BROOKS INTERCHANGE AREA MANAGEMENT PLAN

I-5 Exit 263 | VOLUME 2

November 2022

PREPARED FOR:

Oregon Department of Transportation

PREPARED BY:

David Evans and Associates, Inc.

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I-5 Exit 263 | VOLUME 2

November 2022

PREPARED FOR:

Oregon Department of Transportation, Region 2
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Salem, OR 97301

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VOLUME 2

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1 TECHNICAL MEMORANDUM #1

Communications and Public Involvement Plan and Title VI Summary

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I-5/Brooklake Road Interchange Area Management Plan

IAMP/No Associated Key Number

Communications & Public Involvement Plan

Project Characterization: Other **Date Communications Plan Updated: 1/8/2021**

Project Timeline – Design: IAMP Planning/Concept only thru 2021 **Construction Year: None/IAMP Only**

Budget. *Use the PI Assessment Tool to help determine the level of outreach may be needed and to estimate the budget.*

Design	Construction – Anticipated Item
Staff Time & Direct Expenses: N/A	*Staff Time & Direct Expenses: N/A*

IAMP Only

Check if there is PI firm under contract for the project? (check all that apply) ☐ Design ☐ Construction

Note: PI Firm on contract for IAMP effort

Summarize previous outreach efforts (Planning & Scoping Phases):

ODOT will work with Marion County to develop an Interchange Area Management Plan. ODOT has done some initial look at the interchange, specifically as area business May Trucking was studying their future plans for expansion. Marion County recently developed the Brooks-Hopmere Community Plan in 2020 https://www.brooks-hopmere.com It has not yet been adopted by Marion County. Transportation was a common community concern, especially in relation to the future of the area.

Project Objective. *What problem are we addressing with this project? What is the goal/purpose of the project outreach (inform/consult/involve/collaborate)?*

The project corridor includes the I-5 interchange with Brooklake Road that is located within Marion County. The project area will also include Brooklake Road from River Road on the west to OR 99E on the east. The primary objective of this project is to assess existing and future traffic and safety conditions within the study area and identify potential solutions to these problems. This project will serve as a tool to preserve function and capacity of the interchange and ensure that the integrity of this publicly funded structure is maintained in a way that serves the public. Potential issues include business and driveway access, future development opportunities surrounding the interchange, and compatibility with a local vision for Brooks-Hopmere/Marion County residents.

Issues, Considerations, Risks or Opportunities. *Is there an incident, ongoing issue or opportunity that should be addressed? Share relevant project development history and background information. List specific issues by stakeholder group.*

The immediate project area serves several large freight or trucking-related businesses, agricultural interests, County commuter traffic accessing I-5, small businesses and residential communities of Brooks-Hopmere, and some regional community destinations such as Chemeketa Community College Brooks Campus (Emergency Services Programs) and Willamette Mission State Park. The interchange has seen increased use to access I-5 from the growing community of Keizer. Businesses, such as May Trucking, have expressed a desire to expand in the area due to the I-5 access.

Stakeholders/Interested Parties. *Who needs to be engaged to effectively manage their interest, expectations and influence to ensure a successful project? Think about who will be impacted, by the design and by the construction. If you already have a list started check the box below and insert a link to the file. If you don't have a list started, here's the template, be sure to save the list, then come back to this form and check the box and insert link below.*

☒ I have a comprehensive stakeholder list (with contact information). List attached or Insert link for ProjectWise.

Note: The initial project list will include property owner/address list for the immediate area, the email list generated through the County's Brooks-Hopmere Community Plan, and an update of local businesses, organizations, elected and agency staff.

Communications Management – IAMP/Planning Phase – Internal & Partners

Actions and Plan Implementation. *What actions, and by who, need to be taken? What groups need progress updates during design? Think about which teams, outside the PDT, who should be consulted or informed on developments or changes.*

Who is Responsible?	**Date or Frequency**	**Tool – Action Notes/Comments:**	**Audience Message/Purpose:**
Project Manager (TPM) ***Dan Fricke***	Specific Date As Needed	Delivery-Method *Regular coordination with jurisdiction planning partner - Janelle Shanahan, Marion County Transportation Planner*	Jurisdictional Partner (city/county) *Inform/involve and track for updates to Marion County Board*
Who ***Dan Fricke***	Specific Date As Needed	Presentation *MWACT, SKATS updates as needed*	Planning *Audience with local planning staff; use this group to serve as link to Keizer, SAMTD or other interested jurisdictions; they can determine what formal briefings they may want.*
Who ***Dan Fricke***	Specific Date As Needed	Presentation *Marion County Board of Commissioners*	County Commission *Formal adoption of IAMP/County land use actions*

Public Involvement – IAMP/Planning Phase – External & Stakeholders

Methods and Tools. *What tools or technology will be needed to deliver the messaging to stakeholders? A list of available methods are listed in the "Tool – Action" field below. You can also click here for the list of options to consider:* Tool/Action or view in the Tools and Resources document. These tools are further defined in the Public Involvement Technique document.

Actions and Plan Implementation. *What actions, and by who, need to be taken?*

Who is Responsible?	**Date to be Completed**	**Tool – Action Notes/Comments:**	**Audience Message/Purpose:**
Consultant - Public Involvement Kristen Kibler	1/29/2021 As Needed	Proj. Information One-pager (PIP) *For Project general use; initial info for website and for including on any direct outreach*	Audience Group *Develop for general use.*
Community Affairs Michele Becker with consultant Kristen Kibler	2/12/2021 As Needed	Project Website *Create and update website; update approximately quarterly with updates and meeting details*	Audience Group *Develop for general information out use and to invite participation*
Consultant - Public Involvement JLA	3/5/2021 As Needed	Phone Calls *4 stakeholder interviews will be conducted by phone for the purpose of Environmental Justice outreach and understanding non-access-specific truck/freight users. Note: Prime consultant shall be reaching out to freight/transportation-specific interests.*	Special Interest Group (define) *Planning consultant will reach out to business access/freight related businesses. PI Consultant will reach out to organizations that may have different interests than freight/business access.*
Consultant - Public	3/19/2021 As Needed	**Open House - Online** *Open House originally intended to be in-person, will be moved online due to the ongoing COVID-19*	Directly Impacted Residents/Businesses *Present on process, objectives, decision making; opportunity for community to*

Involvement JLA		*pandemic. EXISTING AND FUTURE NO BUILD CONDITIONS The purpose of this open house is to provide an overview of the Public Involvement and Communications Plan Technical Memorandum ("TM #1"). and to present the findings from TM #1 through #3. The open house will consist of a presentation and opportunity to comment on transportation concerns.*	*share information related to access/land use/transportation EXACT DATE FORMAT TO BE DETERMINED IN JANUARY 2021*
Consultant - Public Involvement JLA	5/20/2021 Frequency	**Open House - Online** *EVALUATE THE SOLUTIONS The purpose of this open house is to present the findings from TM #4 and #5 and gather input regarding draft transportation solutions. Subconsultant shall summarize the public involvement feedback from open house #2 in a memorandum ("Public Involvement Memorandum #2.").*	Directly Impacted Residents/Businesses *Online open house or event to be held in late April or May to share potential transportation solutions and collect community input on those. Exact date to be determined.*
Consultant - Public Involvement JLA	Date Quarterly	Stakeholder Email *Using stakeholder list and GovDelivery), JLA will work with Community Affairs to draft and send up to 6 email updates, including, but not limited to, announcements for meetings and final decisions.*	Audience Group *Update interested parties on process or opportunities to participate/comment*
Community Affairs Michele Becker with support from PI Consultant Kristen Kibler	Date As Needed	Tool/Action *Coordination opportunities – watch for coordination opportunities to share planning update with clear expectations regarding status (no design/construction funding) with other efforts, specifically Aurora-Donald Interchange and the County's action on the Brooks-Hopmere Community Plan*	Audience Group *Coordinate message and set expectations as information is distributed on nearby/related construction or planning projects. Important message is to set clear expectations that this project is not funded for final design or construction.*

Evaluate and Update. *This is a living document. As the project progresses, the information you need to share will change. Your internal and external stakeholders will need to be updated. You may determine the current plan isn't working and needs an adjustment.*

Transition: The Hand-off from Design to Construction

The TPM is responsible to help ensure the construction portion of the project is successful. For this reason, PI plan PS&E sign-off is required and a hand-off meeting with the Construction Office and Community Affairs is recommended.

Communications Management – Construction Phase – Internal & Partners

Construction Contract # Click or tap here to enter text. **Estimated Start Date:** Click or tap to enter a date.

Actions and Plan Implementation. *What actions, and by who, need to be taken? What groups need to be kept in the loop on progress and updates during construction?*

Who is Responsible?	**Date or Frequency**	**Tool – Action Notes/Comments:**	**Audience Message/Purpose:**
Who Name	Specific Date Frequency	Email *Form to initiate project info going on TripCheck*	Dispatch *Post information and impacts*
Who Name	Specific Date Frequency	Phone Call *Ongoing updates as project constructs*	Dispatch *Update TripCheck as impacts change*
Resident Engineer (-C) Name	Specific Date Weekly	Email *Weekly construction impacts update - using template*	PIOs *Email/press on changing impacts*
Who Name	Specific Date Frequency	Delivery-Method *Notes/Details*	Internal Group/Person *Message/Purpose*

Public Involvement – Construction Phase – External & Stakeholders

Actions and Plan Implementation. *Who and what needs to be done for public outreach or engagement to ensure a successful construction project?*

Who is Responsible?	**Date to be Completed**	**Tool – Action Notes/Comments:**	**Audience Message/Purpose:**
Who Name	Date Frequency	Tool/Action *Notes/Details*	Audience Group *Message/Purpose*

TITLE VI SUMMARY REPORT

(Task 2.6)

Date: September 1, 2022

To: Oregon Department of Transportation, Region 2
Marion County

From: Angela Rogge, PE, David Evans and Associates, Inc.

Subject: I-5: Brooks Interchange Area Management Plan (Exit 263) – Title VI Summary

Overview

Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations of February 11, 1994, requires agencies undertaking federal projects to identify low-income and minority populations; assess whether high and adverse human health or environmental impacts would result from the alternatives; and ensure participation of low-income and minority populations in the transportation decision making process.

Additional underserved populations are the "transportation disadvantaged." These are those persons who, because of physical or mental disability, income status, or age, are unable to transport themselves or to purchase transportation and are, therefore, dependent upon others to obtain access to health care, employment, education, shopping, social activities, or other life-sustaining activities. Projects receiving federal assistance must also evaluate impacts to these populations to comply with the Age Discrimination Act of 1975, Federal-Aid Highways Act, Rehabilitation Act of 1973 and Americans with Disabilities Act of 1990.

This memorandum summarizes the process and outreach for all low income, race, gender, and age groups for the Brooks Interchange Area Management Plan (IAMP).

Identification

The low-income and minority populations within the census tract containing the IAMP study area are discussed below along with elements of the transportation infrastructure that serve the transportation disadvantaged.

Socioeconomic Data

Socioeconomic data for the study area was drawn primarily from the U.S. Census Bureau. The geographies reviewed for this memorandum represent the following areas:

- Census tract 25.02 represents census tract 25.02, which contains the Brooks IAMP study area and the Brooks-Hopmere community.
- Marion County
- Oregon

Based on the data from the American Community Survey (ACS) and 2020 Census, the study area is less diverse than the state. Table 10-1 provides a summary of race and ethnicity survey data.

Table 1. Population Demographics by Geography

Subject	Census Tract 25.02	Marion County	Oregon
Total Population	5,464	345,920	4,176,346
Median Age	42.6	37.1	39.5
% Population Under 18 Years	22.3	24.5	20.8
% Population 65 Years and Over	19.3	16.4	17.6
% African American	0.0	2.3	3.0
% American Indian and Alaska Native	3.9	6.6	3.1
% Asian	0.9	3.8	6.2
% Caucasian	92.7	81.3	88.4
% Native Hawaiian and Other Pacific Islander	0.2	1.7	0.9
% Some Other Race	7.9	25.0	5.1
% Hispanic or Latino (Of Any Race)	32.4	28.2	13.2
Median Household Income	$63,571	$64,406	$71,562
% Population for Whom Poverty Status is Determined (past 12 months)	11.8	13.2	14.1

Source: American Community Survey, 2021.

Census tract 25.02 tends to have an older population than the state and Marion County.

Persons are considered to be in poverty status when income earned is less than the income threshold. The poverty threshold is a measure of annual pretax cash income which falls below a federal measure of poverty that is recalculated each year. The percent of population in poverty that includes the study area has a lower percentage of individuals living in poverty than Marion County or the state.

Transportation Barriers

The non-auto transportation (i.e., pedestrian, bicycle, and transit) infrastructure was reviewed as part of the system inventory to identify potential barriers in the system (*Technical Memorandum #3)*. Potential transportation barriers in the study area include limited bicycle and pedestrian facilities, and a lack of public transit service that serves the study area or connects the Brooks-Hopmere community.

Outreach

This chapter describes the stakeholder and public involvement process for the Brooks IAMP.

The public involvement effort started with documenting the decision-making process and approach to building awareness about the need for the project, presenting project information and gathering public feedback at key milestones, selecting a preferred interchange option, defining interim improvements, and supporting development of the IAMP.

The following sections summarize stakeholder identification, engagement activities, and stakeholder feedback.

Stakeholders

Public outreach efforts were focused on keeping local jurisdictions and their elected officials – Marion County Board of Commissioners, the Brooks-Hopmere Community and City of Keizer – updated on the review of interchange options and options, ODOT selection of a preferred option, design refinements of the full interchange, and definition of interim improvements. The Mid-Willamette Valley Area

Commission on Transportation (MWACT) was briefed periodically to ensure the broader community was informed and could share concerns.

A stakeholder group of interchange area businesses and property owners was convened periodically throughout the duration of the project (2020-2022) to share project progress and direction, review ODOT work, and to understand comments, questions, and concerns about proposed improvements to the interchange and the county roads. The meetings were open to everyone, but the direct invitation list was built from businesses and property owners in the area.

Multiple public open houses were held to share project direction and to hear comments and concerns from the public about proposed improvements to the interchange and the county roads.

Additionally, representatives from the Confederated Tribes of Grand Ronde and Confederated Tribes of the Siletz Indians were included in all stakeholder outreach communications.

Outreach Summary

The following sections summarize the rounds of outreach that occurred at key project milestones. The briefings and meetings helped ODOT inform area stakeholders and collect comments and questions leading to the selection of the Preferred Options. The key milestones were:

- Project Kick-Off
- Confirm Deficiencies and Needs
- Concept Development
- Preferred Option Selection and Refinement

After IAMP adoption, outreach will continue related to final design of the Preferred Option and construction to prepare the community for implementation and temporary disruptions resulting from construction.

Project Kick-Off

A project kick-off meeting was held for ODOT and local agency staff to learn about the project, review the IAMP goal and objectives and confirm historical findings of the various studies completed at the Brooks Interchange. Attendees included representatives from the Consultant team, ODOT (Traffic, Roadway, Right of Way, Interchange Design, TPAU, Environmental and Policy and Data Analysis Division), MVCOG/SKATS, and City of Keizer (Public Works and Planning).

Confirm Deficiencies and Needs

Public information materials were developed to introduce the project to the public and confirm the deficiencies and needs of the Brooks Interchange.

- **Website** – a map and background information were included on the project website (https://www.oregon.gov/odot/projects/pages/project-details.aspx?project=BrooksIAMP)
- **A project information postcard** was mailed to addresses near the interchange, as well as a list of other regional interested parties. The mailer introduced the project purpose and timeline and shared the project website as an ongoing reference for updates or a means to contact the project manager. (March 2021)
- **Stakeholder Workshop Meeting #1 (March 2021)** – The project team invited area stakeholders – property owners, residents, agency representatives, and business owners/managers – through

a mailing, emails, and phone calls to an initial stakeholder engagement meeting, to introduce the project and highlight funding limitations, gather feedback on the interchange concerns, and discuss the purpose of the IAMP. Ten stakeholders attended. Generally, there was broad support for any improvement to ease congestion at the interchange. Specific concerns were expressed about the congestion in front of the truck stop, the northbound exit ramp, and the barriers to multimodal connectivity between the Brooks and Hopmere communities.

- **Online Public Comment Form (March 2021)** – An online map and comment form were made available to stakeholders to document concerns or share specific areas of concern. An email was sent out to 859 stakeholders in the area on March 29, 2021 to alert them of the upcoming planning process and provide the opportunity to give feedback online. On April 13, 2021, a second email was sent out to 668 recipients who hadn't opened the email to encourage their participation and alert them to the comment form closing date. The feedback opportunity was available from March 29 until April 21, 2021. Public comment responses echoed the concerns raised by Stakeholders about congestion, particularly at the northbound exit ramp.

Concept Development

After development of interchange options and narrowing to two option interchange designs, the following stakeholder and public involvement activities were conducted in late 2021:

- **Briefings to elected bodies and other stakeholders (September 2021)** – The project team introduced the project and schedule to MWACT.
- **Stakeholder Workshop Meeting #2 (October 2021)** – The project team invited area stakeholders – property owners, residents, agency representatives, and business owners/managers – through a postcard mailing and email invitation. The purpose of the meeting was to review the evaluation criteria for the interchange concepts, provide a summary of each of the six potential concepts and present the access management draft key principles. Eleven stakeholders attended. Questions were raised about the anticipated timeline and expressed desire to see improvements made before the end of the 20-year planning horizon.

Preferred Option Selection and Refinement

The following stakeholder and public involvement activities were conducted during the process of selecting the Preferred Option in summer 2022:

- **Stakeholder Workshop Meeting #3 (July 2022)** – The project team invited area stakeholders – property owners, residents, agency representatives, and business owners/managers – through an email. The intent of the meeting was to review the six concepts in more detail and explain the process for arriving at the Preferred and Alternate Preferred Options (TDI and Dogbone). Nineteen stakeholders attended. The project team answered specific questions about how trucks and vehicles would navigate the various options. There were also questions raised about potential land use and right of way impacts. The project team responded that when funding is available, further design refinement and additional environmental work would need to occur to understand the exact level of impact. At that time, additional coordination and outreach to landowners and the public would be a critical component of the project development.

- **Briefings to elected bodies and other stakeholders (August 2022)** – The project team review the preferred options and local system improvements with MWACT.

Inclusion

Environmental, land use, and multimodal considerations were part of the concept evaluation. Impacts to resources were qualitatively assessed based on the data assembled for the environmental and land use reconnaissance in the study area. The level of analysis of the study area is designed to identify those areas judged to have considerable potential for conflict.

The specific socioeconomic (Title VI) considerations in the evaluation included:

Would the footprint of the concept expand into areas where minority and/or low income populations have been identified?

> *None of the projects included in the IAMP involve significant expansion of the transportation infrastructure. The preferred option may require additional right of way in areas with commercial or industrial zoning.*

Would the concept benefit or impact the transportation disadvantaged population by changing the sidewalk or bicycle network?

> *Within the transportation network considered for the IAMP, the bicycle network is complete with bike lanes or widened shoulders on Brooklake Road. The sidewalk network is also improved with connections across the I-5 structure included in the preferred option.*
>
> *The interim improvements would widen the exit ramps to add an additional storage lane resulting in a longer crossing for both pedestrians and bicyclists. This would have minimal impacts to disadvantaged populations.*

Would the concept benefit or impact the transportation disadvantaged population by changing access to transit?

> *Improved operations and safety are expected to benefit vehicular travel, which could accommodate any future transit operations through the study area.*
>
> *The IAMP supports a future transit route along Brooklake Road but requires that transit stops must not be located where they could impact the safe and efficient operations of the interchange ramp terminals.*

Would the concept benefit or impact the transportation disadvantaged population by changing access to community resources, particularly those that serve minority and/or low-income populations?

> *None of the projects included in the IAMP would change access to community resources.*

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2 TECHNICAL MEMORANDUM #2

Plans and Policies Framework

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TECHNCIAL MEMORANDUM #2

Plans and Policies Framework (Task 3.1)

Date: October 30, 2022

To: Oregon Department of Transportation, Region 2

From: Darci Rudzinski and Emma Porricolo, Angelo Planning Group

Subject: I-5: Brooks Interchange Area Management Plan (Exit 263)

INTRODUCTION

Pursuant to the scope of work (Task 3.1), this memorandum presents a review of existing plans, regulations, and policies that affect transportation planning in the Brooklake (Brooks) Interchange Area Management Plan (IAMP) study area. The review explains the relationship between the documents and planning in this area, identifying key issues to track through the IAMP development process.

Documents in this review establish transportation-related standards, targets, and guidelines as well as transportation improvements with which the IAMP will be coordinated and consistent. Other documents in this review – such as the County's Rural Transportation System Plan (RTSP) and Marion County Code (MCC) – may be subject to future recommended amendments in order to implement the IAMP. Once the IAMP and implementing ordinances are completed, the County may be requested to adopt key elements of the IAMP as a refinement to the RTSP before the IAMP is considered by the Oregon Transportation Commission (OTC) for adoption. Upon adoption by the OTC, the IAMP becomes an amendment to the Oregon Highway Plan (OHP).

TABLE OF CONTENTS

FEDERAL AND STATE DOCUMENTS

Federal Highway Administration (FHWA) Access to Interstate System Policy (2017)

The Federal Highway Administration's (FHWA) policy established the federal requirements for new or improved access to the interstate system. The policy states the following:

> *"It is in the national interest to preserve and enhance the Interstate System to meet the needs of the 21st Century by assuring that it provides the highest level of service in terms of safety and mobility. Full control of access along the Interstate mainline and ramps, along with control of access on the crossroad at interchanges, is critical to providing such service. Therefore, the Federal Highway Administration's (FHWA) decision to approve new or revised access points to the Interstate System under Title 23, United States Code (U.S.C.), Section 111, must be supported by substantiated information justifying and documenting that decision. The FHWA's decision to approve a request is dependent on the proposal satisfying and documenting the following requirements.*
>
> *1) An operational and safety analysis that have proven the proposed access changes does not have "a significant adverse impact on the safety and operation of the Interstate facility" or connected local street network. The area of analysis should at minimum expand from the interstate to the to the nearest major intersection on either side of proposed change in access.*
>
> *2) The proposed access connects to a public road only and will provide for all traffic movements. The report should demonstrate the proposed change meets the current standards of 23 CFR 625.2(a), 625.4(a)(2), and 655.603(d) and mitigation proposed to compensate for the missing movements, including wayfinding signage, impacts on local intersections, mitigation of driver expectation leading to wrong-way movements on ramps, etc."*
>
> **Project Relevance:** The Oregon Department of Transportation (ODOT) is responsible for the submission of access modification requests to the designated FHWA Division office for review. The IAMP must include all information required for submission under this policy.

ODOT Interchange Area Management Plan Guidelines (2013)

The Interchange Area Management Plan (IAMP) Guidelines provides guidance in the preparation of IAMPs. The guidelines include background about what IAMPs are and their purpose and regulatory significance and address the following:

- IAMP contents and level of analysis
- Timing
- IAMP process
- Relationship of ODOT and local governments
- Relationship to the National Environmental Policy Act (NEPA)[1]
- Schedule, cost and funding.

[1] According to the U.S. Environmental Protection Agency, the National Environmental Policy Act (NEPA) was one of the first laws ever written that establishes the broad national framework for protecting our environment. NEPA's basic policy is to assure that all branches of government give proper consideration to the environment prior to undertaking any major federal action that significantly affects the environment. Environmental Assessments (EAs) and Environmental Impact Statements (EISs) are required from all Federal agencies and are the most visible NEPA requirements.

As part of "IAMP Process," the guidelines establish local development code, deed restrictions, funding mechanisms, traffic/transportation mechanisms, and access management as five sets of IAMP implementation measures. The guidelines identify policy statements, concurrency ordinances, trip capacity/allocation ordinances, trip budgets, overlay districts, and design review and performance standards as specific implementation measures to be pursued through potential local development code amendments.

Updates to the guidelines that were completed in 2013 added new information, including differentiation of access management plans and strategies and expanded explanations of coordination of IAMPs and project development (NEPA).

> **Project Relevance**: The project team will use the IAMP Guidelines as a tool during development of the IAMP, particularly in terms of the implementation measures identified in the guidelines.

ODOT Title VI Guidance (2009)

Title VI of the Civil Rights Act of 1964 prohibits discrimination on the basis of race, color, or national origin in programs that receive federal funding, including ODOT, Metropolitan Planning Organizations (MPOs), and local government transportation planning, design, construction, and operations activities. Related statutes and policies prohibit discrimination on other bases, such as Executive Order 12898 (Environmental Justice), which requires that minority and low-income populations not be disproportionally subjected to impacts of proposed projects.

Title VI Guidance for Transportation Planning was released by the ODOT Transportation Development Division (TDD) in July 2009. It provides direction to local governments, MPOs, and ODOT staff in annual reporting to the FHWA and Federal Transit Administration (FTA) regarding the compliance of planning, design, and construction activities with Title VI. The guide provides direction for planning activities, with an emphasis on activities related to identifying Title VI populations in planning study areas, developing and conducting targeted outreach to these populations, and documenting activities and findings. The guide essentially provides checklists for local governments, MPOs, and ODOT Region Planning Project Managers, Region Planning Managers, TDD Planning Staff, and the Title VI Program Manager for documenting and reporting- reporting that is rolled up into the annual Title VI Accomplishment Report.

> **Project Relevance**: The IAMP will address Title VI and Environmental Justice populations to ensure the planning project complies with related federal requirements.[2]

Oregon Transportation Plan (2006)

The OTP is a comprehensive plan that addresses the future transportation needs of the State of Oregon through the year 2030. The primary function of the OTP is to establish goals, policies, strategies and initiatives that guide the development of the State's transportation modal plans, such as the Oregon Highway Plan and Oregon Bike and Pedestrian Plan.

The OTP emphasizes the following key initiatives for implementation of the OTP:

- Maintaining and maximizing the assets in place
- Optimizing the performance of the existing system through technology

[2] SKATs generates a report that identifies transportation disadvantaged populations in their service area. See https://www.mwvcog.org/programs/transportation-planning/skats/reports-and-data/ This information can be accessed to evaluate the impacts and benefits of proposed transportation improvements on protected populations.

- Integrating transportation, land use, economic development and the environment
- Integrating the transportation system across jurisdictions, ownerships and modes
- Creating sustainable funding
- Investing in strategic capacity enhancements

Project Relevance: The Brooks IAMP will seek to maximize performance of the existing transportation system by, for example, the use of technology and system management before considering larger and costlier additions to the system.

Oregon Highway Plan (1999, last amended 2015)

The Oregon Highway Plan (OHP) is a modal plan of the Oregon Transportation Plan (OTP) that guides ODOT's Delivery and Operations Division in planning, operations, and financing. The Brooks IAMP is being developed by ODOT so projects, policies, and regulations proposed as part of the plan document will comply with or move in the direction of meeting the standards and targets related to safety, access, and mobility that are established in the OHP. Ultimately, the IAMP will need to be found consistent with the OHP and will be reviewed by the Oregon Transportation Commission (OTC) for adoption. If adopted, it will be one of the many special facility plans that have amended the OHP over the years.

Policies in the OHP emphasize the need to efficiently manage the highway system to increase safety and to extend highway capacity, partner with other agencies and local governments, and use new techniques to improve road safety and capacity. These policies also link land use and transportation, set standards for highway performance and access management, and emphasize the relationship between state highways and local road, bicycle, pedestrian, transit, rail, and air systems. The following policies are relevant to the Brooks IAMP.

Policy 1A: State Highway Classification System

The OHP classifies the state highway system into four levels of importance: Interstate, Statewide, Regional, and District. ODOT uses this classification system to guide management and investment decisions regarding state highway facilities. The system guides the development of facility plans, such as the Brooks IAMP, as well as ODOT's review of local plan and zoning amendments, highway project selection, design and development, and facility management decisions including road approach permits. Interstate 5 (I-5) is an interstate freeway that is part of the National Highway System (NHS). The purpose and management objectives of these highways are provided in Policy 1A, as summarized below.

- **Interstate highways** provide connections between major cities in a state, regions of the state, and other states. A secondary function in urban areas is to serve regional trips within the urban area. Their primary objective is to provide mobility and, therefore, the management objective is to provide for safe and efficient high-speed continuous-flow operation in urban and rural areas.
- **Regional Highways**, such as portions of OR 99E typically provide connections and links to regional centers, Statewide or Interstate Highways, or economic or activity centers of regional significance. The management objective is to provide safe and efficient, highspeed, continuous-flow operation in rural areas and moderate to high-speed operations in urban and urbanizing areas. A secondary function is to serve land uses in the vicinity of these highways.

In addition to the state highway classification system, I-5 is a designated freight route as discussed under Policy 1C.

Policy 1B: Land Use and Transportation

Policy 1B applies to all state highways. It is designed to clarify how ODOT will work with local governments and others to link land use and transportation in transportation plans, facility and corridor plans, plan amendments, access permitting and project development. Policy 1B recognizes the need to find balance between serving local communities (accessibility) and the through traveler (mobility) on state facilities. This policy recognizes the role of both the state and local governments related to the state highway system and calls for a coordinated approach to land use and transportation planning.

Policy 1C: State Highway Freight System

The primary purpose of the State Highway Freight System is to facilitate efficient and reliable interstate, intrastate, and regional truck movement through a designated freight system. This freight system, made up of the Interstate Highways and select Statewide, Regional, and District Highways, includes routes that carry significant tonnage of freight by truck and serve as the primary interstate and intrastate highway freight connection to ports, intermodal terminals, and urban areas. I-5 has this designation and consequently higher highway mobility standards than other statewide highways. In addition, I-5 has been designated as a "Reduction Review Route," where proposed activities (including those proposed in planning documents approved by a public agency) that will alter, relocate, change or realign these facilities must be reviewed for possible "Reduction of Vehicle-Carrying Capacity." Oregon Administrative Rule 731-012-0010, last revised in 2012, explains the review process and requirements.[3]

Policy 1F: Highway Mobility Policy

Policy 1F sets mobility targets for ensuring a reliable and acceptable level of mobility on the state highway system. The targets are used to assess system needs as part of long range, comprehensive planning and transportation planning projects (such as this Brooks IAMP), during development review, and to demonstrate compliance with the Transportation Planning Rule (TPR – OAR 660-012).

Significant amendments to Policy 1F were adopted at the end of 2011. The revisions were made to address concerns that state transportation policy and requirements have led to unintended consequences and inhibited economic development. Policy 1F now provides a clearer policy framework for considering measures other than volume-to-capacity (v/c) ratios for evaluating mobility performance.[4] Also, as part of these amendments, v/c ratios established in Policy 1F were changed from being standards to "targets." These targets can be used to determine significant effect pursuant to TPR Section -0060.

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[3] September 2013 OHP text amendments provide the following explanation: "The 2003 legislature adopted changes to Oregon Revised Statutes (ORS) 366.215. This statute identifies the Oregon Transportation Commission's authority to build and modify state highways. The statute states that that the Commission may not permanently reduce the 'vehicle-carrying capacity' of an identified freight route unless safety or access considerations require the reduction or a local government requests the reduction. In the context of this statute, 'vehicle-carrying capacity' references the vertical and horizontal clearance for larger vehicles. Depending on the size and weight of a truck, oversized vehicles are issued permits on an annual or trip specific basis.
The need to protect existing vertical and horizontal clearance is different from the mobility function of the State Highway Freight System. The designated Reduction Review Routes identify where the Department will apply the OAR 731-012-0010 review of vertical and horizontal clearance."

[4] The volume to capacity ratio is the degree of utilization of the capacity of a segment, intersection or approach. A lower ratio indicates smooth operations and minimal delays. As the ratio approaches 1.0, congestion increases and performance is reduced. At 1.0 the capacity is fully utilized. Definition from ODOT's *Analysis Procedures Manual Version 2*, Last Updated 12/2019.

Policy 1G: Major Improvements

This policy requires maintaining performance and improving safety on the highway system by improving efficiency and management on the existing roadway network before adding capacity. The state's highest priority is to preserve the functionality of the existing highway system. Tools that could be employed to improve the function of the existing interchanges include access management, transportation demand management, traffic operations modifications, and changes to local land use designations or development regulations.

After existing system preservation, the second priority is to make minor improvements to existing highway facilities, such as adding ramp signals, or making improvements to the local street network to minimize local trips on the state facility. The third priority is to make major roadway improvements which could, in the case of interchange improvements, include adding lanes or reconfiguring on- or off-ramps. The fourth priority is to add new facilities to the system to address capacity needs.

Policy 2B: Off-System Improvements

This policy recognizes that the state may provide financial assistance to local jurisdictions to make improvements to local transportation systems if the improvements would provide a cost-effective means of improving the operations of the state highway system. As part of this planning process, improvements to the local road system that support the planned land use designations in the vicinity of the interchanges and that will help preserve capacity and ensure the long-term efficient and effective operation of the interchanges may be identified.

Policy 3A: Classification and Spacing Standards

It is the policy of the State of Oregon to manage the location, spacing, and type of road intersections on state highways to ensure the safe and efficient operation of state highways consistent with the classification of the highways.

Action 3A.2 calls for spacing standards to be established for state highways based on highway classification, type of area, and posted speed. Tables in OHP Appendix C present access spacing standards which consider urban and rural highway classification, traffic volumes, speed, safety, and operational needs. Table 16 of the OHP describes interchange spacing standards.

The access management spacing standards established in the OHP are implemented by access management rules in OAR 734, Division 51, addressed later in this report.

Policy 3C: Interchange Access Management Areas

This policy addresses management of grade-separated interchange areas to ensure safe and efficient operation between connecting roadways. Action items include developing interchange area management plans to protect the function of existing interchanges, provide safe and efficient operations between connecting roadways, and minimize the need for major improvements.

Policy 4A: Efficiency of Freight Movement

This policy emphasizes the need to maintain and improve the efficiency of freight movement on the state highway system. I-5 is a designated Freight Route. A principal function of the interchange is to accommodate safe and efficient freight movements by providing free-flow movements for through-traffic on the Interstate system and for traffic accessing existing (and future planned) industrial areas.

> **Project Relevance:** The Brooks IAMP will be adopted as an amendment to the OHP, therefore it must align with all relevant policies summarized above. The planning process will include

developing and analyzing alternatives for optimizing the function and capacity of the existing interchanges prior to selecting a package of improvements that will comprise a preferred alternative.

ODOT Highway Design Manual (2012)

The Highway Design Manual includes ODOT standards and procedures for the location and design of new construction, major reconstruction, and resurfacing, restoration or rehabilitation (3R) projects. The Highway Design Manual is used for all projects that are located on state highways. Design standards for state highways are dependent on the highway's functional classification and the project type.

Chapter 5 addresses rural freeway design, applicable to the freeway (I-5) through the interchange area; Chapter 7 addresses rural highway design (non-freeway), applicable to OR 99E (Portland Road) in the study area.

Chapter 9 addresses grade-separated interchanges. Section 9.6, Interchange Design, includes the design standards, guidelines, and processes for designing interchanges for State Highways. ODOT, through the Engineering Services Unit, and FHWA must approve the reconstruction of an interchange on the Interstate system. The proposed interchange design must be prepared on the Standard Interchange Layout Sheet by the Engineering Services Unit or authorized representative. The approved design is then used for contract plans. Proposed modifications as a result of this planning process to the Brooks Interchange is subject to the standards of section 9.1.6, Standard Interchange Layout Sheets.

Chapter 13 addresses bicycle and pedestrian facilities on State Highways; detailed standards for ODOT highways and other facilities are found in the Oregon Bicycle and Pedestrian Design Guide (Appendix L of the Highway Design Manual). Chapter 13 standards are applicable to state highways in the study area.

> **Project Relevance**: The transportation improvement alternatives will be developed to be consistent with the applicable HDM standards for interchanges and state highways. Any proposed bicycle or pedestrian improvements associated with the preferred alternatives will also need to be consistent with the HDM.

Transportation Planning Rule (OAR 660-012)

The TPR implements Goal 12 (Transportation) of the statewide planning goals. The TPR contains numerous requirements governing transportation planning and project development. The TPR provides the connection between local development codes and access management, coordinated land use review procedures, and other standards, allowances, and requirements to protect road operations and safety.

Section -0045

OAR 660-012-0045 requires each local government to amend its land use regulations to implement its TSP. It also requires local government to adopt land use or subdivision ordinance regulations consistent with applicable federal and state requirements "to protect transportation facilities, corridors and sites for their identified functions."

Local compliance with -0045 provisions is achieved through a variety of measures, including access control measures, standards to protect future operations of roads, and expanded notice requirements and coordinated review procedures for land use applications. Local development codes should also include a process to apply conditions of approval to development proposals, and regulations ensuring that amendments to land use designations, densities, and design standards are consistent with the functions, capacities, and performance standards of facilities identified in the TSP.

Section -0060

The 2012 revisions to the rule include new language in Section -0060 that allows a local government to exempt a zone change from the "significant effect" determination if the proposed zoning is consistent with the comprehensive plan map designation and the TSP.

Section -0065

This section addresses transportation improvements on rural lands which includes transportation facilities, services, and improvements that may be consistent with statewide Goals 3, 4, 11, and 14 without goal exceptions under OAR 660-012-006. Transportation improvements listed in this provision that may be relevant to the Brooks IAMP include the following:

> (d) Realignment of roads otherwise not allowed under subsection 9 (a) or (b) of this section;[5]
> (e) Replacement of an intersection with an interchange;
> (i) Park and ride lots;

The entire list of exceptions can be found OAR 660-012-0065(3) (a) through (o).

Section -0070

This section details the process and requirements for transportation facilities and improvements on rural lands that do not meet the requirements of OAR 660-012-0065 (reviewed above), which require an exception.

> **Project Relevance**: While the TPR (OAR 660-012) does not regulate access, the TPR provides the connection between local development codes and access management, coordinated land use review procedures, and other standards, allowances, and requirements to protect road operations and safety. Recommended implementation measures for the IAMP may entail local code amendments to ensure IAMP recommendations are reflected in the Marion County Code.

Access Management Rule (OAR 734-051)

Oregon Administrative Rule (OAR) 734-051 defines the State's role in managing access to highway facilities in order to maintain functional use and safety and to preserve public investment. The rule includes spacing standards for varying types of state roadways and criteria for granting right of access and approach locations onto state highway facilities.

Amendments to OAR 734-051 were adopted in early 2012 based on passage of Senate Bill 1024 and Senate Bill 264 in the 2010 and 2011 Oregon Legislature respectively. The amendments were intended to allow more consideration for economic development when developing and implementing access management rules and involved changes to how ODOT deals with approach road spacing, highway improvement requirements with development, and traffic impact analyses requirements for approach road permits.

Senate Bill 408, which passed in the 2013 legislative session and became effective January 1, 2014, addressed three priorities: existing approaches (private driveways) without ODOT's written permission; access management in highway facility plans; and access management in highway project delivery. The legislation provides new requirements for access management in the development of highway facility

[5] (a) Accessory transportation improvements for a use that is allowed or conditionally allowed by ORS 215.213, 215.283 or OAR chapter 660, division 6 (Forest Lands);
(b) Transportation improvements that are allowed or conditionally allowed by ORS 215.213, 215.283 or OAR chapter 660, division 6 (Forest Lands);

plans such as IAMPs and corridor plans and requires collaboration with local governments in determining the location of local roads that intersect highways in the planning area. The legislation also directs ODOT to develop an access management strategy for each highway modernization or improvement project. ODOT must develop key principles for each facility plan, which will be used to evaluate how abutting properties may retain or obtain access to the state highway during and after plan implementation. In developing the key principles, ODOT must also develop a methodology to weigh the benefits of a highway improvement to public safety and mobility against the locally adopted TSP and land uses permitted in the local comprehensive plan, as well as the economic development objectives of affected real property owners who require access to the state highway. If a facility plan identifies the need to modify, relocate or close existing private approaches, the plan must include key principles for managing access to the state highway and a timeline for plan implementation. Highway facility plans shall provide a public involvement process for affected property owners and appropriate stakeholders. Prior to finalization of a highway facility plan, affected real property owners shall have the opportunity to review the key principles and related methodology. Senate Bill 408 resulted in the adoption of two permanent rules by the Oregon Transportation Commission (OTC): 734-051-1065 Restriction of Turning Movements for Existing Approaches, and 734-051-3015 Presumption of Written Permission for an Existing Private Connection. Additionally, fifteen (15) existing permanent rules were amended, and five previously adopted temporary rules were repealed.

OAR 734-051-4020 (Standards and Criteria for Approval of Private Approaches)

New spacing standards were established in 2012 for new or modified approaches to statewide highways[6] but spacing standards related to interchanges (spacing of tapers between interchanges, spacing between ramp tapers and approaches or intersections with left-turns) were not amended.[7] The amendments also allow access management plans (AMPs) and IAMPs to establish spacing standards that may take precedence over the highway/approach spacing standards in the rule.[8]

Interchange improvements that are proposed in the IAMP will need to meet or improve, "by moving in the direction of," the access management spacing standards by means of an access management strategy, plan, or mitigation proposal.[9]

OAR 734-051-5120 (Access Management in Project Delivery)

OAR 734-051-5120 requires ODOT to develop an access management strategy during project delivery for modernization and highway improvement projects in the STIP. ODOT must collaborate with cities, counties, and owners of property adjacent to the highway to develop the access management strategy. The strategy must be consistent with the OTP, the Oregon Highway Plan (OHP), and other modal plans adopted by the OTC.

The access management strategy must include methodology that balances the economic development objectives of properties abutting the state highway with the transportation safety, access management objectives, and mobility of state highways, while also being consistent with local transportation system plans and the local comprehensive plans acknowledged under ORD Chapter 197.

[6] Tables 3-6 in OAR 734-051

[7] Tables 7-10 and Figures 1-4 in OAR 734-051

[8] Pursuant to OAR 734-051-4020(8)(b)(C), spacing standards in AMPs and IAMPS may take precedence only over spacing standards in Tables 3-5 of OAR 734-051.

[9] OAR 734-051-1070(2), (3), and (4)

OAR 734-051-7010 (Access Management in Highway Facility Plans)

OAR 734-051-7010 identifies ODOT's responsibilities to address access management during the development of highway facility plans (access management plans and/or IAMPs) for particular sections of a state highway. The IAMP must comply with the following, unless it can be demonstrated that a criterion is not applicable.

- For the public participation process provide notice and include interested stakeholders in the planning process. The process must include an opportunity for affected real property owners that abut the highway to review key principals and related methodology.
- Identify the need to modify, relocate, or close one or more existing approaches and how they will retain or obtain access to the state highway during and after plan implementation.
- Balance economic development objectives with transportation safety, access management, and mobility of state highway consistent with local plans.
- Articulate key principals in sufficient detail and include anticipated timeline for implementation.
- The plan must be consistent with the agreed upon local road connections identified in the TSP or during development of the plan and consider implications to state and local roadway networks and greater transportation systems.

The section also states that the methodology may include the following factors:

- How properties abutting state highways can develop or redevelop consistent with local designations, zoning and comprehensive plan.
- The level of direct highway access needed for properties.
- Effects of out of direction travel for customers to recognize differences between destination and pass-by uses.
- Effect of changing existing connections and circulation.
- Safety and operational implications of traffic congestions or speed.
- Creation of permanent jobs in the study area.
- Community support for the project.
- Reduction of vehicle conflict points where possible.
- Safety and operation concerns.
- Safety planning tools, data, and resources.

Project Relevance: The Brooks IAMP will comply with, or move in the direction of, spacing standards in OAR 734-051 and its development will be consistent with the applicable criteria established for facility plans and project delivery in the rule. To be consistent with the direction provided in Senate Bill 408, the development and evaluation of alternatives should acknowledge the impacts and benefits of property access, as measured by adopted local land use designations (allowed uses) and economic development objectives of the property owners. The IAMP access management plan should "include level of detail sufficient to inform affected real property owners of the potential for the modification, relocation or closure of existing private approaches within the area (§4(3)(c))." The location of local streets that intersect with the state highway system in the vicinity of the subject interchanges will be discussed with the County during the existing conditions phase of the project. Further, implementation measures for the Brooks IAMP may require amendments to the MCC to ensure compliance with TPR provisions and IAMP recommendations.

Oregon Freight Plan (2011 updated 2017)

The Oregon Freight Plan (OFP) is another modal plan of the OTP and implements the state's goals, and policies related to the movement of goods and commodities. Its purpose statement is: "to improve freight connections to local, Native American, state, regional, national and global markets in order to increase trade-related jobs and income for workers and businesses." The objectives of the plan include prioritizing and facilitating investments in freight facilities (including rail, marine, air, and pipeline infrastructure) and adopting strategies to maintain and improve the freight transportation system.

To achieve the purpose statement, the Oregon Freight Plan:

- Supports identifying, prioritizing and facilitating investments in Oregon's highway, rail, marine, air and pipeline transport infrastructure to advance a safe, seamless multimodal and interconnected freight system;
- Identifies institutional and organizational barriers to an efficient and effective freight transportation system in Oregon, and develops strategies for addressing issues associated with overcoming these barriers; and
- Adopts strategies for implementation of OTP goals and policies related to the maintenance and improvement of the freight transportation system.

The plan defines a statewide strategic freight network. I-5, including the segment through the Brooks IAMP study area, is designated as a strategic corridor in the OFP.

Policy and strategic direction provided in the OFP prioritizes preservation of strategic corridors as well as improvements to the supply chain achieved through coordination of freight and system management planning. The associated strategy and action policies are listed below.

> ***Strategy 1.2****: Strive to support freight access to the Strategic Freight System. This includes proactively protecting and preserving corridors designated as strategic.*
>
> ***Action 1.2.1****. Preserve freight facilities included as part of the Strategic Freight System from changes that would significantly reduce the ability of these facilities to operate as efficient components of the freight system unless alternate facilities are identified or a safety-related need arises.*
>
> ***Strategy 2.4****: Coordinate freight improvements and system management plans on corridors comprising the Strategic Freight System with the intent to improve supply chain performance.*

The 2011 OFP was amended in 2017 to maintain compliance with federal requirements.

> **Project Relevance**: I-5 is designated as a strategic corridor in the OFP. Maintaining and enhancing efficiency of the truck and freight system in the study area will be integrated into the Brooks IAMP.

Oregon State Rail Plan (2014, Revised 2020)

The Oregon State Rail Plan is a state modal plan under the OTP that addresses long-term freight and passenger rail planning in Oregon. The Plan provides a comprehensive assessment of the state's rail planning, freight rail, and passenger rail systems. It identifies specific policies concerning rail in the state, establishes a system of integration between freight and passenger elements into the land use and transportation planning process, and calls for cooperation between state, regional, and local jurisdictions in planning for rail.

Its goals, policies, and strategies are based on the vision that "Oregon will have a safe, efficient, and commercially viable rail system that serves its businesses, travelers and communities through private resources leveraged as needed, by strategic public investments." It establishes the following goal areas: partnership, collaboration, and communication; a connected system; system investments and preservation; funding, finance, and investment principles; system safety; preserving and enhancing quality of life; and economic development.

The plan categorizes rail as Class I or Non-Class I and accordingly identifies needs related to rail elements including track, signals, weight, clearance, speed, and bridges and tunnels. A Non-Class I Railroad runs along the west of I-5, owned by Portland & Western Railroad (PNWR), and a Class I Railroad runs along the east side of I-5, owned by Union Pacific Railroad.

> **Project Relevance:** At grade rail crossings along Brooklake Road are offset from the interchange; the planning process will need to ensure that the IAMP improvements will not impact the rail network in the vicinity. Additionally, the IAMP will consider the impact of a potential intermodal facility in the Brooks-Hopmere Community (see more information on the proposed project in this memorandum).

Oregon Bicycle and Pedestrian Plan (2016)

The Oregon Bicycle and Pedestrian Plan (OBPP) provides actions that will assist local jurisdictions in understanding the principals and policies that ODOT follows in providing bikeways and walkways along state highways. In order to reach the plan's objectives, the strategies for system design are outlined and include:

- Providing bikeway and walkway systems and integrating with other transportation systems.
- Providing a safe and accessible biking and walking environment.
- Developing educational programs that improve bicycle and pedestrian safety.

The OBPP is an element of the OTP. The plan includes nine goal areas that support the vision for "people of all ages, incomes, and abilities can access destinations in urban and rural areas on comfortable, safe, well connected biking and walking routes." There are policies and strategies associated with each of the plan's goals. The plan also addresses implementation measures for the plan's policies and strategies. The implementation section also identifies the role state, local, and regional stakeholder's roles as "implementation avenues." The implementation avenues are as follows:

- *Planning* - The policies and strategies in the plan provide an overall framework for planning decisions, safety needs and mobility challenges addressed through planning. Considers a holistic approach to planning and considering the needs for walking and biking in the context of the entire transportation system.
- *Programming* - Strategic investment to use limited fund as efficiently as possible.
- *Design* - Design guidelines reflect consideration of various users and contexts.
- *Project Development and Delivery* - A key consideration for Plan implementation will be leveraging opportunities to institutionalize pedestrian and bicycle transportation within the project development and delivery processes. Plan strategies identify the need for developing project check lists, where explicit walking and biking needs are considered in project development or including health criteria into project development processes.
- *Maintenance* - Facility maintenance is important to the functionality and safety of existing and new facilities.

- *Education, Outreach, and Training* – Provide opportunities for cross-discipline education and training at local, regional, and state levels.

Project Relevance: The Brooks IAMP will include considerations of the bicycle and pedestrian goals and strategies and their implementation avenues where possible.

Oregon Public Transportation Plan (2018)

The Oregon Public Transportation Plan (OPTP) is the modal plan of the OTP that provides guidance for ODOT and public transportation agencies regarding the development of public transportation systems. The vision guiding the Public Transportation Plan is as follows:

> "In 2045, public transportation is an integral, interconnected component of Oregon's transportation system that makes Oregon's diverse cities, towns, and communities work. Because public transportation is convenient, affordable, and efficient, it helps further the state's quality of life and economic vitality and contributes to the health and safety of all residents, while reducing greenhouse gas emissions."

The OPTP's vision is guided by the ten goals of the plan:

1. Mobility
2. Accessibility and Connectivity
3. Community Livability and Economic Vitality
4. Equity
5. Health
6. Safety and Security
7. Environmental Sustainability
8. Land Use
9. Funding and Strategic Investment
10. Communication, Collaboration, and Coordination

The OPTP Implementation Plan directs ODOT investments towards commuter and mobility needs in larger communities and urban areas and in smaller communities where warranted. It also prioritizes investments in intercity connections statewide. Long-term implementation and funding is geared toward both modernization and preservation projects while preservation projects are more the focus for short term implementation and funding.

