay (s)		58.5			19.5			33.0			40.2	
Approach LOS		E			B			C			D	

Intersection Summary			
HCM 2000 Control Delay	39.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	100.7	Sum of lost time (s)	18.5
Intersection Capacity Utilization	75.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	30	445	335	785	390	10
Future Volume (vph)	30	445	335	785	390	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1863	1827	1553	1770	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1863	1827	1553	1770	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.92
Adj. Flow (vph)	33	489	368	863	429	11
RTOR Reduction (vph)	0	0	0	562	0	7
Lane Group Flow (vph)	33	489	368	301	429	4
Heavy Vehicles (%)	2%	2%	4%	4%	2%	2%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	5	2	6		4	4
Permitted Phases				6		
Actuated Green, G (s)	2.5	27.4	19.9	19.9	19.6	19.6
Effective Green, g (s)	2.5	27.4	19.9	19.9	19.6	19.6
Actuated g/C Ratio	0.04	0.48	0.35	0.35	0.34	0.34
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	77	895	637	542	608	544
v/s Ratio Prot	0.02	c0.26	0.20		c0.24	0.00
v/s Ratio Perm				0.19		
v/c Ratio	0.43	0.55	0.58	0.56	0.71	0.01
Uniform Delay, d1	26.6	10.4	15.1	15.0	16.2	12.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.8	0.7	1.3	1.2	3.7	0.0
Delay (s)	30.4	11.1	16.4	16.2	19.9	12.3
Level of Service	C	B	B	B	B	B
Approach Delay (s)		12.3	16.3		19.7	
Approach LOS		B	B		B	

Intersection Summary			
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	57.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	610	660	10	25	15
Future Vol, veh/h	5	610	660	10	25	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	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	5	663	717	11	27	16

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	728	0	-	0	1396	723
Stage 1	-	-	-	-	723	-
Stage 2	-	-	-	-	673	-
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	876	-	-	-	156	426
Stage 1	-	-	-	-	481	-
Stage 2	-	-	-	-	507	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	876	-	-	-	155	426
Mov Cap-2 Maneuver	-	-	-	-	155	-
Stage 1	-	-	-	-	478	-
Stage 2	-	-	-	-	507	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	27.4
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	876	-	-	-	204
HCM Lane V/C Ratio	0.006	-	-	-	0.213
HCM Control Delay (s)	9.1	-	-	-	27.4
HCM Lane LOS	A	-	-	-	D
HCM 95th %tile Q(veh)	0	-	-	-	0.8

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	860	40	88	340	7	6
Future Vol, veh/h	860	40	88	340	7	6
Conflicting Peds, #/hr	0	2	2	0	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	300	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	5	5	33	33
Mvmt Flow	989	46	101	391	8	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1037	0	1608	1014
Stage 1	-	-	-	-	1014	-
Stage 2	-	-	-	-	594	-
Critical Hdwy	-	-	4.15	-	6.73	6.53
Critical Hdwy Stg 1	-	-	-	-	5.73	-
Critical Hdwy Stg 2	-	-	-	-	5.73	-
Follow-up Hdwy	-	-	2.245	-	3.797	3.597
Pot Cap-1 Maneuver	-	-	659	-	97	253
Stage 1	-	-	-	-	307	-
Stage 2	-	-	-	-	496	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	657	-	82	252
Mov Cap-2 Maneuver	-	-	-	-	82	-
Stage 1	-	-	-	-	306	-
Stage 2	-	-	-	-	419	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.4	39.5
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	119	-	-	657	-
HCM Lane V/C Ratio	0.126	-	-	0.154	-
HCM Control Delay (s)	39.5	-	-	11.5	-
HCM Lane LOS	E	-	-	B	-
HCM 95th %tile Q(veh)	0.4	-	-	0.5	-

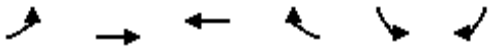
Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	15	65	210	43	28	85
Future Vol, veh/h	15	65	210	43	28	85
Conflicting Peds, #/hr	0	0	1	0	0	1
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	89	89	89	89	89	89
Heavy Vehicles, %	8	8	2	2	4	4
Mvmt Flow	17	73	236	48	31	96

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	600	80	128	0	-	0
Stage 1	80	-	-	-	-	-
Stage 2	520	-	-	-	-	-
Critical Hdwy	6.48	6.28	4.12	-	-	-
Critical Hdwy Stg 1	5.48	-	-	-	-	-
Critical Hdwy Stg 2	5.48	-	-	-	-	-
Follow-up Hdwy	3.572	3.372	2.218	-	-	-
Pot Cap-1 Maneuver	454	964	1458	-	-	-
Stage 1	928	-	-	-	-	-
Stage 2	585	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	378	963	1457	-	-	-
Mov Cap-2 Maneuver	378	-	-	-	-	-
Stage 1	773	-	-	-	-	-
Stage 2	584	-	-	-	-	-

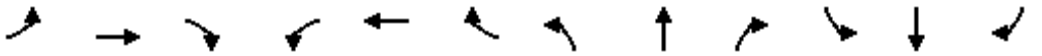
Approach	EB	NB	SB
HCM Control Delay, s	10.5	6.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1457	-	746	-	-
HCM Lane V/C Ratio	0.162	-	0.12	-	-
HCM Control Delay (s)	7.9	0	10.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.6	-	0.4	-	-



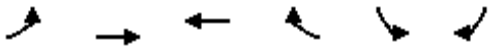
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	10	588	315	240	75	11
Future Volume (vph)	10	588	315	240	75	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	5.4	5.4		6.5	6.5
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.94		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1702	1792	1567		1597	1429
Flt Permitted	0.36	1.00	1.00		0.95	1.00
Satd. Flow (perm)	637	1792	1567		1597	1429
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	11	632	339	258	81	12
RTOR Reduction (vph)	0	0	21	0	0	11
Lane Group Flow (vph)	11	632	576	0	81	1
Confl. Peds. (#/hr)	2			2		
Confl. Bikes (#/hr)				2		
Heavy Vehicles (%)	6%	6%	13%	13%	13%	13%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	37.1	37.1	31.0		6.8	6.8
Effective Green, g (s)	37.1	37.1	31.0		6.8	6.8
Actuated g/C Ratio	0.66	0.66	0.56		0.12	0.12
Clearance Time (s)	5.4	5.4	5.4		6.5	6.5
Vehicle Extension (s)	2.0	3.1	3.1		2.6	2.6
Lane Grp Cap (vph)	436	1191	870		194	174
v/s Ratio Prot	0.00	c0.35	c0.37		c0.05	
v/s Ratio Perm	0.02					0.00
v/c Ratio	0.03	0.53	0.66		0.42	0.01
Uniform Delay, d1	6.0	4.8	8.7		22.7	21.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	0.5	1.9		1.1	0.0
Delay (s)	6.0	5.3	10.6		23.8	21.6
Level of Service	A	A	B		C	C
Approach Delay (s)		5.3	10.6		23.5	
Approach LOS		A	B		C	