Cherriots Regional operated by the Salem Area Mass Transit District, provides intercity transit in Marion and Polk Counties. Based in Salem, the service connects neighboring cities (e.g. Woodburn) and transportation agencies (e.g. Yamhill County Transit, Canby Area Transit). The Marion Woodburn / Salem Express, route 10X, makes a stop in Brooks, at Portland Road and Riverton St.

> **Project Relevance:** The Brooks IAMP process will coordinate with Cherriots Regional to the extent that the planning effort in the Brooks IAMP study area will have an impact on access to transit.

Oregon Transportation Safety Action Plan (2016)

An element of the OTP, the Oregon Transportation Safety Action Plan (OTSAP) establishes a safety agenda to guide the investments and actions of ODOT and the state for the next 20 years. The emphasis

of the OTSAP is action and implementation. Actions included in the OTSAP were chosen based on crash data and information provided by transportation safety experts. The OTSAP is guided by six long-term goals, they include: 1- Improving safety culture, 2 - Improving infrastructure, 3- Facilitating healthy and livable communities, 4 - Utilizing best available technologies, 5 - Collaborate and communicate, and 6 - Strategic investments.

Each of the six major goals include several policies and strategies. Relevant policies to the IAMP planning process include the following:

- *Policy 2.2. - Continually improve and implement design and analysis techniques for safety-related decision-making in transportation planning, programming, design, construction, operations and maintenance for all modes.*
- *Policy 2.3. - Plan, design, construct, operate, and maintain the transportation system to achieve healthy and livable communities and eliminate fatalities and serious injuries for all modes.*
- *Policy 4.1. - Actively monitor technological advances and plan, design, maintain, and operate the system in a way that takes full advantage of opportunities to use technology to eliminate fatalities and serious injuries.*
- *Policy 6.1. - Allocate infrastructure safety funds strategically, considering all modes, to maximize total safety benefits.*

The action plan also includes emphasis areas as a framework for near-term (5 year) components of the plan. Emphasis areas related to the IAMP process include infrastructure and improved systems, described below.

- *Infrastructure* - Transportation facilities in Oregon can be constructed or retrofitted to reduce fatal and serious injury crashes, which can be implemented through the inclusion of implementing safety treatments on a site-specific basis or implementing low-cost treatments system-wide. Actions for the infrastructure emphasis area include identified to minimize intersection and roadway departure crashes.
- *Improved Systems* - Opportunities to address and improve transportation safety come in various forms. Improved systems across professions actions starting with safety should be incorporated into responsibilities. Action items include improve data, support law enforcement and minimize commercial vehicle crashes.

Project Relevance: Reflect OTSAP safety factors in Brooks IAMP Goals and Objectives and the assessment of the IAMP project alternatives.

Oregon Statewide Planning Goals

Statewide Planning Goal 1, Citizen Involvement

Goal 1, Citizen Involvement, requires those jurisdictions that prepare, adopt, and maintain comprehensive plans to provide the "opportunity for citizens to be involved in all phases of the planning process." Pursuant to the goal, the planning process includes preparation of plans and implementation measures, adoption of plans and implementation measures, and minor and major amendments to adopted plans. Technical information associated with the planning process must be available to citizens in an understandable form; accessible means for providing feedback must also be available. All public involvement activities associated with the development of the Brooks IAMP will be guided by and assessed according to Goal 1.

Statewide Planning Goal 2, Land Use Planning

Goal 2, Land Use Planning, requires that a land use planning process and policy framework be established as a basis for all decisions and actions relating to the use of land. Goal 2 is one of five statewide planning goals that play a key role in management planning for the Brooks interchange area. The other goals are Goals 3 (Agricultural Lands), 9 (Economic Development), 10 (Housing), 11 (Public Facilities Planning), and 12 (Transportation).

A second important element of Goal 2 is the provision that land use decisions and actions be supported by an "adequate factual base." This requirement applies to both legislative and quasi-judicial land use actions and requires that such actions be supported by "substantial evidence." In essence, it requires that there be evidence that a reasonable person would find to be adequate to support findings of fact that a land use action complies with the applicable review standards.

Third, Goal 2 requires that city, county, and state and federal agency and special district plans and actions related to land use be "consistent with the comprehensive plans of cities and counties and regional plans adopted under ORS Chapter 268." This provision is important because elements of the IAMP developed for the Brooks interchange may need to be adopted by the County and incorporated into the Marion County Rural Transportation System Plan and SKATs Regional Transportation System Plan.

Finally, Goal 2 includes standards for taking an "exception" to one or more of the statewide planning goals. The Goal 2 exception standards apply when a local government or property owner proposes to use property in a manner otherwise prohibited by one or more statewide planning goals. The Goal 2 exceptions standards are interpreted in significant detail in OAR 660, Division 4. Rule sections particularly relevant to developing an IAMP for the Brooks interchange are:

- OAR 660-004-0022, which establishes standards under which uses such as residential or industrial development may be justified on rural lands; and
- OAR 660-004-0020(2)(b), which requires demonstration why a proposed use cannot reasonably be accommodated on nonresource land or inside an urban growth boundary (UGB).

The Goal 2 exceptions criteria provide resource lands with a very high level of protection from higher intensity rural non-farm uses.

Statewide Planning Goal 3, Agricultural Lands

Statewide Planning Goal 3, Agricultural Lands, requires that agricultural lands be preserved and maintained for farm use. The goal is implemented through zoning that limits uses on agricultural lands to "farm uses and those non-farm uses defined by commission rule that will not have significant adverse effects on accepted farm or forest practices." As is the case in Marion County, such zoning is commonly referred to as exclusive farm use (EFU) zoning.

Goal 3 and ORS 215.780 also require counties to establish minimum sizes for new lots or parcels in each agricultural land designation. ORS 215.780(1)(a) provides that for land zoned EFU and not designated rangeland, the minimum lot or parcel size shall be at least 80 acres.

Marion County is a "nonmarginal lands" county for purposes of Goal 3 compliance. Nonmarginal lands classifications are based primarily on soil type and refer to those lands with quality soils. Nonmarginal lands are considered to be of high agricultural value. The uses identified in ORS 215.283 may be permitted on EFU-zoned lands in the county. Those uses include road, highway and other transportation improvements not allowed under ORS 215.283(1) or (2), which are permitted under ORS 215.283(3). See

OAR-660-012-0065 (Transportation Planning Rule) discussion earlier in this document for more guidance on roadway, highway and other transportation improvements in rural areas.

OAR 660, Division 33 is the Land Conservation and Development Commission's (LCDC) rule establishing limitations on uses statutorily permitted in EFU zones. It includes limitations on uses permitted under ORS 215.283(1) that counties otherwise could not have adopted. It also includes limitations on uses allowed under ORS 215.283(2) that counties may further regulate.

Like ORS 215.780, OAR 660-033-0100(1) requires counties to establish minimum parcel sizes of at least 80 acres for land zoned for EFU. OAR 660-033-0120 and OAR 660-033-0130 respectively address uses authorized on high value agricultural lands and establish minimum standards applicable to those allowed uses. Under these rules, for example, new public and private schools, churches, golf courses, and private parks, playgrounds and campgrounds are not permitted. Moreover, new schools and churches, and most private campgrounds, are not permitted within three miles of a UGB unless an exception is approved pursuant to ORS 197.732 and OAR 660, Division 4. See OAR 660-033-0120, Table 1, and 660-033-0130(2), (19). Commercial uses in conjunction with farm use are permitted only where such uses will not force a significant change in, or significantly increase the cost of, accepted farm or forest practices on surrounding lands devoted to farm or forest uses.

Statewide Planning Goal 9, Economic Development

The intent of the State's economic development Goal is to "provide adequate opportunities throughout the state for a variety of economic activities vital to the health, welfare, and prosperity of Oregon's citizens." Local comprehensive plans and policies must support this goal and should include an assessment of existing economic conditions and comparative advantages along with policies addressing economic development and development opportunities. Plans must also identify an adequate supply of sites with characteristics suitable for a variety of employment and economic development, and limit development around identified industrial sites to that which is compatible with uses allowed on the sites. The goal suggests implementation measures such as tax incentives and disincentives, preferential assessments, land use regulations, capital improvement planning and programming, and fee or partial fee acquisition.

Statewide Planning Goal 12, Transportation

Statewide Planning Goal 12, Transportation, requires cities, counties, metropolitan planning organizations (MPO), and ODOT to provide and encourage a safe, convenient, and economic transportation system. This is accomplished through the development of TSPs based on inventories of local, regional, and state transportation needs.

Goal 12 is implemented through OAR 660, Division 12, the Transportation Planning Rule (TPR). The TPR contains numerous requirements governing transportation planning and project development, several of which are relevant to planning a new interchange and are reviewed earlier in this memorandum.

> **Project Relevance**: All public involvement activities for the IAMP will be guided by and assessed according to Goal 1 (Citizen Involvement). Land use decisions will need to be coordinated and considered for their effect on future use and operations in the IAMP study area pursuant to Goal 2 (Land-use). Preservation of exclusive farm use (EFU) land in the study area will be a consideration in planning, in conformance with Goal 3 (Agricultural Lands). To be in conformance with Goal 9 (Economic Development), the IAMP will demonstrate the ways in which the preferred alternative selected for future improvements supports this goal and the economic development policies adopted in the County's comprehensive plan. The objectives of the Statewide Land Use Planning Goals, and the requirements in associated Rules, will be

considered in the development of the IAMP; divergence from the requirements of the listed goals as a result of IAMP recommendations may require a goal exception.

LOCAL DOCUMENTS

Marion County Comprehensive Plan (2002)

The Marion County Comprehensive Plan was adopted in 2002. The Comprehensive Plan includes general transportation policies in the Transportation Chapter; more detailed information on the transportation policies are included in the Marion County Rural Transportation System Plan (RTSP below. Relevant policies from the Comprehensive Plan area listed below.

Agricultural Lands

Goal - To preserve and maintain agricultural lands for farm use consistent with the present and future need for agricultural products, forest and open space.

Relevant policies include the following:

> *2. Maintain primary agricultural lands in the largest areas with large tract to encourage larger scale commercial agricultural production.*
>
> *3. Discourage development of non-farm uses on high-value farmland and ensure that if such uses are allowed that they do no cause adverse impacts on farm uses.*
>
> *9. When creation of a non-farm parcel is warranted, the size of the parcel shall be as small as possible to preserve the maximum amount of farmland in the farm parcel. Requirements may need to be imposed when non-farm parcels are allowed in farm use areas to minimize the potential for conflicts with accepted farm management practices on nearby land. These may include special setbacks, deed restrictions and vegetative screening.*

Rural Development

Policies specifically for the Brooks Community are found in the Brooks-Hopmere Community Plan (see review in this memorandum).

Transportation

The goals, objectives, and policies listed in the Transportation Chapter of the Comprehensive Plan are the same as those found in the Marion County RTSP, which is reviewed in detail in this memorandum.

Economic Development

Economic development policies and objectives are found in the Marion County Overall Economic Development Plan. The Comprehensive Plan lists economic development goals, including the following relevant policies:

> *d. Diversification of the economic base of communities, and expansion of seasonal employment opportunities to year-round status wherever possible;*
>
> *e. Provision of sufficient areas for future industrial land use;*

f. Development of a transportation system for the safe and efficient movement of persons and goods for present needs.

Project Relevance: The Brooks IAMP goals and policies will need to be consistent with County transportation goals and policies, as well as other policy areas, some of the most relevant of which are highlighted in this review. In some cases, where the existing County goals and policies are not consistent with recommended implementation measures, additions or amendments to the Comprehensive Plan may be prepared and proposed as part of this planning process.

Marion County Rural Transportation System Plan (2005, updated 2013)

The Marion County Rural Transportation System Plan (RTSP) serves as the management document for existing and future transportation facilities for areas of the County outside UGBs. The RSTP was adopted in 2005, and updates to Chapters 3 through 7 of the RTSP were made in 2013[10]. The RTSP includes an inventory of existing facilities and transportation conditions, as well as forecasted transportation demand for the area over an approximately 20-year planning horizon. Recommended standards and improvements to the transportation system are provided along with a funding plan, long-term strategies, and transportation planning rule compliance. The Brooks IAMP may serve as a refinement plan for the RTSP, or IMAP recommendations may be used to update the RTSP if amendments are needed to make the plans consistent. Summaries of pertinent RTSP chapters are discussed below.

Chapter 4 – Goals and Objectives

Below are the RTSP goals and accompanying objectives that are most relevant to the Brooks IAMP.

- *Goal 1: Improve Transportation System Safety*
- *Goal 2: Maintain, Preserve, and Optimize the Transportation System*
- *Goal 3: Provide Mobility and Accessibility for Very Diverse Groups of Users*
  - *Objective 3.1: Facilitate shipping of goods by the most efficient and least-impactive means possible, increasing freight (truck, rail, air and water) mobility and inter-modal opportunities.*
  - *Objective 3.2: Facilitate system connections as needed to improve efficiency and access, with emphasis placed on commercial and industrial lands and the regional transportation network.*
  - *Objective 3.4: Facilitate regional through movement of goods and services while minimizing conflict between through movement and livability.*
- *Goal 4: Provide Sufficient Transportation Capacity*
  - *Objective 4.4: Encourage and support actions that reduce demand on the transportation system (Transportation Demand Management).*
  - *Objective 4.5: Encourage and support actions that maximize the value and efficiency of the existing system (Transportation System Management).*
- *Goal 5: Integrate Transportation, Land Use, Economic Vitality and the Environment*
  - *Objective 5.4: Minimize adverse impacts of transportation system improvements on existing land uses and communities, with special attention to protecting prime farmland, forestland, and other natural resources.*
- *Goal 7: Adopt a Practical Approach to All Aspects of Transportation Processes*

[10] The 2013 updates have not been adopted, but some information from the 2013 draft is included in this summary for informational purposes.

- *Objective 7.1: Make deliberate, transparent, and difficult decisions regarding maintenance and improvement policies based on the limitations of resources and/or high cost-benefit analyses.*

Chapter 5 – Facility Inventory and Conditions

Chapter 5 provides an inventory of conditions of transportation facilities in rural areas of the County. Classifications for roads within the interchange area are found in Table 1 below.

Table 1. RTSP Functional Class Designations for Brooks Interchange Area Roads.

Street	Functional Class
Interstate 5	Principal Arterial
Brooklake Rd	Arterial
OR 99E (Portland Road)	Arterial
River Rd	Arterial
Brooks local roads (Pueblo Ave, Richland Rd, Riverton St, Rockdale St)	Local

Chapter 6– Future Traffic Volume Demand Projections

County staff projected the 2032 traffic volumes through modeling based of many factors including the following: population projections for the areas served by the road, anticipated growth of cities, anticipated growth of business traffic on the road, connections to recreation or tourist activities, directness of the route, character of the roadways, anticipated transportation trends, and land development patterns. The daily traffic projections for Brooklake Road are shown in Table 2.

Table 2. Daily Traffic Projections in Study Area

Corridor	From	To	1995 Daily Volume	2004 Daily Volume	2011 Daily Volume*	2032 Daily Volume*
Brooklake Rd	River Rd	Huff Ave	7,400	9,300	8,400	11,300
Brooklake Rd	Huff Ave	I-5	7,000	12,000	10,600	18,100
Brooklake Rd	I-5	OR 99E	5,800	8,200	7,800	10,000

* Daily volumes from 2013 Draft RTSP.

. The summary of the projections notes that traffic volumes are anticipated to increase on virtually all roadways in Marion County and some key corridors are expected to see large increases in traffic volume.

Chapter 7 - Development and Evaluation of 20-Year Strategies

The 2013 update to the RTSP evaluated long-term strategies to include Intra-County and Inter-County strategies. Corridors designated in the strategies are intended to facilitate safety and mobility for all users. I-5, Brooklake Road, River Road, and OR 99E (Portland Road) are all designated Inter- and Intra-Strategic Corridors. Additionally, the interchange of Brooklake and I-5 is the location of a “possible future park-and-ride/pool location.”

Chapter 8 – Roadway System Needs and Recommended Improvements

This chapter describes the existing and future needs of the Marion County rural roadway system and the improvements recommended to address those needs. Existing needs include those where projects have already been identified but not completed due to a lack of resources, where current roadway safety or operation standards are not met, and where other issues affect the safety or operation of a County facility. The interchange area is identified in several tables throughout the chapter; relevant information from the tables is summarized below.

- Table 8-5, Safety Projects, lists Brooklake Road to Wheatland Road (west of I-5), for safety issues with accidents, particularly vehicles driving off the road. The need identified is ITS safety improvements – speeding (non-stopping) vehicle warning.
- Table 8-15, Recommended Corridor Studies, identified Brooklake Road from River Road to OR 99E (Portland Road) as an area for a future corridor study. Issues cited are capacity issues imminent; future signal locations; many locations needing turn lanes; access management.
- Table 8-16, Future Widening for Capacity Needs, includes Brooklake Road from River Road to I-5. The recommendation is widening the road to four lanes (with turn lanes at I-5 interchange and other key locations)
- Table 8-17, Future Intersection Traffic Control and Modernization Needs, identifies Brooklake and River Road intersection, noting congestions, traffic control issues, and concerns with location of railroad crossing. Probable needs listed are signals, moving railroad gates, adding left turn lanes, drainage and possible realignment of the intersection.
- Table 8-20, State Highway Modernization Needs, identified the I-5 ramps at Brooklake Road. Notes congestion, delay, and queues onto the freeway. The needs identified are: Install traffic signals and turn lanes at ramp intersections; may need to adjust location of ramps.
- Table 8-24, Regional Planning Efforts and Studies, identifies a project to explore a potential new interchange in northern Marion County to alleviate problems on other interchanges (Brooks, Woodburn, Donald/Aurora).

Chapter 9 – Recommended Non-roadway Improvements

Recommendations for non-roadway improvements relevant to the interchange area includes rail improvements in the vicinity of the interchange. According to the RTSP:

> *"A new east-west rail spur has been constructed just north of Brooklake Road to connect a Morse Bros. gravel pit to the Portland & Western Railroad line. The new rail spur is currently in use, and some rock that would otherwise be shipped by truck is now being shipped by train. The County generally supports similar rail spurs when their merit can be demonstrated and the increased transportation efficiency would offset the negative impacts of the spur.*
>
> *Marion County also generally supports the development of intermodal freight transfer facilities, in which goods can be transferred from other transportation modes (particularly trucks) to rail. This could increase the viability of rail lines, improve the efficiency of transportation of these goods, and potentially reduce the number of truck miles traveled and the resulting impact of these trucks on the County Road system. Development of these transfer facilities is supported as long as the impacts of these facilities can be appropriately addressed. These transfer facilities could be particularly useful for shipping of agricultural commodities or industrial goods.*

However, care should be taken to avoid placing these transfer facilities where they would cause trains to block crossings on busy roadways."

For more recent information on development of intermodal freight transfer facilities in the Brooks-Hopmere community, see the summary of the Port of Willamette Proposal in this memorandum.

Additionally, a possible multi-modal trail is proposed to be located between I-5 and OR 99E (Portland Road), which intersects the Brooks community.

Chapter 10 - Policies

The RTSP policies are organized into four categories: 1) Transportation System Management (TSM) Policies 2) Roadway Maintenance and Preservation 3) Transportation Policies 4) Future Evaluation of Transportation Issues. Pertinent policies are listed below.

10.1.3 Access Management

Policy 1: Marion County adopts the following spacing requirements, shown in Table 10-1 (Table, 5 below), for new or modified accesses to County roadways. These spacing standards are measured from centerline to centerline of the respective accesses and/or adjacent roadways (see Policy 4 for variance criteria and Policies 5 and 6 for cases in which longer spacings may be required).

Table 3. RTSP Spacing Requirements for Access

FUNCTIONAL CLASS	ACCESS SPACING REQUIREMENTS
Arterials[1]	500' from any intersection with a state highway, arterial or major collector. 400' from any other intersection (including a private access).
Major Collectors	400' from any intersection with an arterial or state highway 300' from any other intersection (including a private access).
Minor Collectors	300' from any intersection with an arterial or state highway. 150' from any other intersection (including a private access).
Local Roads	200' from any intersection with an arterial or state highway. 100' from any intersection with a major collector, minor collector, or local road. 50' from any intersection with a private access.

Note: Standards are measured from the centerline of the driveway to the centerline of the adjacent facility.

Policy 5: In some cases, the requirements of another jurisdiction (such as the Oregon Department of Transportation) with roadways adjacent to a county road may be more restrictive than these requirements. When this is the case, the more restrictive requirement will be applied. This situation can occur at locations such as freeway interchanges.

Policy 7: Land use changes that could result in increased development levels and thus higher traffic levels will be assessed for their impact to current and future traffic volume and flow, and these impacts must be appropriately mitigated (as determined by the Public Works Director in accordance with applicable standards and practices) in order for the development to be allowed.

10.3 Transportation Policies

10.3.1 Transportation System Planning Policies

- *Policy 5: Levels-of-Service considered acceptable in rural areas include:*
  1) LOS D or better with a volume/capacity ratio (v/c) of 0.85 or better for signalized, all-way stop, and roundabout intersections.
  2) LOS E or better with a volume/capacity ratio (v/c) of 0.90 or better for other unsignalized intersections.
  3) LOS D or better with a volume/capacity ratio (v/c) of 0.60 or better for road segments.
- *Policy 8: The County recognizes the role of State Highways and County Arterials as the backbone of the transportation network. These roads are critical for everyday transportation and serve as critical lifelines in emergency situations. The County will support efforts to enhance and maintain the function of these roads through land use policies, access management strategies, and roadway improvements.*

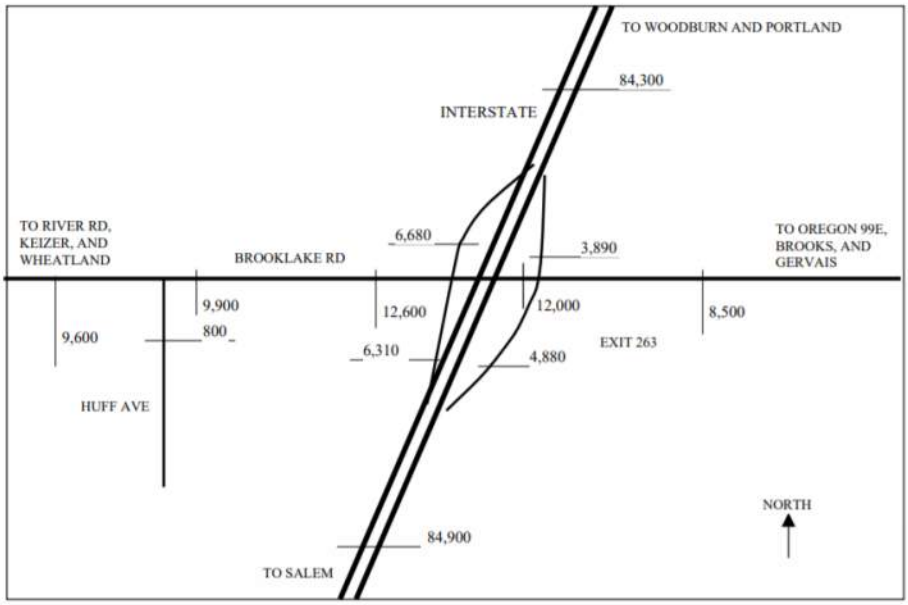
10.3.5 Development and Access Policies

- *Policy 1: Additional interchanges (access points) on Interstate 5 from the northern County line to the Chemawa Interchange, and from the Sunnyside Interchange to the southern County line will be discouraged (except for near Woodburn - see chapter 8), unless it can be shown through a comprehensive study and supported by the County that a new interchange is appropriate for regional access to the Interstate system.*
- *Policy 3: The County will consider and strive to minimize the negative impacts to surrounding land uses and communities in selection and implementation of transportation projects.*
- *Policy 10:*
  a) The number of access points on arterial and major collector roadways shall be kept to a minimum to reduce the interruption to traffic flow and to promote safety. All new or expanded-use accesses must meet the access management standards of this plan (see section 10.1.3).
  b) If a property is partitioned, all platted parcels of that property should use one common access to the road system.
  c) Loop driveways are discouraged
- *Policy 11:*
  a) Direct access to arterials from adjacent parcels should not be allowed if alternative access is available or can be made available.
  b) If a parcel has access options onto more than one roadway, the access should be derived from the road with the lower functional class, and, if of the same functional class, the road with the lower traffic volume and fewer potential conflicts.
  c) Likewise, where property abuts both a County or public use road and a State highway, the preferred access will be onto the County or public use road (unless the roads' functional classifications would indicate otherwise).

Chapter 12 – Sub-area Plans

The Brooks Interchange Area sub-area plan is found in in Section 12.1. The section includes traffic volumes; a level-of-service and volume/capacity analysis; an overview of the 1997 IAMP; and accidents history. It also provides an overview of issues (e.g., access management, bicycle/pedestrian access) and recommendations for the interchange. Figure 1 shows 2002 daily traffic volumes for the Brooks Interchange area.

Figure 1. Brooks Interchange Area Daily Traffic Volumes (2005)



In 2005, the exit ramps from I-5 to Brooklake Road exceeded the intersection capacity and did not meet OHP mobility standards (v/c=0.85). According to the RTSP, the "excessive vehicle delays caused by these capacity deficiencies are highly detrimental to the mobility of freight, agricultural goods, and passengers in the region. It is estimated to cost residents, businesses, and visitors over $1 million per year due to these delays." The plan also notes Brooklake Road intersections and access points that are approaching levels of congestions that warrant attention; they are located at Truckman Way, Pilot Auto driveway, and May Trucking driveway.

With regards to access management, the plan notes that ODOT and Marion County intend to move the intersection into further compliance with OHP access management standards, and "comply with the spirit of the OHP [access management] requirements, while at the same time recognizing that complete compliance with the letter of these requirements is not practical at this time due to existing development patterns, property lines, and land use cases."

Bike and pedestrian issues are also present in the area. There are currently no bike lanes in the interchange area, and only sidewalks in some portions. The subarea plan suggests bike lanes or adequate paved shoulders be provided on Brooklake as a condition of development.

Future Recommendations

The plan suggests Brooks is an ideal location for a rideshare/park and ride facility and suggests locations in the community have already been used for that purpose in an unofficial capacity (parking on a large pavement and gravel area east of the interchange).

The 1997 Brooks IAMP recommended improvements based on level of development around the interchange. With the highest level of development anticipated – specifically on an agricultural center on the NORPAC site – the recommended interchange improvements included:

- Signalization of the Brooklake Road intersections with the I-5 southbound ramps, the I-5 northbound ramps, and the east and west NORPAC accesses.
- Construction of a four-lane cross-section on Brooklake Road from the I-5 northbound ramps to the NORPAC east access, with turn lanes at the accesses.
- Construction of a loop ramp from westbound Brooklake Road to southbound I-5.
- Construction of an additional lane on both the northbound and southbound I-5 off ramps.
- Construction of a free right turn from the I-5 northbound off ramp to eastbound Brooklake Road.
- Improvements at the two NORPAC site access intersections with Brooklake Road, including double left turn lanes on eastbound Brooklake Road.

Project Relevance: The projects recommended in the RTSP, either proposed or already constructed within the study area, will be considered in the development of the IAMP. The IAMP will be adopted as an amendment to the RTSP and therefore will need to be found, or made consistent with, standards and policies in the RTSP.

Marion County Code (MCC) – Rural Zoning Title 17

The Marion County Code (MCC) Title 17, Rural Zoning, consists of Chapters 17.110 through 17.191. The MCC Title 17 regulates all land development within county lands outside of UGBs. Most chapters between Chapter 17.113 through 17.126 administer land development review and includes procedures and requirements for Conditional Use Permits, land division, variances, planned development and zone changes. Various zones and overlays are individual chapters from Chapter 17.128 to Chapter 17.182. Each zone establishes the zoning in the County, including the uses permitted and the site standards for each zone. The unincorporated community surrounding the interchange, Brooks-Hopmere, is zoned for industrial, commercial, public, and residential uses. A summary of the regulations for each zone are included in Table 4. Figure 2 shows the existing zoning in the community. North of the unincorporated community boundaries to the northwest and in the southeast quadrant of the interchange land is zoned Exclusive Farm and Forest Use (EFU). The EFU zone is limited to agricultural and forest uses and associated structures.

Table 4. Regulations of Brooks-Hopmere Zones

Zone	Permitted Uses and Lot Standards[11]
Unincorporated Community Industrial (IUC)	• Permitted uses – offices, agricultural services, manufacturing and processing, trucking, wholesale distribution. • Parcel Coverage – No more than 40% of a lot or parcel shall be covered by buildings • Sewage disposal – New or expanded uses must not exceed carrying capacity of community sewage disposal or on-site disposal • Traffic – A traffic impact analysis may be required, is required for buildings over 60,000 s.f.
Community Commercial (CC)	• Permitted uses – restaurant, small scale retail stores, auto repair, grocery store, and agricultural services, used car sales. • Lot area – New parcels must be a minimum of one acre • Parcel coverage – No more than 75% of a parcel shall be covered by buildings • Traffic – A traffic impact analysis is required for development in the zone.
Interchange District (ID)	• Permitted uses – service station, hotels/motels (up to 35 units), restaurants, RV park, retail, and wholesale. • Height – Industrial uses, maximum building height is 45 feet • Sewage disposal – New or expanded uses must not exceed carrying capacity of community sewage disposal or on-site disposal. • Traffic – A traffic impact analysis may be required for development in the zone.

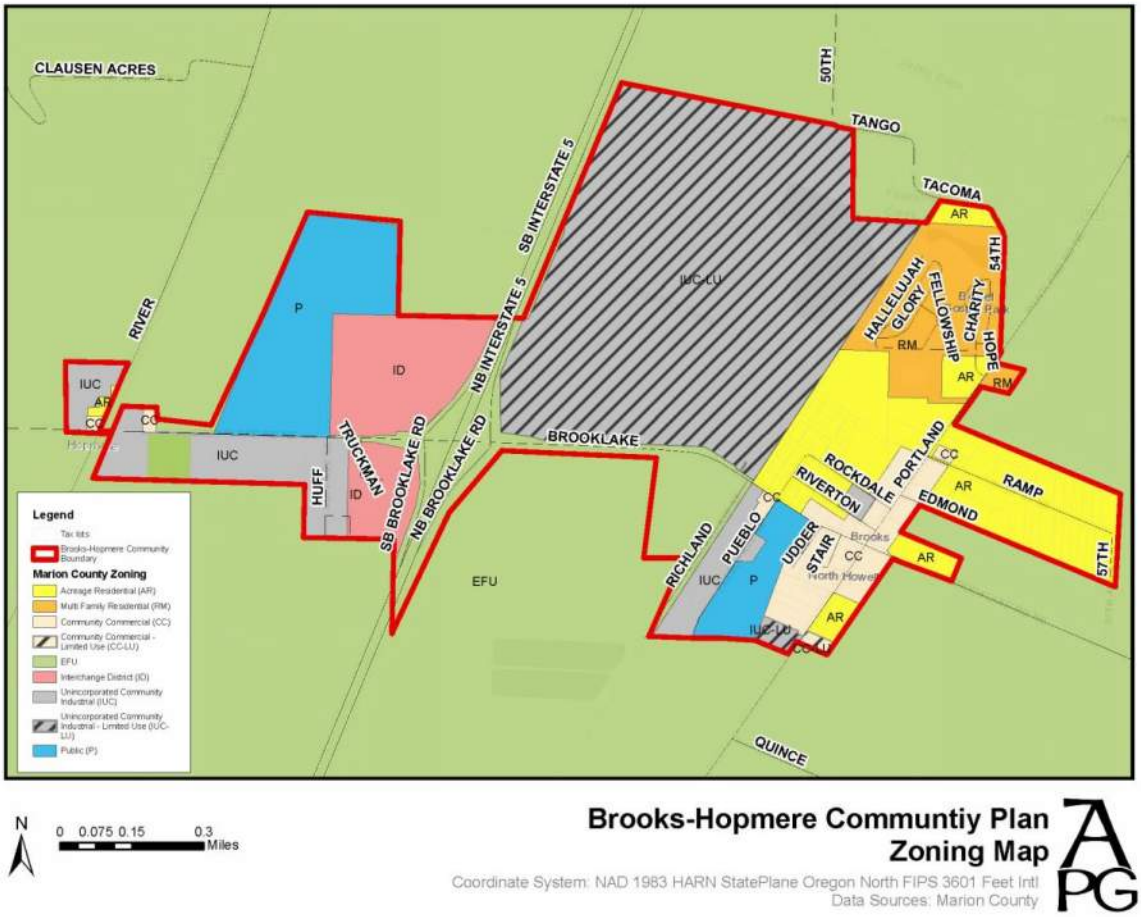
Public (P)	• Permitted uses – public uses such as schools, cemeteries, religious organizations, and public service buildings.
	• Height – Maximum building height, 70 feet
	• Lot coverage –
	  ○ No main building shall occupy more than 30% of the lot
	  ○ Commercial uses must be limited to 3,500 s.f.
	• Sewage disposal – New or expanded uses must not exceed carrying capacity of community sewage disposal or on-site disposal
	• Traffic – A traffic impact analysis may be required for development in the zone.

Acreage Residential	• Permitted uses – single family dwellings, farm uses, public facilities • Height – Maximum building height, 35 ft. • Minimum lot size – For subdivisions, partitions, or planned use developments, 2 acres.
Multifamily Residential (RM)	• Permitted uses – housing (duplexes, and single family dwellings), planned development, public facilities. • Lot area – Minimum lot area is 5,000 s.f. • Lot coverage – Main building(s) shall not occupy more than 40% of the lot area

[11] In addition to the zone standards described in the MCC, state regulations for Urban Unincorporated Communities also apply to the parcels in the Brooks-Hopmere Community boundary.

Zone	Permitted Uses and Lot Standards[11]
Limited Use Overlay (-LU)	• Applies to three properties in the community. • Is used to implement requirements associated with goal exceptions for the properties and to ensure properties do not exceed the capacity of local sewer and water systems. • Limits permitted uses on the site • For the NORPAC (now Oregon Potato) site, establishes specific performance metrics for the sewage disposal and transportation facility requirements.

Figure 2. Brooks-Hopmere Zoning Map



Site development standards are mostly contained within individual zone chapters. Chapters 17.113 Lot Area, Yard and Height Restrictions, and 17.118 Off-Street Parking and Loading also have site development standards. Transportation requirements through the County's code are included in Chapter 17.110, General Provisions. Chapter 17.110.770 regulates vision clearance area standards.

Chapter 17.110.780 designates minimum street width standards. The chapter does not list specific standards and includes instead references to the Marion County Public Works Engineering Standards (1990) for required street width standards based on TSP functional classifications. Table 5, below, shows

street dimension standards for rural roads, roads outside of UGBs and designated unincorporated communities in the County.

Table 5. Rural Geometric Design Standards

Road Classification	Traffic Volume	Minimum Right -of-Way	Minimum Pavement Width	Gravel Shoulders	Parking	Design Speed (mph)
Arterial	1,000 – 10,000	66’	28’	2’ both sides	None provided	35 – 55
Collector	500 -1,500	60’	22’	5’ both sides	None provided	35 – 55
Local	0 -500	60’	22’	5’ both sides	On Shoulder	30 – 50

(Source: Marion County Public Works Engineering Standards Table 2)

Project Relevance: The MCC contains land-use approval processes, requirements and local roadway standards that have a bearing on the function of the Brooks Interchange and the development of transportation improvements in the area. A possible outcome of the Brooks IAMP planning process is the need for local development requirements related to preserving the function and capacity of the interchange and ensuring the safety of those who use the facility.

Keizer Comprehensive Plan (2019)

The City of Keizer is located outside of the Brooks Interchange area to the south, but the community and its growth have a notable impact on the interchange. Today, many vehicular travelers use the Brooks interchange to access Keizer, a pattern that could likely increase with the growth of the city, especially at its northern edge.

The Keizer Comprehensive Plan is a long-range plan for guiding planning in the City of Keizer to the year 2033. The goal of the plan is to accommodate the conservation and development of Keizer’s resources, neighborhoods, and lands in a timely, orderly and efficient manner consistent with the needs and aspirations of present and future City residents.

Chapter II of the Comprehensive Plan addresses forecasts growth for the Keizer community and its connection to regional growth. It documents an imbalance of population and employment in Keizer. New development in Keizer is expected to come in two forms: 1) infill development within development neighborhoods, and 2) new development in vacant areas. The comprehensive plan encourages the emphasis on infill development in the next 20 years, based on citizen input. The community input suggested that the community preferred to not expand the Urban Growth Boundary, which influenced Urban Growth and Growth Management policies, including: *(1) Consider policies that enhance the efficient use of existing land within the UGB; (2) Review the long-term impacts to community livability of seeking additional land though expansion of the City’s UGB.* Although the Comprehensive Plan describes community desire to develop within the UGB, the plan describes the lack of quality land available for employment and industrial uses within the UGB, which could be an influencing factor in considering a UGB expansion.

Other relevant policies in the plan, related to growth include:

1) Ensure a coordinated, current, and vital urban growth program in the Salem/Keizer urban area[12]. This will be accomplished by:

> *a) Maintain a shared urban growth boundary through a coordinated regional effort.*
>
> *b) Adopt urban growth objectives and policies developed through a coordinated regional effort.*
>
> *c) Adopt a revised urban growth coordination agreement among the cities of Keizer and Salem and counties of Marion and Polk whereby land use actions of regional significance are considered by all jurisdictions.*

2) Conserve resources by encouraging orderly development of land by adopting efficiency measures that will further allow for the efficient use of urban land.

3) Preserve farmland and open space not needed for urban growth.

[…]

c) Coordinate with Marion County to ensure that the area outside the urban growth boundary will be maintained with low-density living areas, agricultural, open space lands, and other uses compatible with the intent of the urban growth policies.

> **Project Relevance**: As the closest city to the interchange, Keizer's growth could impact Brooklake Interchange operations; those potential impacts should be considered based on the growth projection in adopted city plans (i.e., Comprehensive Plan) and supplemental conversations with City staff. Potential impacts of future Keizer growth on the Brooklake Interchange is explored in the Keizer Growth Transportation Study, reviewed below.

Keizer Growth Transportation Impacts Study (2020)

The purpose of the Keizer Growth Transportation Study is "to illustrate the level of investment in the transportation system needed to support conceptual planned expansion of the City's Urban Growth Boundary (UGB)." The study evaluated a mix of proposed land uses for two candidate sites, referred to as Option 1 and Option 2, just north of the City limits. The two options are described below and their locations are shown in Figure 3.

Land Use Option 1 includes significant residential (multifamily) development within the existing UGB, and an expansion of 63 acres of employment land along the north edge of Keizer. The employment expansion is expected to add an additional 350 PM peak hour trips to the future roadway network, with the area connecting to River Road.

Land Use Option 2 includes expansion of residential and employment areas outside the UGB. The anticipated growth includes 259 multi-family and 1,731 single family units and 120 acres of employment

[12] Keizer shares its UGB with Salem through a voluntary joint agreement. The Regional Comprehensive Plan Coordination Association includes Keizer, Salem, Turner, Marion and Polk Counties and established the Salem Keizer Area Planning Advisory Committee (SKAPAC). The SKAPAC included goals and process designed to guide the jurisdictions in developing a coordinated regional response to legislative land use decisions while not impinging on the local legislative authority. The Keizer comprehensive plan recognizes the value of such an approach and believes that the involved jurisdictions must continually evaluate and update this agreement to adequately meet the changing nature of growth and development of the region.

(80 industrial and 40 commercial). This growth is expected to generate an additional 1,660 PM peak trips to the future road network, a significantly higher number than Option 1.

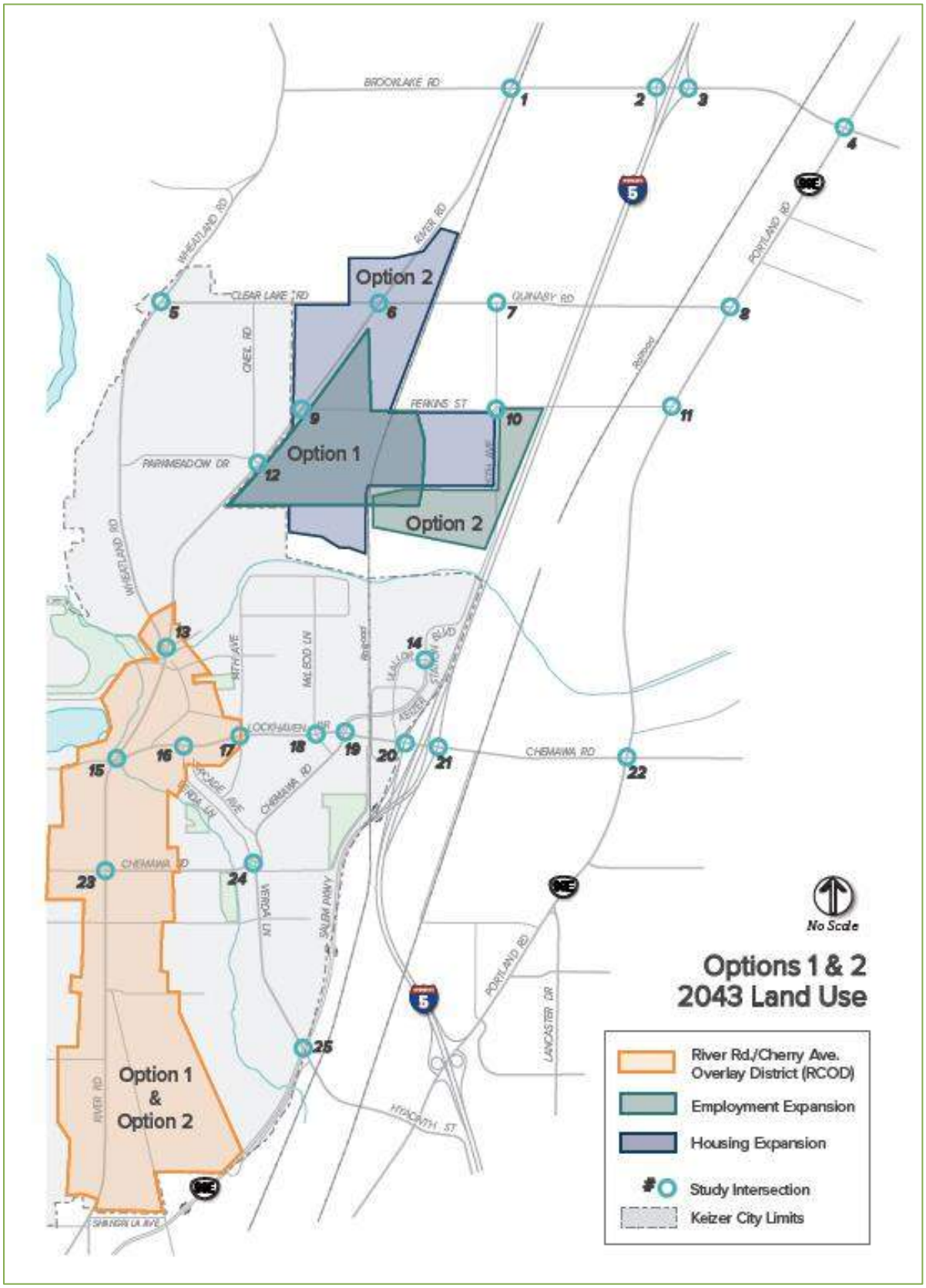
The project described the transportation impacts of each option, taking into consideration the planned projects expected to be completed within the planning horizon (2043).[13] If the projects are not completed in the planning horizon and UGB expansion occurs, traffic forecasting indicates it will cause severe congestion at numerous intersections, including the River Road / Brooklake Road intersection. Additionally, the traffic modeling for both options anticipated added trips north on River Road to Brooklake Road in order to access I-5. Option 2 is forecasted to have a more significant increase in trips in that area. For both options, the transportation system improvements recommended include upgrading River Road to 5 lanes (in the County and City).

Further, the study emphasized recommended transportation studies and planned improvements that would impact the expansion areas. Improvements to Brooklake Interchange, both north and south bound ramp terminals, are included in the list. The listed projects are expected to be needed to accommodate growth that occurs in Keizer by 2043, regardless of a UGB expansion. My quick review shows that both of the Growth Scenarios/Land Use Options would increase traffic through the Brooks Interchange, particularly between River Rd and the interchange. The analysis assumes 3 RTSP projects are completed within the Brooks IAMP study area by 2043 and identifies necessary improvements to the interchange ramp terminals.

> **Project Relevance**: The expected traffic generated by either growth option studied would have an impact on the Brooklake Interchange and surrounding roadways. Option 2 is projected to generate more trips to the Brooklake interchange than Option 1. The planned RTSP Brooklake Interchange improvements will be considered in the development of the IAMP; ramp terminal improvements will be revisited and potentially revised through the current planning process.

[13] RTSP projects located in the Brooklake IAMP study area include M029, M039, and M094.

Figure 3. Keizer Transportation Impacts Study – Options Areas



Keizer Transportation System Plan (2009)

The purpose of the Keizer Transportation System Plan (TSP) is to provide a framework of goals, objectives, and recommended policies that will guide efforts for achieving an acceptable level of transportation facilities and services through the year 2031.

The goals of the TSP which are pertinent to the Brooks IAMP include:

- *Goal 4: Provide efficient and comprehensive linkages between all modes of transportation.*
- *Goal 6: Support a public transit system for all Keizer residents focusing on accessibility and mobility*
- *Goal 9: Reduce the single occupant vehicle demands on the current and future transportation system.*
- *Goal 11: Maximize the efficiency of the existing surface transportation system through management techniques and facility improvements.*

The Keizer TSP includes a Transportation System Management section which identifies projects based on the needs analysis. River Road is a major arterial that connects Keizer to Brooklake Road, which leads to the Brooks Interchange. Several intersection improvements are recommended for River Road to operate near or over level of service standards by the year 2031. The River Road intersections are at: Wheatland Road, Lockhaven Drive, Chemawa Road, Dearborn Avenue, and River Road/Manbrin Drive.

Several other improvements described in Chapter 9 have connections to the Brooks Interchange. The improvements are as follows:

- Bike lanes along Wheatland Road and River Road, two major connectors to Brooks.
- Transit in Keizer is also served by Cherriots. A new transit Center is proposed for Keizer, within the vicinity of the intersection Chemawa Road and River Road. *(Note: Transit Center was built in 2013.)*
- Improvements to the intersection of River Road and Wheatland Road (identified as Project R3, a near-term project) The recommended improvements are:
    - Construction duel northbound left-turn lanes
    - Change northbound/southbound to a protected left-turn phase.
    - Extend length of second southbound through lane.

  Project Relevance: The Brooks Interchange is not located in Keizer. However, Keizer is a growing city; it expects some growth north towards the interchange and many travelers use the Brooks Interchange to access Keizer. The transportation policies and relevant projects listed in the plan could influence the transportation system operations at and around the Brooks Interchange.

Salem-Keizer Transit Long-Range Regional Transit Plan (2013)

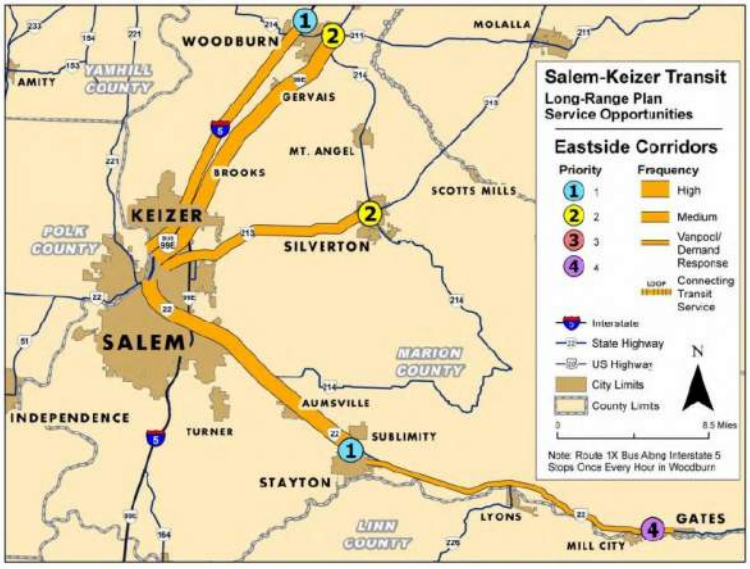
Salem Area Mass Transit District, or Cherriots, provides transit service in Salem, Keizer, rural Marion, and Polk Counties. The agency provides several types of service: 1) “Cherriots,” fixed-route service within the Salem-Keizer Urban Growth Boundary (UGB), 2) “Cherriots LIFT,” a curb-to-curb Americans with Disability Act (ADA) paratransit program, 3) “Cherriots Regional,” the fixed and flexible route program that serves rural areas in Marion and Polk Counties, and 4) “Cherriots Trip Choice,” a vanpool and rideshare program.

The Salem-Keizer Transit Long-Range Regional Transit Plan (LRRTP) provides long-term strategic guidance for area transit service over the next 20 years and a blueprint for operations for the next 20 years. It provides the basis and justification for seeking transit funding for service investments. The plan also addresses coordination with other transit agencies in the region to integrate service and create efficient transit connections. The study area for the LRRTP includes the IAMP project study area and generally lies along the I-5 corridor from Wilsonville to Albany.

The plan describes a prioritized list of recommended improvements. Project prioritization is based on professional judgement with regard to ease of implementation, relative need based on the travel market assessment, cost, and input from the project advisory committee and management team.

Currently, two routes pass through the Brooks Interchange area. The Woodburn-Salem Corridor, Route 10X, which uses OR 99E (Portland Road) in the study area. Transit demand for the corridor is expected to increase due to expansion of the Chemeketa Community College Brooks campus. The other service through the area is along the I-5 corridor, the 1X Wilsonville – Salem (Route 1X), which does not have stops in the Brooks community. The plan recommends the two routes remain as separate distinct services. Figure 4 shows the separate corridors (routes) and their priority level.

Figure 4. Eastside Corridor Priorities



The relevant projects recommended for the short term are adding a stop at the Chemeketa Community College Brooks Campus and a stop at the Keizer Transit Center. The medium- and long-term projects recommend expanding hours and frequency of service, including weekend and late night service.

> **Project Relevance**: The Regional Transit Plan encourages coordination between transit agencies in the Salem/Keizer region and provides operational planning and a prioritized list of improvements for Cherriots, the transit provided in the Brooks Interchange area. The improvements described in the plan, including a new stop at Chemeketa Community College, should be considered in the Brooks IAMP planning process. Cherriots should also be involved

and informed through the process to the extent that access to transit or transit ridership and planned future operations is expected to be impacted by IAMP recommendations

Salem-Keizer Area Transportation Study (SKATS) RTSP (2019-2043)

The Salem-Keizer Area Transportation Study (SKATS) Regional Transportation Systems Plan (RTSP) is the long-range transportation plan of the Salem-Keizer Metropolitan Planning Organization (MPO) to identify the policies, projects, and strategies needed to prepare the regional transportation system for growth in population, employment, and travel demand. The RTSP reviews policies, goals and objectives, multi-modal systems, funding sources, and SKATS projects. Outstanding issues are addressed in the plan related to projects and programs where there are funding deficiencies for the 24-year forecast and that will require identifying additional funding sources.

The existing conditions analysis provides the following information on the interchange area.

- The functional classifications for the roads in the study area: I-5, Interstate/Freeways, and Brooklake Road, Minor Arterial.
- Serious injuries have occurred from accidents at several intersections along Brooklake Road.
- Brooklake Road bridge (owned by ODOT) is listed as a bridge that is potentially vulnerable to seismic events (Table 5-14).

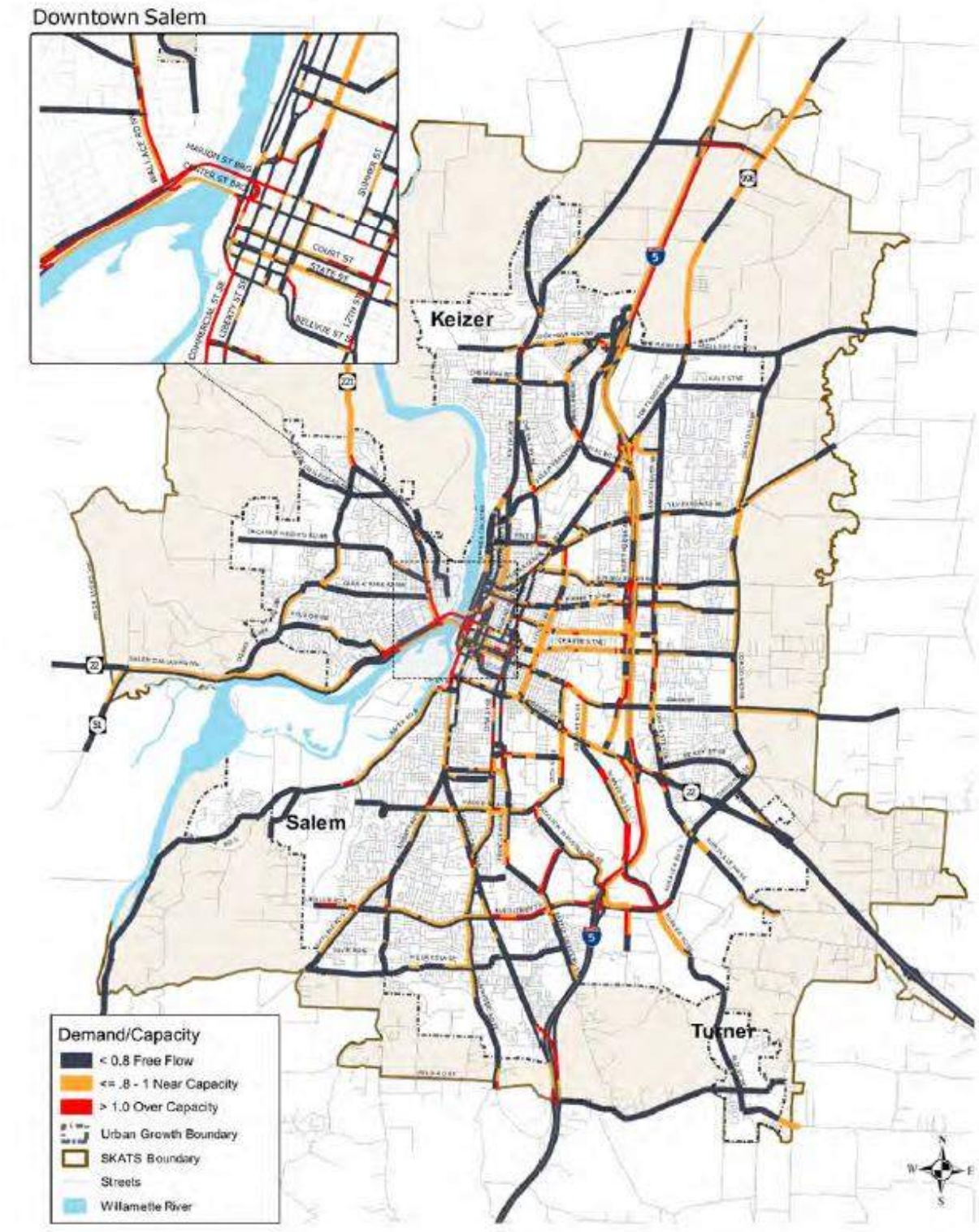
Figure 5 shows the Demand to Capacity on Regional Road in 2043 with proposed projects in the RTSP.

Recommended improvements located in the interchange vicinity are:

- Brooklake Road: River Road to Huff Avenue – Project No. M094. Description: Widen to two lanes each direction with turn lanes. Funding: Assume 50% is developer funded. Cost, $4 million, estimated year of cost $5.6 million.
- Brooklake Road & Huff Avenue – Project No. M039. Description: Add traffic signal and turn lanes. Funding: Assume 50% developer funded. Cost, $2.5 million, estimated year of cost, $3.5 million.
- River Road & Brooklake Road – M029. Description: Signalize and realign intersection. Funding: Assume 50% developer funded. Cost, $2.5 million, estimated year of cost, $3.1 million.

Project Relevance: The projects recommended in the SKATS RTSP, either proposed or already constructed within the study area, will be considered in the development of the IAMP. The IAMP will be adopted as an amendment to the regional plan and therefore will need to be found to be, or made, consistent with standards and policies in the RTSP.

Figure 5. Demand to Capacity on Regional Roads in 2043 with Proposed Projects.



May Trucking Traffic Impact Analysis - Brooklake Road / I-5 Interchange Transportation Study (2019)

The purpose of the study was to evaluate the existing and future traffic operations of Brooklake Road and the interchange ahead of the next IAMP; the evaluations accounted for proposed expansions to May Trucking facilities and operations (not yet completed as of 2020). The study was conducted in two parts:

- Short-term evaluation of existing roadway traffic operations and the impact of proposed May Trucking expansions out to 2025; and
- Long-term evaluation of a partial cloverleaf interchange (originally proposed in the 1997 IAMP) and projected traffic out to 2040.

Existing Conditions

The short-term evaluation found four intersections that currently exceed mobility targets and recommends the following mitigations:

- River Road & Brooklake Road – signalize the intersection and add northbound and southbound left turn lanes
- I-5 Southbound Ramps & Brooklake Road – signalize the intersection and widen the ramp to allow for two approach lanes
- I-5 Northbound Ramps & Brooklake Road – signalize the intersection and widen the ramp to allow for two approach lanes
- May Trucking Access / Pilot Access & Brooklake Road – the accesses are too close to the interchange ramps and should be closed (the study provides a plan for alternate access via Huff Avenue)

May Trucking Expansion Impacts

The proposed May Trucking expansion also would cause the Huff Avenue and Brooklake Road intersection operation to exceed mobility targets. The intersection was recommended for signalization and turn lane additions to accommodate the additional traffic. Various turn lane additions were also recommended at the four intersections listed above.

Future Conditions

A partial cloverleaf interchange, originally proposed in the 1997 IAMP, is expected to operate acceptably out to 2040. By 2040, three intersections along Brooklake Road are expected to exceed mobility targets. The Brooklake intersections and the recommended mitigation for each are described below:

- River Road – Install a westbound right lane and associated traffic signal modifications. Planning level cost estimate: $600K.
- Huff Avenue – Install southbound and northbound right turn lanes and associated traffic signal modifications. Planning level cost estimate: $600K.

- OR 99E (Portland Road) – Install dual left turn lanes on the eastbound approach and an additional receiving lane on the north leg, and single left turn lane on the westbound approach. Planning level cost estimate: $1.9 million. [14]

Project Relevance: May Trucking Headquarters is a notable freight company in the Brooks-Hopmere Community, one that greatly relies on access to the interchange. In the planning and designing of the Brooks Interchange improvements, the impacts to May Trucking and access from other notable businesses will need to be considered. Recommended improvements from the traffic impact analysis will be reviews as part of the IAMP planning process.

Brooks-Hopmere Community Plan (2000, Update in Progress[15])

The Brooks-Hopmere Community (BHC) Plan, adopted in 2000, inventoried existing conditions, created comprehensive plan policies, and established the community boundary of Brooks-Hopmere as an urban unincorporated community. In 2019, Marion County began the process of updating the 2000 Brooks-Hopmere Community Plan to better understand current conditions and plan for the future of the community. The purpose of the update is to develop a plan for capitalizing on the identified opportunities and resources in the BHC. The work describes a desired future of the BHC based upon a cohesive community-driven vision developed through an understanding of existing conditions and communications with community stakeholders. It is intended to guide decisions for the next 15-20 years, but within the context of an even longer horizon (e.g., 50 years or beyond). The plan also is intended to help the community and the County proactively prepare for and address the outcomes of the IAMP planning process, particularly impacts on access to local businesses, potential impacts on future residential development, and mobility within and in and out of the area for local residents, workers and visitors.

Existing Conditions

The community has many assets including its vicinity to the interstate, employment and businesses in the community, as well as the community spaces such as Antique Powerland and Chemeketa Community College. For an unincorporated community, Brooks-Hopmere has a thriving businesses community; approximately 1,500 people are employed by businesses located in the area. In comparison, the residential population is much smaller, at approximately 550.

One of the identified constraints in the community is transportation infrastructure. Specifically, "transportation infrastructure is unable to handle current demand, resulting in congestion, especially when carrying overflow traffic from I-5 to OR 99E (Portland Road). The road system also is lacking connectivity which is further hampered by barriers created by existing rail lines."

Vision

The plan vision is for a continuing thriving business community with employment and community services that include:

- A hub of jobs and services that support the local and regional agricultural industry and economy.
- Improved, well-designed and functioning roads, rail and other transportation facilities, that continue to serve local businesses, travelers, and the surrounding area.

[14] Summary of report is an excerpt from the Keller Associates, Brooks-Hopmere Community Plan Update, Transportation Existing Conditions Summary dated January 13, 2020.
[15] The plan update is scheduled to be reviewed by the Marion County Board of Commissioners in Fall or early Winter 2020.

- A stronger sense of community and the ability for local businesses and residents to advocate for future improvements that support the community's vision.
- Reliable, resilient, and sustainable infrastructure that serves businesses and residents in a cost-effective manner and provides opportunities for desired growth and expansion in the future.
- Continued emphasis on serving, supporting and preserving surrounding agricultural land and enterprises by focusing non-resource based development within the community boundary.

The strong Brooks-Hopmere business community is anticipated to experience growth through the expansion of existing businesses, as well as the potential introduction of new businesses in the area. While there is available land for growth within the community boundary, substantial infrastructure improvements are required to accommodate any significant growth and new funding sources for those improvements will need to be identified.

Recommended Transportation Improvements

The update identified transportation needs and community intentions for the improvements within the community:

- Improve the function of the I-5 interchange, allowing more efficient and safe access to and from I-5 and Brooklake Road.
- Provide non-vehicular connections (i.e., bicycle and pedestrian) between the Brooks and Hopmere and within the individual communities.
- Reduce congestion along major roadways in the community.
- Improve access to properties along Brooklake Road.

The transportation improvements recommended through the plan update are as follows:

- Plan for Brooklake Road to be a five-lane section at a minimum, with right-of-way to accommodate 10-foot multi-use pathways on both sides. The future roadway section will be further defined in the upcoming Interchange Area Management Plan (IAMP) and will be aided by the latest traffic forecasts provided by the Salem-Keizer Area Transportation Study (SKATS).
- In line with recommendations from previous studies, install traffic signals and appropriate turn lanes at the following intersections:
    - River Road & Brooklake Road
    - Huff Avenue & Brooklake Road
    - I-5 Southbound Ramps & Brooklake Road (reevaluate when the interchange is reconstructed)
    - I-5 Northbound Ramps & Brooklake Road (reevaluate when the interchange is reconstructed)
- Build out the Collector network on all four quadrants of the interchange (at ¼ to ½ mile spacing) to allow alternate access for businesses and developments and to support future access management efforts along Brooklake Road. This will involve utilizing or upgrading existing railroad crossings to relieve pressure on the River Road and OR 99E (Portland Road) intersections with Brooklake Road.
- Utilize Union Pacific Railroad and Portland & Western Railroad for freight and passenger transport whenever feasible.

- Minimize impediments to truck travel between I-5 and businesses/developments along Brooklake Road.
- Encourage (with guide signage) east-west pass-through traffic to use the I-5 overpasses at Quinaby Road to the south, or Waconda Road to the north, instead of Brooklake Road.
- Solutions to transportation issues are the highest priority for residents and stakeholders. Existing traffic congestion should be mitigated before allowing, or as part of, new development.
- A center turn lane on Brooklake Road and OR 99E (Portland Road) would improve access for businesses and provide a median refuge for business traffic turning into and out of driveways.

Project Relevance: The Brooks-Hopmere Community Plan update details Marion County's plans for the community and reflects community input. Those plans and recommended transportation improvements will be considered in the development of the Brooks IAMP.

Port of Willamette Intermodal Facility Project Plan (2018)

The Oregon Port of Willamette developed its proposal for an intermodal and transload facility in Brooks, with the goal of establishing an intermodal facility in the Mid-Willamette Valley that will reduce congestion in the Portland area and that will enable farmers in the Willamette Valley to ship their products in a fashion that is predictable, reliable, and cost-effective. The facility would facilitate the transfer of freight between trucks and rail and demonstrates a demand for rail service.

The Project Plan includes an analysis of traffic impacts the facility would have. The findings of the transportation study were:

> *"*Without any funded improvements to the current system, the forecasted traffic operations without the proposed project is expected to exceed the applicable mobility targets at two intersections within the study area: River Road at Brooklake Road and the I-5 Northbound Ramp Terminal at Brooklake Road.
>
> The proposed project is expected to contribute less than 3.5% of the average daily traffic (ADT) and between 0.5%-4.8% of the total entering volume during the AM and PM peak hours.
>
> The added volume will exacerbate the existing operational concerns at River Road at Brooklake Road and at the I-5 Northbound Ramp Terminal, but will not cause any additional study intersections to exceed their applicable mobility targets. The two intersections that are expected to exceed mobility targets in 2038 with the intermodal facility would also exceed capacity without the project*."*

The traffic analysis determined that mitigation for these impacts is needed and could be achieved through a variety of methods, including:

- Transportation Demand Management (TDM): The facility will direct operations to ensure that truck and vehicle traffic to and from the facility occurs during off-peak hours to reduce impacts on the regional transportation network.
- Road Improvements and/or Proportionate Share Contributions (Should TDM measures or other accommodations not fully mitigate the impacts):
  - River Road at Brooklake Road: Financial contribution toward the signalization of the intersection that is proportional to the level of impacts.[1]

- I-5 Northbound Ramp Terminal at Brooklake Road:
    - Extend deceleration length of northbound exit ramp to accommodate queue and formally stripe northbound left-turn lane
    - Signalization of the northbound ramp terminal (pending approval from ODOT)
    - Proportional contribution toward rebuilding of Brooks Interchange

The report states the mitigation "is achievable through a variety of methods that are representative of a fair share of the impacts." Coordination with ODOT and Marion County will be required to agree on the appropriate mitigation for additional traffic anticipated to travel through impacted intersections at completion of the proposed intermodal facility.

The Brooks Facility was not awarded the desired grant funding from Connect Oregon. In 2019, $25 million of grant funding was awarded for a facility in Millersburg. However, proponents of the facility in Brooks are continuing to advocate for an intermodal facility in the Willamette Valley between Salem and Portland, with Brooks still being identified as a potential location. One of the primary hurdles for obtaining additional support and funding will be negotiating an agreement for rail service at the proposed site.

> **Project Relevance**: The proposed facility could have an impact on future operations of the interchange. The potential impacts of a potential facility should be noted and considered in designing interchange improvements.

3 TECHNICAL MEMORANDUM #3

Evaluate Existing Conditions (including Traffic Analysis Methodology)

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TECHNICAL MEMORANDUM #3

Evaluate Existing Conditions – Final (Task 4.5)

Date: February 25, 2021

To: Oregon Department of Transportation, Region 2
Marion County

From: David Evans and Associates, Inc.

Subject: I-5: Brooks Interchange Area Management Plan (Exit 263)

Contents

This memorandum provides a summary of the existing transportation conditions related to Interchange 263. It also identifies potential constraints found within the interchange area management plan (IAMP) study area as it relates to the various modes. The documentation of potential land use and environmental constraints will be in a separate memorandum (*Technical Memorandum #5*).

Study Area

The IAMP study area delineates the vicinity in which transportation facilities, land uses, and approaches may affect operations at the interchange. The boundaries of the management area for the IAMP should extend a minimum of ½ mile in all directions and should be large enough to "address both direct and indirect transportation and land uses." [1] The study area, shown in Figure 1, encompasses the existing interchange and the surrounding areas served by the rural interchange.

The study area extends just over ½ mile west of the southbound ramp terminal to include the intersection of River Road and Brooklake Road. It also extends just over ¾ mile to the east of the northbound ramp terminal to the intersection of Portland Road (OR 99E) and Brooklake Road. Most of the local traffic using I-5 Exit 263 passes through one of these two intersections. Understanding how these intersections operate and their relationship to the interchange traffic flow is a key part of the IAMP planning process.

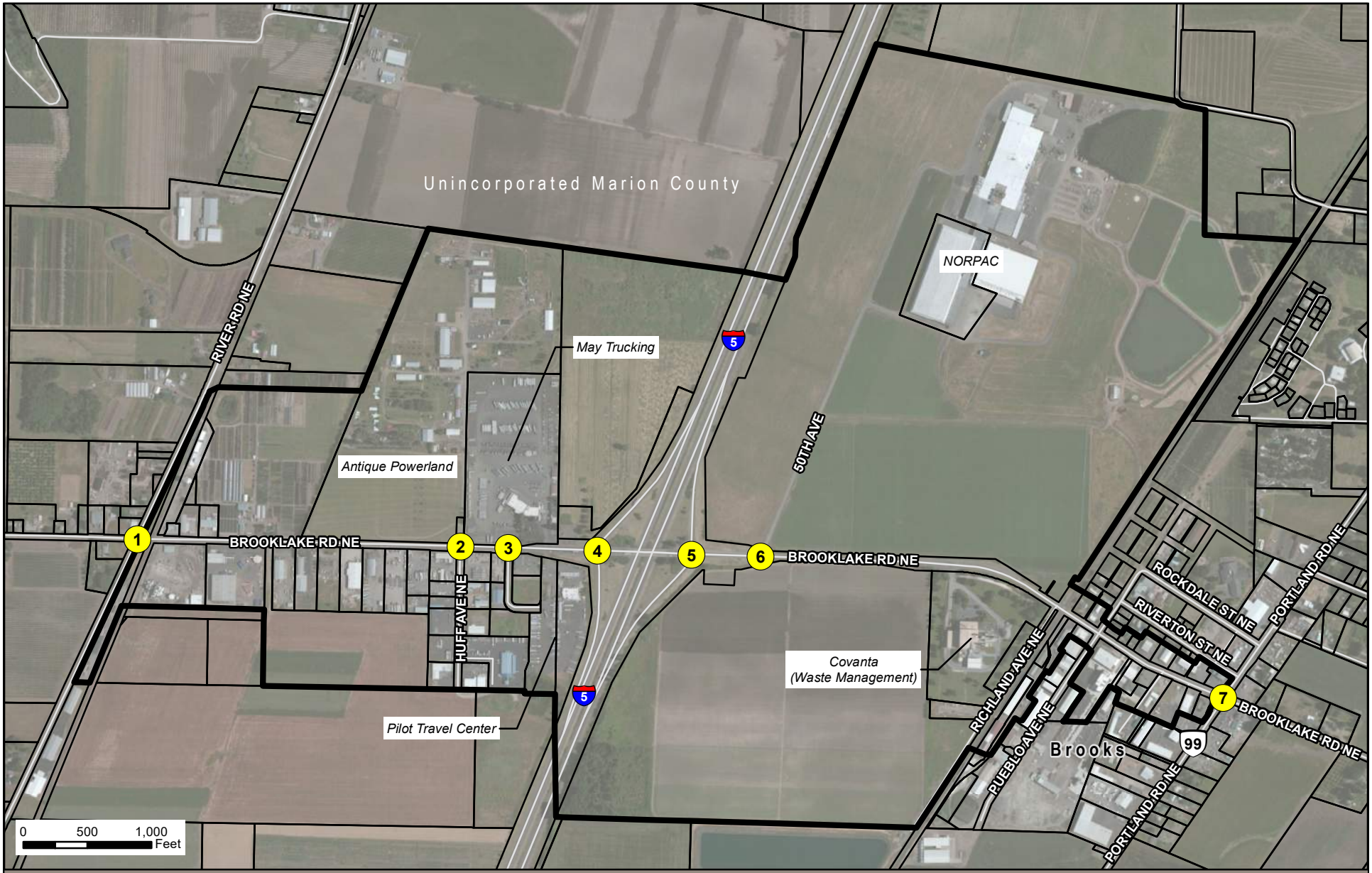
The scope identified seven study intersections, as shown in Figure 1:

1. River Road at Brooklake Road
2. Huff Avenue at Brooklake Road
3. Truckman Way (Pilot Travel Center access) at Brooklake Road
4. I-5 Southbound Ramp Terminal at Brooklake Road
5. I-5 Northbound Ramp Terminal at Brooklake Road
6. 50th Avenue (NORPAC Access) at Brooklake Road
7. Portland Road (OR 99E) at Brooklake Road

The I-5 Brooks Interchange is also used for regional travel between I-5 and OR 99E and is used as part of temporary detour routes when incidents occur on I-5. These detour routes are mapped in Marion County's Rural Transportation Plan (2005) and include "Primary" and "Alternate" detour routes on Brooklake Road between River Road and Portland Road (OR 99E), and on River Road and Portland Road (OR 99E) north of Brooklake Road. Portland Road (OR 99E) south of Brooklake Road is a "Primary" detour route.

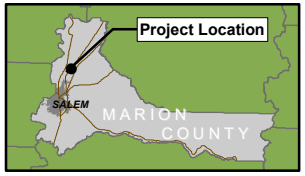
The adjacent interchanges on I-5 are at Exit 271 (Woodburn) nearly eight miles to the north, and at Exit 260 (Chemawa Road) approximately three miles to the south.

[1] Interchange Access Management Plan Guidelines, ODOT, April 2013.



Brooks Interchange Area Management Plan

N



Study Area
Study Intersection
Tax Parcel
Road

Figure 1
Study Area

Data Sources: Marion County, 2020

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Existing Transportation System Inventory

Roadway Classifications

The jurisdiction, functional classification, other special designations, number of lanes and posted speeds of study area roadways are listed in Table 1.

The major roadways in the study area are classified as arterial roadways, which suggest the primary objective of these routes is to efficiently move high volumes of traffic over long distances. The Federal and State designations of I-5 as a truck/freight route highlight the national and local importance of accommodating the movement of large vehicles, which is consistent with many of the land uses present in the interchange area.

Table 1. Roadway Jurisdiction and Functional Classification

Roadway/ Highway Name	Jurisdiction	OHP Highway Classification (Other Designations)	ODOT Functional Classification	County Functional Classification (Other Designations)	No. of Lanes	Posted Speed
Interstate 5 (I-5)	ODOT	Interstate (NHS, FR, TR, HCR, RRR, SP1, NN)	Interstate Hwy	Principal Arterial	6	65 mph
I-5 Ramps	ODOT	Interstate (NHS, FR, TR, HCR, RRR)	Interstate Hwy	-	1	45 mph[1]
Brooklake Rd	Marion County/ ODOT[2]	-	Minor Arterial[3]	Arterial (Detour Route: Primary & Alternate [River Rd to Portland Rd])	2-3[4]	45 mph
River Rd	Marion County	-	Minor Arterial	Arterial (Detour Route: Primary & Alternate [north of Brooklake Rd], Primary [south of Brooklake Rd])	2	55 mph
Huff Avenue	Marion County	-	Local	Local	2	25 mph[5]
Truckman Way	Marion County	-	Local	Local	2	25 mph[5]
50th Ave	Private	-	-	Private	2	45 mph[6]
Portland Rd (OR 99E)	ODOT	Regional (RRR, SP3, NN)	Minor Arterial	Arterial (Primary & Alternate Detour Route [north of Brooklake Rd])	2	40 mph

Sources: ODOT TransGIS and *Marion County Rural Transportation System Plan*
Acronyms: NHS: National Highway System; FR: Freight Route; TR: Truck Route; HCR: High Clearance Route; RRR: Reduction Review Route; SP#: Seismic Program Highway (1-4); NN: National Network

1. Advisory speed.
2. Brooklake Road is under ODOT jurisdiction from approximately 125 feet west of the southbound ramp terminal to approximately 325 feet east of the northbound ramp terminal.
3. Brooklake Road becomes a Major Collector west of River Road and east of Portland Road (OR 99E).
4. Brooklake Road includes short sections of two-way left-turn lanes and designated left-turn pockets.
5. No posted speed; assumed 25 mph.
6. No posted speed; assumed 45 mph.

Geometric Characteristics

The interchange itself has a standard diamond layout and both the northbound and southbound ramp terminals are STOP-controlled. The bridge over I-5 is three lanes wide a single sidewalk on the south side and no bike lanes. The existing pavement widths and condition of study area roads are summarized in Table 2.

Table 2. Typical Roadway Characteristics

Roadway Segment	Lane Widths (ft)		Shoulder Widths (ft)		Pavement Width (ft)[1]	Pavement Condition
	SB/WB	NB/EB	SB/WB	NB/EB		
I-5 Southbound Mainline (3 travel lanes)	12	12	10	10	56	Very Good
I-5 Northbound Mainline (3 travel lanes)	12	12	10	10	56	Very Good
I-5 Southbound Exit Ramp[2]	16	N/A	3	6	25	Very Good
I-5 Southbound Entrance Ramp	16	N/A	3	8	27	Very Good
I-5 Northbound Exit Ramp[2]	N/A	16	6	4	26	Very Good
I-5 Northbound Entrance Ramp	N/A	16	5	4	25	Very Good
Brooklake Rd (Marion County)						
West of Interchange						
River Rd – Huff Ave	12	12	2	2	28	Very Good
Huff Ave – ODOT ROW	12	12	3-6	3-6	30-48[3]	Very Good
Brooklake Rd (ODOT) – West to East						
MP 263.39 – MP 263.41	12	16	6	12	58[3]	Good
MP 263.41 – MP 263.52	12	16	6	6	46[3]	Good
MP 263.52 – MP 263.56	12	16	6	6	40	Good
MP 263.56 – MP 263.61	16	16	6	6	56[3]	Good
MP 263.61 – MP 263.63	16	16	3	8	43	Good
Brooklake Rd (Marion County)						
East of interchange						
ODOT ROW (east) – SPRR Xing	12	12	5	5	34	Good
SPRR Xing – Portland Rd (OR 99E)	12	12	5	5	34	Good
River Rd						
Buena Crest School – Brooklake Rd	12	12	6	4	34	Good
Brooklake Rd – Waconda Rd	11	11	5	5	22	Very Good
Huff Avenue						
South to dead end – Brooklake Rd	N/A	N/A	N/A	N/A	34	Good
Brooklake Rd – North to gate	N/A	N/A	N/A	N/A	22	Good
Truckman Way	N/A	N/A	N/A	N/A	34	Good
50th Ave	12	12	N/A	N/A	24	Good
Portland Rd (OR 99E)						
MP 41.21 – MP 41.24 (north leg)	12	12	N/A	N/A	51[4]	Fair
MP 41.24 – MP 41.34 (south leg)	17	17	N/A	N/A	47-48[4]	Fair

Sources: ODOT TransGIS, ODOT Highway Inventory Detail Report and *Marion County Rural Transportation System Plan, Appendix B (2012)*

Acronyms: SB = Southbound; NB = Northbound; WB = Westbound; EB = Eastbound; MP = Mile Point

1. Pavement width is listed for ODOT facilities while right-of-way (ROW) width is listed for Marion County facilities.
2. Presence of right-turn flares.
3. Median present
4. Turn lane(s) present

The existing geometric design of the interchange does not meet some of the current design guidelines, which raises potential safety and operational concerns at the interchange as summarized by ODOT in the *I-5 State of the Interstate Report*. The geometric deficiency assessment, conducted in 2000, reached the following conclusions:

- The sight distance is limited at both the northbound and southbound ramp terminals.
- The deceleration lane length is too short on both the northbound and southbound exit ramps.
- The acceleration length of the southbound entrance ramp is substandard.
- Adjacent public road accesses on the west side are too close to the ramp terminals.
- The sight distance of crossroad is substandard for the operating speed.

Access Inventory

Access inventory data was obtained from aerial photography and Marion County tax parcel data for Brooklake Road from River Road to Portland Road (OR99E). This data includes public street intersections and public/private approaches to Brooklake Road. A total of 74 accesses were identified: 34 on the north side, 40 on the south side. The access points are summarized in Table 3.

When compared to the applicable OHP spacing standards, few of the driveway accesses meet current spacing standards based on roadway jurisdiction. There are twelve access points within a quarter mile of the northbound and southbound ramp terminals. None of these access points meet the 1,320 feet (1/4 mile) spacing standard set forth by ODOT.

Table 3. Brooklake Road Access Inventory

ID	Public vs. Private	Site Use	Tax Lot Number	Distance to Next Access (ft.)	Access Road Width (ft.)
Access Points on the North Side of Brooklake Road					
1	Private	Center Market Hopmere	062W18BC00800	60	83
2	Public	River Rd (north)	--	75	30
4	Private	Railroad	--	23	43
6	Private	A G Marion Services	062W18BC00701	32	31
8	Private	Contractor Sales & Services	062W18BC00600	27	94
10	Private	3655 Brooklake Rd	062W18BC00500	0	130
11	Private	De Laval	062W18BC00400	274	129
13	Private	Van's Nursery	062W180000800	62	38
14	Private	Van's Nursery		296	14
16	Private	3775 Brooklake Rd	062W180000200	568	11
22	Private	3775 Brooklake Rd		239	59
24	Private	3775 Brooklake Rd		293	27
25	Public	**Huff Ave (north)**	--	639	35
29	Private	**May Trucking Facility**	062W180000900	338	75
31	Public	**I-5 SB Exit Ramp**	--	677	36
33	Public	**I-5 NB Entrance Ramp**	--	255	42
35	Public	**Informal Park & Ride**	--	31	220
37	Private	**50th Ave (north)**	062W170000600	1586	36
43	Public	Weigh Station Exit	--	215	110
44	Public	Weigh Station Entrance	--	347	100
45	Private	Richland Ave (north)	--	8	11

ID	Public vs. Private	Site Use	Tax Lot Number	Distance to Next Access (ft.)	Access Road Width (ft.)
47	Private	Railroad	--	70	74
50	Private	4875 Brooklake Rd	062W17CA00500	40	13
51	Private	4875 Brooklake Rd		136	11
53	Public	Pueblo Ave (north)	--	155	35
55	Private	4945 Brooklake Rd	062W17DB02700	101	10
56	Private	4965 Brooklake Rd	062W17DB02600	105	15
59	Private	Brooks Automotive	062W17DB02500	40	29
61	Private	Valley Spa Covers	062W17DB02501	196	34
64	Private	Ninth Inning Corporation	062W17DB01800	121	30
67	Private	Stop-N-Save #2	062W17DB01700	65	39
69	Private	Route 99 Bar and Grill	062W17DB01400	69	35
70	Public	Portland Rd (north)	--	167	68
73	Private	Low Price Auto & Truck Sales LLC	062W17D000300	n/a	24
Access Points on the South Side of Brooklake Road					
3	Public	River Rd (south)	--	80	28
5	Private	Railroad	--	40	38
7	Private	Nutrien Ag Solutions	062W18C001000	107	26
9	Private	Nutrien Ag Solutions	062W18C001000	424	28
12	Private	Marion Resource Recovery Facility	062W18C000900	212	49
15	Private	Hicks Striping & Curbing	062W18C001800	247	44
17	Private	The Greenhouse Catalog	062W18C000600	80	21
18	Private	Leupitz Contractors Inc	062W18C000500	128	19
19	Private	Leupitz Contractors Inc		80	22
20	Private	Versalift Northwest Service Center	062W18C000400	67	29
21	Private	Shrock Trucking	062W18C000300	69	47
23	Private	Shrock Trucking		572	51
26	Public	**Huff Ave NE (south)**	--	263	35
27	Private	**La Korita Food Cart**	062W18D000600	52	20
28	Private	**Truckman Way NE**	062W18D000609	263	38
30	Private	**Service Driveway**	062W18D000601	376	32
32	Public	**I-5 SB Entrance Ramp**	--	700	26
34	Public	**I-5 NB Exit Ramp**	--	280	42
36	Public	**Informal Park & Ride**	--	0	210
38	Private	**South of 50th Ave NE**	062W17C000500	213	12
39	Private	**South of 50th Ave NE**	062W17C000500	91	12
40	Private	**Weigh Station Entrance**	062W17C000500	483	88
41	Private	Weigh Station Exit	062W17C000500	465	101
42	Private	Covanta Marion	062W17CA02800	837	55
46	Public	Richland Dr (south)	--	33	29
48	Private	Railroad	--	12	47
49	Private	Front St NE	062W17CA00700	111	24
52	Private	Reid's Tire & Automotive	062W17CA00800	101	32
54	Public	Pueblo Ave NE (south)	--	282	32
57	Private	Monterey Ave NE	062W17DB03301	10	31
58	Private	Marion Co. Fire District #1 Station 5	062W17DB03300	32	75

ID	Public vs. Private	Site Use	Tax Lot Number	Distance to Next Access (ft.)	Access Road Width (ft.)
60	Private	U.S. Postal Service Entrance	062W17DB03400	66	24
62	Private	U.S. Postal Service Exit		5	29
63	Private	Udder Way	062W17DB03500	191	28
65	Private	Stair Way	062W17DB03603	55	35
66	Private	Brooks True Value Hardware	062W17DB03600	14	18
68	Private	Platinum Trade	062W17DB03602	121	30
71	Public	Portland Rd NE (south)	--	63	55
72	Private	Oregon Auto Sales	062W17D001100	76	43
74	Private	Oregon Auto Sales		n/a	22

Source: Marion County GIS

Access locations within 1,320 feet of a ramp terminal are **bold and shaded.**

Bicycle and Pedestrian Inventory

The existing bicycle and pedestrian facilities in the study area are limited. On Brooklake Road, there are striped bike lanes just east of the Union Pacific Railroad (UP) line between Front Street and Portland Road (OR 99E). On other segments of the study area, bicyclists are expected to share the road with vehicle traffic.

There is sidewalk across the I-5 overpass on the south side of Brooklake Road. The functional condition of the two sidewalk ramps on either side of the overpass are considered poor and are not ADA compliant[2]. Between Pueblo Avenue and Portland Road, sidewalk is partially provided on both north and south side.

Transit Inventory

Several transit providers travel through the study area on the I-5 mainline (HUT Airport Shuttle, South Metro Area Regional Transit, Greyhound, City2City, Cherriots, Bolts Bus and Cascades POINT) but none regularly travel through the interchange ramp terminals or on Brooklake Road. Cherriots Route 10X regional bus travels on Portland Road (OR 99E) along the eastern edge of the study area with service between Woodburn and Salem. It has a stop north of Brooklake Road on Portland Road (OR 99E) near Riverton Street.

While there are no transit stops in the immediate vicinity of the interchange, there is an existing informal park and ride on Brooklake Road between the northbound ramp terminal and 50th Avenue. Vehicles park on either side of Brooklake Road in the gravel shoulders that are approximately 200 feet long. This interchange area was also identified by Marion County as a possible future site for a park and ride.[3]

Rail Inventory

Two railroad lines pass through the study area, the Portland & Western Railroad (PNWR) and the Union Pacific Railroad (UPRR). The PNWR crosses Brooklake Road at an at-grade crossing approximately 80 feet east of River Road. The crossing is controlled with both passive and active warning devices, including crossbucks, gate arms and flashing lights. The UPRR crosses Brooklake Road at an at-grade crossing

[2] TransGIS, 2020.

[3] Marion County Rural TSP, 2005 https://www.co.marion.or.us/PW/Engineering/rtsp/Documents/chapter13longrange1204boc.pdf

approximately ½-mile east of the interchange. Like the PNWR crossing, the UPRR crossing is controlled with crossbucks, gate arms and flashing lights. Union Pacific serves Amtrak Passenger service through the study area but does not stop.

Bridge Inventory

The 2019 bridge inventory data within the study area was reviewed. One element used to evaluate bridge conditions is the sufficiency rating, which is a complex formula that considers four separate factors to obtain a numeric value rating the ability of a bridge to service demand. The result of this method is a percentage in which 100 percent would represent an entirely sufficient bridge and zero percent would represent an entirely insufficient or deficient bridge. Those bridges with a sufficiency rating of 80 or less are eligible for rehabilitation. Those bridges with a sufficiency of 50 or less are eligible for replacement. Bridges lose their eligibility status for a period of ten years after a (Highway Bridge Program) project is completed.

Two additional elements are used to rate bridge conditions: structural deficiency and functional obsolescence. Structural deficiency is determined based on the condition rating for the deck, superstructure, substructure, or culvert and retaining walls. It may also be based on the appraisal rating of the structural condition or waterway adequacy. Functional obsolescence is determined based on the appraisal rating for the bridge deck geometry, underclearances, and approach roadway alignment. It may also be based on the appraisal rating of the structural condition or waterway adequacy.

The I-5 Brooks interchange structure is the only bridge within the study area. As summarized in Table 4, the bridge sufficiency rating does not necessitate rehabilitation and there are no deficiencies.

Table 4. Management Area Bridge Inventory

Bridge No.	Name	Year Built	Length	Sufficiency Rating	Structural Condition	Deficiencies
07851A	Brooklake Rd NE over Hwy 1	1975	322’	84.8	Fair	Not Distressed / Not Deficient

Source: ODOT, 2019 Bridge Condition Report, TransGIS

Existing Traffic Conditions

The assessment of traffic conditions includes development of existing traffic volumes, assessment of traffic operations, and a review of historical crash patterns.

Traffic Volumes

Average annual daily traffic (AADT) volumes

The average annual daily traffic (AADT) volumes for I-5 and the interchange ramps are currently available for the year 2019. The volumes are summarized in Table 5.

Table 5. I-5 Average Annual Daily Traffic

Location Description	Volume (vpd)
I-5	
North of Interchange	97,800*
South of Interchange	103,400*
I-5 Interchange 263	
Northbound Exit Ramp	5,200
Northbound Entrance Ramp	3,200
Southbound Exit Ramp	3,800
Southbound Entrance Ramp	7,400

*Includes all vehicle totals in both directions

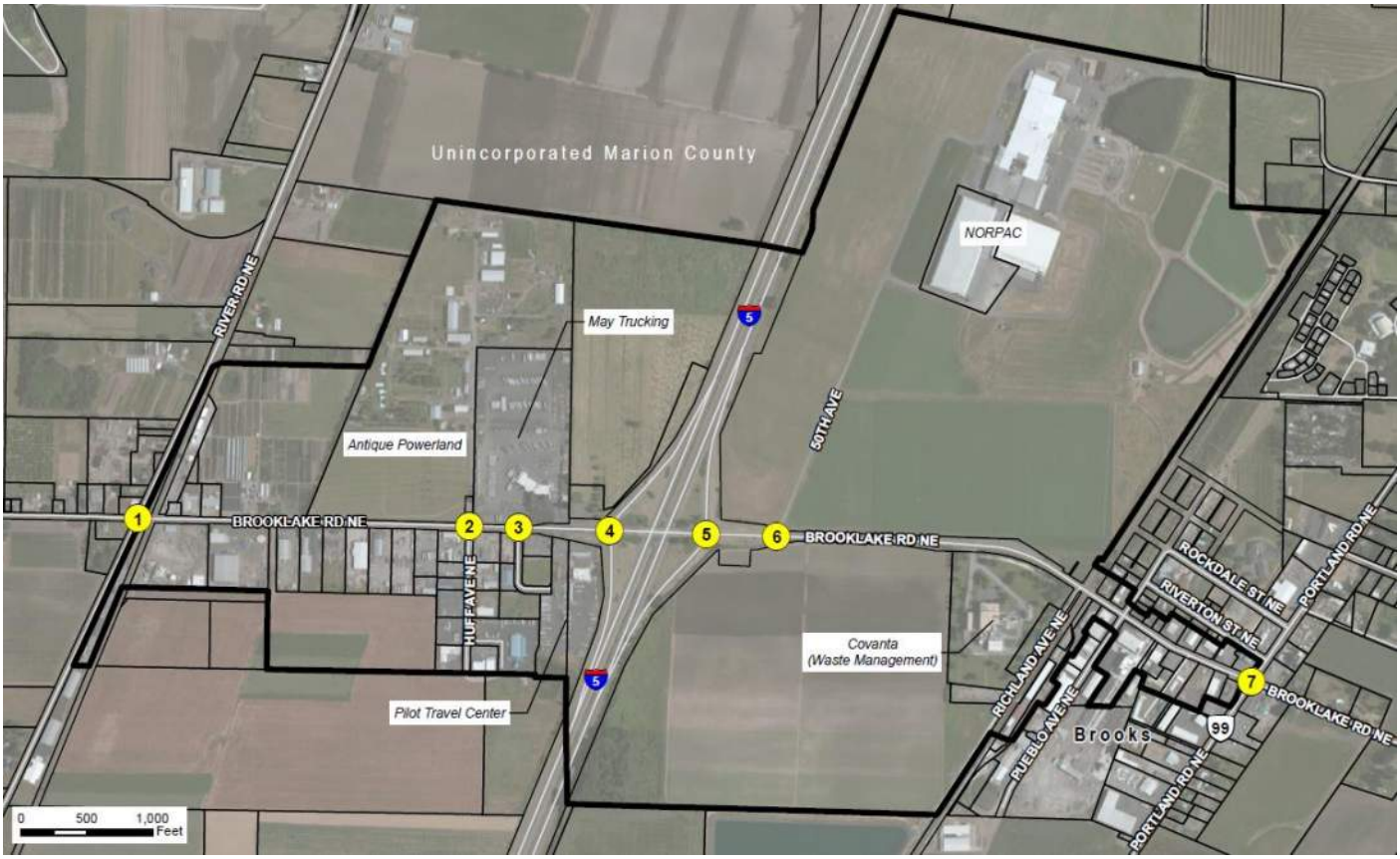
vpd = vehicles per day

Source: 2019 Transportation Volume Tables, Oregon Department of Transportation

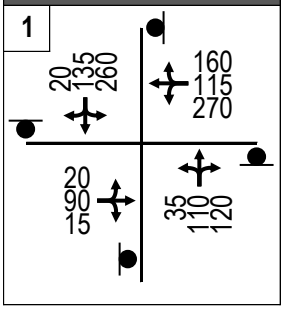
Historic Automatic Traffic Recorder (ATR) data shows average 2.6% annual growth along I-5 mainline south of the study interchange in recent years. From the years of 2012 to 2019, volumes on I-5 through the study area shows a continuously growing trend as a yearly rate varies between 0.5% to 6.1%, except a small 0.4% decrease between year 2013 and 2014.

Design Hour Volumes

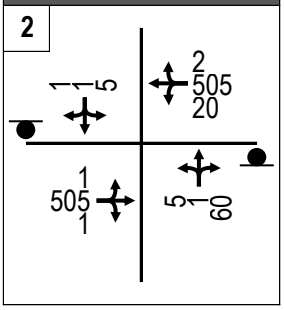
The *Analysis Methodology and Assumptions Memorandum* includes detailed information related to the peak hour development, seasonal adjustment factors, and historical factors used to develop traffic volumes for the traffic operations analysis. Per the memorandum, a system-wide peak hour of 4:15 to 5:15 p.m. was selected as a basis for the analysis. Seasonal adjustment factors of 1.04 and 1.02 were applied to counts collected in May and October, respectively, for the intersections primarily influenced by commuter trends. A seasonal adjustment factor of 1.05 was applied to the counts collected in October at intersections primarily influenced by interstate trends. Historical factors of 1.05 and 1.03 were applied to the counts conducted in 2018 to reflect year 2020 traffic conditions. Additionally, a COVID factor of 1.12 was applied to intersections with counts collected in 2020 and volumes below pre-COVID conditions. Figure 2 summarizes the traffic volumes developed at the study intersections for the traffic operations analysis. The *Analysis Methodology and Assumptions Memorandum* provides details on the various adjustment factors and how they were applied and is included in Attachment C.



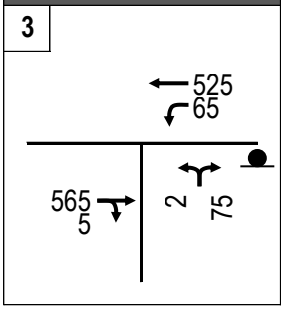
River Rd at Brooklake Rd



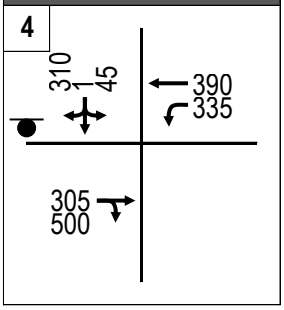
Huff Ave at Brooklake Rd*



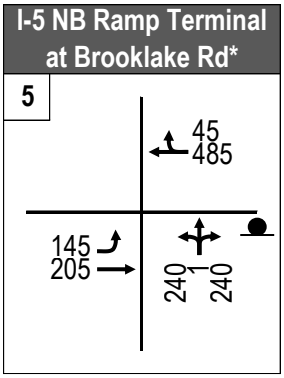
Truckman Way at Brooklake Rd*



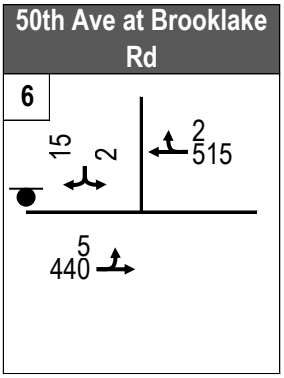
I-5 SB Ramp Terminal at Brooklake Rd*



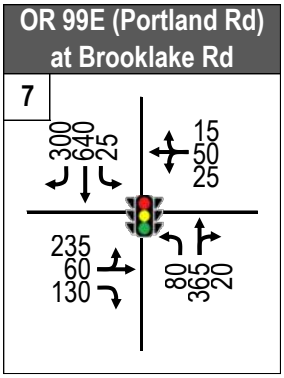
I-5 NB Ramp Terminal at Brooklake Rd*



50th Ave at Brooklake Rd



OR 99E (Portland Rd) at Brooklake Rd



Brooks Interchange Area Management Plan

Legend

(##) Study Area Intersection

Turning Movement Volume

Lane Configuration

STOP Controlled Approach

Signalized Intersection

* *Adjusted for COVID-19 impacts*

Figure 2

Existing (2020) PM Peak Hour Turning Movement Volumes

Traffic Operations

All operations were evaluated using the methodology outlined in the *Highway Capacity Manual, 6th Edition* (HCM6) along with the procedures outlined in ODOT's Analysis Procedures Manual (APM). The Synchro/SimTraffic analysis software was selected to perform the intersection analysis since it can provide the v/c ratio and LOS output of an HCM analysis and consider the systematic interaction of the intersections regarding queuing and delays.

The results from both Synchro and SimTraffic are reported in this document. Because these programs evaluate operations using different methodologies, the analysis results sometimes vary; however, the differences are generally minor unless saturated or congested conditions are present. Under saturated conditions, SimTraffic queuing and delays present results that reflect how congested intersections impact each other, while Synchro represents intersection performance in isolation and may reflect better performance results.

Model Calibration

Before analyzing the traffic conditions, the analysis files were calibrated for local conditions. The northbound and southbound ramp terminals were chosen as the key calibration locations. Traffic volumes, lane configurations, and lane utilization were input into the traffic models. SimTraffic was then run for the peak period. Turning speeds, saturation flow rate and headway factors in the SimTraffic model were adjusted and the model was re-simulated and, once again, compared to the field observed queue lengths and delays. This process was repeated until the model was visually comparable to field observations. Once this visual level of calibration was gained, volume throughputs were summarized from the SimTraffic simulations and compared to actual count data.

Finally, 11 SimTraffic simulation seeds were run, and any outliers were omitted. The five most consistent runs were averaged to obtain an average model run. Calibration notes, simulation reports and queuing outputs are in Attachment D.

Intersection Operations

Table 6 summarizes the results of the intersection operations analysis. Field observations indicate that during the peak hour, the single lane northbound exit ramp and single lane southbound exit ramp each operate as if they had a two-lane approach. The analysis reflects the field observations.

Table 6. Existing (Year 2020) PM Peak Hour Traffic Operations Analysis Results

Intersection (Control Type)	Critical Movement[1]	V/C Ratio	LOS	Jurisdiction	Mobility Target[2,3]
1. River Rd at Brooklake Rd (AWSC)	WB L/T/R SB L/T/R	**>1.0** **0.89**	**F** **E**	Marion Co.	LOS D, 0.85
2. Huff Ave at Brooklake Rd (TWSC)	WB L	0.03	A	Marion Co.	LOS E, 0.90
	NB L/T/R	0.18	C		
3. Truckman Way at Brooklake Rd (TWSC)	WB L	0.11	B	Marion Co.	LOS E, 0.90
	NB L/T/R	0.25	C		
4. I-5 SB Ramps at Brooklake Rd (TWSC)	WB L	0.45	B	ODOT	0.85
	SB R	0.53	C		

Intersection (Control Type)	Critical Movement[1]	V/C Ratio	LOS	Jurisdiction	Mobility Target[2,3]
5. I-5 NB Ramps at Brooklake Rd (TWSC)	EB L	0.17	A	ODOT	0.85
	NB L	**>1.0**	F		
6. 50th Ave at Brooklake Rd (TWSC)	EB L	0.01	A	Marion Co.	LOS E, 0.90
	SB L/R	0.04	B		
7. Portland Rd (OR99E) at Brooklake Rd (Signal)	Overall	0.79	B	ODOT	0.95

Acronyms: EB = eastbound; WB = westbound; NB = northbound; and SB = southbound. L = left; T = through; and R = right.
AWSC = all-way stop control; TWSC = two-way stop control; Signal = signal control.
Intersections exceeding the applicable mobility target are **bold and shaded.**

Notes:
1. At signalized intersections, the overall results are reported; at all-way stop-controlled intersections, the results are reported for the worst movements; and at unsignalized intersections the results are reported for the worst major and minor movements that must stop or yield the right of travel to other traffic flows.
2. 1999 Oregon Highway Plan (OHP), Table 6, Policy 1F applies to existing conditions.
3. The Marion County Rural Transportation System Plan (TSP) designates the traffic operations standard on County facilities and defers to ODOT standards for intersections with state highways within the County.