Intersection Summary			
HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	55.8	Sum of lost time (s)	17.3
Intersection Capacity Utilization	45.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	333	331	70	297	25	287	145	35	20	225	10
Future Volume (vph)	10	333	331	70	297	25	287	145	35	20	225	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5		4.0	5.5		4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.99		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1597	1533		1687	1752		1655	1693		1770	1849	
Flt Permitted	0.47	1.00		0.08	1.00		0.29	1.00		0.63	1.00	
Satd. Flow (perm)	798	1533		151	1752		501	1693		1170	1849	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	11	383	380	80	341	29	330	167	40	23	259	11
RTOR Reduction (vph)	0	90	0	0	2	0	0	6	0	0	2	0
Lane Group Flow (vph)	11	673	0	80	368	0	330	201	0	23	268	0
Confl. Peds. (#/hr)			2	2			2					2
Confl. Bikes (#/hr)			1			2						
Heavy Vehicles (%)	13%	13%	13%	7%	7%	7%	9%	9%	9%	2%	2%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	44.3	43.1		53.1	47.9		44.6	38.4		25.4	23.2	
Effective Green, g (s)	44.3	43.1		53.1	47.9		44.6	38.4		25.4	23.2	
Actuated g/C Ratio	0.41	0.40		0.49	0.44		0.41	0.35		0.23	0.21	
Clearance Time (s)	4.0	5.5		4.0	5.5		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.2		2.0	3.2		2.0	3.2		2.0	3.2	
Lane Grp Cap (vph)	335	610		159	775		392	600		286	396	
v/s Ratio Prot	0.00	c0.44		c0.03	0.21		c0.14	0.12		0.00	0.15	
v/s Ratio Perm	0.01			0.22			c0.21			0.02		
v/c Ratio	0.03	1.10		0.50	0.48		0.84	0.34		0.08	0.68	
Uniform Delay, d1	19.1	32.5		23.7	21.3		24.7	25.6		32.1	39.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	67.9		0.9	0.5		14.5	0.4		0.0	4.6	
Delay (s)	19.2	100.4		24.6	21.8		39.1	25.9		32.1	43.7	
Level of Service	B	F		C	C		D	C		C	D	
Approach Delay (s)		99.3			22.3			34.0			42.8	
Approach LOS		F			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	57.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	108.2	Sum of lost time (s)	18.5
Intersection Capacity Utilization	85.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	5	318	407	370	685	15
Future Volume (vph)	5	318	407	370	685	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1612	1696	1845	1532	1736	1553
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1612	1696	1845	1532	1736	1553
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	6	370	473	430	797	17
RTOR Reduction (vph)	0	0	0	306	0	8
Lane Group Flow (vph)	6	370	473	124	797	9
Confl. Peds. (#/hr)	1			1		
Confl. Bikes (#/hr)				1		1
Heavy Vehicles (%)	12%	12%	3%	3%	4%	4%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	5	2	6		4	4
Permitted Phases				6		
Actuated Green, G (s)	1.1	28.4	22.3	22.3	39.0	39.0
Effective Green, g (s)	1.1	28.4	22.3	22.3	39.0	39.0
Actuated g/C Ratio	0.01	0.37	0.29	0.29	0.50	0.50
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	22	622	531	441	874	782
v/s Ratio Prot	0.00	c0.22	c0.26		c0.46	0.01
v/s Ratio Perm				0.08		
v/c Ratio	0.27	0.59	0.89	0.28	0.91	0.01
Uniform Delay, d1	37.8	19.8	26.4	21.3	17.6	9.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.6	1.5	16.9	0.4	13.6	0.0
Delay (s)	44.4	21.4	43.3	21.7	31.2	9.6
Level of Service	D	C	D	C	C	A
Approach Delay (s)		21.7	33.0		30.8	
Approach LOS		C	C		C	

Intersection Summary			
HCM 2000 Control Delay	30.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	77.4	Sum of lost time (s)	15.0
Intersection Capacity Utilization	67.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	13	650	545	49	24	10
Future Vol, veh/h	13	650	545	49	24	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	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	14	707	592	53	26	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	645	0	-	0	1354	619
Stage 1	-	-	-	-	619	-
Stage 2	-	-	-	-	735	-
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	940	-	-	-	165	489
Stage 1	-	-	-	-	537	-
Stage 2	-	-	-	-	474	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	940	-	-	-	163	489
Mov Cap-2 Maneuver	-	-	-	-	163	-
Stage 1	-	-	-	-	529	-
Stage 2	-	-	-	-	474	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	26.6
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	940	-	-	-	203
HCM Lane V/C Ratio	0.015	-	-	-	0.182
HCM Control Delay (s)	8.9	-	-	-	26.6
HCM Lane LOS	A	-	-	-	D
HCM 95th %tile Q(veh)	0	-	-	-	0.6

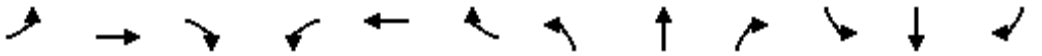
Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	3	250	0	8	85
Future Vol, veh/h	1	3	250	0	8	85
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	1	3	272	0	9	92