Source: David Evans and Associates, Inc

As shown in Table 6, all but two study intersections meet applicable mobility targets under existing conditions in the PM peak hour. The intersection of Brooklake Road at River Road exceeds the Marion County standard and the intersection of Brooklake Road at the northbound ramp terminal exceeds the OHP target. Both intersections are also over capacity.

At the intersection of Brooklake Road at River Road, the westbound and southbound approaches have high traffic volumes. The intersection of Brooklake Road at the I-5 northbound ramp terminal has a high number of northbound left-turning vehicles that must wait for an adequate gap in cross-street traffic. This, paired with poor sight distance across the I-5 overpass, creates delays on the northbound exit ramp.

95th Percentile Queues

Table 7 summarizes the 95th percentile queues by movement at each study area intersection. The table also highlights the locations where the 95th percentile queues either exceed available storage or extend beyond the nearest upstream intersection. There are two intersections with movements exceeding their available storage: Brooklake Road at the I-5 northbound ramp terminal and Brooklake Road at Portland Road (OR99E). If a ramp queue is long enough to extend into deceleration zones or onto the mainline, it could result in unsafe conditions. The northbound exit ramp 95th percentile queue extends back into the deceleration zone, although not onto the I-5 mainline. At Portland Road (OR99E), the southbound right-turn movement exceeds the available storage and spills into the adjacent through lane, which backs up to block access to Riverton Street and Rockdale Street.

There are other intersections within the study area that have 95th percentile queues that may impact adjacent accesses. At the west end of the study area, queues on the westbound approach of Brooklake Road at River Road extend back across the PNWR railroad tracks, creating a potential safety concern. They extend further east and may block driveway access during peak conditions. Between Truckman Way and the southbound ramp terminal, vehicles turning left onto Truckman Way or into the PILOT property do not exceed the available storage in the median, however it can cause slowing and

congestion along Brooklake Road as passenger vehicles and freight trucks travel between the ramp terminals and the businesses immediately west of the interchange.

At the southbound ramp terminal, the exit ramp occasionally backs into the deceleration zone. Most of the vehicles are turning right to travel westbound on Brooklake Road and there is enough pavement width for the left-turning vehicles to queue back. The westbound left-turn at the I-5 southbound ramp terminal extends to the available storage capacity and may impact westbound through traffic.

Field observations suggest that queuing at both ramp terminals is a concern, particularly in the northbound direction. In some instances, vehicles have turned eastbound onto Brooklake Road from the northbound exit ramp to maneuver a U-turn to travel westbound on Brooklake Road to avoid waiting in the northbound left-turn queue.

Table 7. Existing (2020) 95th Percentile Queues

Intersection	Approach & Movement	95th Percentile Queue (ft.)	Available Storage (ft.)[1]
1. River Rd at Brooklake Rd	EB L/T/R	125	>2,000
	WB L/T/R	*1,050*	>2,000
	NB L/T/R	125	>2,000
	SB L/T/R	350	>2,000
2. Huff Ave at Brooklake Rd	EB L/T/R	25	>2,000
	WB L/T/R	100	325
	NB L/T/R	100	1,000
	SB L/T/R	50	1,000
3. Truckman Way at Brooklake Rd	EB T/R	25	325
	WB L	125	250
	NB L/R	125	650
4. I-5 SB Ramps at Brooklake Rd	EB T	50	350
	EB R	75	100
	WB L	*350*	350
	WB T	275	650
	SB L/T	*700*	1,150
	SB R	325	250
5. I-5 NB Ramps at Brooklake Rd	EB L	100	250
	EB T	25	650
	WB T	50	500
	WB R	25	50
	NB L	*950*	1,150
	NB T/R	**525**	400
6. 50th Ave at Brooklake Rd	EB L/T	25	475
	SB L/R	25	1,350
7. Portland Rd (OR99E) at Brooklake Rd (Signal)	EB L/T	325	516
	EB R	100	300
	WB L/T/R	125	>2,000
	NB L	150	180
	NB T/R	225	618
	SB L	150	175
	SB T	**600**	434
	SB R	**250**	100

Bold and highlighted indicates queue exceeds available storage; ***Italic and underlined*** indicates queue is excessive and/or may impact upstream traffic

Notes:

1. Storage distance is reported as either the length of the turn pocket or the distance to the next intersection, as applicable.

Freeway Operations

It is also important to evaluate how the interchange ramps interact with the mainline highway traffic on I-5 through an analysis of the points where traffic enters or merges onto the highway and where it exits or diverges from the highway. These analyses were conducted in accordance with the methodology prescribed in ODOT's APM to determine v/c ratio performance. The results of the analysis are summarized in Table 8**.**

The merge and diverge analyses for the design hour between 4:15 PM and 5:15 PM show that the freeway and the merge and diverge points associated with the Brooks interchange ramps are currently operating below the mobility standard of 0.80. During this period, the southbound direction has the higher directional flow on the freeway.

An alternate hour (7:00 AM to 8:00 AM) was also analyzed to evaluate conditions when the northbound direction has the higher directional flow. The alternate hour analysis also shows that freeway operations meet the state's mobility target.

Table 8. Freeway Operations

Direction/Location	V/C Ratio[1]		OHP Target[4]
	Design Hour[2]	Alternate Hour[3]	
I-5 Northbound			
Mainline South of IC 263	0.65	0.62	0.85
Diverge: IC 263 Northbound Exit Ramp	0.66	0.63	0.85
Mainline between Exit and Entrance Ramps	0.57	0.53	0.85
Merge: IC 263 Northbound Entrance Ramp	0.45	0.40	0.85
Mainline North of IC 263	0.60	0.52	0.85
I-5 Southbound			
Mainline North of IC 263	0.69	0.49	0.85
Diverge: IC 263 Southbound Exit Ramp	0.71	0.50	0.85
Mainline between Exit and Entrance Ramps	0.64	0.46	0.85
Merge: IC 263 Southbound Entrance Ramp	0.58	0.43	0.85
Mainline South of IC 263	0.78	0.57	0.85

Acronyms: IC = Interchange, NA = Not Applicable

Notes:

1. The v/c ratios for the merge/diverge analysis are calculated based on the methodologies outlined in ODOT's Analysis Procedures Manual, using HCS 7 software.
2. The design hour is the system peak hour.
3. The alternate hour is AM peak hour.
4. 1999 Oregon Highway Plan (OHP), Table 6, Policy 1F applies to existing conditions.

Safety Analysis

A safety analysis was conducted to determine whether any significant, documented safety issues exist within the study area and to inform future measures or general strategies for improving overall safety. This analysis includes a review of crash records and ODOT Safety Priority Index System (SPIS) data.

The crash analysis included a review of crash history data supplied by the ODOT Crash Analysis and Reporting Unit for the period between January 1, 2014, and December 31, 2018, which were the five most recent full years for which crash data were available at the time of the analysis.

The study area for the crash analysis reviewed crashes on the local street system as well as on I-5 one mile north and south of the interchange. There were 155 crashes reported at study intersections within the 5-year analysis period, and 25 along Brooklake Road that were not related to a study intersection. Of those 25 Brooklake Road crashes, 13 were related to driveways or access points, and the remaining 12 were segment crashes. None of the reported crashes resulted in fatalities.

In the 5-year analysis period, there were 114 freeway crashes, 65 in the northbound direction, and 49 in the southbound. The 5-year crash rate for the freeway segment north of the interchange is 0.26 crashes per million vehicle miles traveled (crashes/mvmt), and the segment south of the interchange is 0.23 crashes/mvmt. These crash rates were compared to the statewide average crashes rates from Table II for rural interstate freeways and were found to be below the average crash rates for comparable segments, with the statewide average crash rates for rural interstate freeways of 0.38 crashes/mvmt. The most common crash type reported was rear-end collisions (45%). One fatal injury crash occurred in the southbound direction about a ¼-mile north of the southbound exit ramp to the Brooks interchange. The collision occurred in 2017 and was a sideswipe-overtaking collision that occurred in low-light and rainy conditions.

90th Percentile Intersection Crash Rates

Crash rates are a measure of the number of crashes in relation to the amount of traffic volume served. Table 9 summarizes the study intersection crash rates and compares them to the statewide 90th percentile crash rates. The 90th percentile crash rates are obtained from Table 4-1 in the ODOT APM.

Two study intersections exceed the statewide 90th percentile crash rate. These intersections and further details of their crash history are summarized below.

I-5 Southbound Ramps at Brooklake Road (#4): Exceeds statewide 90th percentile crash rate for rural three-legged stop-controlled intersections. Of the 29 crashes at this intersection, 14 were turning-related collisions and 11 were rear end collisions. The remaining crashes were fixed object, angle and backing. The most prevalent cause of the collisions was due to failing to yield the right of way and following too closely.

I-5 Northbound Ramps at Brooklake Road (#5): Exceeds statewide 90th percentile crash rate for rural three-legged stop-controlled intersections. Of the 54 crashes at this intersection, 30 were turning-related collisions and 17 were rear end collisions. The remaining crashes were fixed object and angle. The most prevalent cause of the collisions was due to failing to yield the right of way, following too closely, and making an improper turn.

Critical Crash Rates

The Highway Safety Manual Part B describes the critical crash rate method as a means of identifying locations that warrant further investigation. The critical crash rate is based upon average crash rates at comparable sites, traffic volume, and a confidence interval. There must be five comparable sites to make

a reference population. The study area does not have enough sites of similar characteristics to form a reference population so critical crash rates were not calculated.

Table 9. Study Area 5-Year Crash Summary (2014-2018)

Intersection	Crash Type										Severity			Total	5-Year Crash Rate[1]	90th Percentile Crash Rate
	Rear End	Fixed Object	Angle	Backing	Turning	Sideswipe - Overtaking	Head On	Ped/Bike	Sideswipe-Meeting	Other	Property Damage Only	Minor Injury	Fatal & Serious Injury			
1. River Rd at Brooklake Rd	4	2	6	0	7	0	0	0	0	0	8	11	0	19	0.84	1.08
2. Huff Ave at Brooklake Rd	1	1	1	1	2	0	0	0	1	0	4	3	0	7	0.32	1.08
3. Truckman Way at Brooklake Rd	0	0	0	0	4	0	0	0	0	0	0	4	0	4	0.13	0.475
4. I-5 SB Ramps at Brooklake Rd	11	2	1	1	14	0	0	0	0	0	10	19	0	29	***0.70***	0.475
5. I-5 NB Ramps at Brooklake Rd	17	5	1	0	30	0	0	0	0	1	26	28	0	54	***1.57***	0.475
6. 50th Ave at Brooklake Rd	11	1	0	0	2	0	0	0	0	0	1	13	0	14	0.33	0.475
7. Portland Rd (OR99E) at Brooklake Rd (Signal)	8	0	3	1	15	1	0	0	0	0	16	12	0	28	0.56	0.579
Totals	**52**	**11**	**12**	**3**	**74**	**1**	**0**	**0**	**1**	**1**	**65**	**90**	**0**	**155**		

Source: ODOT Crash Analysis and Reporting Unit 2014-2018

Notes:

1. Where the observed rate exceeds the Statewide 90th Percentile Crash Rate, the observed rate is ***bold, italic, and underlined.***

Safety Priority Index System (SPIS)

The SPIS is a method used in Oregon to identify safety problem areas. Roads are evaluated in approximately one-tenth mile increments (often grouped into larger segments). Each year these segments are ranked by assigning a SPIS score based on the frequency and severity crashes observed, while taking traffic volume into account. When a segment is ranked in the top 10% of the index, a crash analysis is typically warranted, and corrective actions are considered. There is one segment of roadway within the study area identified in the top 10% of the most recent (2018) SPIS rankings and it is summarized in Table 10.

Table 10. Study Area Top 10% SPIS Location

Roadway	Cross Street	ADT	Crashes	Fatal/ Injury A	Injury B/ Injury C	Percentile	SPIS Score
Brooklake Rd	Northbound Ramp Terminal	9,300	10	0/1	1/8	90	51.84

Source: 2018 (2015-2017) On-State, Top 15% SPIS Sites, By Highway Mile Point, ODOT.

Summary of Existing Deficiencies

The existing deficiencies are summarized in Table 11.

Table 11. Summary of Existing Deficiencies

Deficiencies	Location
Geometry	
Interchange	• The deceleration lane length is too short on both the northbound and southbound exit ramps. • The acceleration length of the southbound entrance ramp is substandard.
Access Spacing	• Adjacent public road accesses on the west side are too close to the ramp terminals. • There are twelve access points within a ¼-mile (1,320 feet) of the northbound and southbound ramp terminals. • There is an informal gravel park & ride on the east side of the interchange that has uncontrolled access for approximately 200 feet.
Sight Distance	• The sight distance is limited at both the northbound and southbound ramp terminals. • The sight distance of crossroad is substandard for the operating speed.
Multimodal	
Pedestrian	• Only sidewalk across the I-5 overpass is on the south side. • The functional condition of the two sidewalk ramps on either side of the overpass are considered poor and are not ADA compliant. • Intermittent sidewalk between Pueblo Avenue and Portland Road on both north and south side.
Bicycle	• No bicycle lanes on Brooklake Road between River Road and Front Street (east of UPRR) • Bicycles expected to utilize shoulder, which varies between 2 and 6 feet on Brooklake Road within the study area.
Transit	
Service	There is no regular public transportation/transit available through the interchange ramp terminals or Brooklake Road
Traffic	
Traffic Operations	The following intersections exceed applicable mobility targets: • River Road at Brooklake Road (v/c >1.0) – southbound and westbound approaches are the critical movements. • I-5 Northbound Ramp Terminal at Brooklake Road (v/c > 1.0) – northbound approach is the critical movement.

Deficiencies	Location
Queuing	• The southbound and northbound exit ramp 95th percentile queues extend back into the deceleration zone. • At Portland Road (OR99E), the southbound right-turn movement exceeds the available storage and spills into the adjacent through lane, which backs up to block access to Riverton Street and Rockdale Street. • Queues on the westbound approach of Brooklake Road at River Road extend back across the PNWR railroad tracks, creating a potential safety concern, and may block driveway access. • The westbound left-turn at the I-5 southbound ramp terminal extends to the available storage capacity and may impact westbound through traffic.
Safety	
Crash History	• Both ramp terminals exceed the statewide 90th percentile crash rate. • Northbound ramp terminal is a top 10% SPIS location. • One sideswipe-overtaking fatality on I-5 southbound in 2017 approximately ¼-mile north of Brooks exit ramp.

Attachments:

A. Marion County Roadway Table
B. Traffic Counts
C. *Analysis Methodology and Assumptions Memorandum* and Volume Development
D. Traffic Operational Output (Synchro/SimTraffic)
E. Freeway Facilities Output (HCS7)
F. Crash Calculations

TECHNICAL MEMORANDUM #3 ATTACHMENTS

Evaluate Existing Conditions – Final (Task 4.5)

Table of Contents

Attachment A: Marion County Roadway Table

Appendix B: Marion County Rural Roadway Inventory

Road No.	Road Name	From	To	Milepoint From	Milepoint To	Length Segment	2011 Volumes	2011 V/C	2011 LOS	No. Lanes	Widths L Sh.	Widths Tr. Surf.	Widths R Sh.	Type L Sh.	Type Tr. Surf.	Type R Sh.	R/W Width Typ	Pavement Cond.	2012 Functional Classification	Sidewalks Lt.	Sidewalks Rt.
34 A	Stadeli Ln NE	Cascade Hwy NE	Cascade Hwy NE	0.00	0.28	0.28	100	0.01	A	2	3	16	3	Grav	Asph	Grav	60	Poor	Local		
34 B	Pettit Ln NE	Cascade Hwy NE	Silverton City Limits	0.00	0.37	0.37	100	0.01	A	2	3	16	3	Grav	Asph	Grav	60	Very Poor	Local		
35	Jefferson-Marion Rd	Jefferson City Limits	Skelton Rd	0.39	0.85	0.46	2700	0.10	A	2	3	28	3	Asph	Asph	Asph	60	Good	Arterial		
	Jefferson-Marion Rd	Skelton Rd	Parrish Gap Rd	0.85	1.64	0.79	2300	0.09	A	2	3	28	3	Asph	Asph	Asph	60	Good	Arterial		
	Jefferson-Marion Rd	Parrish Gap Rd	Greens Bridge Rd	1.64	2.63	0.99	2100	0.10	A	2	5	22	5	Grav	Asph	Grav	60	Good	Arterial		
	Jefferson-Marion Rd	Greens Bridge Rd	Pletzer Rd	2.63	3.68	1.05	2600	0.12	B	2	5	22	5	Grav	Asph	Grav	60	Good	Arterial		
	Marion Rd	Pletzer Rd	Stayton Rd	3.68	4.8	1.12	2600	0.12	B	2	5	22	5	Grav	Asph	Grav	60	Very Good	Arterial		
36	River Rd NE	Keizer City Limits	Buena Crest School	1.20	2.62	1.42	5600	0.18	B	2	5	34	5	Asph	Asph	Asph	60	Good	Arterial		
	River Rd NE	Buena Crest School	Brooklake Rd	2.62	3.19	0.57	5500	0.18	B	2	7	34	4	Asph	Asph	Asph	60	Good	Arterial		
	River Rd NE	Brooklake Rd	Waconda Rd	3.19	4.97	1.78	5100	0.25	C	2	5	22	5	Grav	Asph	Grav	60	Very Good	Arterial		
	River Rd NE	Waconda Rd	Matheny Rd	4.97	6.25	1.28	4900	0.23	B	2	5	22	5	Grav	Asph	Grav	60	Very Good	Arterial		
	River Rd NE	Matheny	French Prairie Rd	6.25	7.85	1.60	4900	0.20	B	2	3	28	3	Asph	Asph	Asph	60	Fair	Arterial		
	River Rd NE	French Prairie Rd	Mahony Rd	7.85	10.8	2.93	2300	0.10	A	2	3	28	3	Asph	Asph	Asph	60	Good	Arterial		
	River Rd NE	Mahony Rd	Davidson Rd	10.78	14.7	3.93	2500	0.10	A	2	3	28	3	Asph	Asph	Asph	60	Good	Arterial		
	River Rd NE	Davidson Rd	St. Paul City Limits	14.71	15.4	0.73	3800	0.15	B	2	3	28	3	Asph	Asph	Asph	60	Fair	Arterial		
37	Brooklake Rd NE	Hwy 99E	Lakeside Dr	0.00	1.25	1.25	1800	0.09	A	2	3	20	3	Grav	Asph	Grav	50	Fair	Maj. Collector		
	Brooklake Rd NE	Lakeside Dr	65th Ave NE	1.25	1.44	0.19	1600	0.08	A	2	3	20	3	Grav	Asph	Grav	50	Fair	Min. Collector		
	65th Ave NE	Brooklake Rd NE	Labish Center Rd	1.44	1.97	0.53	1400	0.07	A	2	3	20	3	Grav	Asph	Grav	50	Fair	Min. Collector		
	Labish Center Rd	65th Ave NE	72nd Ave NE	1.97	2.71	0.74	1300	0.06	A	2	3	22	3	Grav	Asph	Grav	50	Good	Min. Collector		
	72nd Ave NE	Labish Center Rd	Brooklake Rd NE	2.71	3.21	0.50	450	0.02	A	2	3	22	3	Grav	Asph	Grav	50	Good	Local		
	Brooklake Rd NE	72nd Ave NE	75th Ave NE	3.21	3.45	0.24	450	0.02	A	2	3	22	3	Grav	Asph	Grav	50	Good	Local		
	75th Ave NE	Brooklake Rd NE	Rambler Dr NE	3.45	3.67	0.22	450	0.02	A	2	3	22	3	Grav	Asph	Grav	50	Good	Local		
	Rambler Dr NE	75th Ave NE	82nd Ave NE	3.67	4.51	0.84	350	0.02	A	2	3	22	3	Grav	Asph	Grav	50	Good	Local		
38	Boones Ferry Rd NE	Hwy 99E	Belle Passi Rd	0.00	0.72	0.72	3100	0.13	B	2	3	22	3	Grav	Asph	Grav	60	Good	Maj. Collector		
	Boones Ferry Rd NE	Belle Passi Rd	Woodburn UGB	0.72	0.96	0.24	3300	0.14	B	2	3	22	3	Grav	Asph	Grav	60	Good	Maj. Collector		
39	Talbot Rd S	Buena Vista Rd S	Gilmour Rd S	0.00	1.57	1.57	150	0.01	A	2	1	20	1	Grav	Asph	Grav	60	Fair	Maj. Collector		
	Talbot Rd S	Gilmour Rd S	Marlatt Rd S	1.57	2.6	1.03	200	0.01	A	2	2	18	2	Grav	Asph	Grav	60	Good	Maj. Collector		
	Talbot Rd S	Marlatt Rd S	Jorgenson Rd S	2.60	4.62	2.02	450	0.03	A	2	2	18	2	Grav	Asph	Grav	60	Very Good	Maj. Collector		
	Talbot Rd S	Jorgenson Rd S	I-5 Overcrossing	4.62	4.78	0.16	900	0.05	A	2	4	21	4	Grav	Asph	Grav	60	Very Good	Maj. Collector		
	Talbot Rd S	I-5 Overcrossing	Jefferson UGB	5.12	7.47	2.36	1100	0.04	A	2	3	28	3	Asph	Asph	Asph	60	Good	Maj. Collector		
39 A	Westside Ln SE	North End of Bridge	Power pole 397 ft N of bridge	0.28	0.35	0.07	50	0.00	A	2		16			Asph		60	Very Poor	Local		
39 B	Hennsingson Ln SE	Talbot Rd S	Dead End	0.00	0.27	0.27	50	0.00	A	2		20			Asph		60	Good	Local		
40	West Stayton Rd SE	SPRR Xing	Darley Rd SE	0.00	0.49	0.49	800	0.04	A	2	5	20	5	Grav	Asph	Grav	60	Very Good	Min. Collector		
	West Stayton Rd SE	Darley Rd SE	Shaff Rd SE	0.49	2.21	1.72	1000	0.05	A	2	5	20	5	Grav	Asph	Grav	60	Very Good	Min. Collector		

Appendix B: Marion County Rural Roadway Inventory

Road No.	Road Name	From	To	Milepoint From	Milepoint To	Length Segment	2011 Volumes	2011 V/C	2011 LOS	No. Lanes	Widths L Sh.	Widths Tr. Surf.	Widths R Sh.	Type L Sh.	Type Tr. Surf.	Type R Sh.	R/W Width Typ	Pavement Cond.	2012 Functional Classification	Sidewalks Lt.	Sidewalks Rt.
	Waconda Rd NE	I-5 OverXing	50th Ave NE	2.96	3.25	0.29	900	0.04	A	2	5	22	5	Grav	Asph	Grav	60	Fair	Min. Collector		
	Waconda Rd NE	50th Ave NE	Hwy 99E	3.25	4.53	1.28	800	0.04	A	2	3	22	3	Grav	Asph	Grav	60	Fair	Min. Collector		
602 A	45th Ave NE	Waconda Rd NE	Pavement Ends	0.00	0.03	0.03	20	0.00	A	2		16			Asph		30	Poor	Local		
	45th Ave NE	Pavement Ends	Dead End	0.03	0.59	0.56	10	0.00	A	2		16			Grav		30	NA	Local		
603	Salmon St N	Ravena Dr N	End of Pavement	0.00	0.03	0.03	150	0.01	A	2		18			Asph		40	Poor	Local		
	Salmon St N	End of Pavement	4th Ave	0.03	1.01	0.98	150	0.01	A	2		20			Grav		40	NA	Local		
	4th Ave N	Salmon St N	Trout St N	0.15	1.01	0.86	150	0.01	A	2		18			Grav		40	NA	Local		
	Trout St N	4th Ave N	Begin Pavement	1.01	1.47	0.46	150	0.01	A	2		17			Grav		40	NA	Local		
	Trout St N	Begin Pavement	Wheatland Rd	1.47	1.6	0.13	150	0.01	A	2		18			Asph		40	Very Poor	Local		
604	Windsor Island Rd N	Naples St N	Bridge (Clear Lake)	0.00	2.25	2.25	900	0.05	A	2	3	22	3	Grav	Asph	Grav	50	Good	Local		
	Windsor Island Rd N	Bridge (Clear Lake)	Simon St N	2.25	3.13	0.88	600	0.03	A	2	2	22	2	Grav	Asph	Grav	50	Good	Local		
	Simon St N	Windsor Island Rd N	9th Ave N	3.13	3.38	0.25	600	0.04	A	2	3	20	3	Grav	Asph	Grav	50	Fair	Local		
	9th Ave N	Simon St N	Salmon St N	3.38	3.53	0.15	600	0.04	A	2	3	20	3	Grav	Asph	Grav	50	Good	Local		
	Salmon St N	9th Ave N	Ravena Dr N	3.53	4.07	0.54	700	0.04	A	2	3	20	3	Grav	Asph	Grav	50	Fair	Local		
	Ravena Dr N	Salmon St N	Wheatland Rd	4.07	5.27	1.20	700	0.04	A	2	3	20	3	Grav	Asph	Grav	50	Fair	Local		
604 A	Simon St N	Windsor Island Rd N	End of Pavement	0.00	0.03	0.03	20	0.00	A	2		18			Asph		50	Good	Local		
	Simon St N	End of Pavement	Windsor Island Rd N	0.03	0.62	0.59	20	0.00	A	1		17			Grav		50	NA	Local		
605	Naples St N	Keizer UGB	22nd Ave N	0.32	0.68	0.36	400	0.02	A	2	2	22	2	Grav	Asph	Grav	60	Fair	Local		
	22nd Ave N	Naples St N	Dead End	0.68	1.58	0.90	300	0.03	A	2	2	20	2	Grav	Grav	Grav	60	Fair	Local		
606	Egan St NE	River Rd NE	End Pavement	0.00	0.02	0.02	100	0.01	A	1		18			Grav		40	Poor	Local		
	Egan St NE	End of Pavement	Dead End	0.02	0.2	0.18	10	0.00	A	1		16			Grav		40	NA	Local		
608	54th Ave NE	Hwy 99E	Tacoma St NE	0.00	0.31	0.31	300	0.02	A	2		20			Asph		40	Poor	Local		
	Tacoma St NE	54th Ave NE	52nd Ave NE	0.31	0.47	0.16	200	0.01	A	2		20			Asph		40	Poor	Local		
	52nd Ave NE	Tacoma St NE	Tango St NE	0.47	0.57	0.10	150	0.01	A	2		20			Asph		40	Poor	Local		
	Tango St NE	52nd Ave NE	50th Ave NE	0.57	0.74	0.17	150	0.01	A	2		20			Asph		40	Poor	Local		
	50th Ave NE	Tango St NE	Waconda Rd NE	0.74	1.7	0.96	600	0.03	A	2	3	20	3	Grav	Asph	Grav	40	Poor	Local		
609	Brooklake Rd NE	Wheatland Rd	River Rd NE	0.00	1.06	1.06	2500	0.13	B	2	2	28	2	Asph	Asph	Asph	60	Fair	Maj. Collector		
	Brooklake Rd NE	River Rd NE	Huff Ave NE	1.06	1.55	0.49	8400	0.36	C	2	2	28	2	Asph	Asph	Asph	60	Very Good	Arterial		
	Brooklake Rd NE	Huff Ave NE	I-5 Row West	1.55	1.68	0.13	10800	0.50	D	2	3	28	3	Grav	Asph	Grav	60	Very Good	Arterial		
	Brooklake Rd NE	I-5 ROW East	SPRR Xing	1.97	2.44	0.47	7800	0.29	C	2	5	28	5	Asph	Asph	Asph	60	Very Good	Arterial		
610	Richland Dr NE	Brooklake Rd NE	End Pavement	0.00	0.06	0.06	70	0.00	A	2	2	21	2	Grav	Asph	Grav	44	Very Poor	Local		
	Richland Dr NE	Begin Gravel	Private Rd	0.06	0.16	0.10	30	0.00	A	2		20			Grav		44	NA	Local		
610 A	Richland Ave NE	Brooklake Rd NE	Dead End	0.00	0.23	0.23	50	0.01	A	1		12			Grav		30	Very Poor	Local		

Appendix B: Marion County Rural Roadway Inventory

Road No.	Road Name	From	To	Milepoint From	Milepoint To	Length Segment	2011 Volumes	2011 V/C	2011 LOS	No. Lanes	Widths L Sh.	Widths Tr. Surf.	Widths R Sh.	Type L Sh.	Type Tr. Surf.	Type R Sh.	R/W Width Typ	Pavement Cond.	2012 Functional Classification	Sidewalks Lt.	Sidewalks Rt.
611	Rockdale St N	Hwy 99E	Pueblo Ave NE	0.00	0.21	0.21	300	0.01	A	2	5	34	5	Asph	Asph	Asph	60	Fair	Local		X
	Pueblo Ave NE	Rockdale St N	Riverton Rd	0.21	0.25	0.04	300	0.01	A	2	5	32	5	Asph	Asph	Asph	60	Good	Local		
	Pueblo Ave NE	Riverton Rd	Brooklake Rd	0.25	0.31	0.06	300	0.01	A	2	3	34	3	Grav	Asph	Grav	60	Good	Local		
	Pueblo Ave NE	Brooklake Rd	Private Rd	0.31	0.43	0.12	250	0.01	A	2	3	22	3	Grav	Asph	Grav	60	Good	Local		
611 A	Riverton St NE	Pueblo Ave NE	Hwy 99E	0.00	0.2	0.20	250	0.01	A	2	1	22	1	Grav	Asph	Grav	60	Good	Local		
613	Clear Lake Rd	Keizer City Limits	River Rd NE	0.55	1.03	0.48	1800	0.09	A	2	3	20	3	Grav	Asph	Grav	60	Very Good	Local		
	Quinaby Rd	River Rd NE	35th Ave NE	1.03	1.57	0.54	1300	0.06	A	2	3	20	3	Grav	Asph	Grav	60	Fair	Min. Collector		
	Quinaby Rd	35th Ave NE	Begin I-5 Overcrossing	1.57	1.82	0.25	1300	0.06	A	2	3	20	3	Grav	Asph	Grav	60	Fair	Min. Collector		
	Quinaby Rd	Begin I-5 Overcrossing	End I-5 Overcrossing	1.82	2.19	0.37	1200	0.04	A	2	8	24	8	Asph	Asph	Asph	60	Fair	Min. Collector		
	Quinaby Rd	End I-5 Overcrossing	Hwy 99E	2.19	2.71	0.52	1200	0.07	A	2	2	17	2	Grav	Asph	Grav	60	Fair	Min. Collector		
615	Perkins St NE	River Rd NE	W side of I 5	0.00	1.3	1.30	900	0.06	A	2	2	19	2	Grav	Asph	Grav	40	Very Good	Local		
	Perkins St NE	W side of I 5	Hwy 99E	1.30	1.75	0.45	700	0.03	A	2	1	22	1	Grav	Asph	Grav	40	Good	Local		
620	Umpqua St NE	Hwy 99E	138 ft E of Hwy 99E	0.00	0.03	0.03	30	0.00	A	2		21			Asph		30	Very Poor	Local		
	Umpqua St NE	138 ft E of Hwy 99E	Dead End	0.03	0.76	0.73	20	0.00	A	2		17			Grav		30	NA	Local		
621	71st Ave NE	Waconda Rd	Pioneer School	0.00	0.02	0.02	100	0.01	A	2		18			Asph		40	Good	Local		
	71st Ave NE	Pioneer School	Wapato St NE	0.02	0.51	0.49	100	0.01	A	2		18			Grav		40	NA	Local		
	Wapato St NE	71st Ave NE	134 ft E of Hwy 99E	0.51	0.73	0.22	100	0.01	A	2		19			Grav		40	NA	Local		
	Wapato St NE	134 ft E of Hwy 99E	Hwy 99E	0.73	0.76	0.03	200	0.01	A	2		20			Asph		40	Poor	Local		
622	Wabash Dr NE	Hwy 99E	Howell Prairie Rd	0.00	2.58	2.58	300	0.02	A	2		22			Asph		40	Good	Local		
623	Duck Inn Rd NE	Waconda Rd NE	Hwy 99E	0.00	2	2.00	250	0.02	A	2	1	19	1	Grav	Asph	Grav	40	Poor	Local		
624	75th Ave NE	Rambler Dr NE	Sequoia St NE	0.00	0.8	0.80	200	0.01	A	2	2	19	2	Grav	Asph	Grav	40	Fair	Local		
	Sequoia St NE	75th Ave NE	72nd Ave NE	0.80	1.07	0.27	300	0.02	A	2	2	19	2	Grav	Asph	Grav	40	Poor	Local		
	72nd Ave NE	Sequoia St NE	Waconda Rd NE	1.07	2.42	1.35	250	0.02	A	2	2	19	2	Grav	Asph	Grav	40	Poor	Local		
624 A	Stratford Dr NE	72nd Ave NE	82nd Ave NE	0.00	1.06	1.06	100	0.01	A	2		20			Grav		30	NA	Local		
	82nd Ave NE	Stratford Dr NE	Roanoke Dr NE	1.06	1.26	0.20	70	0.01	A	2		16			Grav		30	NA	Local		
625	Roanoke Dr NE	75th Ave NE	End of Pavement	0.00	0.02	0.02	100	0.01	A	2		21			Asph		40	Very Poor	Local		
	Roanoke Dr NE	End of Pavement	Beginning of Pavement	0.02	0.8	0.78	100	0.01	A	2		20			Grav		40	NA	Local		
	Roanoke Dr NE	Beginning of Pavement	86th Ave NE	0.80	1.38	0.58	100	0.01	A	2		19			Asph		40	Very Poor	Local		
	86th Ave NE	Roanoke Dr NE	Waconda Rd	1.38	2.42	1.04	350	0.02	A	2		19			Asph		40	Poor	Local		
626	Lakeside Dr NE	Hwy 99E	.24 mi from Brooklake Rd	0.00	3.25	3.25	350	0.02	A	2	1	19	1	Grav	Asph	Grav	60	Poor	Local		
	Lakeside Dr NE	.24 mi from Brooklake Rd	Brooklake Rd NE	3.25	3.49	0.24	300	0.02	A	2	1	19	1	Grav	Asph	Grav	40	Poor	Local		

Appendix B: Marion County Rural Roadway Inventory

Road				Milepoint	Length	2011	2011	2011	No.	Widths			Type			R/W	Pavement	2012 Functional	Sidewalks	
No.	Road Name	From	To	From To	Segment	Volumes	V/C	LOS	Lanes	L Sh.	Tr. Surf.	R Sh.	L Sh.	Tr. Surf.	R Sh.	Width Typ	Cond.	Classification	Lt.	Rt.
	Lakeside Dr NE	Brooklake Rd NE	Rochester St NE	3.49 - 4	0.51	250	0.02	A	2	1	18	1	Grav	Asph	Grav	40	Poor	Local		
	Rochester St NE	Lakeside Dr NE	67th Ave NE	4.00 - 4.64	0.64	150	0.01	A	2	1	18	1	Grav	Asph	Grav	40	Poor	Local		
	67th Ave NE	Rochester St NE	Brooklake Rd NE	4.64 - 5.15	0.51	200	0.02	A	2	1	18	1	Grav	Grav	Grav	40	Poor	Local		
	Brooklake Rd NE	67th Ave NE	65th Ave NE	5.15 - 5.43	0.28	250	0.02	A	2	1	18	1	Grav	Asph	Grav	40	Poor	Local		
627	59th Ave NE	Brooklake Rd NE	End Pavement	0.00 - 0.07	0.07	70	0.00	A	2		20			Asph		40	Poor	Local		
	59th Ave NE	Begin Gravel	Dead End	0.07 - 0.87	0.80	30	0.00	A	2		16			Grav		40	NA	Local		
628	55th Ave NE	Hazelgreen Rd NE	54th Ave NE	0.00 - 1.09	1.09	1800	0.10	A	2	1	20	1	Grav	Asph	Grav	40	Fair	Min. Collector		
	54th Ave NE	55th Ave NE	Quail St NE	1.09 - 2.11	1.02	1500	0.09	A	2	1	19	1	Grav	Asph	Grav	40	Fair	Min. Collector		
	Quail St NE	54th Ave NE	Hwy 99E	2.11 - 2.74	0.63	1600	0.09	A	2	1	20	1	Grav	Asph	Grav	50	Fair	Min. Collector		
628 A	55th Ave NE	Juniper St NE	Cordon Rd NE	0.00 - 0.42	0.42	150	0.01	A	2		18			Grav		30	Poor	Local		
629	72nd Ave NE	Indigo St	Silverton Rd	0.00 - 0.23	0.23	60	0.00	A	2		18			Asph		40	NA	Local		
	72nd Ave NE	Silverton Rd	Linnet St NE	0.23 - 1.07	0.84	150	0.01	A	2	1	19	1	Grav	Asph	Grav	40	Very Poor	Local		
	Linnet St NE	72nd Ave NE	75th Ave NE	1.07 - 1.37	0.30	300	0.02	A	2	1	19	1	Grav	Asph	Grav	40	Poor	Local		
	75th Ave NE	Linnet St NE	Hazelgreen Rd	1.37 - 1.77	0.40	350	0.02	A	2	1	19	1	Grav	Asph	Grav	40	Very Poor	Local		
	75th Ave NE	Hazelgreen Rd	Nutmeg St NE	1.77 - 2.43	0.66	700	0.04	A	2	1	19	1	Grav	Asph	Grav	50	Poor	Local		
	Nutmeg St NE	75th Ave NE	74th Ave NE	2.43 - 2.56	0.13	700	0.04	A	2	1	19	1	Grav	Asph	Grav	50	Fair	Local		
	74th Ave NE	Nutmeg St NE	Labish Center Rd	2.56 - 3.24	0.68	700	0.04	A	2	1	19	1	Grav	Asph	Grav	50	Poor	Local		
630	66th Ave NE	Juniper St NE	End of Pavement	0.00 - 0.02	0.02	80	0.01	A	2		18			Asph		30	Fair	Local		
	66th Ave NE	End of Pavement	Pudding Bridge Pave	0.02 - 0.67	0.65	70	0.01	A	2		18			Grav		30	NA	Local		
	66th Ave NE	S of Little Pudding Bridge	N of Little Pudding Bridge	0.67 - 0.73	0.06	60	0.00	A	2		21			Asph		30	Poor	Local		
	66th Ave NE	Pudding Bridge Pave	Beginning of Pavement	0.73 - 1.05	0.32	80	0.01	A	2		20			Grav		30	NA	Local		
	66th Ave NE	Beginning of Pavement	Hazelgreen Rd	1.05 - 1.08	0.03	100	0.01	A	2		19			Asph		30	Poor	Local		
631	82nd Ave NE	Labish Center Rd	Ramber Dr NE	0.00 - 1.06	1.06	60	0.01	A	2		18			Grav		40	Poor	Local		
632	114th Ave NE	Saratoga Dr	West Church Rd NE	0.00 - 0.19	0.19	800	0.05	A	2	1	20	1	Grav	Asph	Grav	40	Poor	Min. Collector		
	West Church Rd NE	114th Ave NE	Mt. Angel UGB	0.19 - 0.93	0.74	900	0.05	A	2	1	20	1	Grav	Asph	Grav	40	Poor	Min. Collector		
632 A	114th Ave NE	West Church Rd NE	Waypark Dr NE	0.00 - 0.29	0.29	400	0.04	A	2		22			Grav		40	Good	Local		
	Waypark Dr NE	114th Ave NE	Howell Prairie Rd	0.29 - 2.63	2.34	450	0.02	A	2		22			Asph		40	Good	Local		
633	North Howell Rd NE	Nusom Rd NE	Saratoga Dr	0.00 - 1.05	1.05	350	0.02	A	2	1	19	1	Grav	Asph	Grav	50	Poor	Local		
634	Labish Center Rd NE	72nd Ave NE	82nd Ave NE	0.00 - 1.06	1.06	700	0.03	A	2	1	22	1	Grav	Asph	Grav	50	Fair	Min. Collector		
	Labish Center Rd NE	82nd Ave NE	Howell Prairie Rd	1.06 - 2.07	1.01	500	0.03	A	2	1	22	1	Grav	Asph	Grav	50	Fair	Min. Collector		
	Nusom Rd NE	Howell Prairie Rd	Torvend Rd NE	2.07 - 3.9	1.83	800	0.05	A	2	3	19	3	Grav	Asph	Grav	50	Good	Min. Collector		
	Nusom Rd NE	Torvend Rd NE	Mt. Angel Hwy	3.90 - 5.22	1.32	900	0.05	A	2	3	18	3	Grav	Asph	Grav	50	Good	Min. Collector		

Appendix B: Marion County Rural Roadway Inventory

Road No.	Road Name	From	To	Milepoint From	Milepoint To	Length Segment	2011 Volumes	2011 V/C	2011 LOS	No. Lanes	Widths L Sh.	Widths Tr. Surf.	Widths R Sh.	Type L Sh.	Type Tr. Surf.	Type R Sh.	R/W Width Typ	Pavement Cond.	2012 Functional Classification	Sidewalks Lt.	Sidewalks Rt.
6201	Scott Ave NE	Hwy 99E	Peach Tree St NE	0.00	0.26	0.26	200	0.01	A	2	5	20	5	Grav	Asph	Grav	60	Fair	Local		
6202	Dover Ave NE	Hwy 99E	Peach Tree St NE	0.00	0.28	0.28	350	0.02	A	2	5	20	5	Grav	Asph	Grav	60	Fair	Local		
6203	Ramp St NE (Brooks)	Hwy 99E	57th Ave NE	0.00	0.42	0.42	350	0.02	A	2	4	18	4	Grav	Asph	Grav	60	Good	Local		
6220	Poinsetta St NE	Hwy 99E	Dead End	0.00	0.13	0.13	100	0.00	A	2		34			Asph		60	Fair	Local	X	X
6221	45th Pl NE	Poinsetta St NE	Dead ENd	0.00	0.06	0.06	40	0.00	A	2		34			Asph		60	Good	Local		
6235	York Ave NE	Blossom Ave NE	Peach Tree St NE	0.00	0.19	0.19	100	0.01	A	2	5	20	5	Grav	Asph	Grav	60	Fair	Local		
6236	Blossom Ave NE	Dover Ave NE	Scott Ave NE	0.00	0.11	0.11	100	0.01	A	2	5	20	5	Grav	Asph	Grav	60	Fair	Local		
6241	Quartz St NE	River Rd NE	Curb Section	0.00	0.12	0.12	100	0.00	A	2		34			Asph		60	Good	Local		
	Quartz St NE	Curb Section	Suffold Rd	0.12	0.26	0.14	100	0.01	A	2		20			Asph		60	Very Poor	Local		
6253	Huff Ave NE	Brooklake Dr NE	Dead End	0.00	0.21	0.21	500	0.03	A	2		34			Asph		60	Good	Local		
6289	Suffolk Rd NE	Clearlake Rd NE	Quartz St NE	0.00	0.23	0.23	60	0.00	A	2	5	20	5	Grav	Asph	Grav	60	Good	Local		
6293	Webb Ave NE (Labish)	Hwy 99E (Portland Rd NE)	Peach Tree St	0.00	0.29	0.29	250	0.01	A	2	1	20	1	Grav	Asph	Grav	30	Fair	Local		
6313	Edith Ave NE	Webb Ave NE	Dover Ave NE	0.00	0.05	0.05	100	0.01	A	2		20			Asph		60	Good	Local		
6313 A	Edith Ave NE	York Ave NE	Rd 3007 Ahd	0.00	0.07	0.07	100	0.01	A	2		20			Asph		60	Good	Local		
6314	Shady Oak Ln NE	Abiqua Rd NE	Pleasant Vally Dr	0.00	0.27	0.27	50	0.00	A	2	2	22	2	Grav	Asph	Grav	60	Good	Local		
6315	Pleasant Valley Dr NE	Shady Oak Ln NE	Cul-de-sac	0.00	0.19	0.19	40	0.00	A	2	2	22	2	Grav	Asph	Grav	60	Good	Local		
6316	Riverbend Dr NE	Abiqua Rd NE	Cul-de-sac	0.00	0.34	0.34	100	0.01	A	2	4	21	4	Grav	Asph	Grav	60	Good	Local		
6317	Luray Ave NE	Riverbend Dr NE	Cul-de-sac	0.00	0.12	0.12	50	0.00	A	2	4	21	4	Grav	Asph	Grav	50	Fair	Local		
7378	Grey-Mar St NE	64th Pl NE	Dead End	0.00	0.12	0.12	40	0.00	A	2	4	20	4	Grav	Asph	Grav	60	Good	Local		
7380	Guava Ct NE	64th Pl NE	Cul-de-sac	0.00	0.1	0.10	50	0.00	A	2	4	20	4	Grav	Asph	Grav	60	Good	Local		
7383	59th Ave SE	State St	Dead End	0.00	0.25	0.25	150	0.01	A	2		34			Asph		60	Good	Local		
7401	53rd Ave NE	Lardon Rd NE	Dead End	0.00	0.04	0.04	10	0.00	A	2		34			Asph		60	Very Poor	Local		

Attachment B: Traffic Counts

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: River Rd NE -- Brooklake Rd NE

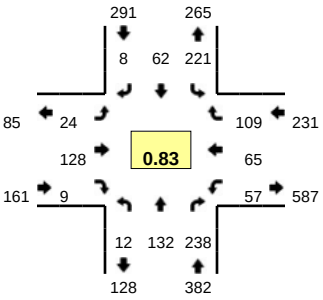
CITY/STATE: Salem, OR

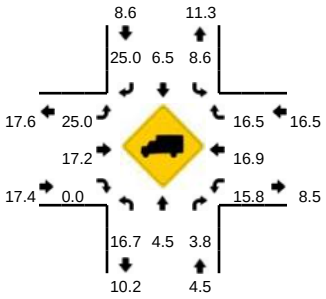
QC JOB #: 14715705

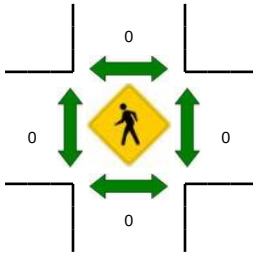
DATE: Wed, May 23 2018

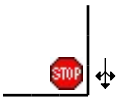
Peak-Hour: 7:00 AM -- 8:00 AM

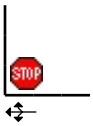
Peak 15-Min: 7:20 AM -- 7:35 AM

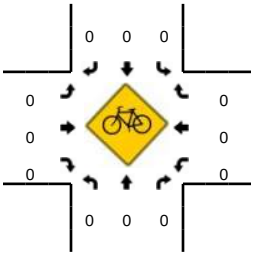


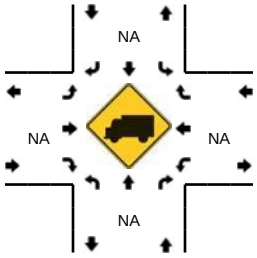


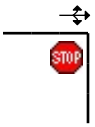


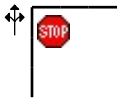


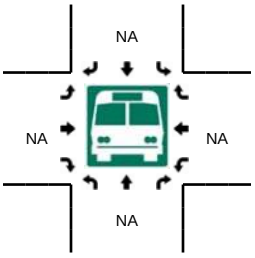












5-Min Count Period Beginning At	River Rd NE (Northbound)				River Rd NE (Southbound)				Brooklake Rd NE (Eastbound)				Brooklake Rd NE (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	2	22	25	0	13	1	0	0	2	10	1	0	4	7	6	0	93	
7:05 AM	2	20	17	0	15	3	1	0	1	11	0	0	0	6	5	0	81	
7:10 AM	0	13	21	0	10	6	0	0	1	11	0	0	3	9	7	0	81	
7:15 AM	0	6	10	0	9	4	1	0	3	6	1	0	4	3	6	0	53	
7:20 AM	1	12	21	0	21	8	0	0	3	14	1	0	3	8	10	0	102	
7:25 AM	0	9	27	0	24	6	3	0	3	17	1	0	4	2	13	0	109	
7:30 AM	1	9	20	0	33	5	0	0	2	13	1	0	9	3	13	0	109	
7:35 AM	0	10	21	0	18	7	1	0	1	10	1	0	3	8	15	0	95	
7:40 AM	1	8	24	0	24	8	1	0	3	15	2	0	5	7	6	0	104	
7:45 AM	3	6	27	0	26	7	1	0	1	9	0	0	12	8	7	0	107	
7:50 AM	1	9	13	0	15	5	0	0	3	9	1	0	4	2	9	0	71	
7:55 AM	1	8	12	0	13	2	0	0	1	3	0	0	6	2	12	0	60	1065
8:00 AM	1	4	14	0	21	5	0	0	3	10	1	0	3	9	11	0	82	1054
8:05 AM	0	5	17	0	14	2	0	0	2	9	0	0	3	4	6	0	62	1035
8:10 AM	1	5	7	0	18	4	3	0	0	9	0	0	7	6	7	0	67	1021
8:15 AM	0	10	8	0	12	3	1	0	0	8	0	0	3	9	13	0	67	1035
8:20 AM	1	5	17	0	9	7	1	0	0	10	0	0	2	2	9	0	63	996
8:25 AM	0	5	13	0	11	4	0	0	0	10	2	0	4	3	19	0	71	958
8:30 AM	0	8	4	0	14	4	1	0	0	5	0	0	6	6	9	0	57	906
8:35 AM	3	5	10	0	6	3	1	0	1	5	0	0	10	3	13	0	60	871
8:40 AM	1	3	10	0	16	8	2	0	0	9	3	0	6	5	4	0	67	834
8:45 AM	0	9	9	0	8	5	1	0	1	6	0	0	5	1	3	0	48	775
8:50 AM	0	5	12	0	13	6	0	0	2	8	0	0	3	4	9	0	62	766
8:55 AM	1	8	10	0	13	4	1	0	1	2	0	0	8	5	9	0	62	768

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	8	120	272	0	312	76	12	0	32	176	12	0	64	52	144	0	1280
Heavy Trucks	4	0	8		28	4	0		8	28	0		8	4	28		120
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 5/31/2018 2:58 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: River Rd NE -- Brooklake Rd NE