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	382	272	0	0	272	0
Stage 1	272	-	-	-	-	-
Stage 2	110	-	-	-	-	-
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	620	767	-	-	1291	-
Stage 1	774	-	-	-	-	-
Stage 2	915	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	616	767	-	-	1291	-
Mov Cap-2 Maneuver	616	-	-	-	-	-
Stage 1	774	-	-	-	-	-
Stage 2	909	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10	0	0.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	723	1291	-
HCM Lane V/C Ratio	-	-	0.006	0.007	-
HCM Control Delay (s)	-	-	10	7.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	325	325	70	275	25	270	145	35	20	225	10
Future Volume (vph)	10	325	325	70	275	25	270	145	35	20	225	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5		4.0	5.5		4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.99		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1597	1532		1687	1750		1656	1693		1770	1849	
Flt Permitted	0.51	1.00		0.07	1.00		0.25	1.00		0.63	1.00	
Satd. Flow (perm)	852	1532		123	1750		437	1693		1170	1849	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	11	374	374	80	316	29	310	167	40	23	259	11
RTOR Reduction (vph)	0	56	0	0	2	0	0	5	0	0	1	0
Lane Group Flow (vph)	11	692	0	80	343	0	310	202	0	23	269	0
Confl. Peds. (#/hr)			2	2			2					2
Confl. Bikes (#/hr)			1			2						
Heavy Vehicles (%)	13%	13%	13%	7%	7%	7%	9%	9%	9%	2%	2%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	54.8	53.6		63.8	58.6		47.8	40.4		27.6	24.2	
Effective Green, g (s)	54.8	53.6		63.8	58.6		47.8	40.4		27.6	24.2	
Actuated g/C Ratio	0.45	0.44		0.52	0.48		0.39	0.33		0.23	0.20	
Clearance Time (s)	4.0	5.5		4.0	5.5		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.2		2.0	3.2		2.0	3.2		2.0	3.2	
Lane Grp Cap (vph)	389	672		143	839		366	560		281	366	
v/s Ratio Prot	0.00	c0.45		c0.03	0.20		c0.14	0.12		0.00	0.15	
v/s Ratio Perm	0.01			0.26			c0.20			0.02		
v/c Ratio	0.03	1.03		0.56	0.41		0.85	0.36		0.08	0.74	
Uniform Delay, d1	18.8	34.2		24.9	20.5		29.4	31.0		37.1	45.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	42.5		2.7	0.3		15.8	0.4		0.0	7.6	
Delay (s)	18.8	76.8		27.6	20.9		45.1	31.5		37.1	53.5	
Level of Service	B	E		C	C		D	C		D	D	
Approach Delay (s)		75.9			22.2			39.7			52.2	
Approach LOS		E			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	51.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	122.1	Sum of lost time (s)	18.5
Intersection Capacity Utilization	84.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	440	7	11	915	44	42
Future Vol, veh/h	440	7	11	915	44	42
Conflicting Peds, #/hr	0	0	0	0	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	300	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	4	4	1	1	4	4
Mvmt Flow	463	7	12	963	46	44

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	470	0	1455	467
Stage 1	-	-	-	-	467	-
Stage 2	-	-	-	-	988	-
Critical Hdwy	-	-	4.11	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	-	-	2.209	-	3.536	3.336
Pot Cap-1 Maneuver	-	-	1097	-	142	592
Stage 1	-	-	-	-	627	-
Stage 2	-	-	-	-	357	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1097	-	140	592
Mov Cap-2 Maneuver	-	-	-	-	140	-
Stage 1	-	-	-	-	627	-
Stage 2	-	-	-	-	353	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	31.8
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	223	-	-	1097	-
HCM Lane V/C Ratio	0.406	-	-	0.011	-
HCM Control Delay (s)	31.8	-	-	8.3	-
HCM Lane LOS	D	-	-	A	-
HCM 95th %tile Q(veh)	1.8	-	-	0	-

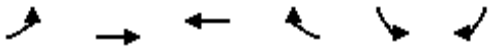
Intersection	
Int Delay, s/veh	8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	55	225	85	36	38	20
Future Vol, veh/h	55	225	85	36	38	20
Conflicting Peds, #/hr	0	0	0	0	0	1
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	91	91	91	91	91	91
Heavy Vehicles, %	1	1	3	3	2	2
Mvmt Flow	60	247	93	40	42	22

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	280	54	65	0	-	0
Stage 1	54	-	-	-	-	-
Stage 2	226	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.13	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.227	-	-	-
Pot Cap-1 Maneuver	712	1016	1531	-	-	-
Stage 1	971	-	-	-	-	-
Stage 2	814	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	666	1015	1530	-	-	-
Mov Cap-2 Maneuver	666	-	-	-	-	-
Stage 1	910	-	-	-	-	-
Stage 2	813	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.9	5.3	0
HCM LOS	B		

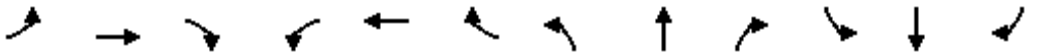
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1530	-	920	-	-
HCM Lane V/C Ratio	0.061	-	0.334	-	-
HCM Control Delay (s)	7.5	0	10.9	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.2	-	1.5	-	-



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	5	371	566	110	245	16
Future Volume (vph)	5	371	566	110	245	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	5.4	5.4		6.5	6.5
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1703	1792	1753		1752	1534
Flt Permitted	0.20	1.00	1.00		0.95	1.00
Satd. Flow (perm)	351	1792	1753		1752	1534
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	6	442	674	131	292	19
RTOR Reduction (vph)	0	0	5	0	0	15
Lane Group Flow (vph)	6	442	800	0	292	4
Confl. Bikes (#/hr)						1
Heavy Vehicles (%)	6%	6%	6%	6%	3%	3%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	51.8	51.8	45.6		17.5	17.5
Effective Green, g (s)	51.8	51.8	45.6		17.5	17.5
Actuated g/C Ratio	0.64	0.64	0.56		0.22	0.22
Clearance Time (s)	5.4	5.4	5.4		6.5	6.5
Vehicle Extension (s)	2.0	3.1	3.1		2.6	2.6
Lane Grp Cap (vph)	237	1143	984		377	330
v/s Ratio Prot	0.00	c0.25	c0.46		c0.17	
v/s Ratio Perm	0.02					0.00
v/c Ratio	0.03	0.39	0.81		0.77	0.01
Uniform Delay, d1	17.3	7.1	14.4		30.0	25.1
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	0.2	5.2		9.3	0.0
Delay (s)	17.3	7.3	19.6		39.3	25.1
Level of Service	B	A	B		D	C
Approach Delay (s)		7.4	19.6		38.4	
Approach LOS		A	B		D	

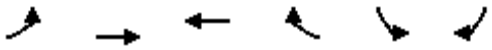
Intersection Summary			
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	81.2	Sum of lost time (s)	17.3
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	332	328	45	350	20	322	255	40	30	130	15
Future Volume (vph)	5	332	328	45	350	20	322	255	40	30	130	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5		4.0	5.5		4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.99		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1673		1687	1759		1719	1773		1687	1744	
Flt Permitted	0.43	1.00		0.09	1.00		0.41	1.00		0.56	1.00	
Satd. Flow (perm)	780	1673		152	1759		742	1773		989	1744	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	6	382	377	52	402	23	370	293	46	34	149	17
RTOR Reduction (vph)	0	21	0	0	1	0	0	4	0	0	3	0
Lane Group Flow (vph)	6	738	0	52	424	0	370	335	0	34	163	0
Confl. Peds. (#/hr)						1						1
Confl. Bikes (#/hr)			2									1
Heavy Vehicles (%)	4%	4%	4%	7%	7%	7%	5%	5%	5%	7%	7%	7%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	43.9	42.8		51.7	46.7		38.4	30.8		20.0	16.4	
Effective Green, g (s)	43.9	42.8		51.7	46.7		38.4	30.8		20.0	16.4	
Actuated g/C Ratio	0.44	0.43		0.51	0.46		0.38	0.31		0.20	0.16	
Clearance Time (s)	4.0	5.5		4.0	5.5		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.2		2.0	3.2		2.0	3.2		2.0	3.2	
Lane Grp Cap (vph)	350	711		154	815		457	542		221	284	
v/s Ratio Prot	0.00	c0.44		c0.02	0.24		c0.14	0.19		0.01	0.09	
v/s Ratio Perm	0.01			0.16			c0.16			0.03		
v/c Ratio	0.02	1.04		0.34	0.52		0.81	0.62		0.15	0.57	
Uniform Delay, d1	16.3	29.0		20.9	19.1		25.0	29.9		33.0	38.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	44.1		0.5	0.6		9.6	2.1		0.1	2.9	
Delay (s)	16.4	73.1		21.3	19.7		34.6	32.1		33.1	41.8	
Level of Service	B	E		C	B		C	C		C	D	
Approach Delay (s)		72.6			19.9			33.4			40.3	
Approach LOS		E			B			C			D	

Intersection Summary			
HCM 2000 Control Delay	45.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	100.7	Sum of lost time (s)	18.5
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	30	462	345	785	390	10
Future Volume (vph)	30	462	345	785	390	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1863	1827	1553	1770	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1863	1827	1553	1770	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.92
Adj. Flow (vph)	33	508	379	863	429	11
RTOR Reduction (vph)	0	0	0	558	0	7
Lane Group Flow (vph)	33	508	379	305	429	4
Heavy Vehicles (%)	2%	2%	4%	4%	2%	2%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	5	2	6		4	4
Permitted Phases				6		
Actuated Green, G (s)	2.5	27.8	20.3	20.3	19.6	19.6
Effective Green, g (s)	2.5	27.8	20.3	20.3	19.6	19.6
Actuated g/C Ratio	0.04	0.48	0.35	0.35	0.34	0.34
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	77	902	646	549	604	540
v/s Ratio Prot	0.02	c0.27	0.21		c0.24	0.00
v/s Ratio Perm				0.20		
v/c Ratio	0.43	0.56	0.59	0.56	0.71	0.01
Uniform Delay, d1	26.8	10.5	15.1	14.9	16.4	12.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.8	0.8	1.4	1.2	3.9	0.0
Delay (s)	30.6	11.3	16.5	16.1	20.4	12.5
Level of Service	C	B	B	B	C	B
Approach Delay (s)		12.5	16.3		20.2	
Approach LOS		B	B		C	

Intersection Summary			
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	57.4	Sum of lost time (s)	15.0
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	610	660	27	55	16
Future Vol, veh/h	6	610	660	27	55	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	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	7	663	717	29	60	17

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	746	0	-	0	1409	732
Stage 1	-	-	-	-	732	-
Stage 2	-	-	-	-	677	-
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	862	-	-	-	153	421
Stage 1	-	-	-	-	476	-
Stage 2	-	-	-	-	505	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	862	-	-	-	152	421
Mov Cap-2 Maneuver	-	-	-	-	152	-
Stage 1	-	-	-	-	472	-
Stage 2	-	-	-	-	505	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	39.9
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	862	-	-	-	178
HCM Lane V/C Ratio	0.008	-	-	-	0.434
HCM Control Delay (s)	9.2	-	-	-	39.9
HCM Lane LOS	A	-	-	-	E
HCM 95th %tile Q(veh)	0	-	-	-	2

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	6	115	0	3	260
Future Vol, veh/h	1	6	115	0	3	260
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	1	7	125	0	3	283

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	414	125	0	0	125	0
Stage 1	125	-	-	-	-	-
Stage 2	289	-	-	-	-	-
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	595	926	-	-	1462	-
Stage 1	901	-	-	-	-	-
Stage 2	760	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	594	926	-	-	1462	-
Mov Cap-2 Maneuver	594	-	-	-	-	-
Stage 1	901	-	-	-	-	-
Stage 2	758	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.2	0	0.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	858	1462	-
HCM Lane V/C Ratio	-	-	0.009	0.002	-
HCM Control Delay (s)	-	-	9.2	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection: 1: SW 108th Ave & SW Tualatin Rd

Movement	EB	WB	NB
Directions Served	TR	L	LR
Maximum Queue (ft)	22	94	72
Average Queue (ft)	1	36	13
95th Queue (ft)	13	74	49
Link Distance (ft)	3156		588
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		300	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: SW 108th Ave & SW Leveton Dr

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	86	69	5
Average Queue (ft)	38	21	0
95th Queue (ft)	68	56	4
Link Distance (ft)	1898	746	658
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: SW Herman Rd & SW 108th Ave

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	57	277	240	102	28
Average Queue (ft)	9	86	91	33	4
95th Queue (ft)	39	231	191	73	18
Link Distance (ft)		4736	432		746
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100			150	
Storage Blk Time (%)		4		0	
Queuing Penalty (veh)		0		0	

Intersection: 4: SW Teton Ave & SW Herman Rd

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	131	531	211	357	268	308	51	257
Average Queue (ft)	10	393	51	154	144	84	13	128
95th Queue (ft)	82	619	137	294	246	221	38	226
Link Distance (ft)		517		996		1985		846
Upstream Blk Time (%)	0	8						
Queuing Penalty (veh)	0	50						
Storage Bay Dist (ft)	450		125		180		170	
Storage Blk Time (%)		18	0	13	7	0		4
Queuing Penalty (veh)		2	1	9	11	0		1

Intersection: 5: SW Herman Rd & SW Tualatin Rd

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	104	327	526	314	427	52
Average Queue (ft)	7	156	195	30	223	9
95th Queue (ft)	44	274	382	191	379	35
Link Distance (ft)		896	1377			1084
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	100			250	800	
Storage Blk Time (%)		19	5			
Queuing Penalty (veh)		1	21			