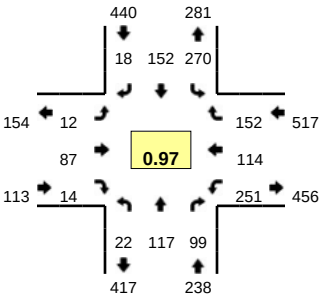
QC JOB #: 14715706

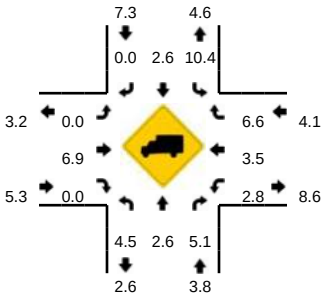
CITY/STATE: Salem, OR

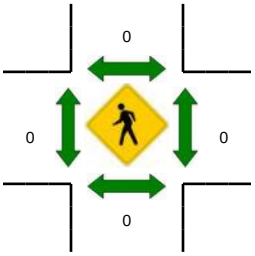
DATE: Wed, May 23 2018

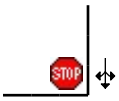
Peak-Hour: 4:40 PM -- 5:40 PM

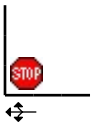
Peak 15-Min: 4:55 PM -- 5:10 PM

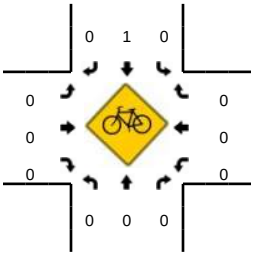


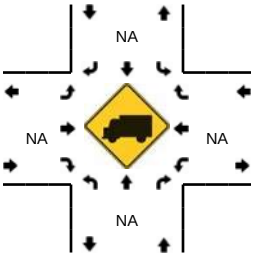


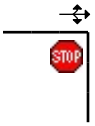


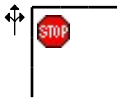


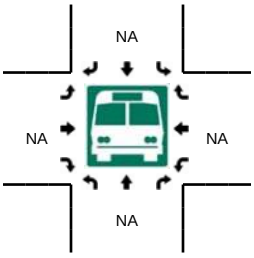












5-Min Count Period Beginning At	River Rd NE (Northbound)				River Rd NE (Southbound)				Brooklake Rd NE (Eastbound)				Brooklake Rd NE (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	2	11	8	0	21	14	2	0	0	4	1	0	19	8	12	0	102	
4:05 PM	1	6	9	0	11	12	1	0	4	5	2	0	9	12	9	0	81	
4:10 PM	0	7	11	0	16	16	2	0	0	3	1	0	9	12	7	0	84	
4:15 PM	1	11	9	0	11	19	0	0	0	10	3	0	19	10	11	0	104	
4:20 PM	2	4	12	0	17	7	2	0	0	2	1	0	17	9	15	0	88	
4:25 PM	5	9	10	0	15	15	3	0	1	8	0	0	26	5	18	0	115	
4:30 PM	2	7	7	0	16	6	1	0	3	5	0	0	14	9	4	0	74	
4:35 PM	3	8	11	0	21	7	2	0	3	10	1	0	24	6	11	0	107	
4:40 PM	2	5	12	0	24	8	4	0	2	5	2	0	26	9	18	0	117	
4:45 PM	5	11	6	0	13	12	1	0	0	10	1	0	21	14	16	0	110	
4:50 PM	4	8	5	0	20	15	2	0	3	7	3	0	14	11	12	0	104	
4:55 PM	1	9	7	0	26	8	3	0	3	7	1	0	22	9	14	0	110	1196
5:00 PM	3	9	9	0	22	12	0	0	2	4	2	0	26	7	14	0	110	1204
5:05 PM	2	9	17	0	26	12	1	0	0	7	1	0	21	10	12	0	118	1241
5:10 PM	1	12	9	0	25	7	2	0	0	11	1	0	23	9	6	0	106	1263
5:15 PM	1	12	9	0	22	14	0	0	0	6	2	0	24	11	9	0	110	1269
5:20 PM	1	11	10	0	21	21	2	0	0	8	1	0	12	7	8	0	102	1283
5:25 PM	1	11	4	0	19	16	0	0	1	10	0	0	19	8	18	0	107	1275
5:30 PM	0	10	5	0	26	13	1	0	1	6	0	0	20	10	10	0	102	1303
5:35 PM	1	10	6	0	26	14	2	0	0	6	0	0	23	9	15	0	112	1308
5:40 PM	2	6	5	0	24	16	5	0	1	8	1	0	14	8	22	0	112	1303
5:45 PM	0	13	10	0	23	13	3	0	0	9	0	0	11	12	12	0	106	1299
5:50 PM	1	9	7	0	21	17	2	0	0	6	1	0	12	6	10	0	92	1287
5:55 PM	1	3	4	0	12	10	0	0	0	4	1	0	20	7	12	0	74	1251

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	24	108	132	0	296	128	16	0	20	72	16	0	276	104	160	0	1352
Heavy Trucks	0	0	0		44	8	0		0	4	0		4	4	16		80
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 5/31/2018 2:58 PM

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

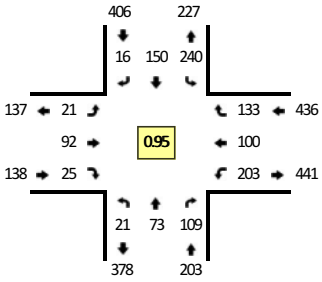
Type of peak hour being reported: Intersection Peak

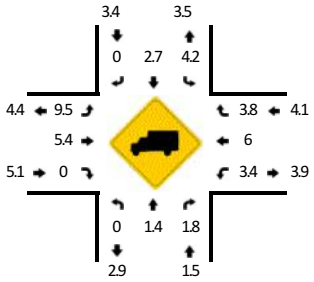
Method for determining peak hour: Total Entering Volume

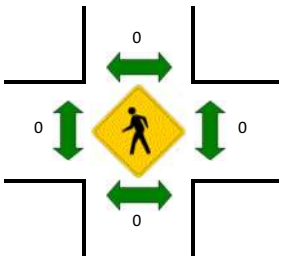
LOCATION: River Rd NE -- Brooklake Rd NE
CITY/STATE: Salem, OR

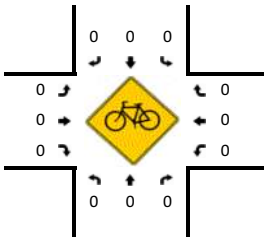
QC JOB #: 15296907
DATE: Thu, Oct 22 2020

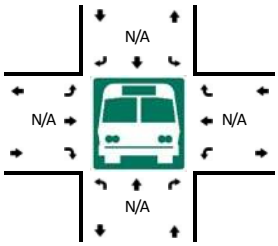
Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 4:40 PM -- 4:55 PM

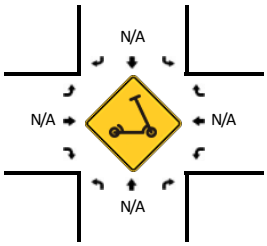












5-Min Count Period Beginning At	River Rd NE (Northbound)				River Rd NE (Southbound)				Brooklake Rd NE (Eastbound)				Brooklake Rd NE (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	0	3	6	0	0	0	0	0	0	8	0	0	2	3	6	0	28	
6:05 AM	1	3	7	0	11	1	0	0	1	4	1	0	0	0	8	0	37	
6:10 AM	1	6	13	0	8	1	0	0	0	4	0	0	0	3	5	0	41	
6:15 AM	1	1	10	0	8	3	0	0	2	5	0	0	0	4	10	0	44	
6:20 AM	0	12	13	0	8	2	0	0	1	7	0	0	3	2	10	0	58	
6:25 AM	1	7	17	0	9	2	0	0	1	5	0	0	3	2	11	0	58	
6:30 AM	3	2	11	0	9	0	0	0	1	5	0	0	3	4	14	0	52	
6:35 AM	1	9	14	0	8	3	0	0	1	5	0	0	0	5	17	0	63	
6:40 AM	1	7	12	0	10	1	0	0	5	5	0	0	3	3	10	0	57	
6:45 AM	1	17	17	0	9	1	0	0	1	7	0	0	5	2	13	0	73	
6:50 AM	1	7	12	0	12	4	0	0	2	11	0	0	2	4	10	0	65	
6:55 AM	1	6	19	0	13	2	2	0	3	8	0	0	5	3	15	0	77	653
7:00 AM	0	10	12	0	9	1	0	0	1	8	0	0	6	4	13	0	64	689
7:05 AM	2	8	11	0	10	1	1	0	2	5	0	0	4	6	18	0	68	720
7:10 AM	3	10	14	0	18	1	0	0	4	7	0	0	0	3	14	0	74	753
7:15 AM	0	7	19	0	15	2	0	0	3	13	1	0	6	7	14	0	87	796
7:20 AM	0	9	7	0	12	2	0	0	2	14	4	0	3	6	14	0	73	811
7:25 AM	3	9	12	0	14	2	5	0	2	5	1	0	2	8	14	0	77	830
7:30 AM	2	6	17	0	14	1	0	0	4	6	0	0	4	3	8	0	65	843
7:35 AM	1	10	14	0	11	1	0	0	2	12	0	0	4	3	6	0	64	844
7:40 AM	1	3	10	0	16	3	2	0	3	13	0	0	1	1	14	0	67	854
7:45 AM	2	7	12	0	22	5	1	0	1	12	1	0	0	3	10	0	76	857
7:50 AM	0	13	14	0	15	5	3	0	0	8	0	0	3	7	16	0	84	876
7:55 AM	0	3	10	0	6	4	3	0	2	10	0	0	3	5	11	0	57	856
8:00 AM	1	4	8	0	11	4	1	0	2	10	0	0	2	5	11	0	59	851
8:05 AM	1	9	9	0	13	2	1	0	0	6	0	0	7	3	4	0	55	838
8:10 AM	2	5	11	0	8	3	0	0	0	8	0	0	4	8	9	0	58	822
8:15 AM	0	0	11	0	22	2	2	0	1	12	1	0	4	9	6	0	70	805
8:20 AM	0	5	6	0	15	2	2	0	1	5	0	0	6	3	10	0	55	787
8:25 AM	4	3	16	0	5	2	0	0	1	6	0	0	3	4	11	0	55	765
8:30 AM	1	7	12	0	1	2	1	0	1	7	0	0	2	5	8	0	47	747
8:35 AM	1	8	5	0	6	0	0	0	1	9	1	0	5	5	5	0	46	729
8:40 AM	0	1	9	0	3	1	0	0	1	7	0	0	3	5	5	0	35	697
8:45 AM	0	3	8	0	2	4	1	0	0	5	0	0	3	6	5	0	37	658
8:50 AM	0	0	8	0	0	0	0	0	0	9	0	0	6	12	7	0	42	616
8:55 AM	0	4	7	0	4	1	1	0	2	8	0	0	5	6	3	0	41	600
9:00 AM	0	3	12	0	3	3	0	0	1	11	0	0	3	2	1	0	39	580
9:05 AM	1	4	10	0	3	1	1	0	1	11	1	0	6	5	8	0	52	577
9:10 AM	0	3	7	0	3	2	1	0	1	6	1	0	3	5	6	0	38	557

5-Min Count Period Beginning At	River Rd NE (Northbound)				River Rd NE (Southbound)				Brooklake Rd NE (Eastbound)				Brooklake Rd NE (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
9:15 AM	1	5	9	0	4	1	0	0	1	7	0	0	9	5	5	0	47	534
9:20 AM	0	7	8	0	3	1	0	0	1	5	1	0	2	7	3	0	38	517
9:25 AM	1	3	11	0	2	0	0	0	0	3	2	0	5	2	10	0	39	501
9:30 AM	0	9	10	0	2	2	1	0	1	5	0	0	4	2	7	0	43	497
9:35 AM	0	5	9	0	5	2	0	0	1	6	0	0	5	8	2	0	43	494
9:40 AM	2	6	15	0	0	2	1	0	1	7	0	0	5	1	8	0	48	507
9:45 AM	3	1	5	0	5	1	1	0	1	11	3	0	5	6	4	0	46	516
9:50 AM	1	1	7	0	3	0	0	0	0	1	3	0	5	4	8	0	33	507
9:55 AM	0	3	9	0	3	1	2	0	0	4	1	0	9	7	5	0	44	510
10:00 AM	2	3	9	0	3	0	0	0	0	3	0	0	8	6	4	1	39	510
10:05 AM	0	5	7	0	2	0	0	0	1	4	0	0	2	7	11	0	39	497
10:10 AM	1	5	6	0	2	1	0	0	1	4	0	0	10	5	4	0	39	498
10:15 AM	1	3	5	0	3	1	1	0	0	7	0	0	4	3	10	0	38	489
10:20 AM	1	3	8	0	2	2	0	0	0	3	0	0	4	4	5	0	32	483
10:25 AM	2	4	4	0	0	1	0	0	0	9	0	0	4	3	11	0	38	482
10:30 AM	1	1	18	0	3	0	1	0	1	7	3	0	3	8	6	0	52	491
10:35 AM	0	5	6	0	7	3	0	0	0	7	2	0	7	6	4	0	47	495
10:40 AM	0	1	9	0	5	2	1	0	1	12	0	0	3	2	6	0	42	489
10:45 AM	2	4	4	0	4	0	0	0	1	4	1	0	4	0	7	0	31	474
10:50 AM	0	5	2	0	5	0	0	0	0	8	2	0	2	3	3	0	30	471
10:55 AM	1	4	7	0	2	1	0	0	0	4	0	0	3	2	4	0	28	455
11:00 AM	3	4	7	0	1	4	0	0	0	7	0	0	7	3	5	0	41	457
11:05 AM	0	3	9	0	6	1	0	0	0	5	0	0	6	7	7	0	44	462
11:10 AM	1	2	3	0	11	5	0	0	1	6	0	0	3	7	9	0	48	471
11:15 AM	1	4	6	0	3	4	0	0	1	5	0	0	8	7	4	0	43	476
11:20 AM	3	4	5	0	3	6	0	0	0	4	0	0	4	9	7	0	45	489
11:25 AM	1	2	8	0	4	0	0	0	0	7	0	0	4	6	12	0	44	495
11:30 AM	0	4	7	0	6	4	2	0	0	11	1	0	7	3	6	0	51	494
11:35 AM	0	5	5	0	8	3	1	0	2	7	0	0	5	9	8	0	53	500
11:40 AM	1	5	6	0	12	4	1	0	0	10	0	0	11	13	3	0	66	524
11:45 AM	2	2	8	0	9	6	0	0	0	8	0	0	7	4	11	0	57	550
11:50 AM	0	9	9	0	12	4	1	0	0	7	3	0	10	4	12	0	71	591
11:55 AM	0	1	5	0	2	3	0	0	1	4	2	0	4	3	10	0	35	598
12:00 PM	2	5	9	0	11	3	1	0	2	2	0	0	13	4	7	0	59	616
12:05 PM	1	6	4	0	11	9	2	0	2	7	1	0	8	8	11	0	70	642
12:10 PM	2	5	5	0	7	6	3	0	1	6	0	0	10	5	11	0	61	655
12:15 PM	2	8	8	0	10	1	2	0	0	5	1	0	12	6	7	0	62	674
12:20 PM	0	2	3	0	7	5	1	0	1	6	0	0	8	5	11	0	49	678
12:25 PM	2	4	10	0	7	5	0	0	0	7	1	0	4	7	8	0	55	689
12:30 PM	0	9	7	0	10	3	1	0	1	9	2	0	9	8	13	0	72	710
12:35 PM	0	5	8	0	10	4	0	0	3	4	1	0	9	7	11	0	62	719
12:40 PM	1	8	8	0	10	4	0	0	0	2	1	0	2	8	10	0	54	707
12:45 PM	1	5	10	0	7	2	0	0	1	9	1	0	5	7	5	0	53	703
12:50 PM	2	8	3	0	6	8	2	0	3	1	2	0	5	4	5	0	49	681
12:55 PM	2	5	6	0	7	3	0	0	0	4	1	0	3	5	1	0	37	683
1:00 PM	0	4	12	0	11	10	2	0	0	8	2	0	9	12	10	0	80	704
1:05 PM	0	4	8	0	8	5	0	0	2	5	1	0	15	7	17	0	72	706
1:10 PM	1	5	5	0	6	3	2	0	2	7	1	0	5	9	10	0	56	701
1:15 PM	1	3	13	0	9	5	1	0	1	2	1	0	6	6	5	0	53	692
1:20 PM	0	7	12	0	7	4	0	0	0	12	0	0	6	5	8	0	61	704
1:25 PM	2	4	4	0	12	4	1	0	1	5	0	0	7	5	7	0	52	701
1:30 PM	3	2	8	0	10	8	3	0	0	5	3	0	5	6	10	0	63	692
1:35 PM	1	5	9	0	7	3	0	0	0	5	3	0	5	1	7	0	46	676
1:40 PM	0	5	11	0	9	5	0	0	0	11	0	0	10	6	8	0	65	687
1:45 PM	2	2	6	0	7	7	1	0	0	12	1	0	3	4	8	0	53	687
1:50 PM	1	6	5	0	10	5	1	0	0	8	3	0	7	3	6	0	55	693
1:55 PM	0	3	10	0	9	6	1	0	0	7	0	0	13	4	11	0	64	720
2:00 PM	1	3	4	0	9	5	1	0	0	4	1	0	12	1	11	0	52	692
2:05 PM	1	3	6	0	13	5	0	0	1	5	2	0	4	2	8	0	50	670
2:10 PM	2	5	9	0	11	6	0	0	3	4	1	0	7	2	6	0	56	670
2:15 PM	3	4	7	0	9	7	1	0	1	9	0	0	13	7	9	0	70	687
2:20 PM	2	6	8	0	10	6	0	0	1	4	2	0	10	8	10	0	67	693
2:25 PM	2	9	11	0	15	3	1	0	2	7	1	0	8	4	10	0	73	714
2:30 PM	1	7	8	0	7	4	3	0	0	12	0	0	12	6	8	0	68	719
2:35 PM	1	6	12	0	1	6	1	0	3	3	1	0	10	6	6	0	56	729
2:40 PM	1	5	16	0	5	3	1	0	1	2	0	0	15	9	6	0	64	728
2:45 PM	1	4	10	0	15	5	1	0	1	3	0	0	11	11	6	0	68	743
2:50 PM	1	5	8	0	8	4	0	0	1	7	0	0	12	5	11	0	62	750
2:55 PM	0	9	10	0	12	6	0	0	1	9	1	0	18	6	8	0	80	766
3:00 PM	3	4	10	0	16	11	0	0	0	4	0	0	5	2	11	0	66	780
3:05 PM	1	3	12	0	12	8	1	0	1	3	0	0	14	16	8	0	79	809
3:10 PM	2	4	9	0	8	8	1	0	1	11	0	0	13	4	9	0	70	823
3:15 PM	2	9	10	0	9	6	2	0	0	8	1	0	22	9	7	0	85	838
3:20 PM	1	7	8	0	13	10	0	0	1	5	1	0	15	5	8	0	74	845
3:25 PM	0	2	5	0	8	7	0	0	0	7	0	0	14	8	8	0	59	831
3:30 PM	1	3	8	0	19	15	3	0	0	4	0	0	9	10	13	0	85	848
3:35 PM	3	6	6	0	9	6	1	0	0	7	2	0	10	5	13	0	68	860
3:40 PM	1	9	11	0	14	7	0	0	1	6	0	0	11	10	9	0	79	875
3:45 PM	2	4	6	0	15	11	1	0	0	9	0	0	10	8	9	0	75	882
3:50 PM	0	7	9	0	9	14	1	0	0	4	2	0	18	7	12	0	83	903
3:55 PM	1	11	8	0	15	6	2	0	0	8	2	0	16	10	15	0	94	917
4:00 PM	0	6	11	0	8	3	0	0	2	4	2	0	20	6	13	0	75	926
4:05 PM	0	5	9	0	13	10	2	0	0	4	0	0	12	6	8	0	69	916
4:10 PM	1	12	4	0	17	10	0	0	0	4	4	0	7	8	15	0	82	928
4:15 PM	2	6	6	0	23	3	1	0	0	6	1	0	21	9	15	0	93	936
4:20 PM	3	8	7	0	12	13	2	0	3	10	0	0	12	7	13	0	90	952
4:25 PM	0	10	3	0	10	9	1	0	2	3	1	0	14	5	7	0	65	958
4:30 PM	1	9	8	0	19	10	2	0	0	3	1	0	16	5	9	0	83	956

5-Min Count Period Beginning At	River Rd NE (Northbound)				River Rd NE (Southbound)				Brooklake Rd NE (Eastbound)				Brooklake Rd NE (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:35 PM	0	6	8	0	17	8	3	0	1	9	2	0	16	9	9	0	88	976
4:40 PM	3	4	10	0	24	11	1	0	2	13	1	0	17	8	10	0	104	1001
4:45 PM	3	6	9	0	16	18	0	0	2	9	0	0	21	10	11	0	105	1031
4:50 PM	3	12	10	0	13	16	0	0	1	7	5	0	14	9	12	0	102	1050
4:55 PM	4	4	10	0	14	12	2	0	1	4	4	0	25	6	7	0	93	1049
5:00 PM	0	4	11	0	17	15	0	0	3	11	1	0	19	8	11	0	100	1074
5:05 PM	1	1	10	0	23	9	2	0	2	9	1	0	16	10	13	0	97	1102
5:10 PM	0	6	13	0	27	7	1	0	1	10	1	0	11	8	12	0	97	1117
5:15 PM	1	8	8	0	26	10	2	0	1	5	3	0	19	12	11	0	106	1130
5:20 PM	2	9	5	0	23	19	0	0	1	4	4	0	13	4	11	0	95	1135
5:25 PM	2	8	7	0	21	13	3	0	4	6	1	0	17	8	14	0	104	1174
5:30 PM	2	5	8	0	19	12	2	0	2	5	2	0	15	8	12	0	92	1183
5:35 PM	1	5	6	0	23	8	1	0	0	5	0	0	12	4	12	0	77	1172
5:40 PM	2	8	5	0	21	14	0	0	1	7	3	0	12	9	13	0	95	1163
5:45 PM	1	4	5	0	23	13	0	0	1	4	1	0	15	2	10	0	79	1137
5:50 PM	0	6	3	0	16	12	1	0	2	7	1	0	17	9	7	0	81	1116
5:55 PM	1	4	5	0	14	6	0	0	1	3	3	0	14	11	21	0	83	1106
6:00 PM	2	7	9	0	15	10	5	0	2	7	0	0	17	6	9	0	89	1095
6:05 PM	1	2	6	0	17	7	4	0	1	10	2	0	14	8	6	0	78	1076
6:10 PM	0	3	5	0	18	6	2	0	0	6	2	0	15	7	14	0	78	1057
6:15 PM	0	5	5	0	18	11	0	0	0	9	2	0	8	6	11	0	75	1026
6:20 PM	0	6	2	0	21	12	1	0	0	5	3	0	14	5	12	0	81	1012
6:25 PM	0	3	5	0	9	5	2	0	2	2	0	0	11	5	7	0	51	959
6:30 PM	0	4	3	0	20	5	0	0	1	4	0	0	10	7	11	0	65	932
6:35 PM	1	3	9	0	14	7	1	0	1	6	0	0	18	6	11	0	77	932
6:40 PM	1	3	3	0	14	6	1	0	0	3	1	0	9	8	6	0	55	892
6:45 PM	0	2	5	0	8	4	0	0	0	7	0	0	7	14	10	0	57	870
6:50 PM	0	6	5	0	14	6	1	0	1	3	1	0	11	4	5	0	57	846
6:55 PM	2	2	4	0	5	3	0	0	2	1	0	0	11	3	9	0	42	805
7:00 PM	1	1	4	0	7	2	0	0	0	1	0	0	9	6	6	0	37	753
7:05 PM	1	3	4	0	7	4	0	0	0	1	1	0	7	5	4	0	37	712
7:10 PM	0	3	5	0	8	4	0	1	0	3	0	0	3	3	5	0	35	669
7:15 PM	1	4	3	0	7	2	0	0	1	2	1	0	6	5	8	0	40	634
7:20 PM	0	3	4	0	5	2	0	0	0	1	1	0	5	4	6	0	31	584
7:25 PM	1	1	8	0	11	4	0	0	0	1	1	0	6	4	2	0	39	572
7:30 PM	1	2	5	0	8	5	1	0	1	2	0	0	7	4	5	0	41	548
7:35 PM	1	3	3	0	3	2	0	0	1	3	0	0	10	2	4	0	32	503
7:40 PM	1	1	3	0	6	1	1	0	0	2	1	0	4	4	8	0	32	480
7:45 PM	1	6	3	0	5	1	0	0	0	0	0	0	0	1	1	0	18	441
7:50 PM	1	1	3	0	3	3	0	0	0	2	0	0	7	6	10	0	36	420
7:55 PM	1	3	2	0	5	2	0	0	0	2	1	0	5	2	3	0	26	404
8:00 PM	0	2	4	0	2	2	0	0	0	1	0	0	7	1	3	0	22	389
8:05 PM	0	3	5	0	1	3	1	0	0	0	0	0	5	0	7	0	25	377
8:10 PM	0	6	3	0	4	1	0	0	0	3	1	0	8	3	4	0	33	375
8:15 PM	2	5	1	0	3	3	0	0	0	2	2	0	4	3	6	0	31	366
8:20 PM	0	0	4	0	2	1	2	0	1	1	2	0	7	3	2	0	25	360
8:25 PM	0	0	1	0	3	2	0	0	1	2	0	0	4	1	6	0	20	341
8:30 PM	0	0	2	0	4	0	2	0	1	0	0	0	6	2	5	0	22	322
8:35 PM	0	2	5	0	4	4	0	0	0	1	0	0	2	7	3	0	28	318
8:40 PM	1	1	1	0	1	2	0	1	0	4	0	0	3	1	5	0	20	306
8:45 PM	1	1	7	0	1	3	1	0	0	2	1	0	5	0	9	0	31	319
8:50 PM	0	4	3	0	2	3	0	0	0	2	0	0	9	1	2	0	26	309
8:55 PM	0	1	7	0	2	1	1	0	0	0	0	0	5	1	5	0	23	306
9:00 PM	2	1	1	0	3	2	1	0	0	1	0	0	7	1	2	0	21	305
9:05 PM	1	1	3	0	3	3	2	0	0	1	2	0	3	2	4	0	25	305
9:10 PM	1	1	5	0	5	2	0	0	0	1	2	0	3	2	3	0	25	297
9:15 PM	1	2	1	0	5	1	0	0	1	0	1	0	1	0	0	0	13	279
9:20 PM	0	2	1	0	2	0	1	0	1	0	0	0	5	1	3	0	16	270
9:25 PM	1	1	2	0	2	2	1	0	0	2	1	0	1	1	3	0	17	267
9:30 PM	0	2	2	0	2	1	0	0	0	0	0	0	2	0	6	0	15	260
9:35 PM	0	2	2	0	3	1	0	0	0	0	0	0	4	3	3	0	18	250
9:40 PM	0	2	0	0	0	1	2	0	0	0	0	0	4	1	1	0	11	241
9:45 PM	0	2	3	0	2	2	0	0	0	0	1	0	2	1	3	0	16	226
9:50 PM	0	2	4	0	2	0	0	0	0	0	0	0	2	0	2	0	12	212
9:55 PM	0	0	1	0	4	1	0	0	0	0	0	0	0	4	2	0	12	201

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	88	116	0	212	180	4	0	20	116	24	0	208	108	132	0	1244
Heavy Trucks	0	0	4		16	4	0		0	4	0		12	12	8		60
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 11/5/2020 1:41 PM

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

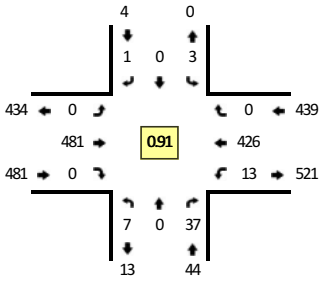
Type of peak hour being reported: Intersection Peak

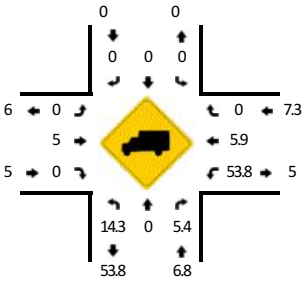
Method for determining peak hour: Total Entering Volume

LOCATION: Huff Ave NE -- Brooklake Rd NE
CITY/STATE: Salem, OR

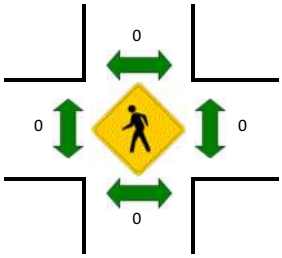
QC JOB #: 15296908
DATE: Thu, Oct 22 2020

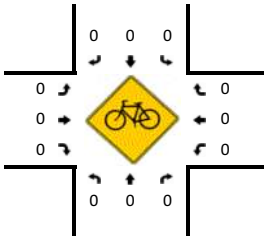
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

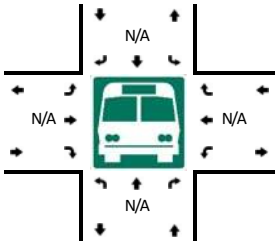


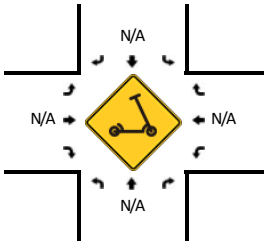


Quality Counts
DATA THAT DRIVES COMMUNITIES









5-Min Count Period Beginning At	Huff Ave NE (Northbound)				Huff Ave NE (Southbound)				Brooklake Rd NE (Eastbound)				Brooklake Rd NE (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	0	0	0	0	0	0	0	0	0	11	1	0	6	13	0	0	31	
6:05 AM	0	0	0	0	0	0	0	0	0	22	1	0	2	9	0	0	34	
6:10 AM	0	0	2	0	0	0	0	0	0	24	0	0	0	16	0	0	42	
6:15 AM	0	0	1	0	0	0	0	0	0	24	0	0	3	12	0	0	40	
6:20 AM	0	0	1	0	0	0	0	0	0	27	1	0	4	21	0	0	54	
6:25 AM	0	0	2	0	0	0	0	0	0	33	0	0	4	23	0	0	62	
6:30 AM	1	0	0	0	0	0	0	0	0	29	0	0	2	20	0	0	52	
6:35 AM	0	0	4	0	0	0	0	0	0	30	0	0	4	25	0	0	63	
6:40 AM	0	0	0	0	0	0	0	0	0	23	1	0	1	22	0	0	47	
6:45 AM	0	0	0	0	0	0	0	0	0	29	2	0	0	24	0	0	55	
6:50 AM	0	0	3	0	0	0	0	0	0	30	1	0	4	20	0	0	58	
6:55 AM	0	0	5	0	0	0	0	0	0	40	1	0	3	27	0	0	76	614
7:00 AM	0	0	0	0	0	0	0	0	0	35	1	0	2	29	0	0	67	650
7:05 AM	0	0	1	0	0	0	0	0	0	27	0	0	1	27	0	0	56	672
7:10 AM	0	0	0	0	1	0	0	0	0	38	0	0	0	28	1	0	68	698
7:15 AM	0	0	2	0	0	0	0	0	0	39	3	0	3	24	0	0	71	729
7:20 AM	0	0	0	0	0	0	0	0	0	36	0	0	2	32	0	0	70	745
7:25 AM	0	0	3	0	0	0	0	0	0	32	0	0	2	22	0	0	59	742
7:30 AM	1	0	1	0	0	0	0	0	0	43	0	0	0	17	0	0	62	752
7:35 AM	1	0	2	0	0	0	0	0	0	38	0	0	7	16	0	0	64	753
7:40 AM	0	0	2	0	0	0	0	0	0	36	1	0	1	20	0	0	60	766
7:45 AM	0	0	2	0	0	0	0	0	0	47	1	0	5	15	0	0	70	781
7:50 AM	0	0	1	0	0	0	0	0	0	36	0	0	5	31	0	0	73	796
7:55 AM	0	0	0	0	0	0	0	0	0	28	1	0	3	22	0	0	54	774
8:00 AM	0	0	1	0	0	0	0	0	0	24	0	0	4	25	0	0	54	761
8:05 AM	1	0	0	0	0	0	0	0	0	29	0	0	1	15	0	0	46	751
8:10 AM	1	0	0	0	0	0	0	0	0	33	0	0	1	26	0	0	61	744
8:15 AM	0	0	1	0	0	0	0	0	0	41	0	0	0	22	0	0	64	737
8:20 AM	0	0	0	0	0	0	0	0	0	30	0	0	1	24	0	0	55	722
8:25 AM	0	0	2	0	0	0	0	0	0	26	1	0	1	20	0	0	50	713
8:30 AM	1	0	1	0	0	0	0	0	0	22	0	0	1	15	1	0	41	692
8:35 AM	0	0	2	0	0	0	0	0	0	21	1	0	2	13	1	0	40	668
8:40 AM	0	0	0	0	1	0	0	0	0	22	0	0	0	16	0	0	39	647
8:45 AM	0	0	2	0	0	0	0	0	0	16	0	0	2	19	1	0	40	617
8:50 AM	0	0	1	0	0	0	0	0	0	14	0	0	1	25	0	0	41	585
8:55 AM	0	0	1	0	0	0	0	0	0	21	0	0	3	16	0	0	41	572
9:00 AM	0	0	0	0	0	0	0	0	0	26	0	0	0	12	0	0	38	556
9:05 AM	0	0	1	0	0	0	0	0	0	27	1	0	7	16	0	0	52	562
9:10 AM	1	0	2	0	1	0	0	0	0	18	1	0	0	19	0	0	42	543

5-Min Count Period Beginning At	Huff Ave NE (Northbound)				Huff Ave NE (Southbound)				Brooklake Rd NE (Eastbound)				Brooklake Rd NE (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
9:15 AM	0	0	2	0	0	0	0	0	0	20	1	0	2	20	0	0	45	524
9:20 AM	0	0	2	0	0	0	0	0	0	19	0	0	1	15	2	0	39	508
9:25 AM	1	0	2	0	0	0	1	0	1	15	2	0	2	18	0	0	42	500
9:30 AM	1	0	2	0	0	0	0	0	0	23	0	0	1	17	0	0	44	503
9:35 AM	1	0	2	0	0	0	0	0	0	22	0	0	5	13	0	0	43	506
9:40 AM	1	0	3	0	0	0	0	0	0	25	2	0	1	15	0	0	47	514
9:45 AM	0	0	5	0	0	0	0	0	0	27	0	0	3	25	1	0	61	535
9:50 AM	0	0	0	0	0	0	0	0	0	15	0	0	1	17	0	0	33	527
9:55 AM	0	0	0	0	1	0	0	0	0	14	0	0	2	26	1	0	44	530
10:00 AM	0	0	1	0	0	0	1	0	0	16	0	0	1	21	0	0	40	532
10:05 AM	1	0	2	0	1	0	0	0	0	21	0	0	2	20	0	0	47	527
10:10 AM	1	0	2	0	0	0	0	0	0	17	1	0	2	22	0	0	45	530
10:15 AM	0	0	2	0	0	0	0	0	0	16	0	0	3	20	0	0	41	526
10:20 AM	0	0	0	0	0	0	0	0	0	14	0	0	0	13	0	0	27	514
10:25 AM	0	0	1	0	0	0	0	0	0	14	0	0	3	24	0	0	42	514
10:30 AM	0	0	2	0	0	0	0	0	0	31	1	0	2	21	0	0	57	527
10:35 AM	2	0	2	0	0	0	0	0	0	19	0	0	1	20	1	0	45	529
10:40 AM	0	0	0	0	0	0	0	0	0	28	0	0	0	14	1	0	43	525
10:45 AM	0	0	1	0	0	0	0	0	0	17	1	0	2	12	0	0	33	497
10:50 AM	0	0	1	0	0	0	0	0	0	16	1	0	3	6	2	0	29	493
10:55 AM	0	0	1	0	0	0	0	0	0	19	0	0	4	8	1	0	33	482
11:00 AM	1	0	3	0	0	0	0	0	0	23	1	0	2	25	0	0	55	497
11:05 AM	0	0	1	0	0	0	0	0	0	19	1	0	2	22	0	0	45	495
11:10 AM	0	0	4	0	0	0	1	0	0	22	1	0	2	22	1	0	53	503
11:15 AM	1	0	1	0	0	0	0	0	0	21	0	0	2	24	1	0	50	512
11:20 AM	0	0	2	0	0	0	0	0	0	12	0	0	1	23	0	0	38	523
11:25 AM	0	0	2	0	0	0	0	0	0	17	0	0	1	20	5	0	45	526
11:30 AM	0	0	5	0	0	0	0	0	0	23	2	0	3	18	0	0	51	520
11:35 AM	0	0	5	0	0	0	1	0	0	22	1	0	2	22	0	0	53	528
11:40 AM	0	0	1	0	0	0	0	0	0	33	0	0	1	28	0	0	63	548
11:45 AM	3	0	3	0	0	0	0	0	0	26	1	0	0	22	0	0	55	570
11:50 AM	0	0	4	0	0	0	0	0	1	25	1	0	1	24	0	0	56	597
11:55 AM	0	0	2	0	0	0	0	0	0	16	0	0	0	19	0	0	37	601
12:00 PM	0	0	6	0	0	0	0	0	0	19	0	0	2	29	1	0	57	603
12:05 PM	2	0	1	0	0	0	0	0	0	26	1	0	1	25	0	0	56	614
12:10 PM	0	0	1	0	0	1	0	0	0	24	2	0	2	32	0	0	62	623
12:15 PM	0	0	2	0	1	0	0	0	0	23	0	0	2	27	0	0	55	628
12:20 PM	2	0	4	0	0	0	0	0	0	21	0	0	2	28	0	0	57	647
12:25 PM	0	0	4	0	0	0	0	0	0	24	0	0	5	20	0	0	53	655
12:30 PM	0	0	3	0	1	0	0	0	0	29	0	0	3	36	0	0	72	676
12:35 PM	0	0	1	0	0	0	0	0	0	24	0	0	0	22	0	0	47	670
12:40 PM	0	0	2	0	0	0	0	0	0	17	0	0	1	26	0	0	46	653
12:45 PM	0	0	1	0	0	0	0	0	0	27	0	1	0	16	0	0	45	643
12:50 PM	0	0	0	0	0	0	0	0	0	20	0	0	3	26	0	0	49	636
12:55 PM	0	0	3	0	2	0	0	0	1	10	1	0	1	28	0	0	46	645
1:00 PM	0	0	0	0	0	0	0	0	0	35	0	0	1	34	1	0	71	659
1:05 PM	1	0	2	0	0	0	0	0	0	28	1	0	2	17	1	0	52	655
1:10 PM	0	0	1	0	0	0	0	0	0	22	0	0	1	26	0	0	50	643
1:15 PM	0	0	0	0	0	0	0	0	1	24	2	0	2	21	0	0	50	638
1:20 PM	0	0	2	0	0	0	0	0	0	35	1	0	3	17	1	0	59	640
1:25 PM	0	0	1	0	0	0	0	0	0	22	1	0	2	24	0	0	50	637
1:30 PM	1	0	1	0	0	0	0	0	0	23	0	0	1	31	0	0	57	622
1:35 PM	0	0	3	0	0	0	0	0	0	19	0	0	1	13	0	0	36	611
1:40 PM	0	0	3	0	1	0	0	0	0	28	0	0	2	28	0	0	62	627
1:45 PM	0	0	2	0	0	0	0	0	0	33	0	0	1	16	0	0	52	634
1:50 PM	1	0	1	0	1	0	0	0	0	23	0	0	0	24	1	0	51	636
1:55 PM	0	0	3	0	0	0	0	0	1	29	1	0	3	26	0	0	63	653
2:00 PM	0	0	2	0	1	0	0	0	0	24	0	0	3	25	0	0	55	637
2:05 PM	0	0	2	0	0	0	0	0	0	29	0	0	2	18	0	0	51	636
2:10 PM	0	0	4	0	0	0	0	0	0	26	0	0	5	22	0	0	57	643
2:15 PM	1	0	1	0	0	0	0	0	0	33	0	0	1	23	0	0	59	652
2:20 PM	0	0	2	0	0	0	0	0	0	22	0	0	4	28	0	0	56	649
2:25 PM	0	0	2	0	1	0	1	0	0	33	1	0	1	26	0	0	65	664
2:30 PM	0	0	3	0	0	0	0	0	0	32	1	0	4	25	0	0	65	672
2:35 PM	0	0	2	0	0	0	0	0	0	21	0	0	3	28	0	0	54	690
2:40 PM	1	0	4	0	0	0	0	0	0	22	2	0	2	30	0	0	61	689
2:45 PM	1	0	1	0	0	0	1	0	0	25	0	0	4	24	0	0	56	693
2:50 PM	1	0	0	0	1	0	0	0	0	25	1	0	3	27	0	0	58	700
2:55 PM	1	0	0	0	0	0	1	0	0	31	1	0	1	28	0	0	63	700
3:00 PM	1	0	2	0	0	0	0	0	0	31	1	0	2	31	1	0	69	714
3:05 PM	2	0	2	0	0	0	0	0	0	30	1	0	2	35	0	0	72	735
3:10 PM	0	0	3	0	0	0	0	0	0	31	0	0	1	34	0	0	69	747
3:15 PM	1	0	1	0	2	0	0	0	0	24	1	0	3	33	0	0	65	753
3:20 PM	1	0	1	0	0	0	0	0	0	29	1	0	4	29	0	0	65	762
3:25 PM	1	0	3	0	1	0	1	0	0	25	0	0	2	29	2	0	64	761
3:30 PM	2	0	3	0	1	0	0	0	0	32	0	0	2	31	0	0	71	767
3:35 PM	1	0	1	0	0	0	0	0	0	29	0	0	0	28	0	0	59	772
3:40 PM	0	0	4	0	0	0	0	0	0	33	0	0	1	32	0	0	70	781
3:45 PM	0	0	1	0	0	0	0	0	0	27	0	0	1	28	0	0	57	782
3:50 PM	1	0	2	0	0	0	0	0	0	28	0	0	0	37	1	0	69	793
3:55 PM	0	0	1	0	0	0	1	0	1	33	1	0	0	40	0	0	77	807
4:00 PM	0	0	1	0	1	0	0	0	0	27	0	0	1	40	0	0	70	808
4:05 PM	0	0	2	0	0	0	0	0	0	30	0	0	1	21	0	0	54	790
4:10 PM	0	0	1	0	0	0	0	0	0	25	0	0	2	36	0	1	65	786
4:15 PM	0	0	5	0	1	0	0	0	0	41	0	0	2	41	0	0	90	811
4:20 PM	0	0	3	0	0	0	0	0	0	30	1	0	4	36	1	0	75	821
4:25 PM	0	0	6	0	1	0	0	0	0	24	0	0	1	26	0	0	58	815

5-Min Count Period Beginning At	Huff Ave NE (Northbound)				Huff Ave NE (Southbound)				Brooklake Rd NE (Eastbound)				Brooklake Rd NE (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:30 PM	2	0	6	0	1	0	0	0	0	33	0	0	0	31	0	0	73	817
4:35 PM	0	0	1	0	0	0	0	0	0	42	0	0	3	40	0	0	86	844
4:40 PM	0	0	1	0	1	0	0	0	0	48	0	0	1	29	0	0	80	854
4:45 PM	0	0	2	0	0	0	0	0	0	41	0	0	1	46	0	0	90	887
4:50 PM	1	0	1	0	0	0	0	0	0	31	0	0	1	32	0	0	66	884
4:55 PM	0	0	8	0	0	0	1	0	0	29	0	0	0	38	0	0	76	883
5:00 PM	1	0	5	0	1	0	0	0	0	44	0	0	4	36	0	0	91	904
5:05 PM	2	0	3	0	0	0	0	0	0	46	0	0	0	33	0	0	84	934
5:10 PM	0	0	2	0	0	0	0	0	0	50	0	0	0	40	0	0	92	961
5:15 PM	0	0	4	0	0	0	0	0	0	42	0	0	0	34	0	0	80	951
5:20 PM	1	0	3	0	0	0	0	0	0	37	0	0	2	32	0	0	75	951
5:25 PM	0	0	1	0	0	0	0	0	0	38	0	0	1	35	0	0	75	968
5:30 PM	0	0	1	0	0	0	0	0	0	31	0	0	1	39	0	0	72	967
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5:40 PM	0	0	5	0	0	0	0	0	0	30	0	0	0	39	0	0	74	938
5:45 PM	0	0	0	0	0	0	0	0	0	37	2	0	1	29	0	0	69	917
5:50 PM	0	0	3	0	0	0	0	0	0	24	0	0	2	30	0	0	59	910
5:55 PM	1	0	4	0	0	0	0	0	0	27	0	0	0	47	0	0	79	913
6:00 PM	0	0	0	0	0	0	0	0	0	31	0	0	1	33	0	0	65	887
6:05 PM	1	0	1	0	0	0	0	0	0	32	0	0	1	21	0	0	56	859
6:10 PM	1	0	1	0	0	0	0	0	0	31	1	0	1	37	0	0	72	839
6:15 PM	1	0	4	0	0	0	0	0	0	32	1	0	0	26	0	0	64	823
6:20 PM	0	0	1	0	0	0	0	0	0	31	0	0	0	28	0	0	60	808
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7:10 PM	0	0	0	0	0	0	0	0	0	15	0	0	1	13	0	0	29	556
7:15 PM	0	0	0	0	0	0	0	0	0	10	0	0	1	23	0	0	34	526
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7:25 PM	1	0	2	0	0	0	0	0	0	17	1	0	0	10	0	0	31	479
7:30 PM	0	0	0	0	0	0	0	0	0	16	0	0	2	18	0	0	36	453
7:35 PM	0	0	0	0	0	0	0	0	0	12	0	0	0	17	0	0	29	417
7:40 PM	0	0	0	0	0	0	0	0	0	7	0	0	2	14	0	0	23	391
7:45 PM	0	0	0	0	0	0	0	0	0	11	0	0	1	14	0	0	26	370
7:50 PM	0	0	0	0	0	0	0	0	0	8	0	0	1	13	0	0	22	350
7:55 PM	0	0	1	0	0	0	0	0	0	9	0	0	0	6	0	0	16	327
8:00 PM	0	0	3	0	0	0	0	0	0	7	0	0	0	13	0	0	23	320
8:05 PM	0	0	1	0	0	0	0	0	0	6	0	0	0	12	0	0	19	309
8:10 PM	0	0	2	0	0	0	0	0	0	13	0	0	1	15	0	0	31	311
8:15 PM	0	0	0	0	0	0	0	0	0	5	0	0	0	14	0	0	19	296
8:20 PM	0	0	0	0	0	0	0	0	0	6	0	0	0	12	0	0	18	293
8:25 PM	0	0	0	0	0	0	0	0	0	6	0	0	0	11	0	0	17	279
8:30 PM	0	0	2	0	0	0	0	0	0	9	0	0	0	16	0	0	27	270
8:35 PM	0	0	0	0	0	0	0	0	0	9	0	0	1	9	0	0	19	260
8:40 PM	0	0	0	0	0	0	0	0	0	7	0	0	0	11	0	0	18	255
8:45 PM	0	0	0	0	0	0	0	0	0	11	0	0	0	13	0	0	24	253
8:50 PM	0	0	0	0	0	0	0	0	0	7	0	0	0	13	1	0	21	252
8:55 PM	0	0	0	0	0	0	1	0	0	11	0	0	0	9	0	0	21	257
9:00 PM	0	0	0	0	0	0	0	0	0	5	0	0	1	10	0	0	16	250
9:05 PM	0	0	0	0	0	0	0	0	0	7	0	0	0	11	0	0	18	249
9:10 PM	0	0	0	0	0	0	0	0	0	9	0	0	0	5	0	0	14	232
9:15 PM	0	0	0	0	0	0	0	0	0	8	0	0	0	4	0	0	12	225
9:20 PM	0	0	1	0	0	0	0	0	0	4	0	0	0	8	0	0	13	220
9:25 PM	0	0	0	0	0	0	0	0	0	4	0	0	1	4	0	0	9	212
9:30 PM	0	0	0	0	0	0	0	0	0	5	0	0	0	8	0	0	13	198
9:35 PM	0	0	1	0	0	0	0	0	0	3	0	0	0	11	0	0	15	194
9:40 PM	0	0	0	0	0	0	0	0	0	3	0	0	0	8	0	0	11	187
9:45 PM	0	0	0	0	0	0	0	0	0	5	0	0	0	4	0	0	9	172
9:50 PM	0	0	0	0	0	0	0	0	0	6	0	0	1	3	0	0	10	161
9:55 PM	0	0	1	0	0	0	0	0	0	4	0	0	0	6	0	0	11	151

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	40	0	4	0	0	0	0	560	0	0	16	436	0	0	1068
Heavy Trucks	0	0	4		0	0	0		0	28	0		8	28	0		68
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 11/5/2020 1:41 PM

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

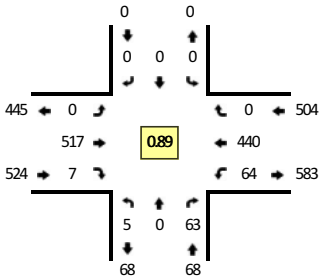
Type of peak hour being reported: Intersection Peak

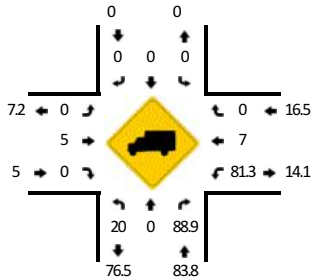
Method for determining peak hour: Total Entering Volume

LOCATION: Truckman Way NE -- Brooklake Rd NE
CITY/STATE: Keizer, OR

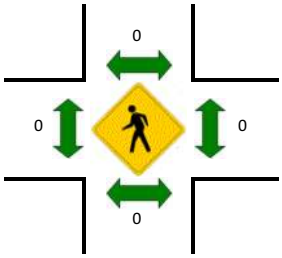
QC JOB #: 15296906
DATE: Thu, Oct 22 2020

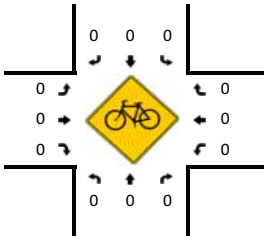
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