Intersection: 6: SW Herman Rd/SW 108th Ave & Site Driveway

Movement	EB	EB	SB
Directions Served	L	T	LR
Maximum Queue (ft)	60	363	54
Average Queue (ft)	4	72	16
95th Queue (ft)	36	272	47
Link Distance (ft)		432	180
Upstream Blk Time (%)		1	
Queuing Penalty (veh)		4	
Storage Bay Dist (ft)	200		
Storage Blk Time (%)		4	
Queuing Penalty (veh)		0	

Zone Summary

Zone wide Queuing Penalty: 101

Intersection: 1: SW 108th Ave & SW Tualatin Rd

Movement	EB	WB	WB	NB
Directions Served	TR	L	T	LR
Maximum Queue (ft)	6	35	12	99
Average Queue (ft)	0	4	1	39
95th Queue (ft)	5	23	8	73
Link Distance (ft)	3152		1572	584
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		300		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: SW 108th Ave & SW Leveton Dr

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	105	56	2
Average Queue (ft)	59	6	0
95th Queue (ft)	89	31	2
Link Distance (ft)	1894	737	654
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: SW Herman Rd & SW 108th Ave

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	38	200	344	166	140
Average Queue (ft)	4	80	160	91	12
95th Queue (ft)	22	159	292	156	89
Link Distance (ft)		4732	424		737
Upstream Blk Time (%)			0		
Queuing Penalty (veh)			1		
Storage Bay Dist (ft)	100			150	
Storage Blk Time (%)		3		2	0
Queuing Penalty (veh)		0		0	0

Intersection: 4: SW Teton Ave & SW Herman Rd

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	77	518	152	424	268	356	91	186
Average Queue (ft)	7	330	32	166	143	135	22	83
95th Queue (ft)	78	571	99	320	244	265	60	159
Link Distance (ft)		508		991		1981		842
Upstream Blk Time (%)	0	5						
Queuing Penalty (veh)	0	30						
Storage Bay Dist (ft)	450		125		180		170	
Storage Blk Time (%)		11		14	5	2	0	1
Queuing Penalty (veh)		1		6	15	8	0	0

Intersection: 5: SW Herman Rd & SW Tualatin Rd

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	134	288	281	180	252	34
Average Queue (ft)	31	143	125	12	130	6
95th Queue (ft)	89	249	223	96	211	27
Link Distance (ft)		892	1373			1080
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	100			250	800	
Storage Blk Time (%)	0	12	1	0		
Queuing Penalty (veh)	0	4	5	0		

Intersection: 6: SW Herman Rd/SW 108th Ave & Site Driveway

Movement	EB	EB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (ft)	50	289	25	145
Average Queue (ft)	4	45	1	45
95th Queue (ft)	37	227	19	122
Link Distance (ft)		424	508	216
Upstream Blk Time (%)		1		2
Queuing Penalty (veh)		4		0
Storage Bay Dist (ft)	200			
Storage Blk Time (%)	0	4		
Queuing Penalty (veh)	0	0		

Zone Summary

Zone wide Queuing Penalty: 74

Intersection: 1: SW 108th Ave & SW Tualatin Rd

Movement	EB	WB	WB	NB
Directions Served	TR	L	T	LR
Maximum Queue (ft)	31	90	16	77
Average Queue (ft)	1	36	1	12
95th Queue (ft)	15	73	9	48
Link Distance (ft)	3156		1576	592
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		300		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: SW 108th Ave & SW Leveton Dr

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	80	72	3
Average Queue (ft)	39	23	0
95th Queue (ft)	65	60	4
Link Distance (ft)	1898	746	662
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: SW Herman Rd & SW 108th Ave

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	96	589	288	98	28
Average Queue (ft)	11	189	101	40	4
95th Queue (ft)	57	570	223	81	16
Link Distance (ft)		4736	430		746
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100			150	
Storage Blk Time (%)	0	16			
Queuing Penalty (veh)	0	2			

Intersection: 4: SW Teton Ave & SW Herman Rd

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	87	535	186	375	272	335	48	296
Average Queue (ft)	9	509	53	149	154	109	14	149
95th Queue (ft)	62	575	136	290	253	255	40	251
Link Distance (ft)		519		1000		1986		846
Upstream Blk Time (%)		20						
Queuing Penalty (veh)		136						
Storage Bay Dist (ft)	450		125		180		170	
Storage Blk Time (%)		39	1	15	8	1		7
Queuing Penalty (veh)		4	2	11	15	2		1

Intersection: 5: SW Herman Rd & SW Tualatin Rd

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	95	368	514	279	472	47
Average Queue (ft)	10	169	202	31	234	8
95th Queue (ft)	60	300	397	196	389	34
Link Distance (ft)		900	1377			1084
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	100			250	800	
Storage Blk Time (%)	0	19	6			
Queuing Penalty (veh)	0	1	23			

Intersection: 6: SW Herman Rd/SW 108th Ave & Site Driveway

Movement	EB	EB	SB
Directions Served	L	T	LR
Maximum Queue (ft)	193	444	128
Average Queue (ft)	12	216	47
95th Queue (ft)	94	502	147
Link Distance (ft)		430	236
Upstream Blk Time (%)		5	4
Queuing Penalty (veh)		36	0
Storage Bay Dist (ft)	200		
Storage Blk Time (%)		20	
Queuing Penalty (veh)		2	

Zone Summary

Zone wide Queuing Penalty: 237

Intersection: 1: SW 108th Ave & SW Tualatin Rd

Movement	EB	WB	WB	NB
Directions Served	TR	L	T	LR
Maximum Queue (ft)	12	31	16	140
Average Queue (ft)	0	3	1	49
95th Queue (ft)	8	20	9	101
Link Distance (ft)	3152		1572	584
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		300		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: SW 108th Ave & SW Leveton Dr

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	114	54	5
Average Queue (ft)	64	7	0
95th Queue (ft)	96	34	3
Link Distance (ft)	1894	737	654
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: SW Herman Rd & SW 108th Ave

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	61	406	430	174	345
Average Queue (ft)	5	127	229	108	52
95th Queue (ft)	30	347	427	179	250
Link Distance (ft)		4732	424		737
Upstream Blk Time (%)			2		
Queuing Penalty (veh)			16		
Storage Bay Dist (ft)	100			150	
Storage Blk Time (%)	0	12		11	0
Queuing Penalty (veh)	0	1		2	0

Intersection: 4: SW Teton Ave & SW Herman Rd

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	78	523	167	472	269	476	82	215
Average Queue (ft)	6	464	34	172	175	173	22	97
95th Queue (ft)	56	640	106	341	281	365	59	174
Link Distance (ft)		508		991		1981		842
Upstream Blk Time (%)		19						
Queuing Penalty (veh)		123						
Storage Bay Dist (ft)	450		125		180		170	
Storage Blk Time (%)		38	0	15	12	4		1
Queuing Penalty (veh)		2	0	7	37	12		0

Intersection: 5: SW Herman Rd & SW Tualatin Rd

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	116	367	296	160	265	44
Average Queue (ft)	30	159	138	9	142	7
95th Queue (ft)	79	287	240	89	230	30
Link Distance (ft)		892	1373			1080
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	100			250	800	
Storage Blk Time (%)	0	14	1	0		
Queuing Penalty (veh)	0	4	7	0		

Intersection: 6: SW Herman Rd/SW 108th Ave & Site Driveway

Movement	EB	EB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (ft)	112	432	225	240
Average Queue (ft)	6	191	24	127
95th Queue (ft)	55	474	145	285
Link Distance (ft)		424	508	237
Upstream Blk Time (%)		4	0	26
Queuing Penalty (veh)		28	0	0
Storage Bay Dist (ft)	200			
Storage Blk Time (%)		20		
Queuing Penalty (veh)		1		

Zone Summary

Zone wide Queuing Penalty: 242

Intersection: 1: SW 108th Ave & SW Tualatin Rd

Movement	EB	WB	WB	NB
Directions Served	TR	L	T	LR
Maximum Queue (ft)	32	122	12	74
Average Queue (ft)	2	41	0	15
95th Queue (ft)	17	90	9	50
Link Distance (ft)	3152		1572	584
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		300		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: SW 108th Ave & SW Leveton Dr

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	86	66	26
Average Queue (ft)	39	25	1
95th Queue (ft)	69	61	11
Link Distance (ft)	1896	327	654
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: SW Herman Rd/SW 108th Ave

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	115	1347	346	145	83
Average Queue (ft)	15	595	139	54	7
95th Queue (ft)	71	1339	297	117	50
Link Distance (ft)		4732	421		352
Upstream Blk Time (%)			0		
Queuing Penalty (veh)			0		
Storage Bay Dist (ft)	100			150	
Storage Blk Time (%)	0	48		1	
Queuing Penalty (veh)	0	5		0	

Intersection: 4: SW Teton Ave & SW Herman Rd

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	222	526	174	370	268	359	114	316
Average Queue (ft)	23	516	56	168	168	122	15	156
95th Queue (ft)	174	531	139	317	269	274	65	274
Link Distance (ft)		511		991		1982		842
Upstream Blk Time (%)	0	37						
Queuing Penalty (veh)	0	250						
Storage Bay Dist (ft)	450		125		180		170	
Storage Blk Time (%)		61	0	16	11	1		7
Queuing Penalty (veh)		6	1	12	20	4		2

Intersection: 5: SW Herman Rd & SW Tualatin Rd

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	79	304	662	336	504	46
Average Queue (ft)	6	160	249	38	249	7
95th Queue (ft)	43	274	576	235	418	30
Link Distance (ft)		892	1373			1080
Upstream Blk Time (%)			1			
Queuing Penalty (veh)			0			
Storage Bay Dist (ft)	100			250	800	
Storage Blk Time (%)		19	11			
Queuing Penalty (veh)		1	46			

Intersection: 6: SW Herman Rd & Site Driveway

Movement	EB	EB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (ft)	224	437	20	176
Average Queue (ft)	28	380	1	138
95th Queue (ft)	140	555	18	213
Link Distance (ft)		421	511	156
Upstream Blk Time (%)		21		72
Queuing Penalty (veh)		137		0
Storage Bay Dist (ft)	200			
Storage Blk Time (%)	0	55		
Queuing Penalty (veh)	0	7		

Intersection: 7: Site Driveway & SW 108th Ave

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	31	31
Average Queue (ft)	4	2
95th Queue (ft)	21	17
Link Distance (ft)	241	327
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 490

Intersection: 1: SW 108th Ave & SW Tualatin Rd

Movement	EB	WB	NB
Directions Served	TR	L	LR
Maximum Queue (ft)	7	37	108
Average Queue (ft)	0	4	47
95th Queue (ft)	5	24	86
Link Distance (ft)	3152		584
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		300	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: SW 108th Ave & SW Leveton Dr

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	114	48	3
Average Queue (ft)	64	7	0
95th Queue (ft)	97	32	3
Link Distance (ft)	1897	327	654
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: SW Herman Rd/SW 108th Ave

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	84	569	425	171	303
Average Queue (ft)	9	187	235	117	75
95th Queue (ft)	50	474	425	193	286
Link Distance (ft)		4732	421		352
Upstream Blk Time (%)			2		2
Queuing Penalty (veh)			11		6
Storage Bay Dist (ft)	100			150	
Storage Blk Time (%)	0	25		17	0
Queuing Penalty (veh)	0	1		3	1

Intersection: 4: SW Teton Ave & SW Herman Rd

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	123	526	174	423	269	468	93	221
Average Queue (ft)	6	506	34	183	177	181	20	94
95th Queue (ft)	77	575	100	349	282	386	61	180
Link Distance (ft)		511		991		1982		842
Upstream Blk Time (%)	0	26						
Queuing Penalty (veh)	0	176						
Storage Bay Dist (ft)	450		125		180		170	
Storage Blk Time (%)		49		17	12	4		1
Queuing Penalty (veh)		3		8	36	14		0

Intersection: 5: SW Herman Rd & SW Tualatin Rd

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	134	344	296	217	292	36
Average Queue (ft)	31	155	137	14	138	5
95th Queue (ft)	86	281	232	111	233	25
Link Distance (ft)		892	1373			1080
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	100			250	800	
Storage Blk Time (%)	0	13	1	0		
Queuing Penalty (veh)	0	4	6	1		

Intersection: 6: SW Herman Rd & Site Driveway

Movement	EB	EB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (ft)	186	437	190	194
Average Queue (ft)	12	271	18	160
95th Queue (ft)	87	546	116	207
Link Distance (ft)		421	511	156
Upstream Blk Time (%)		10		91
Queuing Penalty (veh)		61		0
Storage Bay Dist (ft)	200			
Storage Blk Time (%)	0	34		
Queuing Penalty (veh)	0	2		

Intersection: 7: Site Driveway & SW 108th Ave

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	35	64
Average Queue (ft)	8	6
95th Queue (ft)	31	49
Link Distance (ft)	241	327
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 333

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Portland, OR 97205
503.243.3500
www.dksassociates.com

MEMORANDUM (DRAFT)

DATE: April 26, 2019

TO: Gary Danielson, SRG Partnership, Inc

FROM: Garth Appanaitis, PE

SUBJECT: Tualatin Ops Site Transportation Planning Rule Analysis

The purpose of this memorandum is to address Oregon Administrative Rule (OAR) 660-012-0060, Transportation Planning Rule (TPR), requirements for a map change amendment to rezone two parcels near SW 108th Ave/SW Herman Rd in Tualatin. The change in zoning may be pursued to support additional development on the site. Prior traffic analysis conducted for the site[1] addressed the additional traffic that would be added with the actual proposed development use but did not address TPR requirements.