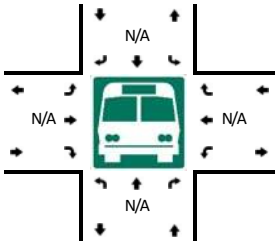


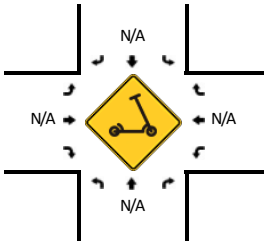


Quality Counts
DATA THAT DRIVES COMMUNITIES









5-Min Count Period Beginning At	Truckman Way NE (Northbound)				Truckman Way NE (Southbound)				Brooklake Rd NE (Eastbound)				Brooklake Rd NE (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	0	0	6	0	0	0	0	0	0	30	2	0	9	36	0	0	83	
3:05 PM	0	0	6	0	0	0	0	0	0	28	2	0	5	36	0	0	77	
3:10 PM	2	0	8	0	0	0	0	0	0	35	1	0	5	35	0	0	86	
3:15 PM	1	0	12	0	0	0	0	0	0	28	0	0	6	33	0	0	80	
3:20 PM	0	0	9	0	0	0	0	0	0	29	2	0	5	34	0	0	79	
3:25 PM	0	0	11	0	0	0	0	0	0	28	0	0	4	33	0	0	76	
3:30 PM	0	0	1	0	0	0	0	0	0	34	1	0	5	33	0	0	74	
3:35 PM	0	0	6	0	0	0	0	0	0	30	1	0	5	29	0	0	71	
3:40 PM	1	0	5	0	0	0	0	0	0	34	1	0	3	29	0	0	73	
3:45 PM	0	0	1	0	0	0	0	0	0	30	0	0	6	31	0	0	68	
3:50 PM	0	0	10	0	0	0	0	0	0	32	0	0	6	38	0	0	86	
3:55 PM	0	0	6	0	0	0	0	0	0	34	0	0	4	39	0	0	83	936
4:00 PM	0	0	3	0	0	0	0	0	0	28	1	0	8	41	0	0	81	934
4:05 PM	0	0	3	0	0	0	0	0	0	33	1	0	7	22	0	0	66	923
4:10 PM	0	0	8	0	0	0	0	0	0	26	0	0	5	40	0	2	81	918
4:15 PM	0	0	4	0	0	0	0	0	0	47	0	0	3	43	0	0	97	935
4:20 PM	0	0	3	0	0	0	0	0	0	33	0	0	9	41	0	0	86	942
4:25 PM	0	0	4	0	0	0	0	0	0	33	0	0	2	26	0	0	65	931
4:30 PM	0	0	6	0	0	0	0	0	0	38	1	0	7	32	0	0	84	941
4:35 PM	1	0	4	0	0	0	0	0	0	45	0	0	3	43	0	0	96	966
4:40 PM	0	0	4	0	0	0	0	0	0	49	0	0	7	29	0	0	89	982
4:45 PM	0	0	7	0	0	0	0	0	0	43	1	0	5	49	0	0	105	1019
4:50 PM	1	0	5	0	0	0	0	0	0	30	1	0	6	31	0	1	75	1008
4:55 PM	0	0	3	0	0	0	0	0	0	38	0	0	3	38	0	1	83	1008
5:00 PM	0	0	8	0	0	0	0	0	0	50	0	0	6	42	0	0	106	1033
5:05 PM	0	0	6	0	0	0	0	0	0	49	1	0	5	31	0	1	93	1060
5:10 PM	0	0	8	0	0	0	0	0	0	55	0	0	5	41	0	0	109	1088
5:15 PM	1	0	3	0	0	0	0	0	0	42	3	0	2	33	0	0	84	1075
5:20 PM	1	0	5	0	0	0	0	0	0	41	0	0	7	34	0	0	88	1077
5:25 PM	1	0	4	0	0	0	0	0	0	37	0	0	5	37	0	0	84	1096
5:30 PM	1	0	1	0	0	0	0	0	0	33	0	0	6	38	0	0	79	1091
5:35 PM	0	0	3	0	0	0	0	0	0	36	0	0	8	27	0	0	74	1069
5:40 PM	2	0	4	0	0	0	0	0	0	37	0	0	3	33	0	0	79	1059
5:45 PM	0	0	9	0	0	0	0	0	0	35	2	0	5	29	0	0	80	1034
5:50 PM	0	0	6	0	0	0	0	0	0	28	0	0	8	32	0	0	74	1033
5:55 PM	0	0	2	0	0	0	0	0	0	30	0	0	3	46	0	0	81	1031

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	88	0	0	0	0	0	0	616	4	0	64	456	0	4	1232
Heavy Trucks	0	0	80		0	0	0		0	32	0		48	36	0		196
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 11/5/2020 1:41 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: Truckman Way NE -- Brooklake Rd NE

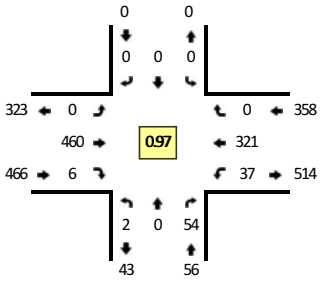
CITY/STATE: Keizer, OR

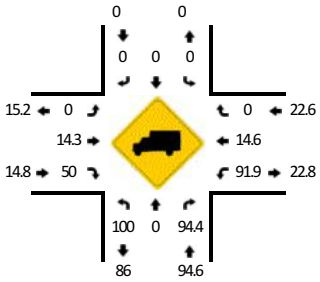
QC JOB #: 15296910

DATE: Thu, Oct 22 2020

Peak-Hour: 6:55 AM -- 7:55 AM

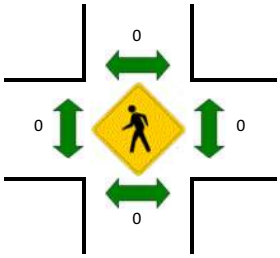
Peak 15-Min: 7:10 AM -- 7:25 AM

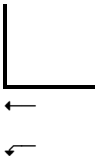


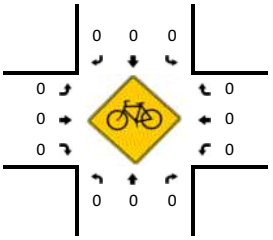


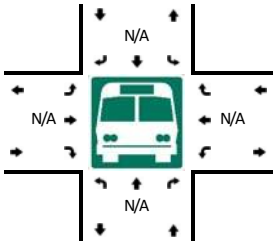
Quality Counts

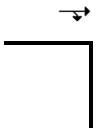
DATA THAT DRIVES COMMUNITIES

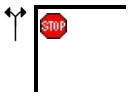


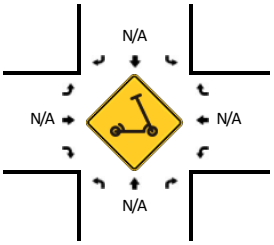












5-Min Count Period Beginning At	Truckman Way NE (Northbound)				Truckman Way NE (Southbound)				Brooklake Rd NE (Eastbound)				Brooklake Rd NE (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	0	0	6	0	0	0	0	0	0	12	0	0	2	19	0	0	39	
6:05 AM	0	0	1	0	0	0	0	0	0	21	1	0	6	12	0	0	41	
6:10 AM	0	0	3	0	0	0	0	0	0	26	0	0	1	15	0	0	45	
6:15 AM	0	0	3	0	0	0	0	0	0	25	0	0	2	15	0	0	45	
6:20 AM	0	0	4	0	0	0	0	0	0	26	0	0	2	26	0	0	58	
6:25 AM	0	0	5	0	0	0	0	0	0	37	0	0	3	27	0	0	72	
6:30 AM	0	0	3	0	0	0	0	0	0	28	0	0	4	24	0	0	59	
6:35 AM	0	0	4	0	0	0	0	0	0	34	1	0	2	27	0	0	68	
6:40 AM	0	0	5	0	0	0	0	0	0	23	0	0	3	23	0	0	54	
6:45 AM	0	0	6	0	0	0	0	0	0	28	1	0	3	23	0	0	61	
6:50 AM	0	0	3	0	0	0	0	0	0	32	0	0	2	24	0	0	61	
6:55 AM	1	0	3	0	0	0	0	0	0	44	0	0	2	29	0	0	79	682
7:00 AM	0	0	5	0	0	0	0	0	0	36	0	0	3	33	0	0	77	720
7:05 AM	0	0	2	0	0	0	0	0	0	28	0	0	7	28	0	0	65	744
7:10 AM	0	0	5	0	0	0	0	0	0	37	2	0	3	29	0	0	76	775
7:15 AM	0	0	4	0	0	0	0	0	0	40	0	0	0	28	0	0	72	802
7:20 AM	0	0	7	0	0	0	0	0	0	36	0	0	2	33	0	0	78	822
7:25 AM	0	0	5	0	0	0	0	0	0	35	1	0	2	25	0	0	68	818
7:30 AM	1	0	3	0	0	0	0	0	0	41	0	0	5	15	0	0	65	824
7:35 AM	0	0	6	0	0	0	0	0	0	43	0	0	5	22	0	0	76	832
7:40 AM	0	0	5	0	0	0	0	0	0	35	1	0	4	22	0	0	67	845
7:45 AM	0	0	4	0	0	0	0	0	0	48	1	0	2	20	0	0	75	859
7:50 AM	0	0	5	0	0	0	0	0	0	37	1	0	2	37	0	0	82	880
7:55 AM	0	0	4	0	0	0	0	0	0	28	1	0	4	24	0	0	61	862
8:00 AM	0	0	3	0	0	0	0	0	0	21	0	0	5	28	0	0	57	842
8:05 AM	0	0	6	0	0	0	0	0	0	33	0	0	2	16	0	0	57	834
8:10 AM	1	0	4	0	0	0	0	0	0	33	0	0	2	26	0	0	66	824
8:15 AM	0	0	4	0	0	0	0	0	0	42	0	0	4	22	0	0	72	824
8:20 AM	0	0	3	0	0	0	0	0	0	29	3	0	5	26	0	0	66	812
8:25 AM	1	0	3	0	0	0	0	0	0	28	0	0	4	21	0	0	57	801
8:30 AM	0	0	3	0	0	0	0	0	0	23	1	0	4	16	0	0	47	783
8:35 AM	0	0	2	0	0	0	0	0	0	21	2	0	6	17	0	0	48	755
8:40 AM	0	0	6	0	0	0	0	0	0	22	0	0	6	16	0	0	50	738
8:45 AM	1	0	5	0	0	0	0	0	0	17	2	0	1	21	0	0	47	710
8:50 AM	0	0	5	0	0	0	0	0	0	14	0	0	4	26	0	0	49	677
8:55 AM	0	0	6	0	0	0	0	0	0	22	0	0	8	19	0	0	55	671

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	64	0	0	0	0	0	0	452	8	0	20	360	0	0	904
Heavy Trucks	0	0	64		0	0	0		0	56	8		20	52	0		200
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 11/5/2020 1:41 PM

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

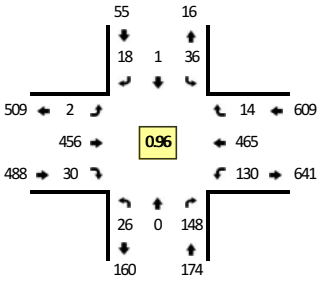
Type of peak hour being reported: Intersection Peak

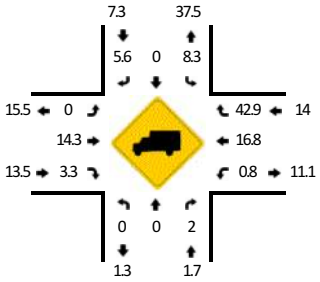
Method for determining peak hour: Total Entering Volume

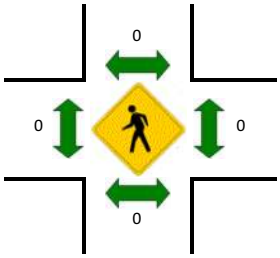
LOCATION: Pilot/May Dwy -- Brooklake Rd NE
CITY/STATE: Keizer, OR

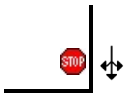
QC JOB #: 15296905
DATE: Tue, Oct 27 2020

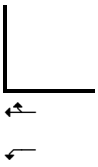
Peak-Hour: 4:10 PM -- 5:10 PM
Peak 15-Min: 4:25 PM -- 4:40 PM

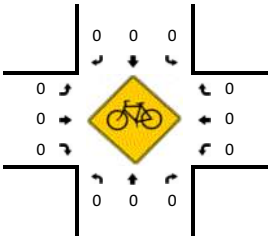


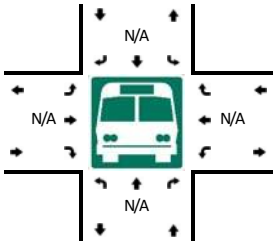


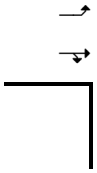


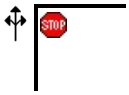


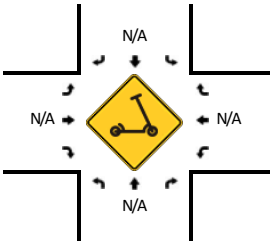












5-Min Count Period Beginning At	Pilot/May Dwy (Northbound)				Pilot/May Dwy (Southbound)				Brooklake Rd NE (Eastbound)				Brooklake Rd NE (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	2	0	14	0	1	0	1	0	1	34	2	0	12	27	3	0	97	
3:05 PM	1	0	9	0	1	1	1	0	0	30	1	0	13	39	2	0	98	
3:10 PM	2	1	11	0	2	0	0	0	2	30	2	0	4	39	1	0	94	
3:15 PM	3	0	12	0	0	0	4	0	0	20	1	0	13	43	1	0	97	
3:20 PM	2	0	11	0	3	0	0	0	0	23	1	0	9	24	1	0	74	
3:25 PM	1	0	8	0	1	0	0	0	0	36	6	0	8	24	0	0	84	
3:30 PM	3	0	15	0	3	0	3	0	1	43	4	0	8	23	0	0	103	
3:35 PM	4	0	7	0	3	0	1	0	1	33	3	0	13	22	0	0	87	
3:40 PM	2	0	12	0	2	0	1	0	0	32	2	0	6	38	1	0	96	
3:45 PM	1	0	11	0	1	0	0	0	0	34	0	0	9	25	0	0	81	
3:50 PM	1	0	8	0	1	0	0	0	0	28	1	0	11	35	1	0	86	
3:55 PM	2	0	11	0	1	0	1	0	1	31	2	0	14	44	4	0	111	1108
4:00 PM	1	0	13	0	3	0	2	0	1	36	2	0	13	32	0	0	103	1114
4:05 PM	1	0	7	0	2	0	1	0	0	35	2	0	11	34	0	1	94	1110
4:10 PM	3	0	9	0	4	1	0	0	0	32	1	0	14	44	0	1	109	1125
4:15 PM	4	0	12	0	4	0	1	0	1	32	4	0	12	40	1	0	111	1139
4:20 PM	1	0	14	0	0	0	1	0	0	39	3	0	14	34	0	0	106	1171
4:25 PM	3	0	13	0	2	0	0	0	0	35	3	0	5	51	0	0	112	1199
4:30 PM	2	0	12	0	2	0	1	0	0	48	1	0	14	35	4	0	119	1215
4:35 PM	1	0	13	0	4	0	2	0	0	40	3	0	6	41	4	0	114	1242
4:40 PM	0	0	12	0	0	0	0	0	0	51	2	0	13	29	1	0	108	1254
4:45 PM	5	0	17	0	3	0	2	0	0	35	1	0	15	41	1	0	120	1293
4:50 PM	1	0	12	0	1	0	1	0	0	28	4	0	11	43	1	0	102	1309
4:55 PM	2	0	11	0	5	0	2	0	0	34	3	0	11	36	0	0	104	1302
5:00 PM	1	0	12	0	4	0	3	0	1	37	3	0	9	37	0	0	107	1306
5:05 PM	3	0	11	0	7	0	5	0	0	45	2	0	5	34	2	0	114	1326
5:10 PM	3	0	8	0	3	0	1	0	0	38	2	0	6	24	1	0	86	1303
5:15 PM	0	0	6	0	1	0	0	0	0	43	3	0	7	42	0	0	102	1294
5:20 PM	0	0	14	0	1	0	2	0	0	41	2	0	7	31	1	0	99	1287
5:25 PM	1	0	12	0	3	0	0	0	0	36	1	0	20	32	0	0	105	1280
5:30 PM	0	0	11	0	1	0	0	0	1	35	3	0	12	35	0	0	98	1259
5:35 PM	2	0	14	0	2	0	0	0	0	35	2	0	17	27	2	0	101	1246
5:40 PM	1	0	19	0	0	0	1	0	0	40	4	0	11	31	0	0	107	1245
5:45 PM	2	0	12	0	0	0	0	0	0	35	1	0	8	36	0	0	94	1219
5:50 PM	1	0	12	0	0	0	0	0	0	22	2	0	4	35	2	0	78	1195
5:55 PM	1	0	11	0	2	0	0	0	0	34	3	0	16	24	0	0	91	1182

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	24	0	152	0	32	0	12	0	0	492	28	0	100	508	32	0	1380
Heavy Trucks	0	0	4		0	0	4		0	64	0		0	104	20		196
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 11/5/2020 1:41 PM

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

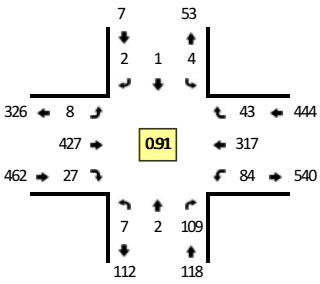
Type of peak hour being reported: Intersection Peak

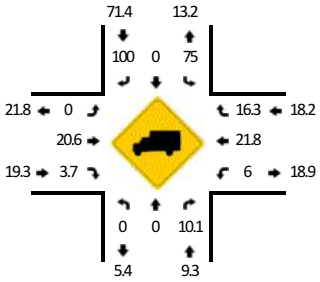
Method for determining peak hour: Total Entering Volume

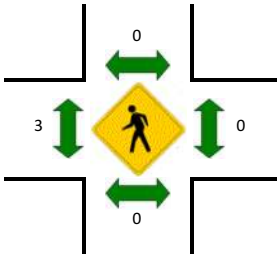
LOCATION: Pilot/May Dwy -- Brooklake Rd NE
CITY/STATE: Keizer, OR

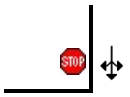
QC JOB #: 15296909
DATE: Wed, Oct 28 2020

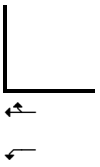
Peak-Hour: 7:10 AM -- 8:10 AM
Peak 15-Min: 7:50 AM -- 8:05 AM

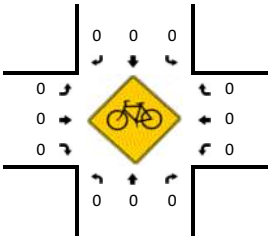


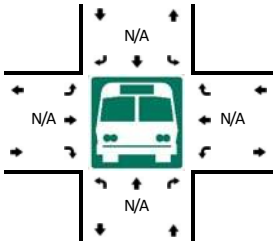


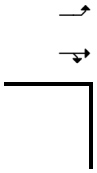


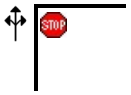


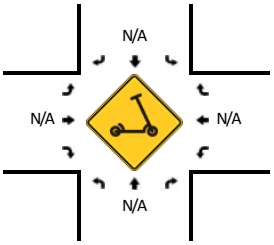












5-Min Count Period Beginning At	Pilot/May Dwy (Northbound)				Pilot/May Dwy (Southbound)				Brooklake Rd NE (Eastbound)				Brooklake Rd NE (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	1	0	10	0	1	0	0	0	1	20	1	0	5	23	0	0	62	
6:05 AM	1	0	7	0	0	0	0	0	0	19	2	0	7	15	0	0	51	
6:10 AM	0	0	9	0	0	0	0	0	0	31	2	0	6	13	0	0	61	
6:15 AM	1	0	11	0	0	0	0	0	0	24	2	0	4	20	2	0	64	
6:20 AM	0	0	5	0	0	0	0	0	1	33	3	0	3	26	1	0	72	
6:25 AM	2	0	9	0	0	0	0	0	0	28	1	0	6	20	1	0	67	
6:30 AM	1	0	3	0	0	0	0	0	0	28	4	0	6	27	0	0	69	
6:35 AM	0	0	9	0	0	0	0	0	0	37	1	0	4	28	0	0	79	
6:40 AM	2	0	7	0	1	0	0	0	0	35	1	0	5	28	1	0	80	
6:45 AM	0	0	9	0	0	0	1	0	0	34	1	0	6	22	0	0	73	
6:50 AM	1	0	5	0	0	0	0	0	0	40	4	0	4	36	5	0	95	
6:55 AM	0	0	6	0	0	0	0	0	3	36	5	0	2	18	5	0	75	848
7:00 AM	1	1	4	0	0	0	1	0	0	28	4	0	6	29	3	0	77	863
7:05 AM	1	0	6	0	0	0	0	0	0	35	1	0	6	25	1	0	75	887
7:10 AM	0	1	10	0	0	0	0	0	1	38	1	0	3	20	5	0	79	905
7:15 AM	0	0	5	0	0	0	0	0	1	37	5	0	2	28	3	0	81	922
7:20 AM	0	0	8	0	0	0	1	0	0	37	4	0	10	26	0	0	86	936
7:25 AM	0	0	6	0	0	0	0	0	1	34	1	0	4	27	1	0	74	943
7:30 AM	1	0	10	0	0	0	0	0	2	33	3	0	10	25	3	0	87	961
7:35 AM	0	0	9	0	1	0	0	0	0	32	3	0	14	26	2	0	87	969
7:40 AM	1	0	13	0	0	0	0	0	1	39	2	0	7	27	1	0	91	980
7:45 AM	1	0	14	0	1	0	0	0	0	37	1	0	5	23	5	0	87	994
7:50 AM	0	1	9	0	0	0	0	0	0	42	3	0	9	27	5	0	96	995
7:55 AM	0	0	11	0	0	0	1	0	0	34	1	0	6	29	11	0	93	1013
8:00 AM	4	0	7	0	0	0	0	0	1	31	3	0	8	35	5	0	94	1030
8:05 AM	0	0	7	0	2	1	0	0	1	33	0	0	6	24	2	0	76	1031
8:10 AM	1	0	6	0	1	0	0	0	1	27	4	0	4	30	0	0	74	1026
8:15 AM	0	0	5	0	0	0	0	0	1	34	1	0	9	18	0	0	68	1013
8:20 AM	2	0	4	0	0	0	0	0	0	26	3	0	4	29	1	0	69	996
8:25 AM	0	0	8	0	1	0	0	0	0	11	0	0	6	18	3	0	47	969
8:30 AM	0	0	6	0	0	0	0	0	0	30	3	0	3	15	0	0	57	939
8:35 AM	1	0	8	0	0	0	0	0	0	22	3	0	12	23	0	0	69	921
8:40 AM	1	0	3	0	1	0	0	0	0	21	3	0	8	19	0	0	56	886
8:45 AM	1	0	13	0	0	0	0	0	0	36	1	0	5	23	1	0	80	879
8:50 AM	1	0	13	0	1	0	1	0	0	32	1	0	10	19	2	0	80	863
8:55 AM	0	0	6	0	0	0	0	0	0	26	0	0	5	26	3	0	66	836

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	16	4	108	0	0	0	4	0	4	428	28	0	92	364	84	0	1132
Heavy Trucks	0	0	12		0	0	4		0	88	4		4	80	24		216
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 11/5/2020 1:41 PM

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

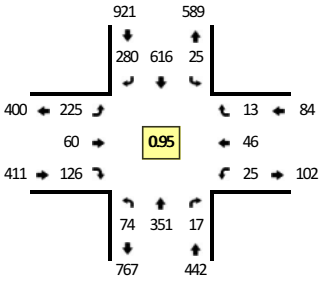
Type of peak hour being reported: Intersection Peak

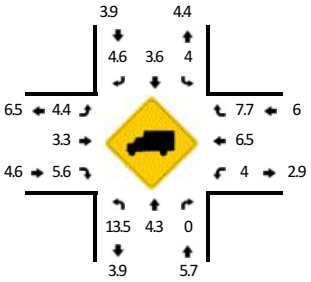
Method for determining peak hour: Total Entering Volume

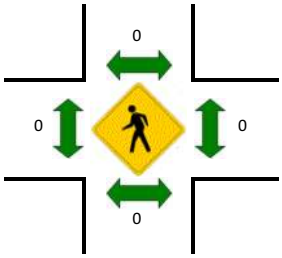
LOCATION: Portland Rd NE -- Brooklake Rd NE
CITY/STATE: Brooks, OR

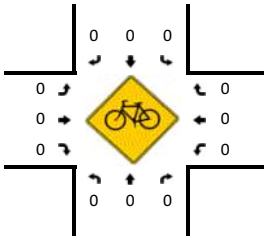
QC JOB #: 15296911
DATE: Thu, Oct 22 2020

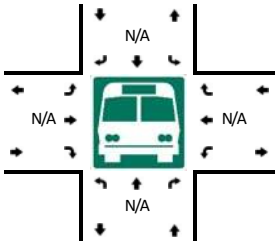
Peak-Hour: 4:15 PM -- 5:15 PM
Peak 15-Min: 4:25 PM -- 4:40 PM

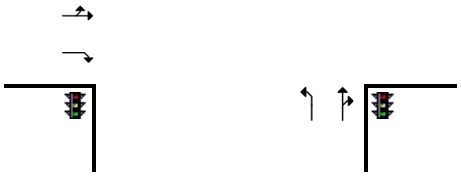


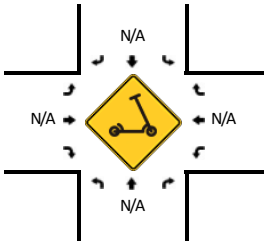












5-Min Count Period Beginning At	Portland Rd NE (Northbound)				Portland Rd NE (Southbound)				Brooklake Rd NE (Eastbound)				Brooklake Rd NE (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	8	25	1	0	1	38	16	0	23	5	11	0	2	1	2	0	133	
3:05 PM	9	23	1	0	1	32	11	0	16	3	12	0	1	5	3	0	117	
3:10 PM	5	26	2	0	4	35	16	0	25	4	6	0	3	2	0	0	128	
3:15 PM	4	24	1	0	2	41	17	0	18	4	11	0	3	5	1	0	131	
3:20 PM	5	23	1	0	1	35	11	0	21	5	4	0	2	3	2	0	113	
3:25 PM	6	38	3	0	1	19	16	0	15	6	8	0	1	8	1	0	122	
3:30 PM	4	22	2	0	1	35	16	0	18	4	9	0	0	1	0	0	112	
3:35 PM	7	31	0	0	0	36	21	0	15	3	9	0	0	2	2	0	126	
3:40 PM	2	19	2	0	3	39	21	0	13	4	4	0	1	4	7	0	119	
3:45 PM	6	30	2	0	1	35	21	0	20	3	11	0	4	5	1	0	139	
3:50 PM	4	22	3	0	1	50	17	0	16	6	6	0	1	1	1	0	128	
3:55 PM	6	41	2	0	1	36	26	0	14	5	9	0	2	7	1	0	150	1518
4:00 PM	4	37	1	0	3	30	16	0	22	4	11	0	0	4	2	0	134	1519
4:05 PM	6	32	4	0	1	45	21	0	17	5	12	0	3	5	2	0	153	1555
4:10 PM	7	29	3	0	2	46	17	0	20	5	7	0	0	2	0	0	138	1565
4:15 PM	8	31	1	0	0	52	13	0	16	4	12	0	2	7	2	0	148	1582
4:20 PM	4	22	2	0	2	41	24	0	26	6	12	0	1	6	1	0	147	1616
4:25 PM	3	31	2	0	2	64	23	0	15	5	15	0	2	1	2	0	165	1659
4:30 PM	11	30	3	0	6	52	23	0	12	4	10	0	1	3	0	0	155	1702
4:35 PM	5	33	1	0	0	42	34	0	28	7	10	0	3	7	1	0	171	1747
4:40 PM	3	34	0	0	2	58	20	0	11	4	18	0	3	5	0	0	158	1786
4:45 PM	3	24	2	0	1	54	22	0	21	8	11	0	4	6	2	0	158	1805
4:50 PM	8	23	1	0	1	50	22	0	26	5	6	0	0	6	0	0	148	1825
4:55 PM	4	33	0	0	3	49	28	0	21	2	9	0	2	4	2	0	157	1832
5:00 PM	9	28	2	0	2	54	18	0	16	7	7	0	1	0	2	0	146	1844
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5:25 PM	5	31	1	0	3	46	28	0	19	9	10	0	1	4	1	0	158	1824
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5:35 PM	7	44	2	0	1	26	18	0	19	2	9	0	2	4	5	0	139	1764
5:40 PM	4	28	1	0	1	49	14	0	16	7	6	0	1	4	3	0	134	1740
5:45 PM	8	20	7	0	0	36	19	0	22	5	1	0	1	1	0	0	120	1702
5:50 PM	9	19	1	0	0	49	5	0	14	3	6	0	2	3	3	0	114	1668
5:55 PM	7	20	2	0	0	38	14	0	20	4	7	0	1	4	6	0	123	1634

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	76	376	24	0	32	632	320	0	220	64	140	0	24	44	12	0	1964
Heavy Trucks	8	12	0		0	20	16		12	0	0		0	4	0		72
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 11/5/2020 1:41 PM

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

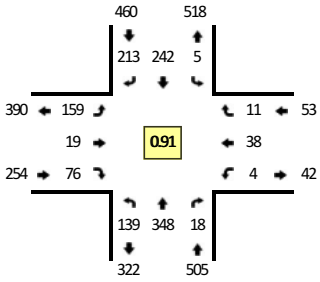
Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

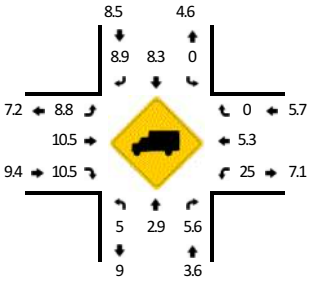
LOCATION: Portland Rd NE -- Brooklake Rd NE
CITY/STATE: Brooks, OR

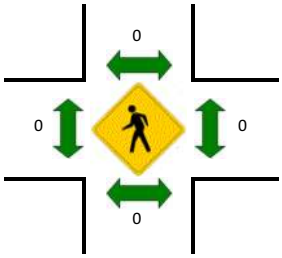
QC JOB #: 15296912
DATE: Thu, Oct 22 2020

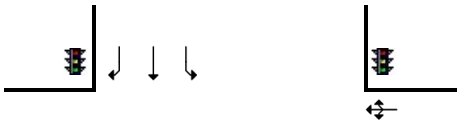
Peak-Hour: 7:05 AM -- 8:05 AM
Peak 15-Min: 7:10 AM -- 7:25 AM

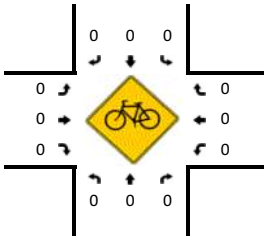


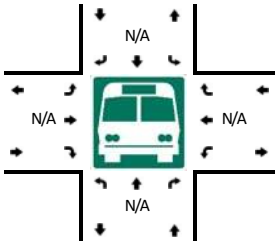
Quality Counts
DATA THAT DRIVES COMMUNITIES

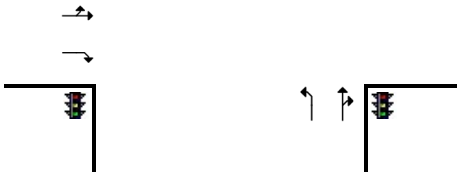


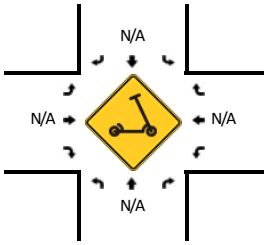












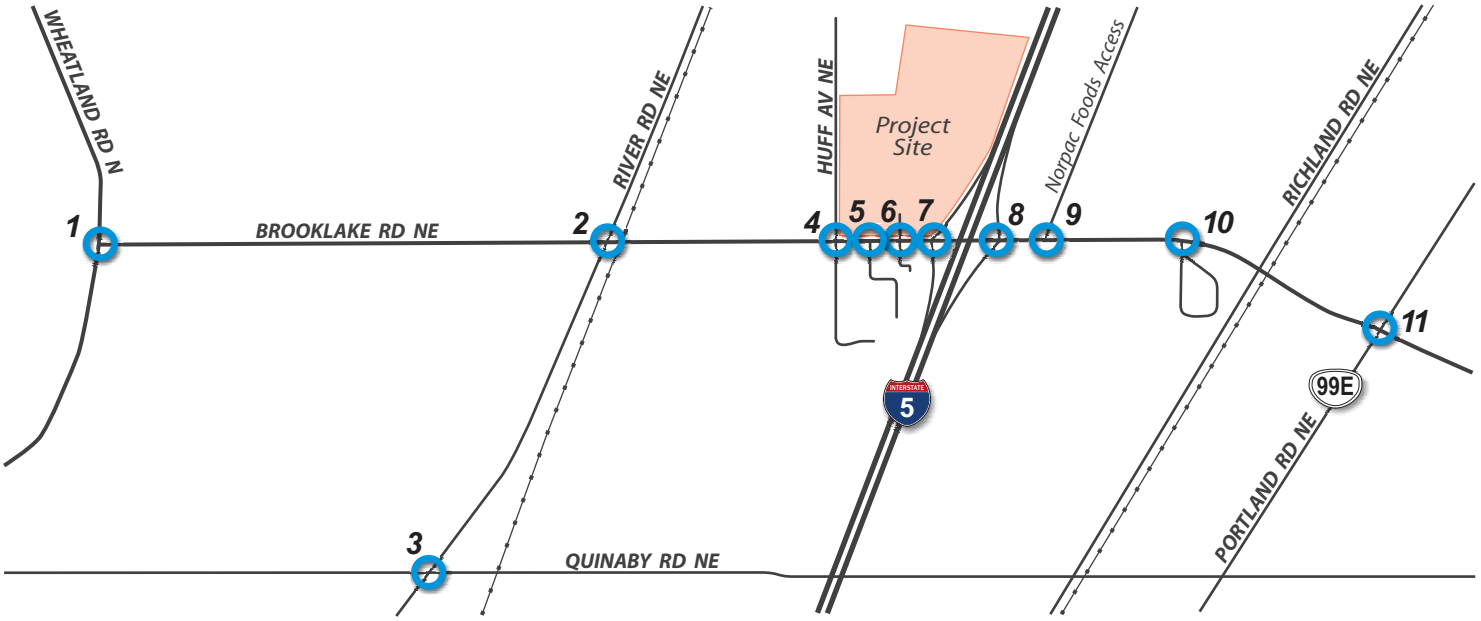
5-Min Count Period Beginning At	Portland Rd NE (Northbound)				Portland Rd NE (Southbound)				Brooklake Rd NE (Eastbound)				Brooklake Rd NE (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	5	13	0	0	0	10	11	0	4	1	0	0	0	2	0	0	46	
6:05 AM	9	25	0	0	3	5	11	0	3	2	2	0	0	1	0	0	61	
6:10 AM	11	27	0	0	1	8	11	0	5	0	1	0	1	1	1	0	67	
6:15 AM	10	23	0	0	0	10	18	0	8	1	3	0	0	0	1	0	74	
6:20 AM	7	22	0	0	1	13	14	0	4	1	1	0	1	3	1	0	68	
6:25 AM	19	26	0	0	1	17	18	0	16	0	2	0	0	5	3	0	107	
6:30 AM	13	29	0	0	0	16	16	0	9	0	2	0	1	2	1	0	89	
6:35 AM	16	43	3	0	2	12	15	0	11	1	2	0	0	5	0	0	110	
6:40 AM	13	47	4	0	3	12	8	0	13	2	5	0	1	2	0	0	110	
6:45 AM	17	38	1	0	3	12	20	0	14	2	1	0	1	3	2	0	114	
6:50 AM	18	38	4	0	4	17	14	0	13	0	3	0	0	2	0	0	113	
6:55 AM	14	27	0	0	0	13	14	0	15	1	8	0	0	4	2	0	98	1057
7:00 AM	9	22	0	0	1	10	11	0	16	1	3	0	1	1	0	0	75	1086
7:05 AM	10	38	1	0	0	13	17	0	7	3	7	0	1	2	2	0	101	1126
7:10 AM	15	38	0	0	1	20	13	0	13	1	8	0	0	3	2	0	114	1173
7:15 AM	16	37	1	0	0	23	23	0	18	4	6	0	0	1	1	0	130	1229
7:20 AM	16	22	5	0	0	22	12	0	17	2	4	0	0	4	1	0	105	1266
7:25 AM	5	23	3	0	0	20	19	0	13	0	7	0	0	3	1	0	94	1253
7:30 AM	9	27	0	0	1	13	21	0	3	0	8	0	0	3	1	0	86	1250
7:35 AM	13	33	2	0	1	17	22	0	16	0	3	0	0	4	0	0	111	1251
7:40 AM	8	31	1	0	1	19	16	0	19	0	10	0	1	1	0	0	107	1248
7:45 AM	19	19	3	0	0	24	19	0	16	4	5	0	1	4	1	0	115	1249
7:50 AM	14	24	1	0	1	29	26	0	14	2	7	0	0	6	0	0	124	1260
7:55 AM	10	26	0	0	0	21	14	0	14	3	7	0	0	5	1	0	101	1263
8:00 AM	4	30	1	0	0	21	11	0	9	0	4	0	1	2	1	0	84	1272
8:05 AM	10	16	2	0	0	15	19	0	7	1	2	0	3	6	3	0	84	1255
8:10 AM	13	13	1	0	0	18	14	0	4	0	6	0	0	4	1	0	74	1215
8:15 AM	9	16	0	0	0	21	16	0	11	4	4	0	1	1	0	0	83	1168
8:20 AM	10	10	2	0	0	7	9	0	10	7	9	0	3	3	1	0	71	1134
8:25 AM	5	15	0	0	0	21	12	0	9	0	5	0	1	5	2	0	75	1115
8:30 AM	6	21	1	0	0	15	20	0	11	4	2	0	0	0	1	0	81	1110
8:35 AM	8	10	0	0	0	16	9	0	8	2	2	0	0	4	0	0	59	1058
8:40 AM	10	13	1	0	1	19	25	0	9	4	4	0	2	3	1	0	92	1043
8:45 AM	6	20	1	0	0	21	12	0	12	1	4	0	1	4	0	0	82	1010
8:50 AM	2	16	2	0	1	22	20	0	14	2	0	0	0	4	1	0	84	970
8:55 AM	10	14	3	0	1	16	17	0	12	3	4	0	1	3	1	0	85	954

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	188	388	24	0	4	260	192	0	192	28	72	0	0	32	16	0	1396
Heavy Trucks	4	8	0		0	28	32		20	0	0		0	4	0		96
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

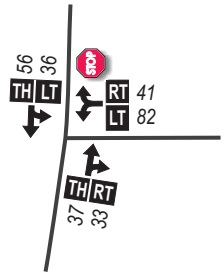
Comments:

Report generated on 11/5/2020 1:41 PM

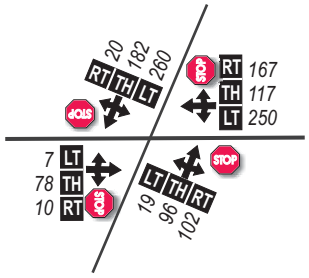
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212



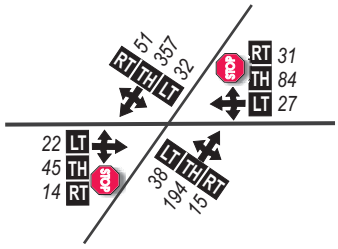
1. Brooklake Rd. NE @ Wheatland Rd. N



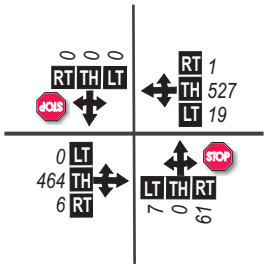
2. Brooklake Rd. NE @ River Rd. NE



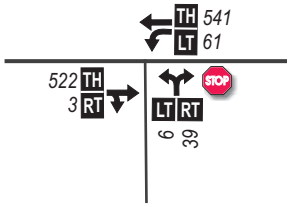
3. River Rd. NE @ Quinaby Rd. NE



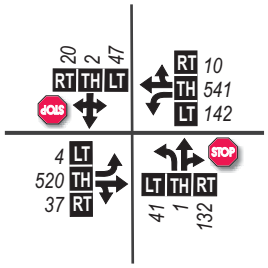
4. Brooklake Rd. NE @ Huff Ave. NE



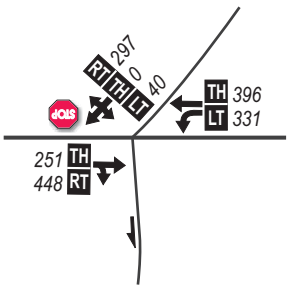
5. Brooklake Rd. NE @ Truckman Way



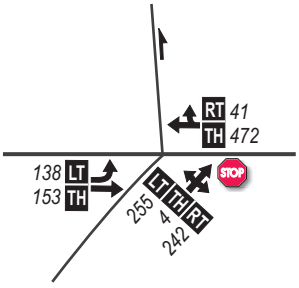
6. Brooklake Rd. NE @ May Trucking Access/Pilot Access



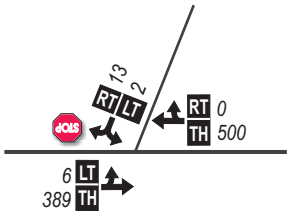
7. Brooklake Rd. NE @ I-5 SB Ramps



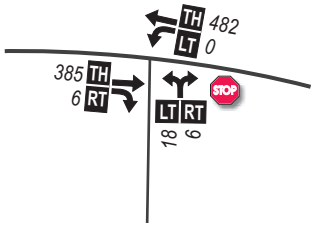
8. Brooklake Rd. NE @ I-5 NB Ramps



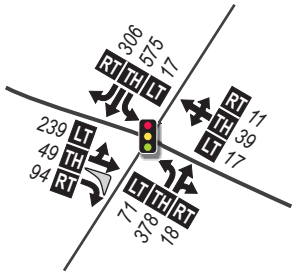
9. Brooklake Rd. NE @ Norpac Foods Access



10. Brooklake Rd. NE @ Covanta Access



11. Brooklake Rd. NE @ OR-99E



LEGEND

- # - Study Intersection
- Traffic Signal
- STOP - Stop Sign
- Lane Configuration
- 000 - PM Peak Hour Traffic Volumes
- LT TH RT - Volume Turn Movement (Left • Thru • Right)

DKS

No Scale

Figure **2**

2018 Existing Conditions PM Peak Hour Traffic Volumes

Brooklake Road/OR-99E

The most common collision type was turning movement collisions (43%). Of the 23 collisions, eight involved rear-end collisions. Ten collisions involved turning movements, the majority of which involved vehicles turning left from the west leg of Brooklake Road onto the north leg of OR-99E.

The final severe injury collision was reported at the intersection of Brooklake Road/OR-99E, at 10:00 pm in November of 2015 under clear, dry conditions. It was a turning collision with a vehicle on OR-99E turning left onto Brooklake Road and failing to yield to oncoming north-south traffic.

Field Observations

Observations were performed during the PM peak hour period (4:00 – 6:00 pm) at the study intersections on Thursday April 19, 2018. The purpose of the site visit was to observe vehicle operations and identify queuing and general issues related to traffic congestion and safety. The following issues were observed:

- On the I-5 northbound off-ramp, left turning vehicles experienced an extended wait time while attempting to turn left onto Brooklake Road. The observed delay for a left turning passenger car turning left onto Brooklake Road was greater than 2 minutes. This led to queues around 850 feet, nearly backing up to the I-5 main line.
- Due to the long delays for left turning vehicles on the I-5 northbound off-ramp, right turning vehicles drove along the shoulder of the off-ramp in order to by-pass the line of westbound vehicles waiting to turn left onto Brooklake Road.

- On the segment of Brooklake Road between the I-5 southbound off-ramp and Truckman Way, trucks turning right from I-5 southbound off-ramp turned directly into the two-way left turn lane (TWLTL) and while in the TWLTL, passed through the intersection of Brooklake Road and May Trucking Access/Pilot Access without turning left in order to reach Truckman Way.
- At the intersection of Brooklake Road/River Road, southbound vehicles on River Road experienced excessive delay (over three minutes) causing significant queuing of up to 1,200 feet (see photo below).

Summary

Below is a summary of the findings in this technical memorandum:

- The total number of vehicles traveling along a section west of the I-5 southbound off-ramp is 19,900 vehicles (approximately equally distributed eastbound to westbound), with an 85th percentile speed of 35 mph and an average 12.1% trucks.
- Two intersections have turn movements which exceed available storage; Brooklake Road/I-5 northbound and Brooklake Road/I-5 southbound.
- Delays of over a minute were reported for the northbound approach at the I-5 northbound ramp and for the southbound approach at the I-5 southbound ramp.
- The following intersections failed to meet Marion County operating standards and ODOT mobility targets under existing conditions:
    - Brooklake Road/River Road
    - Brooklake Road/May Trucking Access/Pilot Access
    - Brooklake Road/I-5 southbound ramp terminal
    - Brooklake Road/I-5 northbound
- The following intersections exceeded critical crash rates:

  - Brooklake Road/Wheatland Road
  - River Road/Quinaby Road
  - Brooklake Road/I-5 northbound
  - Brooklake Road/OR-99E
- There was one fatal collision and three major injury collisions at the critical intersections included in the study area from 2012 to 2016.
- Based on field observations recorded within the study area during the PM peak hours on Thursday, April 19, 2018, intersections/segments with issues observed include:
  - I-5 northbound off-ramp (extended queuing, eastbound vehicles driving on off-ramp shoulder, poor sight distance)
  - Intersection of Brooklake Road/River Road (southbound vehicles experience significant congestion)
  - TWLTL between I-5 southbound off-ramp and Truckman Way (trucks turning directly from I-5 southbound off-ramp into TWLTL, then driving straight through Brooklake Road/May Trucking Access/Pilot Access intersection without turning left to get to Truckman Way)

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 NB Ramp & Brooklake Rd NE
Direction Counted: Southbound Thru

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 NB Ramp & Brooklake Rd NE
Direction Counted: Southbound Left

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 NB Ramp & Brooklake Rd NE
Direction Counted: Southbound Right

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 NB Ramp & Brooklake Rd NE
Direction Counted: Southbound U-Turn

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 NB Ramp & Brooklake Rd NE
Direction Counted: Westbound Thru

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
6:00 AM	0	14	20	0	3	1	0	0	1	0	0	0	1	40
6:15 AM	0	25	38	0	2	1	0	0	1	0	0	0	0	67
6:30 AM	0	22	33	0	4	1	1	0	2	6	0	0	0	69
6:45 AM	0	35	51	0	5	2	0	0	0	1	0	0	0	94
7:00 AM	0	30	46	0	4	0	0	0	5	1	0	0	0	86
7:15 AM	0	37	52	0	4	4	0	0	1	3	0	0	0	101
7:30 AM	0	35	49	0	3	5	0	1	1	0	0	0	1	95
7:45 AM	0	41	59	0	3	2	0	0	1	1	0	0	2	109
8:00 AM	0	30	42	0	4	1	1	0	2	2	0	0	0	82
8:15 AM	0	25	35	0	3	2	0	0	3	0	0	0	1	69
8:30 AM	0	25	36	0	3	6	0	0	3	1	0	0	1	75
8:45 AM	0	22	31	0	3	4	1	0	1	3	0	0	1	66
9:00 AM	0	23	33	0	5	2	0	0	6	2	0	0	1	72
9:15 AM	0	29	40	1	4	7	0	2	4	0	0	0	1	88
9:30 AM	0	26	36	0	2	1	0	0	4	0	0	0	2	71
9:45 AM	0	23	32	0	7	5	0	1	5	1	0	0	1	75
10:00 AM	0	21	30	0	2	0	0	0	7	1	0	0	1	62
10:15 AM	0	20	28	0	3	3	0	0	2	2	0	0	0	58
10:30 AM	0	22	32	0	5	3	0	2	3	2	0	0	4	73
10:45 AM	0	24	32	0	2	1	0	0	3	0	0	0	1	63
11:00 AM	0	28	39	0	4	2	1	2	2	6	0	0	1	85
11:15 AM	0	25	34	1	7	4	0	0	3	0	0	0	1	75
11:30 AM	0	19	26	0	2	1	1	1	3	0	0	0	1	54
11:45 AM	0	24	36	0	2	6	0	1	2	1	1	0	1	74
12:00 PM	0	26	38	0	4	4	0	3	4	0	0	0	0	79
12:15 PM	0	28	40	1	2	4	0	1	3	0	0	0	0	79
12:30 PM	0	26	38	0	2	3	0	2	1	2	0	0	0	74
12:45 PM	0	24	34	0	4	2	1	2	3	1	0	0	0	71
1:00 PM	0	24	37	0	8	7	0	1	4	0	0	0	0	81
1:15 PM	0	26	40	0	5	4	0	0	2	0	0	0	1	78
1:30 PM	0	25	35	0	4	3	0	2	2	0	0	0	2	73
1:45 PM	0	23	34	1	4	3	0	1	1	0	0	0	2	69
2:00 PM	1	26	37	0	6	5	1	0	0	0	0	0	1	77
2:15 PM	0	24	37	0	7	3	0	0	0	0	0	0	3	74
2:30 PM	0	29	41	0	8	2	0	0	4	3	0	0	0	87
2:45 PM	0	26	37	0	4	1	0	0	1	0	0	0	0	69
3:00 PM	0	48	69	0	4	2	0	1	5	0	0	0	0	129
3:15 PM	0	33	47	0	4	1	0	0	2	0	0	0	0	87
3:30 PM	1	39	55	0	2	2	0	0	3	2	0	0	0	104
3:45 PM	1	40	57	0	4	1	0	0	1	0	0	0	1	105
4:00 PM	0	38	54	0	2	1	0	0	2	0	0	0	2	99
4:15 PM	0	36	51	0	2	2	0	1	2	0	0	0	1	95
4:30 PM	1	44	63	0	2	2	0	0	4	0	0	0	2	118
4:45 PM	0	45	62	0	0	1	0	2	1	0	0	0	0	111
5:00 PM	0	37	53	0	2	0	0	1	2	0	0	0	0	95
5:15 PM	0	37	53	0	2	0	0	1	4	0	0	0	0	97
5:30 PM	0	32	47	0	1	0	0	0	0	0	0	0	0	80
5:45 PM	1	27	38	0	2	1	0	0	1	0	0	0	0	70
6:00 PM	0	25	33	0	0	0	0	0	1	0	0	0	0	59
6:15 PM	0	23	34	0	1	0	0	0	0	0	0	0	0	58
6:30 PM	0	22	31	0	1	1	0	0	0	0	0	0	0	55
6:45 PM	0	21	30	0	1	0	0	0	1	0	0	0	0	53
7:00 PM	0	21	30	0	0	0	0	0	1	0	0	0	0	52
7:15 PM	0	15	22	0	0	0	0	0	0	0	0	0	0	37
7:30 PM	0	15	20	0	1	0	0	0	0	0	0	0	0	36
7:45 PM	0	9	11	0	0	0	0	0	0	0	0	0	0	20
8:00 PM	0	16	22	0	1	1	0	0	0	0	0	0	0	40
8:15 PM	0	11	15	0	0	0	0	0	0	0	0	0	0	26
8:30 PM	0	10	14	0	0	0	0	0	0	0	0	0	1	25
8:45 PM	0	8	10	0	1	0	0	0	1	1	0	0	0	21
9:00 PM	0	9	14	0	0	0	0	0	0	0	0	0	0	23
9:15 PM	0	7	10	0	0	0	0	0	0	0	0	0	0	17
9:30 PM	0	4	6	0	1	0	0	0	0	0	0	0	0	11
9:45 PM	0	5	6	0	0	1	0	0	0	0	0	0	0	12
Total	5	1609	2295	4	178	121	7	28	121	42	1	0	38	4449
%	0.11%	36.17%	51.58%	0.09%	4.00%	2.72%	0.16%	0.63%	2.72%	0.94%	0.02%	0.00%	0.85%	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 NB Ramp & Brooklake Rd NE
Direction Counted: Westbound Left

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 NB Ramp & Brooklake Rd NE
Direction Counted: Westbound Right

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
6:00 AM	0	7	10	0	2	0	0	0	0	0	0	0	0	19
6:15 AM	0	6	9	0	0	0	0	0	0	0	0	0	0	15
6:30 AM	0	4	8	0	0	0	0	0	0	1	0	0	0	13
6:45 AM	0	8	11	0	0	1	1	0	1	0	0	0	0	22
7:00 AM	0	5	8	0	1	0	0	0	0	4	0	0	0	18
7:15 AM	0	8	13	0	0	0	2	0	0	0	0	0	0	23
7:30 AM	0	6	11	0	3	0	0	0	0	1	0	0	0	21
7:45 AM	0	8	13	0	3	0	0	0	1	2	0	0	0	27
8:00 AM	0	4	4	0	2	0	0	0	2	1	0	0	0	13
8:15 AM	0	5	5	0	2	0	0	0	0	1	0	0	0	13
8:30 AM	0	6	7	0	1	0	0	0	1	1	0	0	0	16
8:45 AM	0	4	6	0	2	0	0	0	1	1	0	0	0	14
9:00 AM	0	2	5	0	1	1	0	0	0	0	0	0	0	9
9:15 AM	0	2	4	0	1	1	0	0	0	2	0	0	0	10
9:30 AM	0	2	4	0	1	0	0	0	0	0	0	0	0	7
9:45 AM	0	2	5	0	1	0	0	0	1	0	0	0	0	9
10:00 AM	0	4	6	0	0	0	0	0	1	3	0	0	0	14
10:15 AM	0	3	3	0	0	1	0	0	0	0	0	0	0	7
10:30 AM	0	4	4	0	1	1	0	0	1	1	0	0	0	12
10:45 AM	0	1	3	0	0	0	1	0	1	1	0	0	0	7
11:00 AM	0	1	4	0	0	0	0	0	0	0	0	0	0	5
11:15 AM	0	4	5	0	2	0	0	0	0	3	0	0	0	14
11:30 AM	0	3	4	0	0	0	0	0	0	0	0	0	0	7
11:45 AM	0	5	7	0	0	0	0	0	1	2	0	0	0	15
12:00 PM	0	4	6	0	0	0	0	0	0	0	0	0	0	10
12:15 PM	0	2	3	0	0	0	0	1	1	0	0	0	0	7
12:30 PM	0	1	2	0	0	0	0	0	0	0	0	0	0	3
12:45 PM	0	2	5	0	0	0	0	0	2	0	0	0	0	9
1:00 PM	0	4	5	0	0	0	0	0	0	1	0	0	0	10
1:15 PM	0	5	7	0	0	0	0	0	2	1	0	0	0	15
1:30 PM	0	6	7	0	0	0	0	0	0	0	0	0	0	13
1:45 PM	0	1	4	0	1	0	0	0	2	0	0	0	0	8
2:00 PM	0	1	2	0	0	0	0	0	2	0	0	0	0	5
2:15 PM	0	4	5	0	1	0	0	0	0	0	0	0	0	10
2:30 PM	0	3	3	0	1	1	0	0	1	0	0	0	0	9
2:45 PM	0	0	2	0	0	0	0	0	0	0	0	0	0	2
3:00 PM	0	5	6	0	0	0	0	0	0	0	0	0	0	11
3:15 PM	0	3	3	0	0	0	0	0	0	1	0	0	0	7
3:30 PM	0	3	5	0	0	0	0	0	0	0	0	0	0	8
3:45 PM	0	3	6	0	0	2	0	0	0	0	0	0	0	11
4:00 PM	0	1	3	0	0	0	0	0	1	0	0	0	0	5
4:15 PM	0	4	6	0	0	0	0	0	0	0	0	0	0	10
4:30 PM	0	6	8	0	0	0	0	0	0	2	0	0	0	16
4:45 PM	0	4	6	0	0	0	0	0	0	0	0	0	0	10
5:00 PM	0	3	4	0	0	0	0	0	0	0	0	0	0	7
5:15 PM	0	4	5	0	0	1	0	0	1	0	0	0	0	11
5:30 PM	0	2	4	0	1	0	0	1	0	0	0	0	0	8
5:45 PM	0	4	5	0	0	2	0	0	0	0	0	0	0	11
6:00 PM	0	1	4	0	1	1	0	1	0	0	0	0	0	8
6:15 PM	0	1	2	0	0	1	0	0	0	0	0	0	0	4
6:30 PM	0	3	6	0	0	0	0	0	0	0	0	0	0	9
6:45 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	2
7:00 PM	0	0	2	0	0	0	0	0	0	0	0	0	0	2
7:15 PM	0	1	1	0	1	0	0	0	0	0	0	0	0	3
7:30 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	1
7:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	1
8:00 PM	0	0	2	0	0	0	0	0	0	0	0	0	0	2
8:15 PM	0	1	2	0	0	0	0	0	0	0	0	0	0	3
8:30 PM	0	1	3	0	0	0	0	0	0	0	0	0	0	4
8:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	1
9:00 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	1
9:15 PM	0	1	2	0	0	0	0	0	0	0	0	0	0	3
9:30 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	1
9:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	188	302	0	30	13	4	3	23	29	0	0	0	592
%	0.00%	31.76%	51.01%	0.00%	5.07%	2.20%	0.68%	0.51%	3.89%	4.90%	0.00%	0.00%	0.00%	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 NB Ramp & Brooklake Rd NE
Direction Counted: Westbound U-Turn

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 NB Ramp & Brooklake Rd NE
Direction Counted: Northbound Thru

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
6:00 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	1
6:15 AM	0	1	0	0	1	0	0	0	2	0	0	0	0	4
6:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	1
6:45 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	1
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	1
8:00 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	1
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	1	1	0	0	0	0	0	1	0	0	0	0	3
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	1
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	1
12:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	1
12:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	1
1:00 PM	0	0	2	0	0	0	0	0	0	0	0	0	0	2
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	1
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	2	0	0	0	0	0	0	0	0	0	0	2
2:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	1
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	1
3:45 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	1
4:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	1
4:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	2	1	0	0	0	0	0	0	0	0	0	0	3
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	1
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	1
6:45 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	1
7:00 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	1
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	1
7:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	1
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	1
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Total	0	15	10	0	2	0	0	0	10	1	1	0	0	39
%	0.00%	38.46%	25.64%	0.00%	5.13%	0.00%	0.00%	0.00%	25.64%	2.56%	2.56%	0.00%	0.00%	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 NB Ramp & Brooklake Rd NE
Direction Counted: Northbound Left

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
6:00 AM	0	9	25	0	0	0	0	0	5	4	0	0	0	43
6:15 AM	0	11	30	0	1	2	0	0	3	1	0	0	0	48
6:30 AM	0	10	28	0	4	0	0	0	4	0	0	0	0	46
6:45 AM	0	12	32	0	4	1	0	0	1	1	0	0	0	51
7:00 AM	0	15	38	0	1	2	0	0	6	1	0	0	0	63
7:15 AM	1	12	30	0	0	3	1	0	1	1	0	0	0	49
7:30 AM	0	5	10	0	2	0	0	0	6	0	0	0	1	24
7:45 AM	0	12	29	0	2	6	0	0	3	2	0	0	0	54
8:00 AM	0	9	24	0	2	3	0	0	4	3	0	0	0	45
8:15 AM	0	8	22	0	6	5	0	1	6	1	0	0	0	49
8:30 AM	0	7	17	0	1	3	0	0	7	1	0	0	0	36
8:45 AM	0	7	20	0	2	6	1	1	1	2	0	0	1	41
9:00 AM	0	7	16	0	2	6	0	0	7	1	0	0	1	40
9:15 AM	0	5	13	1	3	5	0	0	1	1	0	0	0	29
9:30 AM	0	7	19	0	6	2	0	1	7	1	0	0	0	43
9:45 AM	0	6	17	0	2	7	0	0	6	1	0	0	0	39
10:00 AM	0	5	12	0	2	5	1	0	10	5	0	0	0	40
10:15 AM	0	9	24	1	3	4	0	0	4	2	0	0	1	48
10:30 AM	0	9	23	0	0	2	1	1	4	2	0	0	0	42
10:45 AM	0	7	20	0	2	2	0	0	4	1	0	0	1	37
11:00 AM	0	7	20	0	1	7	1	1	10	1	0	0	0	48
11:15 AM	0	10	23	0	2	3	0	0	11	1	0	0	2	52
11:30 AM	0	7	21	0	3	3	0	1	8	0	0	0	0	43
11:45 AM	0	9	21	0	2	2	0	0	11	3	0	0	1	49
12:00 PM	0	14	34	0	2	3	0	1	6	4	0	0	1	65
12:15 PM	0	11	28	0	2	2	0	0	5	1	0	0	0	49
12:30 PM	0	12	32	0	3	4	0	0	4	0	0	0	0	55
12:45 PM	0	11	29	0	4	4	1	0	5	0	0	0	3	57
1:00 PM	0	11	31	0	2	0	0	1	10	3	0	0	0	58
1:15 PM	0	8	22	0	3	5	0	0	5	2	0	0	0	45
1:30 PM	0	10	29	0	0	3	0	1	7	2	0	0	0	52
1:45 PM	0	10	29	0	3	4	0	0	7	2	0	0	0	55
2:00 PM	0	9	23	1	7	5	0	1	11	0	0	0	0	57
2:15 PM	0	12	33	0	4	0	0	0	4	1	0	0	0	54
2:30 PM	1	9	27	0	2	3	0	0	9	1	0	0	0	52
2:45 PM	0	12	28	0	6	2	1	0	10	0	0	0	0	59
3:00 PM	1	11	29	0	1	4	0	0	5	1	0	0	0	52
3:15 PM	0	9	26	0	2	3	0	0	8	1	0	0	0	49
3:30 PM	0	12	28	0	3	1	1	1	6	2	0	0	1	55
3:45 PM	0	12	31	0	5	2	0	1	11	0	0	0	0	62
4:00 PM	1	11	32	0	2	0	0	0	9	1	0	0	0	56
4:15 PM	0	12	35	1	3	3	0	0	4	0	0	1	0	59
4:30 PM	0	8	23	0	1	0	0	2	8	2	0	1	0	45
4:45 PM	0	10	29	0	1	0	0	1	3	2	0	0	0	46
5:00 PM	0	11	30	0	3	1	0	1	7	1	0	0	0	54
5:15 PM	0	16	43	0	3	0	0	0	4	0	0	0	0	66
5:30 PM	0	16	41	0	1	1	0	1	9	0	0	0	0	69
5:45 PM	0	12	29	0	5	1	0	0	6	1	0	0	0	54
6:00 PM	0	13	35	0	1	0	0	0	5	1	0	0	0	55
6:15 PM	0	11	25	0	1	0	0	0	7	1	0	0	0	45
6:30 PM	0	10	30	0	2	0	0	0	5	0	0	0	0	47
6:45 PM	0	10	25	0	0	1	0	0	3	0	0	0	0	39
7:00 PM	0	6	18	0	0	2	0	0	6	0	0	0	0	32
7:15 PM	0	9	20	0	1	1	0	0	6	0	0	0	0	37
7:30 PM	0	7	18	0	0	0	0	0	7	1	0	0	0	33
7:45 PM	0	6	16	0	0	0	0	0	6	0	0	0	0	28
8:00 PM	0	8	23	0	0	3	0	0	3	0	0	0	0	37
8:15 PM	0	7	16	0	0	0	0	0	5	0	0	0	0	28
8:30 PM	1	5	15	0	1	0	0	0	0	0	0	0	0	22
8:45 PM	0	5	12	0	0	0	0	0	5	0	0	0	1	23
9:00 PM	0	3	7	0	0	0	0	0	1	0	0	0	0	11
9:15 PM	0	3	8	0	1	0	0	0	2	0	0	0	1	15
9:30 PM	0	5	10	0	0	0	0	0	2	0	0	0	0	17
9:45 PM	0	3	8	0	0	0	0	0	2	0	0	0	0	13
Total	5	585	1541	4	128	137	8	17	358	66	0	2	15	2866
%	0.17%	20.41%	53.77%	0.14%	4.47%	4.78%	0.28%	0.59%	12.49%	2.30%	0.00%	0.07%	0.52%	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 NB Ramp & Brooklake Rd NE
Direction Counted: Northbound Right

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
6:00 AM	0	8	16	0	0	0	0	0	1	1	0	0	0	26
6:15 AM	0	15	25	0	1	0	0	0	1	1	0	0	0	43
6:30 AM	0	26	44	0	1	1	0	0	2	0	0	0	0	74
6:45 AM	0	30	52	0	5	1	0	0	1	0	0	0	1	90
7:00 AM	0	18	30	0	0	2	1	0	0	2	0	0	0	53
7:15 AM	0	18	30	0	1	0	0	0	3	1	0	0	0	53
7:30 AM	0	22	34	0	0	1	0	0	1	1	0	0	0	59
7:45 AM	0	27	46	0	3	1	0	1	0	0	0	0	0	78
8:00 AM	1	12	21	0	1	0	0	0	0	0	0	0	0	35
8:15 AM	0	11	19	0	2	2	0	0	1	0	0	0	0	35
8:30 AM	0	11	19	1	5	0	1	0	4	0	0	0	0	41
8:45 AM	0	13	23	0	3	3	1	0	3	0	0	0	0	46
9:00 AM	0	15	23	0	2	0	0	0	4	2	0	0	2	48
9:15 AM	0	12	17	0	1	2	0	0	1	2	0	0	0	35
9:30 AM	0	10	16	0	1	0	1	0	0	0	0	0	1	29
9:45 AM	0	10	17	0	0	0	0	0	3	0	0	0	1	31
10:00 AM	0	8	13	0	0	1	0	0	3	3	0	0	2	30
10:15 AM	0	7	10	0	1	1	0	0	1	0	0	0	0	20
10:30 AM	0	6	11	0	1	0	0	1	2	0	0	0	2	23
10:45 AM	0	7	13	0	0	1	0	1	1	0	0	0	0	23
11:00 AM	0	9	17	0	1	0	1	0	1	0	0	0	1	30
11:15 AM	0	12	22	0	3	0	0	1	3	0	0	0	0	41
11:30 AM	0	11	19	0	1	0	0	1	2	0	0	0	0	34
11:45 AM	0	17	28	0	0	1	0	0	0	0	0	0	0	46
12:00 PM	0	12	22	0	4	2	0	2	1	0	0	0	0	43
12:15 PM	0	14	24	0	3	0	0	2	3	0	0	0	1	47
12:30 PM	0	14	25	0	5	3	0	2	1	0	0	0	0	50
12:45 PM	0	11	19	0	2	0	0	1	0	0	0	0	3	36
1:00 PM	0	9	16	0	1	2	1	1	1	0	0	0	2	33
1:15 PM	0	16	24	0	1	0	0	1	0	0	0	0	4	46
1:30 PM	1	16	27	0	3	2	4	0	2	0	0	0	1	56
1:45 PM	1	18	30	0	1	0	1	0	0	1	0	0	1	53
2:00 PM	0	19	31	0	4	1	0	0	2	0	0	0	0	57
2:15 PM	0	21	35	0	0	1	0	0	1	0	0	0	0	58
2:30 PM	0	20	34	0	3	0	0	0	3	0	0	0	0	60
2:45 PM	0	24	41	0	3	0	0	0	0	0	0	0	1	69
3:00 PM	0	23	38	0	0	1	0	0	0	0	0	0	0	62
3:15 PM	0	21	35	0	0	2	0	0	2	1	0	0	2	63
3:30 PM	0	15	26	0	1	1	0	0	1	1	0	0	1	46
3:45 PM	0	16	29	0	1	0	0	2	2	1	0	0	1	52
4:00 PM	0	21	34	0	2	0	0	2	0	0	0	0	0	59
4:15 PM	0	20	35	0	0	0	0	0	0	1	0	0	0	56
4:30 PM	0	19	33	0	3	0	0	1	1	0	0	0	0	57
4:45 PM	0	19	33	0	3	0	0	1	1	0	0	0	0	57
5:00 PM	0	11	20	0	0	2	0	1	1	0	0	0	0	35
5:15 PM	1	24	39	0	1	0	0	2	1	0	0	0	0	68
5:30 PM	0	19	30	0	5	2	0	1	0	0	0	0	0	57
5:45 PM	0	18	33	0	1	0	0	0	0	0	0	0	0	52
6:00 PM	0	15	25	0	3	0	0	0	0	0	0	0	1	44
6:15 PM	0	9	14	0	1	0	0	0	0	0	0	0	0	24
6:30 PM	0	11	18	0	0	0	0	0	0	0	0	0	0	29
6:45 PM	0	11	22	0	2	0	0	0	1	0	0	0	0	36
7:00 PM	0	10	17	0	0	0	0	0	0	0	0	0	0	27
7:15 PM	0	8	16	0	0	1	0	0	0	0	0	0	1	26
7:30 PM	0	9	15	0	0	0	0	0	1	0	0	0	0	25
7:45 PM	0	9	14	0	1	1	0	0	1	0	0	0	0	26
8:00 PM	0	8	16	0	0	0	0	0	0	0	0	0	2	26
8:15 PM	0	10	17	0	0	0	0	0	0	0	0	1	0	28
8:30 PM	0	6	11	0	0	0	0	0	0	0	0	0	2	19
8:45 PM	0	5	9	0	0	0	0	1	0	0	0	0	1	16
9:00 PM	0	3	6	0	1	0	0	0	0	0	0	0	1	11
9:15 PM	0	5	9	0	0	0	0	0	0	0	0	0	0	14
9:30 PM	0	3	6	0	0	0	0	0	0	0	0	0	1	10
9:45 PM	0	4	6	0	2	0	0	0	1	0	0	0	0	13
Total	4	881	1499	1	90	38	11	25	65	18	0	1	36	2669
%	0.15%	33.01%	56.16%	0.04%	3.37%	1.42%	0.41%	0.94%	2.44%	0.67%	0.00%	0.04%	1.35%	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 NB Ramp & Brooklake Rd NE
Direction Counted: Northbound U-Turn

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 NB Ramp & Brooklake Rd NE
Direction Counted: Eastbound Thru

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
6:00 AM	0	3	6	0	0	0	0	0	1	0	0	0	0	10
6:15 AM	0	3	6	0	1	2	0	0	0	0	0	0	0	12
6:30 AM	0	5	13	0	1	3	0	0	1	0	0	0	0	23
6:45 AM	0	5	8	0	2	1	0	0	5	0	0	0	0	21
7:00 AM	0	5	9	0	0	1	1	0	1	0	0	0	0	17
7:15 AM	0	7	16	0	2	1	0	0	2	2	0	0	0	30
7:30 AM	0	11	20	0	0	0	0	0	2	2	0	0	0	35
7:45 AM	0	12	22	0	0	0	1	0	0	0	0	0	0	35
8:00 AM	0	7	12	0	2	0	2	0	0	1	0	0	0	24
8:15 AM	0	10	20	0	0	1	1	0	1	0	0	0	1	34
8:30 AM	0	8	14	0	2	0	0	0	1	0	0	0	0	25
8:45 AM	0	6	10	0	3	0	3	0	1	1	0	0	0	24
9:00 AM	0	7	15	0	2	1	1	0	0	1	0	0	0	27
9:15 AM	0	5	10	0	2	2	1	2	0	1	0	0	0	23
9:30 AM	0	4	10	0	0	2	1	1	1	1	0	0	1	21
9:45 AM	0	5	8	0	2	2	0	0	1	1	0	0	0	19
10:00 AM	0	7	15	0	1	2	0	1	1	1	0	0	0	28
10:15 AM	0	5	12	1	3	1	0	0	1	0	0	0	0	23
10:30 AM	0	8	18	0	0	1	0	0	1	0	0	0	0	28
10:45 AM	1	8	16	0	1	0	3	0	4	4	0	0	0	37
11:00 AM	0	8	15	0	0	0	0	0	1	0	0	0	1	25
11:15 AM	0	6	13	0	0	1	0	1	3	2	0	0	0	26
11:30 AM	0	9	18	0	1	2	1	0	1	1	0	0	0	33
11:45 AM	0	12	25	0	1	0	0	1	0	0	0	0	0	39
12:00 PM	0	13	26	0	1	3	0	1	1	0	0	0	0	45
12:15 PM	0	11	23	0	0	1	1	1	1	0	0	0	0	38
12:30 PM	0	9	18	0	2	0	1	0	1	2	0	0	0	33
12:45 PM	0	10	18	1	2	1	0	1	0	2	0	0	0	35
1:00 PM	0	11	19	0	1	2	0	1	0	0	0	0	1	35
1:15 PM	0	12	24	0	2	2	2	1	1	1	0	0	0	45
1:30 PM	1	9	18	0	6	1	1	1	1	1	0	0	0	39
1:45 PM	1	7	15	0	1	1	1	0	0	0	0	0	0	26
2:00 PM	0	8	18	1	1	2	0	0	0	2	0	0	0	32
2:15 PM	0	9	17	0	0	4	2	0	1	2	0	0	0	35
2:30 PM	2	11	22	0	3	0	1	0	0	0	0	0	0	39
2:45 PM	0	16	32	0	0	1	0	0	0	0	0	0	1	50
3:00 PM	0	10	21	0	2	0	0	0	0	2	0	0	0	35
3:15 PM	0	12	26	0	4	2	0	1	1	0	0	0	0	46
3:30 PM	0	9	17	0	1	0	1	0	0	1	0	0	0	29
3:45 PM	0	7	15	0	4	0	1	1	2	0	0	0	0	30
4:00 PM	0	13	28	0	2	0	0	0	0	0	0	0	0	43
4:15 PM	1	13	27	0	0	2	0	0	2	0	0	0	0	45
4:30 PM	0	15	32	0	0	0	1	0	0	0	0	0	0	48
4:45 PM	0	14	29	0	0	0	0	0	0	0	0	0	0	43
5:00 PM	0	15	30	0	2	0	0	1	1	0	0	0	0	49
5:15 PM	0	10	19	0	2	0	0	1	0	0	0	0	0	32
5:30 PM	0	11	21	0	0	0	0	0	0	0	0	0	0	32
5:45 PM	0	11	23	0	1	1	0	0	1	0	0	0	0	37
6:00 PM	0	10	20	0	0	0	0	0	1	0	0	0	0	31
6:15 PM	0	7	13	0	0	0	0	0	1	0	0	0	0	21
6:30 PM	0	11	22	0	1	0	0	0	0	1	0	0	0	35
6:45 PM	0	8	18	0	2	0	0	0	0	0	0	0	0	28
7:00 PM	0	5	10	0	1	0	0	0	1	0	0	0	0	17
7:15 PM	0	5	10	0	1	0	0	0	1	0	0	0	0	17
7:30 PM	0	6	12	0	0	0	0	0	0	0	0	0	0	18
7:45 PM	0	3	6	0	0	0	0	0	0	0	0	0	0	9
8:00 PM	0	5	9	0	0	0	0	0	0	0	0	0	0	14
8:15 PM	0	5	11	0	0	0	0	0	0	0	0	0	0	16
8:30 PM	0	3	7	0	0	0	0	0	0	0	0	0	0	10
8:45 PM	0	4	9	0	0	0	0	0	0	0	0	0	0	13
9:00 PM	0	4	7	0	0	0	0	0	0	0	0	0	0	11
9:15 PM	0	3	6	0	0	0	0	0	1	1	0	0	0	11
9:30 PM	0	2	5	0	0	0	0	0	0	0	0	0	0	7
9:45 PM	0	2	5	0	0	0	0	0	0	0	0	0	0	7
Total	6	515	1039	3	68	46	27	16	47	33	0	0	5	1805
%	0.33%	28.53%	57.56%	0.17%	3.77%	2.55%	1.50%	0.89%	2.60%	1.83%	0.00%	0.00%	0.28%	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 NB Ramp & Brooklake Rd NE
Direction Counted: Eastbound Left

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
6:00 AM	0	9	25	0	2	0	0	0	5	1	0	0	1	43
6:15 AM	0	13	36	0	3	1	1	0	5	0	0	0	1	60
6:30 AM	0	10	27	0	2	0	0	0	4	2	0	0	0	45
6:45 AM	0	11	29	0	2	0	0	1	4	1	0	0	0	48
7:00 AM	0	11	32	0	0	0	1	0	2	2	0	0	0	48
7:15 AM	0	11	29	0	0	0	0	0	3	3	0	0	0	46
7:30 AM	0	14	34	0	2	0	1	0	9	5	0	0	1	66
7:45 AM	0	8	19	0	1	1	0	0	7	1	0	0	0	37
8:00 AM	0	9	22	0	1	0	0	0	3	4	0	0	0	39
8:15 AM	0	8	23	0	2	0	0	0	5	3	0	0	0	41
8:30 AM	0	9	23	0	1	0	1	1	2	1	0	0	1	39
8:45 AM	0	7	17	0	0	0	1	0	6	3	0	0	0	34
9:00 AM	0	7	20	0	3	1	0	0	3	3	0	0	0	37
9:15 AM	0	7	19	0	2	1	0	1	5	3	0	0	0	38
9:30 AM	0	9	24	0	1	0	1	0	5	2	0	0	0	42
9:45 AM	0	7	18	0	4	1	0	0	1	4	0	0	0	35
10:00 AM	0	7	20	0	1	0	0	0	3	1	0	0	0	32
10:15 AM	0	5	14	0	1	0	0	0	9	3	0	0	0	32
10:30 AM	0	9	26	0	2	1	0	0	3	3	0	0	0	44
10:45 AM	0	3	10	0	1	1	1	0	7	2	0	0	0	25
11:00 AM	0	8	19	0	0	2	1	0	2	3	0	0	1	36
11:15 AM	0	5	15	0	0	0	0	0	1	8	0	0	0	29
11:30 AM	0	9	24	0	0	1	0	0	7	1	0	0	0	42
11:45 AM	0	4	11	0	3	1	0	1	6	3	0	0	1	30
12:00 PM	0	5	14	0	2	1	0	0	2	1	0	0	0	25
12:15 PM	0	8	21	0	1	1	1	0	3	5	0	0	1	41
12:30 PM	0	8	19	0	0	1	0	0	7	3	0	0	0	38
12:45 PM	0	3	8	0	0	1	0	0	6	1	0	0	0	19
1:00 PM	0	8	17	0	2	2	0	0	6	4	0	0	0	39
1:15 PM	0	8	22	0	0	0	1	0	5	2	0	0	1	39
1:30 PM	0	7	19	0	2	0	0	0	3	2	0	0	0	33
1:45 PM	0	8	21	0	1	1	0	1	7	4	0	0	0	43
2:00 PM	0	6	16	0	3	0	0	0	6	3	0	0	0	34
2:15 PM	0	6	18	0	3	0	0	0	5	1	0	0	0	33
2:30 PM	0	7	20	0	2	0	0	0	5	1	0	0	0	35
2:45 PM	0	6	13	0	2	0	0	0	5	1	0	0	0	27
3:00 PM	0	10	27	0	2	0	0	0	1	2	0	0	0	42
3:15 PM	0	8	22	0	2	3	0	0	9	2	0	0	0	46
3:30 PM	0	7	22	0	1	1	0	0	5	0	0	0	0	36
3:45 PM	0	6	17	0	1	1	0	0	7	0	0	0	0	32
4:00 PM	0	7	19	0	1	0	0	0	6	1	0	0	0	34
4:15 PM	1	6	17	0	2	0	0	0	7	0	0	0	0	33
4:30 PM	0	7	19	0	2	1	0	0	5	0	0	0	0	34
4:45 PM	0	6	15	0	1	0	0	0	5	0	0	1	0	28
5:00 PM	0	7	19	0	1	0	0	0	3	1	0	1	0	32
5:15 PM	0	6	15	0	1	0	0	0	4	0	0	0	0	26
5:30 PM	0	8	21	0	2	0	0	0	2	1	0	0	0	34
5:45 PM	0	8	22	0	0	0	0	1	4	0	0	0	0	35
6:00 PM	0	9	25	0	0	0	0	0	1	1	0	0	0	36
6:15 PM	0	5	14	0	1	0	0	0	5	1	0	0	0	26
6:30 PM	0	5	12	0	0	0	0	0	5	0	0	0	0	22
6:45 PM	0	4	11	0	1	0	0	0	0	0	0	0	0	16
7:00 PM	0	4	14	0	0	0	0	0	1	0	0	0	0	19
7:15 PM	0	4	10	0	1	0	0	0	6	0	0	0	0	21
7:30 PM	0	4	9	0	0	0	0	0	3	0	0	0	0	16
7:45 PM	0	3	8	0	1	0	0	0	3	0	0	0	0	15
8:00 PM	0	4	11	0	0	0	0	0	6	0	0	0	0	21
8:15 PM	0	3	8	1	0	1	0	0	3	0	0	0	0	16
8:30 PM	0	4	7	0	0	1	0	0	2	0	0	0	0	14
8:45 PM	0	4	9	0	0	0	0	0	2	0	0	0	0	15
9:00 PM	0	2	6	0	0	0	0	0	1	0	0	0	0	9
9:15 PM	0	2	3	0	1	0	0	0	1	1	0	0	0	8
9:30 PM	0	1	2	0	0	0	0	0	2	0	0	0	0	5
9:45 PM	0	2	4	0	0	0	0	0	2	0	0	0	1	9
Total	1	426	1132	1	73	26	10	6	268	100	0	2	9	2054
%	0.05%	20.74%	55.11%	0.05%	3.55%	1.27%	0.49%	0.29%	13.05%	4.87%	0.00%	0.10%	0.44%	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 NB Ramp & Brooklake Rd NE
Direction Counted: Eastbound Right

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 NB Ramp & Brooklake Rd NE
Direction Counted: Eastbound U-Turn

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 NB Ramp & Brooklake Rd NE
Direction Counted: Bicycles

	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR	EBT	EBL	EBR	Interval Total
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	1	0	0	0	1
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	1
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	1
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	1
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	1	0	0	0	1
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	0	1	2	1	0	1	6
	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR	EBT	EBL	EBR	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 NB Ramp & Brooklake Rd NE
Direction Counted: Pedestrians

	North Leg	East Leg	South Leg	West Leg	Interval Total
6:00 AM	0	0	0	0	0
6:15 AM	0	0	0	0	0
6:30 AM	0	0	0	0	0
6:45 AM	0	0	0	0	0
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
9:00 AM	0	0	0	0	0
9:15 AM	0	0	0	0	0
9:30 AM	0	0	0	0	0
9:45 AM	0	0	0	0	0
10:00 AM	0	0	0	0	0
10:15 AM	0	0	0	0	0
10:30 AM	0	0	0	0	0
10:45 AM	0	0	0	0	0
11:00 AM	0	0	0	0	0
11:15 AM	0	0	0	0	0
11:30 AM	0	0	0	0	0
11:45 AM	0	0	0	0	0
12:00 PM	0	0	0	0	0
12:15 PM	0	0	0	0	0
12:30 PM	0	0	0	0	0
12:45 PM	0	0	0	0	0
1:00 PM	0	0	0	0	0
1:15 PM	0	0	0	0	0
1:30 PM	0	0	0	0	0
1:45 PM	0	0	0	0	0
2:00 PM	0	0	0	0	0
2:15 PM	0	0	0	0	0
2:30 PM	0	0	0	0	0
2:45 PM	0	0	0	1	1
3:00 PM	0	0	0	0	0
3:15 PM	0	0	0	0	0
3:30 PM	0	0	0	0	0
3:45 PM	0	0	0	0	0
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
6:00 PM	0	0	0	0	0
6:15 PM	0	0	0	0	0
6:30 PM	0	0	0	0	0
6:45 PM	0	0	0	0	0
7:00 PM	0	0	0	0	0
7:15 PM	0	0	0	0	0
7:30 PM	0	0	0	0	0
7:45 PM	0	0	0	0	0
8:00 PM	0	0	0	0	0
8:15 PM	0	0	0	0	0
8:30 PM	0	0	0	0	0
8:45 PM	0	0	0	0	0
9:00 PM	0	0	0	0	0
9:15 PM	0	0	0	0	0
9:30 PM	0	0	0	0	0
9:45 PM	0	0	0	0	0
Total	0	0	0	1	1
	North Leg	East Leg	South Leg	West Leg	

Quality Counts

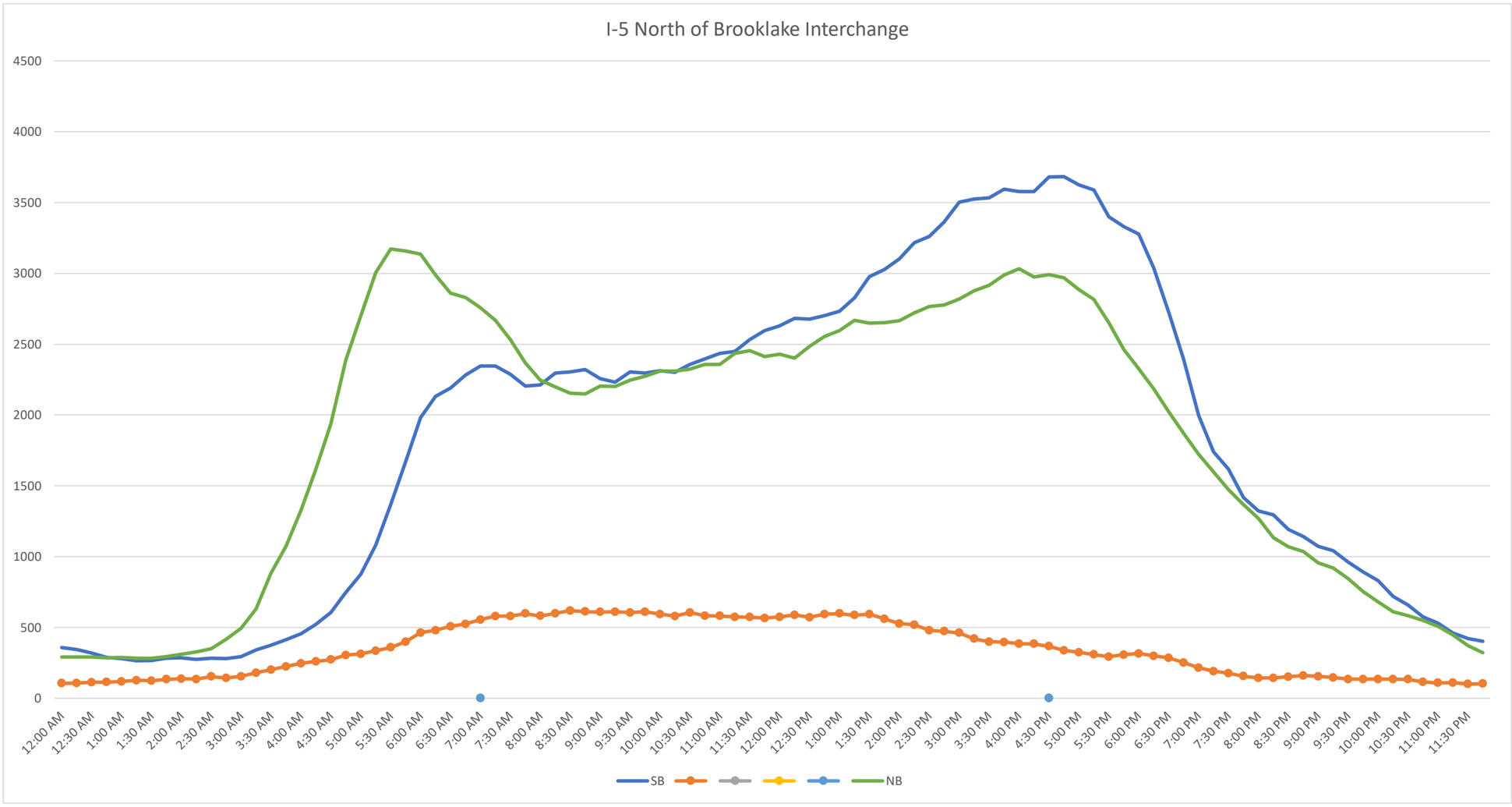
Date Counted: 10/22/2020
Location/Intersection: I-5 north of Brooklake Interchange
Direction Counted: Southbound Thru

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
12:00 AM	0	27	42	0	2	0	0	0	19	1	0	0	2	93
12:15 AM	0	27	42	0	2	0	0	0	19	1	0	0	2	93
12:30 AM	0	24	39	0	1	1	0	0	17	3	0	0	4	89
12:45 AM	0	20	34	0	2	1	0	0	18	2	0	0	5	82
1:00 AM	0	20	32	0	3	1	0	0	18	1	0	0	4	79
1:15 AM	0	18	26	0	6	0	0	0	13	1	0	0	5	69
1:30 AM	0	15	21	0	4	0	0	0	13	1	0	0	4	58
1:45 AM	0	13	22	0	3	0	0	0	29	1	0	0	5	73
2:00 AM	0	11	18	1	6	1	0	0	24	0	0	0	4	65
2:15 AM	0	18	27	0	0	0	0	0	21	1	0	0	3	70
2:30 AM	0	15	24	0	7	1	0	0	20	0	0	0	9	76
2:45 AM	0	14	23	0	6	1	0	0	27	0	0	2	1	74
3:00 AM	0	8	12	0	3	1	0	0	22	0	0	0	9	55
3:15 AM	0	14	22	0	6	1	0	0	26	0	0	0	8	77
3:30 AM	0	15	25	0	4	2	0	0	25	0	0	0	2	73
3:45 AM	0	16	23	0	8	2	0	0	31	0	0	0	9	89
4:00 AM	0	18	26	0	12	2	0	0	40	1	0	0	3	102
4:15 AM	0	20	30	0	8	0	0	0	48	0	0	0	6	112
4:30 AM	0	27	40	0	7	1	0	0	34	0	0	0	2	111
4:45 AM	0	23	35	0	16	0	0	0	37	2	0	0	16	129
5:00 AM	0	40	62	0	13	0	0	0	39	2	2	0	11	169
5:15 AM	0	47	74	0	11	0	0	0	53	1	1	0	9	196
5:30 AM	0	66	101	0	14	0	0	0	54	12	0	0	5	252
5:45 AM	0	73	113	0	18	1	0	0	42	6	0	0	5	258
6:00 AM	0	109	170	0	17	5	0	0	58	11	0	2	2	374
6:15 AM	0	149	236	0	17	6	0	0	55	15	0	2	4	484
6:30 AM	0	167	263	0	28	8	0	1	66	17	0	2	2	554
6:45 AM	0	177	277	1	21	9	0	0	63	13	0	3	6	570
7:00 AM	0	163	254	0	18	9	0	0	58	14	0	0	7	523
7:15 AM	0	168	260	1	23	3	0	2	56	20	0	2	9	544
7:30 AM	0	209	326	4	17	7	1	2	47	20	1	2	9	645
7:45 AM	1	192	302	3	26	10	3	4	59	25	0	1	9	635
8:00 AM	0	159	248	0	16	10	2	4	55	18	2	2	7	523
8:15 AM	0	144	227	5	17	8	0	6	58	14	2	1	2	484
8:30 AM	0	166	258	4	18	11	3	6	70	21	0	1	5	563
8:45 AM	1	196	309	1	22	8	2	7	59	28	1	0	9	643
9:00 AM	1	184	287	1	29	6	0	2	66	12	4	0	14	606
9:15 AM	0	139	217	0	31	6	1	3	76	15	0	0	3	491
9:30 AM	0	174	272	1	29	8	1	2	65	22	0	1	5	580
9:45 AM	1	173	271	0	27	3	0	4	69	22	0	1	9	580
10:00 AM	0	168	262	0	34	4	0	4	75	22	1	0	11	581
10:15 AM	0	165	258	1	26	5	0	1	87	15	1	0	5	564
10:30 AM	0	169	263	0	33	2	0	3	63	22	1	2	12	570
10:45 AM	0	183	286	0	24	11	0	6	63	15	1	0	9	598
11:00 AM	0	172	270	0	16	7	1	3	70	21	1	2	6	569
11:15 AM	0	183	289	1	21	8	0	3	77	26	1	4	7	620
11:30 AM	0	192	300	1	29	4	0	2	59	16	0	0	5	608
11:45 AM	0	200	313	1	23	7	0	1	69	21	0	1	2	638
12:00 PM	2	179	280	1	24	7	0	0	70	14	0	2	5	584
12:15 PM	2	213	332	1	19	5	0	1	110	13	0	0	7	703
12:30 PM	1	211	330	1	19	12	0	2	80	7	0	2	5	670
12:45 PM	0	214	336	0	21	5	0	2	70	21	0	0	4	673
1:00 PM	0	193	304	0	19	4	0	1	85	19	0	0	10	635
1:15 PM	1	216	338	2	26	3	1	0	82	24	0	0	6	699
1:30 PM	2	213	335	1	27	6	0	3	81	22	0	1	4	695
1:45 PM	6	223	348	1	14	8	0	3	68	22	0	1	8	702
2:00 PM	1	234	368	1	25	10	0	3	61	21	1	0	6	731
2:15 PM	2	276	430	1	20	4	0	3	80	26	0	1	6	849
2:30 PM	0	249	391	0	21	8	0	1	56	15	0	1	2	744
2:45 PM	0	260	407	2	20	2	0	3	61	18	0	2	4	779
3:00 PM	2	279	435	0	37	1	0	2	63	21	0	0	3	843
3:15 PM	0	312	490	0	22	7	1	2	42	15	1	0	2	894
3:30 PM	2	290	453	0	29	5	0	1	40	26	0	0	2	848
3:45 PM	1	315	494	2	29	1	2	1	53	16	0	1	3	918
4:00 PM	0	302	473	1	20	5	0	0	47	13	1	1	3	866
4:15 PM	1	315	494	0	21	5	0	2	47	7	0	2	7	901
4:30 PM	3	314	492	1	30	7	0	1	44	14	0	0	2	908
4:45 PM	1	319	500	0	18	3	0	1	44	13	0	0	3	902
5:00 PM	1	307	480	1	28	1	0	1	31	12	1	1	2	866
5:15 PM	0	360	564	1	22	1	1	3	40	9	1	0	2	1004
5:30 PM	1	327	512	1	21	2	1	3	27	10	2	1	3	911
5:45 PM	1	303	475	0	16	4	0	0	34	10	0	0	2	845
6:00 PM	2	295	460	1	16	1	0	3	40	9	0	1	2	830
6:15 PM	0	294	457	0	16	2	0	3	33	6	0	1	3	815
6:30 PM	0	295	461	2	12	0	0	1	59	7	0	0	4	841
6:45 PM	0	273	427	3	23	1	0	3	53	8	0	0	0	791
7:00 PM	0	209	327	1	7	3	0	2	33	6	0	1	1	590
7:15 PM	0	177	278	0	7	2	0	1	29	9	0	0	1	504
7:30 PM	0	177	277	1	13	1	0	0	33	4	0	1	1	508
7:45 PM	0	135	211	0	9	2	0	0	38	1	0	0	1	397
8:00 PM	0	115	180	0	5	0	0	0	23	4	0	0	3	330
8:15 PM	0	134	209	0	4	3	0	0	27	3	0	0	2	382
8:30 PM	0	107	169	0	5	2	0	0	22	1	0	0	2	308
8:45 PM	0	105	162	1	5	1	0	0	26	2	0	0	1	303
9:00 PM	0	103	159	0	5	0	0	0	26	5	1	0	4	303
9:15 PM	0	92	143	0	3	2	0	1	23	9	1	0	3	277
9:30 PM	0	86	134	0	6	1	0	0	28	2	1	0	1	259
9:45 PM	0	80	124	0	1	0	0	2	23	4	0	0	0	234
10:00 PM	0	96	149	1	1	1	0	0	20	1	1	2	0	272
10:15 PM	0	65	101	0	3	1	0	0	22	1	0	1	2	196
10:30 PM	0	57	91	2	3	1	0	0	25	2	0	3	7	191
10:45 PM	0	52	83	0	4	0	0	0	20	5	0	0	7	171
11:00 PM	0	53	81	0	1	0	0	0	19	2	0	0	5	161
11:15 PM	0	40	64	0	2	4	0	0	19	0	0	0	5	134
11:30 PM	0	30	47	0	7	0	0	0	17	4	0	0	3	108
11:45 PM	0	38	60	0	2	0	0	0	20	3	0	0	4	127
Total	36	14222	22246	56	1432	325	20	121	4326	967	30	57	455	44293
%	0.08%	32.11%	50.22%	0.13%	3.23%	0.73%	0.05%	0.27%	9.77%	2.18%	0.07%	0.13%	1.03%	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I-5 north of Brooklake Interchange
Direction Counted: Northbound Thru

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
12:00 AM	0	16	28	0	1	0	0	0	16	7	1	0	4	73
12:15 AM	0	17	28	0	1	0	0	0	21	9	2	0	3	81
12:30 AM	0	19	30	0	2	0	0	0	18	6	1	0	0	76
12:45 AM	0	14	21	0	2	0	0	0	15	7	0	1	2	62
1:00 AM	0	12	19	0	1	0	0	0	24	11	1	0	5	73
1:15 AM	0	14	22	0	3	0	0	0	23	13	1	0	3	79
1:30 AM	0	16	25	0	1	0	0	1	18	5	2	0	3	71
1:45 AM	0	9	14	0	2	0	0	2	20	12	2	1	4	66
2:00 AM	0	14	20	0	2	0	0	2	15	9	0	0	5	67
2:15 AM	0	14	21	0	2	4	0	0	27	9	0	0	1	78
2:30 AM	0	17	28	0	1	1	0	1	21	12	0	0	3	84
2:45 AM	0	20	29	0	1	1	0	0	17	13	0	0	0	81
3:00 AM	0	17	26	0	7	0	0	0	21	10	0	1	1	83
3:15 AM	0	26	40	0	3	0	0	1	20	8	3	0	1	102
3:30 AM	1	39	61	0	7	0	0	0	23	13	2	0	3	149
3:45 AM	0	38	62	0	8	3	0	1	26	15	2	0	4	159
4:00 AM	0	61	97	0	4	1	0	0	36	17	0	5	0	221
4:15 AM	0	111	173	0	10	3	0	0	32	20	0	5	0	354
4:30 AM	1	112	174	0	8	3	0	0	26	11	0	4	0	339
4:45 AM	1	133	208	0	10	7	0	1	35	10	1	6	0	412
5:00 AM	0	174	271	0	9	2	0	2	32	15	0	8	0	513
5:15 AM	1	228	355	1	11	3	0	0	48	15	0	10	0	672
5:30 AM	1	277	433	0	14	3	0	1	46	10	0	5	0	790
5:45 AM	0	244	383	2	20	4	0	0	48	18	0	5	0	724
6:00 AM	0	278	435	0	20	5	0	2	56	16	0	7	0	819
6:15 AM	0	284	446	0	19	4	0	3	55	23	2	3	0	839
6:30 AM	0	270	422	0	17	9	1	3	36	13	0	0	6	777
6:45 AM	1	238	373	2	10	6	0	3	43	19	0	2	3	700
7:00 AM	0	225	352	0	25	5	1	1	31	24	2	1	6	673
7:15 AM	1	246	385	2	14	7	3	0	29	19	1	0	3	710
7:30 AM	1	250	391	1	21	4	1	4	46	20	0	2	7	748
7:45 AM	1	204	319	1	30	6	2	1	39	19	1	0	4	627
8:00 AM	0	177	276	2	20	10	2	1	59	24	3	0	9	583
8:15 AM	1	182	284	1	23	5	0	1	49	24	0	0	5	575
8:30 AM	0	184	288	2	20	7	0	2	54	16	1	1	7	582
8:45 AM	0	152	235	2	24	5	4	1	62	21	1	0	0	507
9:00 AM	1	164	255	0	27	6	0	1	53	20	0	1	7	535
9:15 AM	0	159	249	2	26	8	1	1	57	23	1	1	3	531
9:30 AM	0	174	274	0	20	5	2	1	70	26	1	1	2	576
9:45 AM	1	163	253	0	36	5	0	2	77	21	0	0	3	561
10:00 AM	1	162	253	0	20	7	1	4	62	20	0	0	4	534
10:15 AM	0	176	276	2	27	3	0	2	58	25	1	0	4	574
10:30 AM	0	186	290	0	30	4	0	1	59	25	2	0	7	604
10:45 AM	0	175	276	0	18	8	1	5	90	16	0	0	8	597
11:00 AM	0	156	246	0	25	10	1	3	70	18	0	0	5	534
11:15 AM	0	178	280	0	27	4	1	3	64	29	0	0	3	589
11:30 AM	0	190	298	2	28	3	0	7	78	26	0	1	5	638
11:45 AM	1	182	285	2	13	7	0	3	72	24	1	0	7	597
12:00 PM	3	189	293	0	24	2	0	4	69	21	2	1	3	611
12:15 PM	1	186	291	1	26	7	1	2	60	27	0	1	6	609
12:30 PM	0	173	270	0	30	5	0	4	89	21	0	3	1	596
12:45 PM	1	190	297	0	16	4	0	7	72	16	0	2	7	612
1:00 PM	0	178	279	2	27	7	0	5	61	22	1	2	1	585
1:15 PM	1	218	342	1	20	6	0	2	78	21	0	0	2	691
1:30 PM	0	211	331	2	30	4	2	3	67	12	0	2	3	667
1:45 PM	1	204	319	1	22	3	0	3	70	22	1	2	4	652
2:00 PM	2	207	323	0	28	6	0	4	74	14	0	0	1	659
2:15 PM	0	214	335	0	25	2	1	4	71	14	0	1	5	672
2:30 PM	1	210	330	0	32	2	0	3	72	15	1	2	2	670
2:45 PM	0	211	333	1	24	6	0	3	67	19	0	0	2	666
3:00 PM	1	232	361	1	15	8	0	3	77	10	1	1	2	712
3:15 PM	0	235	369	1	25	7	1	5	60	15	0	1	0	719
3:30 PM	1	228	358	0	24	4	0	0	55	6	0	1	3	680
3:45 PM	0	235	367	2	35	7	0	3	52	0	1	1	5	708
4:00 PM	0	256	402	1	21	3	1	2	63	17	0	0	4	770
4:15 PM	1	258	405	3	11	3	0	4	61	8	0	2	2	758
4:30 PM	0	253	395	1	22	5	0	2	60	9	1	0	4	752
4:45 PM	0	256	400	2	15	5	0	2	64	5	0	1	3	753
5:00 PM	0	243	380	0	16	2	0	2	55	6	0	2	4	710
5:15 PM	1	262	409	1	17	2	0	2	68	8	0	0	5	775
5:30 PM	0	247	386	0	12	5	0	4	67	7	1	0	2	731
5:45 PM	1	226	355	1	9	3	0	6	60	5	0	0	3	669
6:00 PM	1	216	339	0	9	2	1	5	52	11	0	1	3	640
6:15 PM	0	202	315	0	10	4	2	3	61	10	1	2	3	613
6:30 PM	0	173	273	0	7	3	1	0	61	15	2	0	5	540
6:45 PM	0	173	270	1	12	2	1	0	57	12	3	0	3	534
7:00 PM	0	163	252	0	10	1	0	0	66	5	0	1	0	498
7:15 PM	0	141	221	2	11	1	0	0	61	8	1	1	3	450
7:30 PM	0	124	195	0	5	3	0	0	45	10	0	0	6	388
7:45 PM	0	121	188	0	8	0	0	0	54	10	0	0	6	387
8:00 PM	0	114	177	0	15	0	0	1	35	23	0	0	7	372
8:15 PM	0	106	167	1	6	2	0	0	35	7	0	0	3	327
8:30 PM	0	87	136	1	5	3	0	0	43	4	0	0	2	281
8:45 PM	0	88	135	0	8	1	0	0	45	9	0	0	3	289
9:00 PM	0	73	115	0	2	2	0	0	38	3	0	0	3	236
9:15 PM	1	80	125	1	4	0	0	1	35	9	0	0	7	263
9:30 PM	0	76	117	0	5	0	0	1	34	3	0	0	11	247
9:45 PM	0	65	100	0	6	0	0	0	26	6	0	0	7	210
10:00 PM	0	59	94	0	2	2	0	1	28	9	0	0	5	200
10:15 PM	1	53	82	0	1	0	0	2	28	9	0	0	11	187
10:30 PM	0	37	58	0	3	0	0	0	34	9	0	0	16	157
10:45 PM	0	34	54	0	4	2	0	0	34	2	0	0	6	136
11:00 PM	0	35	55	0	3	0	0	0	22	9	0	0	8	132
11:15 PM	0	42	65	0	3	0	0	1	25	15	0	0	7	158
11:30 PM	0	29	47	0	3	0	0	0	28	8	0	0	10	125
11:45 PM	0	22	34	0	2	0	0	1	19	7	0	0	7	92
Total	32	14032	21953	51	1340	314	32	162	4555	1319	51	101	366	44308
%	0.07%	31.67%	49.55%	0.12%	3.02%	0.71%	0.07%	0.37%	10.28%	2.98%	0.12%	0.23%	0.83%	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	