TPR Overview

The TPR provides a means for ensuring that future land use and traffic growth is consistent with transportation system planning. The TPR requires that a change of allowable land uses do not create a significant impact on the transportation system beyond currently allowed (planned) uses. The TPR can be addressed through a variety of means, but typically compares the change in trip potential (simply trip generation or traffic impacts) between the allowed use (existing zoning) and proposed use (proposed zoning). In many cases the reasonable worst-case use (for either the existing or propose zoning) will not reflect the actual existing use for a site or the specific use that may ultimately be developed on a site. Rather, the reasonable worst case considers the allowed trip potential for either zoning condition and is rarely development specific (e.g., no site plan, nor intent to use the site for that purpose). In some cases, a "trip cap" or limit to the maximum trips generated by a site will be imposed with a change in zoning in order to limit the future trip potential while still allowing for the intended development.

Site Traffic Potential

The City of Tualatin Public Works Department is located in the northeast quadrant of SW 108th Ave/SW Herman Rd. The site is currently zoned as Light Manufacturing (ML) and composed of two parcels:

- 2S122AD00200 (approximately 5.18 acres)
- 2S122AD00300 (approximately 3.54 acres)

[1] *Tualatin City Operation Site Traffic Impact Analysis*, prepared by DKS Associates, December 2018.

For purposes of the TPR analysis, the existing uses on the site are ignored and redevelopment options allowed within zoning designations are considered. Applying typical industrial development assumptions, the combined size of the site (8.72 acres) could provide approximately 95,000 feet of floor area[2] based on overall size and not considering other site-specific limitations (topography, etc.) that may be identified through a site design process. This development potential of 95 ksf is considered for both the existing and proposed zoning designations.

Existing Zoning (ML) Traffic Potential

The existing ML zoning[3] allows several industrial uses, including manufacturing and warehousing. Some components of commercial uses are allowed as ancillary components of the site. *ITE Trip Generation, 10th Edition* was used to determine traffic potential for allowed uses. The allowed industrial use with the highest trip generation rate for the p.m. peak hour is 155 High-Cube Fulfilment Center Warehouse (1.37 trips/ksf). However, data in the ITE manual indicates that these uses typically exceed 500 ksf and would not be reasonable for the site given the size.

Under the existing ML zoning, the reasonable worst-case trip potential (that would scale to the size of the site) would fall under ITE Category 140 – Manufacturing, which generates approximately 0.67 trips/ksf during the p.m. peak hour. Therefore, the reasonable worst-case trip potential for a 95 ksf building would generate approximately 64 p.m. peak hour trips. Further, this trip potential is approximately the same as the government office building documented and analyzed in the related TIA (59 p.m. peak hour trips) [4].

Proposed Zoning (IN) Traffic Potential

The proposed Institutional (IN) zoning allows uses that serve the community, such as educational, religious, recreational, and government uses. The Community Services category within IN includes community recreation building, which is the reasonable worst-case use from a trip potential standpoint. ITE category 495 Recreational Community Center would generate approximately 2.31 p.m. peak hour vehicle trips/ksf. Therefore, a 95 ksf building would generate approximately 219 p.m. peak hour trips.

TEXT AMENDMENT IMPACTS

While the government office building analyzed in the prior TIA would fit within the general intent of the IN zone, it is not currently listed as an allowed use. A text amendment to specifically allow government office buildings in the IN zone may be required in addition to a map amendment for the site.

The potential text amendment action would not create a significant effect for TPR purposes. While a text amendment would affect all locations with IN zone designation, allowing government office uses would not increase the reasonable worst-case trip potential for IN zoning designation. The ITE trip rate for 730 Government Office Building is 1.71 trips/ksf[5] during the p.m. peak hour, which is less trips than a

[2] 8.72 acres * 0.25 FAR = 95 ksf
[3] https://www.tualatinoregon.gov/developmentcode/tdc-chapter-60-light-manufacturing-zone-ml
[4] TIA Table 5 lists 59 p.m. peak hour trips for the additional government office building.
[5] A higher effective trip rate of approximately 2.95 trips/ksf (59 trips/20 ksf) was used for the smaller 20 ksf building in the TIA to provide a conservative estimate and account for potential public service counter trips. However, for consideration of larger building sizes and reasonable worst-case trip potential, the overall ITE average rate of 1.71 (which includes building sizes approaching 80 ksf) is appropriate.

recreational community center (2.31 trips/ksf) and would not increase the trip potential for zones designated IN to allow this additional use.

FINDINGS

The TPR analysis addressed two potential actions, which, while related, include separate findings.

Map Amendment (ML to IN)

The trip generation potential for the existing zoning (ML) and proposed zoning (IN) was calculated using site redevelopment assumptions for a reasonable worst-case use and ITE trip generation rates. For the two subject parcels, a map amendment to change the zoning designation from ML to IN has the potential to add an increase of approximately 155 (219-64) p.m. peak hour vehicle trips. This action has the potential to create a significant effect on the transportation system, but can be resolved through either of the following actions:

1) Conduct additional traffic analysis to address TPR requirements and determine if additional offsite transportation improvements would be required to offset the impacts of the map amendment. This analysis would identify specific potential impacts related to adding 155 vehicle trips to the transportation system for the p.m. peak hour (during the future year Transportation System Plan horizon). This action would maximize flexibility for future uses allowed for the zoning designation, but would require additional analysis, and (pending the results of the analysis) may lead to unnecessary transportation system investments if the reasonable worst-case use is not developed.

--or--

2) Include a trip cap with the map amendment that would limit site trips and not further degrade the transportation system. The analysis indicates that the existing zoning would allow approximately 64 p.m. peak hour trips, which would exceed the number of trips required for the government office building included in the TIA (59 p.m. peak hour trips). A trip cap of 80 p.m. peak hour trips would provide some flexibility for the site design to add a nominal portion of trips, while not creating a significant increase above the reasonable worst-case trip potential of the existing ML zoning.

Text Amendment (Allow Government Office use in IN)

The potential text amendment to allow government office buildings in any IN zone would not increase the reasonable worst-case trip potential for IN zones beyond what is currently allowed for recreational community center. Therefore, such action would meet TPR requirements.

If you have any questions, please call.

Title 4, Industrial and Other Employment Areas

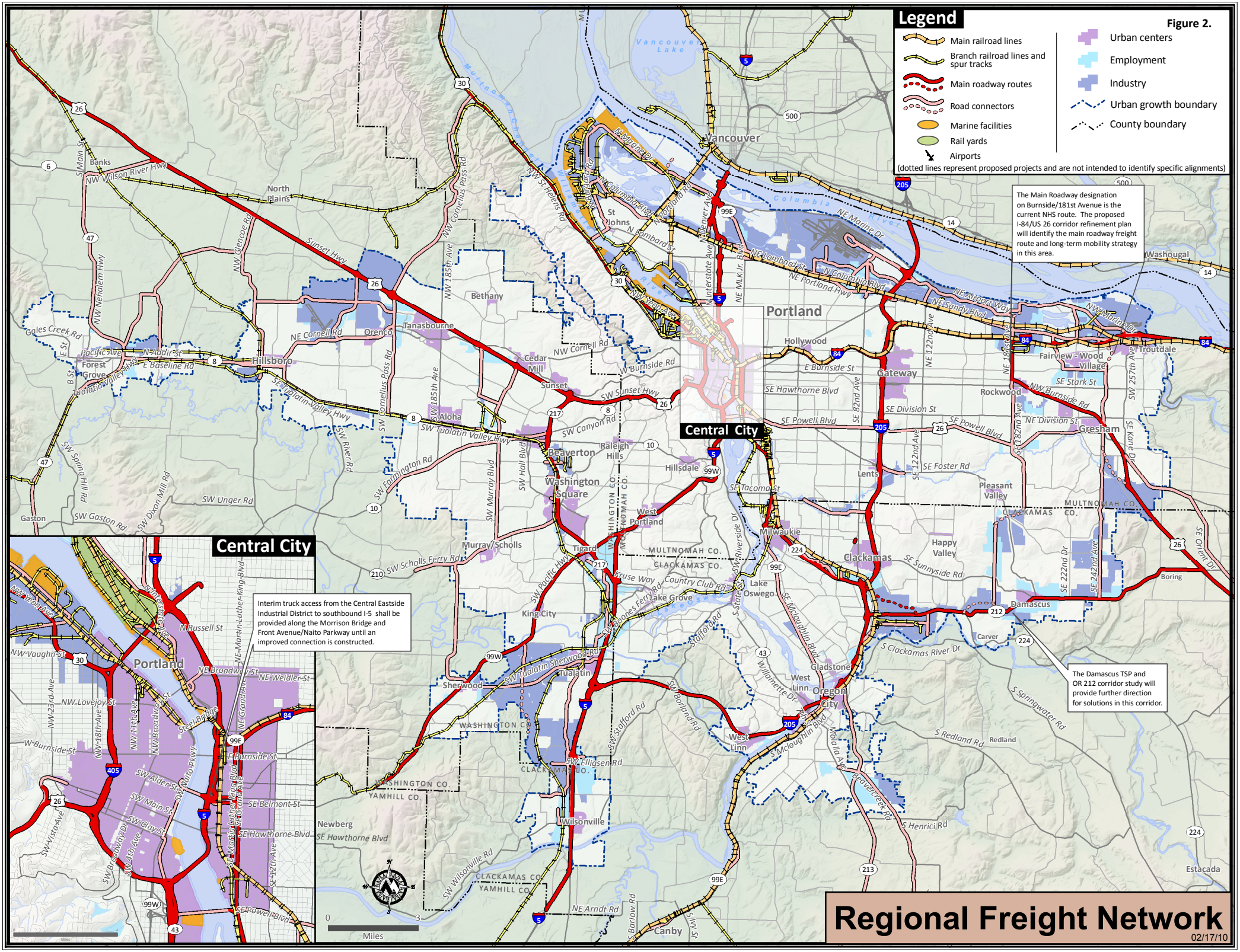
October 2014

0 1 2 4 miles

- Employment areas
- Industrial areas
- Regionally significant industrial areas
- Proposed main roadway routes
- Proposed road connectors
- Mainline freight
- Branch line freight
- Rail yards
- County boundaries
- Urban growth boundaries
- Neighbor cities

Metro

Making a great place


Legend
Main railroad lines
Branch railroad lines and spur tracks
Main roadway routes
Road connectors
Marine facilities
Rail yards
Airports
(dotted lines represent proposed projects and are not intended to identify specific alignments)
Urban centers
Employment
Industry
Urban growth boundary
County boundary
Figure 2.
The Main Roadway designation on Burnside/181st Avenue is the current NHS route. The proposed I-84/US 26 corridor refinement plan will identify the main roadway freight route and long-term mobility strategy in this area.
Central City
Interim truck access from the Central Eastside Industrial District to southbound I-5 shall be provided along the Morrison Bridge and Front Avenue/Naito Parkway until an improved connection is constructed.
The Damascus TSP and OR 212 corridor study will provide further direction for solutions in this corridor.
Vancouver
Portland
Hillsboro
Beaverton
Tigard
Tualatin
Lake Oswego
Oregon City
West Linn
Wilsonville
Gresham
Troutdale
Washougal
Estacada
Canby
Newberg
Sherwood
King City
Forest Grove
Banks
North Plains
Gaston
Aloha
Raleigh Hills
Hollywood
Gateway
Rockwood
Fairview - Wood Village
Lents
Pleasant Valley
Happy Valley
Clackamas
Milwaukie
Damascus
Boring
Gladstone
Carver
Redland
Bethany
Cedar Mill
Sunset
Tanasbourne
Orenco
West Portland
Washington Square
Hillsdale
Murray Scholls
Lake Grove
MULTNOMAH CO.
WASHINGTON CO.
CLACKAMAS CO.
YAMHILL CO.
0
3
Miles
Regional Freight Network
02/17/10