I-5 North of Brooklake Interchange
4500
4000
3500
3000
2500
2000
1500
1000
500
0
12:00 AM
12:30 AM
1:00 AM
1:30 AM
2:00 AM
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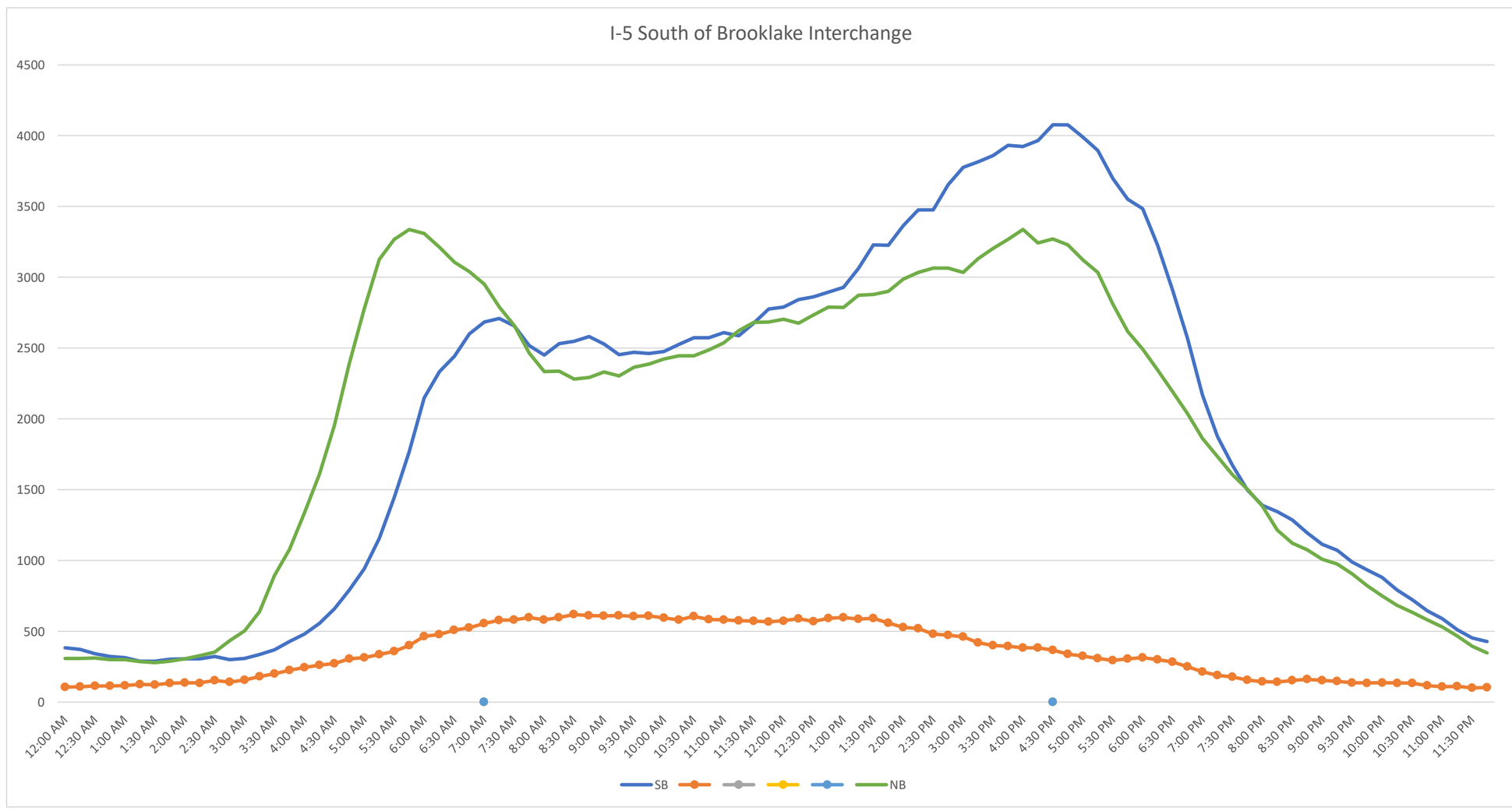
10:00 PM
10:30 PM
11:00 PM
11:30 PM
SB
NB


I-5 South of Brooklake Interchange
4500
4000
3500
3000
2500
2000
1500
1000
500
0
12:00 AM
12:30 AM
1:00 AM
1:30 AM
2:00 AM
2:30 AM
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11:00 PM
11:30 PM
SB
NB

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 SB Ramp & Brooklake Rd NE
Direction Counted: Southbound Thru

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	1	1	0	0	0	2
7:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	1
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	1
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	1
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	1
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	1
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	2
12:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	1
12:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	1
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	1	0	0	0	0	0	1	1	0	0	0	0	3
1:45 PM	0	1	1	0	0	0	0	0	0	0	0	0	0	2
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	1
3:30 PM	0	1	0	0	0	0	0	0	1	0	0	0	0	2
3:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	1
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	1
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	1
6:45 PM	0	0	2	0	0	0	0	0	0	0	0	0	0	2
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	1
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	1	0	0	0	0	0	0	1	0	0	0	0	2
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	1
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	9	6	0	1	3	0	1	7	2	0	0	0	29
%	0.00%	31.03%	20.69%	0.00%	3.45%	10.34%	0.00%	3.45%	24.14%	6.90%	0.00%	0.00%	0.00%	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 SB Ramp & Brooklake Rd NE
Direction Counted: Southbound Left

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
6:00 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	2
6:15 AM	0	2	0	0	1	1	0	0	0	0	0	0	0	4
6:30 AM	0	3	2	0	0	0	0	0	2	0	0	0	0	7
6:45 AM	0	2	0	0	0	0	0	0	1	0	0	0	0	3
7:00 AM	0	2	2	0	0	0	0	0	0	0	0	0	0	4
7:15 AM	0	3	2	0	1	0	0	0	2	1	0	0	0	9
7:30 AM	0	4	1	0	0	0	0	0	0	1	0	0	0	6
7:45 AM	0	3	1	0	0	1	0	0	0	0	0	0	0	5
8:00 AM	0	3	1	0	0	0	0	0	0	0	0	0	0	4
8:15 AM	0	2	1	0	0	0	0	0	1	0	0	0	0	4
8:30 AM	0	3	3	0	1	0	0	0	0	0	0	0	0	7
8:45 AM	0	2	1	0	2	0	1	0	1	0	0	0	0	7
9:00 AM	0	3	2	0	1	0	0	0	0	1	0	0	0	7
9:15 AM	0	3	1	0	2	0	0	1	0	0	0	0	0	7
9:30 AM	0	2	0	0	0	1	0	0	0	0	0	0	0	3
9:45 AM	0	4	3	0	0	0	0	0	1	0	0	0	0	8
10:00 AM	0	3	3	0	0	0	0	0	0	0	0	0	0	6
10:15 AM	0	4	1	0	1	1	0	0	0	0	0	0	0	7
10:30 AM	0	3	2	0	0	0	0	0	1	0	0	0	0	6
10:45 AM	0	7	5	0	1	0	0	0	2	4	0	0	0	19
11:00 AM	0	2	0	0	0	0	0	0	1	0	0	0	0	3
11:15 AM	0	2	2	0	0	0	0	0	1	3	0	0	0	8
11:30 AM	0	5	3	0	0	0	0	0	0	0	0	0	0	8
11:45 AM	0	5	2	0	0	0	0	0	1	0	0	0	0	8
12:00 PM	0	6	5	0	1	0	0	0	1	0	0	0	0	13
12:15 PM	0	8	8	0	0	0	0	0	0	1	0	0	0	17
12:30 PM	0	7	4	0	0	0	0	0	1	1	0	0	0	13
12:45 PM	0	4	3	0	1	0	0	0	0	2	0	0	0	10
1:00 PM	0	3	0	0	0	0	0	1	0	0	0	0	0	4
1:15 PM	0	5	3	0	1	0	0	0	1	0	0	0	0	10
1:30 PM	1	2	0	0	3	0	0	0	0	0	0	0	0	6
1:45 PM	0	4	2	0	1	0	0	0	0	0	0	0	0	7
2:00 PM	0	4	3	0	1	0	0	0	0	2	0	0	0	10
2:15 PM	0	4	4	0	0	0	0	0	0	0	0	0	0	8
2:30 PM	0	4	4	0	1	0	0	0	0	0	0	0	0	9
2:45 PM	0	4	4	0	1	0	0	0	0	0	0	0	0	9
3:00 PM	0	7	5	0	1	0	0	0	0	0	0	0	0	13
3:15 PM	0	6	3	0	1	0	0	0	0	0	0	0	0	10
3:30 PM	0	3	2	0	0	0	0	0	0	1	0	0	0	6
3:45 PM	0	3	2	0	0	0	0	0	0	0	0	0	0	5
4:00 PM	0	8	5	0	1	0	0	0	0	0	0	0	0	14
4:15 PM	1	7	5	0	0	0	0	0	1	0	0	0	0	14
4:30 PM	0	6	4	0	1	0	0	0	0	0	0	0	0	11
4:45 PM	0	7	5	0	0	0	0	0	0	0	0	0	0	12
5:00 PM	0	1	1	0	0	0	0	0	0	0	0	0	0	2
5:15 PM	0	4	3	0	0	0	0	0	0	0	0	0	0	7
5:30 PM	0	8	5	0	0	0	0	0	0	0	0	0	0	13
5:45 PM	0	8	7	0	0	0	0	0	0	0	0	0	0	15
6:00 PM	0	6	5	0	0	0	0	0	0	0	0	0	0	11
6:15 PM	0	2	2	0	0	0	0	0	0	0	0	0	0	4
6:30 PM	0	5	3	0	0	0	0	0	0	1	0	0	0	9
6:45 PM	0	5	3	0	2	0	0	0	0	0	0	0	0	10
7:00 PM	0	4	1	0	0	0	0	0	1	0	0	0	0	6
7:15 PM	0	3	3	0	1	0	0	0	0	0	0	0	0	7
7:30 PM	0	4	3	0	0	0	0	0	0	0	0	0	0	7
7:45 PM	0	2	0	0	1	0	0	0	0	0	0	0	0	3
8:00 PM	0	3	2	0	0	0	0	0	0	0	0	0	0	5
8:15 PM	0	1	1	0	0	0	0	0	0	0	0	0	0	2
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	2	1	0	0	0	0	0	0	0	0	0	0	3
9:00 PM	0	3	1	0	0	0	0	0	0	0	0	0	0	4
9:15 PM	0	2	1	0	0	0	0	0	0	0	0	0	0	3
9:30 PM	0	1	1	0	0	0	0	0	0	0	0	0	0	2
9:45 PM	0	1	1	0	0	0	0	0	0	0	0	0	0	2
Total	2	241	153	0	28	4	1	2	19	18	0	0	0	468
%	0.43%	51.50%	32.69%	0.00%	5.98%	0.85%	0.21%	0.43%	4.06%	3.85%	0.00%	0.00%	0.00%	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 SB Ramp & Brooklake Rd NE
Direction Counted: Southbound Right

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
6:00 AM	0	6	8	0	3	0	0	0	4	3	0	0	0	24
6:15 AM	0	6	9	0	0	1	0	0	2	1	0	0	0	19
6:30 AM	0	6	7	0	3	0	0	0	6	2	0	0	0	24
6:45 AM	0	7	11	0	0	1	0	0	2	1	0	0	1	23
7:00 AM	0	5	8	0	1	0	0	0	4	5	0	0	2	25
7:15 AM	0	8	12	0	0	0	0	0	3	3	0	0	0	26
7:30 AM	0	10	14	1	0	2	0	0	5	3	0	0	0	35
7:45 AM	0	7	10	0	1	1	0	0	3	3	0	0	0	25
8:00 AM	0	11	17	0	4	1	0	0	2	3	0	0	0	38
8:15 AM	0	10	17	0	2	0	0	0	5	2	0	0	0	36
8:30 AM	0	11	18	0	1	2	0	0	4	2	0	0	1	39
8:45 AM	0	9	16	0	1	0	0	1	8	6	0	0	1	42
9:00 AM	0	9	15	0	3	1	0	1	7	3	0	0	1	40
9:15 AM	0	6	11	0	0	1	0	0	7	2	0	0	0	27
9:30 AM	0	6	8	0	3	0	0	0	2	2	0	0	0	21
9:45 AM	0	8	13	0	1	1	0	0	4	4	0	0	1	32
10:00 AM	0	13	22	0	2	0	0	0	9	3	0	0	0	49
10:15 AM	0	8	13	0	3	0	0	0	5	4	0	0	0	33
10:30 AM	0	8	14	0	2	0	0	0	9	4	0	0	2	39
10:45 AM	0	8	12	0	2	0	0	0	5	1	0	0	0	28
11:00 AM	0	8	14	0	4	0	1	0	6	3	0	0	0	36
11:15 AM	0	11	17	0	0	0	1	1	9	1	0	0	1	41
11:30 AM	0	15	24	0	3	1	0	0	5	3	0	0	0	51
11:45 AM	0	11	16	0	0	2	0	0	6	4	0	0	0	39
12:00 PM	0	8	12	0	0	0	0	0	2	5	0	0	0	27
12:15 PM	0	9	17	0	2	1	0	0	5	1	0	0	1	36
12:30 PM	0	12	18	0	1	3	0	0	6	3	0	0	0	43
12:45 PM	0	16	25	1	3	1	0	0	9	1	0	0	1	57
1:00 PM	0	10	17	0	1	0	0	0	7	5	0	0	0	40
1:15 PM	0	9	16	0	3	0	1	0	12	4	0	0	1	46
1:30 PM	0	13	20	1	4	1	0	0	9	1	0	1	1	51
1:45 PM	0	11	17	0	1	0	0	1	7	2	0	0	0	39
2:00 PM	0	12	19	0	1	0	0	0	6	3	0	0	0	41
2:15 PM	1	13	20	0	2	2	0	0	6	1	0	0	2	47
2:30 PM	0	16	25	0	1	0	0	0	9	4	0	0	1	56
2:45 PM	0	20	33	0	3	1	1	0	10	1	0	0	1	70
3:00 PM	0	16	24	0	1	0	0	0	10	2	0	0	0	53
3:15 PM	0	24	39	0	3	0	0	0	1	0	0	0	0	67
3:30 PM	0	17	26	0	3	0	0	0	3	4	0	0	0	53
3:45 PM	1	24	40	0	2	0	0	0	8	2	0	0	0	77
4:00 PM	0	19	30	0	0	0	0	0	7	3	0	0	0	59
4:15 PM	0	22	35	0	2	1	0	0	7	1	0	1	1	70
4:30 PM	0	21	34	0	3	1	0	1	2	0	0	0	0	62
4:45 PM	0	22	36	0	1	0	0	4	2	0	0	0	0	65
5:00 PM	0	23	39	0	1	1	0	0	4	0	0	0	0	68
5:15 PM	0	21	35	0	2	0	0	0	3	2	0	0	0	63
5:30 PM	1	18	29	0	2	1	0	0	7	2	0	0	0	60
5:45 PM	1	25	42	0	2	0	0	0	3	1	0	0	0	74
6:00 PM	0	21	37	0	0	0	0	0	4	0	0	0	0	62
6:15 PM	0	17	28	0	1	0	0	0	1	1	0	0	0	48
6:30 PM	0	20	32	0	0	0	0	0	5	0	0	1	0	58
6:45 PM	0	14	25	0	3	0	0	0	2	0	0	0	0	44
7:00 PM	0	12	19	0	0	0	0	0	4	1	0	0	0	36
7:15 PM	0	12	18	0	2	0	0	0	0	0	1	0	0	33
7:30 PM	0	10	16	0	0	0	0	0	3	0	0	0	0	29
7:45 PM	0	8	13	0	0	0	0	0	4	0	0	0	0	25
8:00 PM	0	6	12	0	0	0	0	0	2	0	0	0	0	20
8:15 PM	0	10	17	0	0	0	0	0	3	0	0	0	0	30
8:30 PM	0	6	10	0	0	0	0	0	1	0	0	0	1	18
8:45 PM	0	10	17	0	0	0	0	0	2	0	0	1	0	30
9:00 PM	0	8	10	0	0	0	0	0	4	0	0	0	1	23
9:15 PM	0	6	9	0	0	1	0	0	2	0	0	0	0	18
9:30 PM	0	7	12	0	0	0	0	0	1	0	0	0	0	20
9:45 PM	0	3	4	0	0	0	0	0	4	0	0	0	0	11
Total	4	778	1253	3	89	28	4	9	309	118	1	4	21	2621
%	0.15%	29.68%	47.81%	0.11%	3.40%	1.07%	0.15%	0.34%	11.79%	4.50%	0.04%	0.15%	0.80%	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 SB Ramp & Brooklake Rd NE
Direction Counted: Southbound U-Turn

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 SB Ramp & Brooklake Rd NE
Direction Counted: Westbound Thru

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
6:00 AM	0	17	31	0	1	1	0	0	6	3	0	0	0	59
6:15 AM	0	22	42	0	3	3	0	0	4	1	0	0	0	75
6:30 AM	0	21	38	0	6	1	1	0	5	1	0	0	0	73
6:45 AM	0	31	59	0	5	1	0	0	1	2	0	0	0	99
7:00 AM	0	28	54	0	4	2	0	0	9	1	0	0	0	98
7:15 AM	1	28	51	0	1	3	1	0	3	1	0	0	0	89
7:30 AM	0	16	30	0	3	3	0	1	6	0	0	0	1	60
7:45 AM	0	29	57	0	4	5	0	0	3	2	0	0	0	100
8:00 AM	0	20	38	0	4	4	1	0	4	3	0	0	0	74
8:15 AM	0	18	32	0	6	6	0	1	7	1	0	0	0	71
8:30 AM	0	12	23	0	2	7	0	0	8	2	0	0	0	54
8:45 AM	0	16	28	0	3	8	2	1	1	2	0	0	1	62
9:00 AM	0	12	25	0	3	7	0	0	9	1	0	0	2	59
9:15 AM	0	11	21	1	5	11	0	2	2	1	0	0	1	55
9:30 AM	0	15	29	0	7	3	0	1	9	1	0	0	0	65
9:45 AM	0	13	27	0	8	10	0	1	8	2	0	0	0	69
10:00 AM	0	12	23	0	4	5	1	0	14	5	0	0	0	64
10:15 AM	0	17	28	1	5	5	0	0	4	2	0	0	1	63
10:30 AM	0	15	29	0	2	5	1	3	5	3	0	0	1	64
10:45 AM	0	14	26	0	4	2	0	0	6	1	0	0	1	54
11:00 AM	0	18	30	0	2	8	2	1	9	4	0	0	0	74
11:15 AM	0	19	38	0	5	5	0	0	13	1	0	0	2	83
11:30 AM	0	16	30	0	4	4	0	1	8	0	0	0	0	63
11:45 AM	0	18	35	0	3	6	0	0	12	2	1	0	1	78
12:00 PM	0	31	57	0	2	8	0	4	7	5	0	0	1	115
12:15 PM	0	20	39	1	3	3	0	1	6	1	0	0	0	74
12:30 PM	0	24	44	0	3	7	0	1	4	1	0	0	0	84
12:45 PM	0	20	39	0	4	7	1	0	6	1	0	0	2	80
1:00 PM	0	24	45	0	5	4	0	1	11	2	0	0	1	93
1:15 PM	0	21	38	0	4	5	0	0	4	3	0	0	0	75
1:30 PM	0	19	34	0	1	5	0	1	9	2	0	0	1	72
1:45 PM	0	22	40	1	5	7	0	0	7	2	0	0	1	85
2:00 PM	0	18	31	1	6	9	1	1	11	0	0	0	0	78
2:15 PM	0	23	43	0	5	1	0	0	4	1	0	0	0	77
2:30 PM	1	19	33	0	5	5	0	0	12	3	0	0	0	78
2:45 PM	0	20	35	0	7	3	1	0	11	0	0	0	0	77
3:00 PM	1	28	52	0	3	6	0	1	7	1	0	0	0	99
3:15 PM	0	21	42	0	2	3	0	0	9	1	0	0	0	78
3:30 PM	1	20	35	0	4	3	0	1	7	3	0	0	1	75
3:45 PM	1	25	46	0	4	2	0	1	11	1	0	0	1	92
4:00 PM	1	21	41	0	3	1	0	0	11	1	0	0	0	79
4:15 PM	0	22	42	0	2	4	0	0	5	0	0	1	0	76
4:30 PM	0	24	43	0	3	1	0	1	12	1	0	1	1	87
4:45 PM	0	25	50	0	1	1	0	3	4	2	0	0	0	86
5:00 PM	0	24	43	0	4	1	0	1	8	1	0	0	0	82
5:15 PM	0	26	50	0	3	0	0	0	7	0	0	0	0	86
5:30 PM	0	27	51	0	3	1	0	1	9	0	0	0	0	92
5:45 PM	0	21	38	0	5	1	0	0	6	1	0	0	0	72
6:00 PM	0	22	40	0	2	0	0	0	6	1	0	0	0	71
6:15 PM	0	16	30	0	2	0	0	0	7	1	0	0	0	56
6:30 PM	0	21	40	0	2	1	0	0	4	0	0	0	0	68
6:45 PM	0	18	31	0	1	1	0	0	5	0	0	0	0	56
7:00 PM	0	13	24	0	0	2	0	0	7	0	0	0	0	46
7:15 PM	0	12	23	0	1	1	0	0	6	0	0	0	0	43
7:30 PM	0	12	23	0	1	0	0	0	7	1	0	0	0	44
7:45 PM	0	9	18	0	0	0	0	0	6	0	0	0	0	33
8:00 PM	0	17	31	0	1	4	0	0	3	0	0	0	0	56
8:15 PM	0	10	20	0	0	0	0	0	5	0	0	0	0	35
8:30 PM	0	10	19	0	1	0	0	0	0	0	0	0	0	30
8:45 PM	0	7	16	0	0	0	0	0	6	0	0	0	1	30
9:00 PM	0	6	12	0	0	0	0	0	1	0	0	0	0	19
9:15 PM	0	5	9	0	1	0	0	0	2	0	0	0	1	18
9:30 PM	0	6	12	0	0	0	0	0	2	0	0	0	0	20
9:45 PM	0	6	11	0	0	1	0	0	2	0	0	0	0	20
Total	6	1173	2194	5	193	213	12	30	413	78	1	2	22	4342
%	0.14%	27.02%	50.53%	0.12%	4.44%	4.91%	0.28%	0.69%	9.51%	1.80%	0.02%	0.05%	0.51%	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 SB Ramp & Brooklake Rd NE
Direction Counted: Westbound Left

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
6:00 AM	0	8	15	0	1	0	0	0	0	1	0	0	1	26
6:15 AM	0	14	31	0	0	0	0	0	0	0	0	0	0	45
6:30 AM	0	10	23	0	3	0	0	0	1	5	0	0	0	42
6:45 AM	0	13	29	0	3	2	0	0	0	0	0	0	0	47
7:00 AM	0	14	30	0	2	0	0	0	1	1	0	0	0	48
7:15 AM	0	16	35	0	3	3	0	0	0	3	0	0	0	60
7:30 AM	0	18	40	0	3	3	0	0	1	0	0	0	1	66
7:45 AM	0	16	33	0	1	3	0	0	1	1	0	0	2	57
8:00 AM	0	14	32	0	2	0	0	0	1	2	0	0	0	51
8:15 AM	0	12	28	0	3	1	0	0	3	0	0	0	1	48
8:30 AM	0	16	32	0	2	1	0	0	2	0	0	0	1	54
8:45 AM	0	13	26	0	2	3	0	0	0	2	0	0	1	47
9:00 AM	0	13	28	0	4	1	0	0	5	3	0	0	0	54
9:15 AM	0	18	38	1	2	1	0	0	3	0	0	0	0	63
9:30 AM	0	13	27	0	1	0	0	0	2	0	0	0	2	45
9:45 AM	0	12	30	0	1	2	0	0	3	0	0	0	1	49
10:00 AM	0	10	20	0	1	0	0	0	3	1	0	0	1	36
10:15 AM	0	10	23	0	2	2	0	0	1	2	0	0	0	40
10:30 AM	0	14	31	0	2	0	0	0	3	1	0	0	3	54
10:45 AM	0	13	29	0	1	1	0	0	1	0	0	0	1	46
11:00 AM	0	14	32	0	4	1	0	2	3	3	0	0	1	60
11:15 AM	0	11	25	1	4	2	0	0	1	0	0	0	1	45
11:30 AM	0	10	20	0	1	0	1	1	3	0	0	0	1	37
11:45 AM	0	10	22	0	1	0	0	1	1	1	0	0	1	37
12:00 PM	0	9	18	0	4	1	0	0	3	0	0	0	0	35
12:15 PM	0	14	32	0	1	1	0	0	2	0	0	0	0	50
12:30 PM	0	14	30	0	1	1	0	1	1	1	0	0	0	49
12:45 PM	0	9	21	0	5	0	1	2	1	0	0	0	0	39
1:00 PM	0	13	27	0	4	3	0	1	4	0	0	0	0	52
1:15 PM	0	12	25	0	4	4	0	0	2	0	0	0	1	48
1:30 PM	0	15	31	0	3	1	0	2	1	0	0	0	1	54
1:45 PM	0	12	24	0	2	0	0	1	1	0	0	0	1	41
2:00 PM	1	14	27	0	7	1	0	0	0	0	0	0	1	51
2:15 PM	0	13	28	0	6	2	0	0	0	0	0	0	3	52
2:30 PM	0	15	33	0	5	0	0	0	1	1	0	0	0	55
2:45 PM	0	17	35	0	3	0	0	0	0	0	0	0	0	55
3:00 PM	0	24	51	0	2	0	0	0	3	0	0	0	0	80
3:15 PM	0	16	36	0	4	1	0	0	1	0	0	0	0	58
3:30 PM	0	24	52	0	1	0	1	0	2	0	0	0	0	80
3:45 PM	0	22	46	0	4	1	0	0	1	0	0	0	0	74
4:00 PM	0	23	48	0	1	0	0	0	0	0	0	0	2	74
4:15 PM	0	20	44	1	3	1	0	1	1	0	0	0	1	72
4:30 PM	1	23	51	0	0	1	0	0	0	1	0	0	1	78
4:45 PM	0	21	45	0	0	0	0	1	0	0	0	0	0	67
5:00 PM	0	21	46	0	1	0	0	1	0	0	0	0	0	69
5:15 PM	0	23	49	0	1	0	0	1	2	0	0	0	0	76
5:30 PM	0	19	40	0	0	0	0	0	0	0	0	0	0	59
5:45 PM	1	12	29	0	2	1	0	0	0	0	0	0	0	45
6:00 PM	0	14	30	0	0	0	0	0	1	0	0	0	0	45
6:15 PM	0	15	34	0	0	0	0	0	0	0	0	0	0	49
6:30 PM	0	9	19	0	1	0	0	0	0	0	0	0	0	29
6:45 PM	0	12	26	0	0	0	0	0	0	0	0	0	0	38
7:00 PM	0	12	25	0	0	0	0	0	0	0	0	0	0	37
7:15 PM	0	11	23	0	0	0	0	0	0	0	0	0	0	34
7:30 PM	0	8	17	0	0	0	0	0	0	0	0	0	0	25
7:45 PM	0	6	10	0	0	0	0	0	0	0	0	0	0	16
8:00 PM	0	6	12	0	0	0	0	0	0	0	0	0	0	18
8:15 PM	0	6	13	0	0	0	0	0	0	0	0	0	0	19
8:30 PM	1	4	10	0	0	0	0	0	0	0	0	0	1	16
8:45 PM	0	5	8	0	1	0	0	0	0	1	0	0	0	15
9:00 PM	0	5	11	0	0	0	0	0	0	0	0	0	0	16
9:15 PM	0	5	10	0	0	0	0	0	0	0	0	0	0	15
9:30 PM	0	2	4	0	1	0	0	0	0	0	0	0	0	7
9:45 PM	0	2	4	0	0	0	0	0	0	0	0	0	0	6
Total	4	839	1803	3	116	45	3	15	66	30	0	0	31	2955
%	0.14%	28.39%	61.02%	0.10%	3.93%	1.52%	0.10%	0.51%	2.23%	1.02%	0.00%	0.00%	1.05%	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 SB Ramp & Brooklake Rd NE
Direction Counted: Westbound Right

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 SB Ramp & Brooklake Rd NE
Direction Counted: Westbound U-Turn

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 SB Ramp & Brooklake Rd NE
Direction Counted: Northbound Thru

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 SB Ramp & Brooklake Rd NE
Direction Counted: Northbound Left

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 SB Ramp & Brooklake Rd NE
Direction Counted: Northbound Right

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 SB Ramp & Brooklake Rd NE
Direction Counted: Northbound U-Turn

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 SB Ramp & Brooklake Rd NE
Direction Counted: Eastbound Thru

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
6:00 AM	0	12	26	0	2	0	0	0	6	1	0	0	1	48
6:15 AM	0	15	36	0	3	2	1	0	5	0	0	0	1	63
6:30 AM	0	14	34	0	3	3	0	0	3	2	0	0	0	59
6:45 AM	0	16	37	0	4	1	0	1	8	1	0	0	0	68
7:00 AM	0	15	35	0	0	1	2	0	3	2	0	0	0	58
7:15 AM	0	17	39	0	1	1	0	0	4	4	0	0	0	66
7:30 AM	0	22	51	0	2	0	1	0	10	6	0	0	1	93
7:45 AM	0	17	40	0	1	0	2	0	8	1	0	0	0	69
8:00 AM	0	12	31	0	3	0	1	0	2	5	0	0	0	54
8:15 AM	0	16	40	0	2	1	1	0	5	3	0	0	1	69
8:30 AM	0	13	30	0	2	0	1	1	3	2	0	0	1	53
8:45 AM	0	10	26	0	2	0	3	0	6	3	0	0	0	50
9:00 AM	0	12	30	0	3	2	1	0	4	3	0	0	0	55
9:15 AM	0	10	25	0	2	3	1	2	4	4	0	0	0	51
9:30 AM	0	13	30	0	1	2	2	1	6	4	0	0	1	60
9:45 AM	0	8	19	0	6	2	0	0	1	4	0	0	0	40
10:00 AM	0	12	28	0	2	2	0	1	6	2	0	0	0	53
10:15 AM	0	9	22	1	3	0	0	0	8	3	0	0	0	46
10:30 AM	0	16	38	0	2	2	0	0	4	3	0	0	0	65
10:45 AM	1	7	18	0	1	1	4	0	8	2	0	0	0	42
11:00 AM	0	13	31	0	0	2	1	0	2	3	0	0	2	54
11:15 AM	0	9	24	0	0	1	0	1	3	7	0	0	0	45
11:30 AM	0	15	34	0	1	3	1	0	8	2	0	0	0	64
11:45 AM	0	13	29	0	4	1	0	2	5	3	0	0	1	58
12:00 PM	0	14	35	0	2	4	0	1	2	1	0	0	0	59
12:15 PM	0	14	32	0	1	2	2	1	4	4	0	0	1	61
12:30 PM	0	13	27	0	3	1	1	0	7	4	0	0	0	56
12:45 PM	0	10	21	1	0	2	0	1	7	1	0	0	0	43
1:00 PM	0	15	34	0	3	4	0	0	5	4	0	0	1	66
1:15 PM	0	17	40	0	1	2	3	1	5	3	0	0	1	73
1:30 PM	0	14	33	0	5	1	1	1	4	4	0	0	0	63
1:45 PM	1	14	32	0	1	2	1	1	7	4	0	0	0	63
2:00 PM	0	12	25	1	3	2	0	0	6	2	0	0	0	51
2:15 PM	0	12	27	0	3	4	2	0	6	3	0	0	0	57
2:30 PM	2	14	34	0	4	0	1	0	6	1	0	0	0	62
2:45 PM	0	17	40	0	1	1	0	0	4	1	0	0	1	65
3:00 PM	0	15	37	0	3	0	0	0	1	4	0	0	0	60
3:15 PM	0	17	40	0	5	5	0	1	10	2	0	0	0	80
3:30 PM	0	13	34	0	2	1	1	0	5	0	0	0	0	56
3:45 PM	0	12	29	0	5	1	1	1	9	0	0	0	0	58
4:00 PM	0	15	36	0	2	0	0	0	6	1	0	0	0	60
4:15 PM	1	14	35	0	2	2	0	0	8	0	0	0	0	62
4:30 PM	0	18	43	0	1	1	1	0	5	0	0	0	0	69
4:45 PM	0	15	34	0	1	0	0	0	5	0	0	1	0	56
5:00 PM	0	20	49	0	3	0	0	1	4	1	0	1	0	79
5:15 PM	0	12	29	0	3	0	0	1	5	0	0	0	0	50
5:30 PM	0	14	32	0	2	0	0	0	1	1	0	0	0	50
5:45 PM	0	13	33	0	1	1	0	1	5	0	0	0	0	54
6:00 PM	0	15	37	0	0	0	0	0	2	1	0	0	0	55
6:15 PM	0	9	24	0	1	0	0	0	6	1	0	0	0	41
6:30 PM	0	11	29	0	1	0	0	0	5	0	0	0	0	46
6:45 PM	0	8	21	0	1	0	0	0	0	0	0	0	0	30
7:00 PM	0	9	20	0	1	0	0	0	1	0	0	0	0	31
7:15 PM	0	5	14	0	1	0	0	0	7	0	0	0	0	27
7:30 PM	0	7	17	0	0	0	0	0	3	0	0	0	0	27
7:45 PM	0	5	12	0	0	0	0	0	3	0	0	0	0	20
8:00 PM	0	7	18	0	0	0	0	0	6	0	0	0	0	31
8:15 PM	0	7	17	1	0	1	0	0	3	0	0	0	0	29
8:30 PM	0	6	14	0	0	1	0	0	3	0	0	0	0	24
8:45 PM	0	7	16	0	0	0	0	0	1	0	0	0	0	24
9:00 PM	0	4	11	0	0	0	0	0	1	0	0	0	0	16
9:15 PM	0	2	7	0	1	0	0	0	2	2	0	0	0	14
9:30 PM	0	2	6	0	0	0	0	0	3	0	0	0	0	11
9:45 PM	0	3	7	0	0	0	0	0	1	0	0	0	1	12
Total	5	767	1834	4	113	68	36	20	296	115	0	2	14	3274
%	0.15%	23.43%	56.02%	0.12%	3.45%	2.08%	1.10%	0.61%	9.04%	3.51%	0.00%	0.06%	0.43%	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 SB Ramp & Brooklake Rd NE
Direction Counted: Eastbound Left

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 SB Ramp & Brooklake Rd NE
Direction Counted: Eastbound Right

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
6:00 AM	0	12	25	0	0	0	0	1	1	2	0	0	0	41
6:15 AM	0	11	20	0	4	0	0	0	6	3	0	0	1	45
6:30 AM	0	11	24	0	1	2	2	0	6	7	0	0	0	53
6:45 AM	0	17	34	0	4	1	3	1	6	5	0	0	0	71
7:00 AM	0	14	28	0	4	2	2	0	8	2	0	0	0	60
7:15 AM	0	14	30	0	4	4	2	2	9	4	0	0	1	70
7:30 AM	0	15	34	0	3	2	2	0	8	1	0	0	1	66
7:45 AM	0	18	39	0	6	1	4	0	9	0	0	0	2	79
8:00 AM	0	13	29	1	1	4	2	0	6	0	0	0	1	57
8:15 AM	0	16	36	0	3	3	1	0	7	1	0	0	0	67
8:30 AM	0	10	19	1	0	1	3	3	5	4	0	0	1	47
8:45 AM	0	8	17	0	3	0	1	0	7	1	0	0	0	37
9:00 AM	0	12	27	0	3	4	2	0	3	3	0	0	0	54
9:15 AM	0	9	17	0	2	2	2	1	7	1	0	0	1	42
9:30 AM	0	10	19	0	3	2	1	0	9	3	0	0	2	49
9:45 AM	0	9	18	0	4	1	1	1	12	2	0	0	1	49
10:00 AM	0	7	16	0	4	5	1	1	4	0	0	0	0	38
10:15 AM	0	9	16	0	2	2	0	0	7	2	0	0	0	38
10:30 AM	0	12	26	1	3	3	1	0	10	0	0	0	1	57
10:45 AM	0	10	20	0	4	3	0	2	4	0	0	0	1	44
11:00 AM	0	14	27	0	6	3	1	0	7	2	0	0	0	60
11:15 AM	0	8	18	0	1	4	2	0	9	4	0	0	0	46
11:30 AM	0	11	21	0	4	4	1	1	8	4	0	0	2	56
11:45 AM	0	12	26	0	2	1	3	1	6	0	0	0	1	52
12:00 PM	0	14	28	0	5	1	1	0	4	2	0	0	1	56
12:15 PM	0	15	28	0	0	5	1	0	5	0	0	0	0	54
12:30 PM	0	18	36	0	4	2	1	0	6	1	0	0	1	69
12:45 PM	0	12	24	0	7	2	0	0	10	2	0	0	1	58
1:00 PM	0	16	33	0	1	1	1	1	14	0	0	0	0	67
1:15 PM	0	14	29	0	4	2	0	0	7	2	0	0	1	59
1:30 PM	0	15	30	0	1	4	1	0	6	2	0	0	1	60
1:45 PM	0	18	40	1	8	3	2	0	9	0	0	0	1	82
2:00 PM	0	19	40	0	6	3	3	1	6	2	0	1	0	81
2:15 PM	1	18	40	0	3	3	2	0	6	0	0	0	0	73
2:30 PM	1	16	33	0	4	3	0	0	8	2	0	0	2	69
2:45 PM	0	17	37	0	5	1	1	0	2	1	0	0	0	64
3:00 PM	0	17	37	0	4	4	1	0	11	0	0	0	0	74
3:15 PM	0	14	31	0	9	3	1	0	8	0	0	0	0	66
3:30 PM	0	23	48	0	4	3	0	0	10	0	0	0	0	88
3:45 PM	0	24	51	0	4	1	0	1	2	1	0	0	0	84
4:00 PM	1	25	53	0	3	2	0	1	3	1	0	0	0	89
4:15 PM	0	27	56	0	6	0	0	1	2	0	0	0	0	92
4:30 PM	0	32	66	0	2	2	0	0	6	2	0	0	0	110
4:45 PM	0	27	57	0	2	3	0	0	9	1	0	1	0	100
5:00 PM	1	35	73	0	5	4	0	0	8	1	0	0	0	127
5:15 PM	1	34	72	0	2	0	0	0	4	0	0	0	0	113
5:30 PM	0	30	63	0	1	0	0	0	5	0	0	0	0	99
5:45 PM	0	23	46	0	4	1	0	1	3	2	0	0	0	80
6:00 PM	1	24	49	0	3	0	0	0	4	1	0	0	0	82
6:15 PM	0	26	55	0	2	0	0	0	4	2	0	0	0	89
6:30 PM	0	21	45	0	4	0	0	0	3	0	0	0	0	73
6:45 PM	0	15	31	0	1	0	0	0	4	1	0	0	1	53
7:00 PM	0	11	22	0	1	0	0	0	2	0	0	0	0	36
7:15 PM	0	13	26	0	3	0	0	0	3	1	0	0	0	46
7:30 PM	0	10	23	0	1	3	0	0	4	0	0	0	0	41
7:45 PM	0	9	18	0	1	0	0	0	1	0	0	0	0	29
8:00 PM	0	8	16	0	0	0	0	0	0	0	0	0	0	24
8:15 PM	0	5	10	0	0	0	0	0	1	0	0	0	0	16
8:30 PM	0	8	17	0	0	0	0	0	4	0	0	0	0	29
8:45 PM	0	6	12	0	0	0	0	0	2	0	0	0	0	20
9:00 PM	0	7	15	0	1	0	0	0	0	0	0	0	1	24
9:15 PM	0	7	14	0	0	0	0	0	4	0	0	0	0	25
9:30 PM	0	4	7	0	0	0	0	0	3	0	0	0	0	14
9:45 PM	0	6	10	0	0	0	0	0	2	0	0	0	1	19
Total	6	965	2007	4	182	110	52	20	359	78	0	2	27	3812
%	0.16%	25.31%	52.65%	0.10%	4.77%	2.89%	1.36%	0.52%	9.42%	2.05%	0.00%	0.05%	0.71%	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 SB Ramp & Brooklake Rd NE
Direction Counted: Eastbound U-Turn

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 SB Ramp & Brooklake Rd NE
Direction Counted: Bicycles

	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR	EBT	EBL	EBR	Interval Total
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	1
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	1
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	1	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	1
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	2	0	0	0	0	0	2	0	0	4
	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR	EBT	EBL	EBR	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I- 5 SB Ramp & Brooklake Rd NE
Direction Counted: Pedestrians

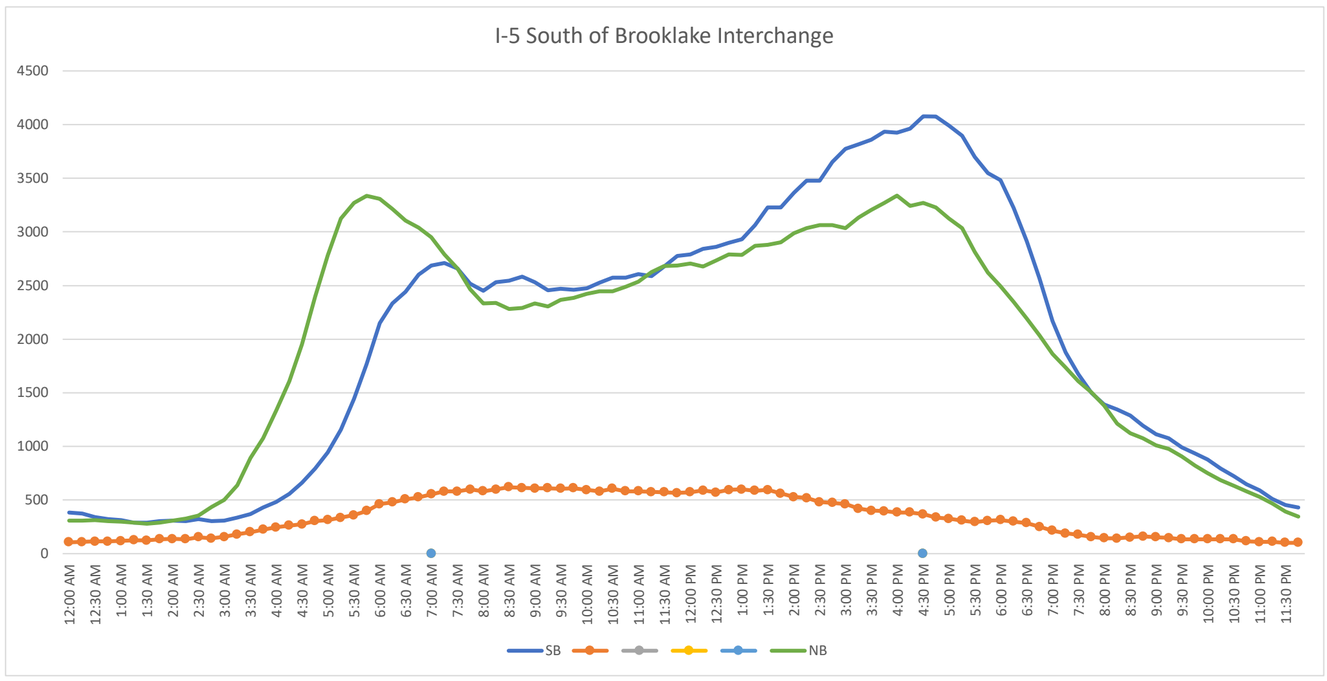
	North Leg	East Leg	South Leg	West Leg	Interval Total
6:00 AM	0	0	0	0	0
6:15 AM	0	0	0	0	0
6:30 AM	0	0	0	0	0
6:45 AM	0	0	0	0	0
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	1	0	1
8:45 AM	0	0	0	0	0
9:00 AM	0	0	0	0	0
9:15 AM	0	0	0	0	0
9:30 AM	0	0	0	0	0
9:45 AM	0	0	0	0	0
10:00 AM	0	0	0	0	0
10:15 AM	0	0	0	0	0
10:30 AM	0	0	0	0	0
10:45 AM	0	0	0	0	0
11:00 AM	0	0	0	0	0
11:15 AM	0	0	0	0	0
11:30 AM	0	0	0	0	0
11:45 AM	0	0	0	0	0
12:00 PM	0	0	0	0	0
12:15 PM	0	0	0	0	0
12:30 PM	0	0	1	0	1
12:45 PM	0	0	1	0	1
1:00 PM	0	0	0	0	0
1:15 PM	0	0	0	0	0
1:30 PM	0	0	1	0	1
1:45 PM	0	0	1	0	1
2:00 PM	0	0	0	0	0
2:15 PM	0	0	0	0	0
2:30 PM	0	0	0	0	0
2:45 PM	0	0	1	0	1
3:00 PM	0	0	0	0	0
3:15 PM	0	0	0	0	0
3:30 PM	0	0	0	0	0
3:45 PM	0	0	0	0	0
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
6:00 PM	0	0	0	0	0
6:15 PM	0	0	0	0	0
6:30 PM	0	0	1	0	1
6:45 PM	0	0	2	0	2
7:00 PM	0	0	1	0	1
7:15 PM	0	0	0	0	0
7:30 PM	0	0	2	0	2
7:45 PM	0	0	0	0	0
8:00 PM	0	0	0	0	0
8:15 PM	0	1	1	0	2
8:30 PM	0	0	0	0	0
8:45 PM	0	0	1	0	1
9:00 PM	0	0	1	0	1
9:15 PM	0	0	0	0	0
9:30 PM	0	0	0	0	0
9:45 PM	0	0	0	0	0
Total	0	1	15	0	16
	North Leg	East Leg	South Leg	West Leg	

Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I-5 south of Brooklake Interchange
Direction Counted: Southbound Thru

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
12:00 AM	0	30	46	0	3	0	0	0	16	4	1	0	2	102
12:15 AM	0	30	49	0	3	0	0	0	14	1	1	3	2	103
12:30 AM	0	27	41	0	2	1	0	1	11	2	2	1	7	95
12:45 AM	0	21	34	0	2	1	0	0	17	1	1	2	5	84
1:00 AM	0	25	37	0	2	0	0	0	19	0	0	5	2	90
1:15 AM	0	18	27	0	3	0	0	2	15	1	1	4	3	74
1:30 AM	0	18	29	0	5	0	0	2	12	3	0	3	3	75
1:45 AM	0	16	25	0	3	0	0	0	20	5	0	0	5	74
2:00 AM	0	12	19	0	5	2	0	1	18	2	2	0	6	67
2:15 AM	0	18	29	0	0	0	0	6	16	2	0	1	1	73
2:30 AM	0	19	30	0	9	0	0	4	12	6	1	1	6	88
2:45 AM	0	16	27	0	7	1	0	4	18	3	0	1	2	79
3:00 AM	0	13	18	0	5	0	0	1	16	1	2	3	6	65
3:15 AM	0	19	28	0	7	1	0	2	16	9	0	2	7	91
3:30 AM	0	15	22	0	4	1	0	2	11	6	0	1	4	66
3:45 AM	0	15	25	0	5	2	0	5	17	9	2	0	8	88
4:00 AM	0	13	20	0	16	1	0	0	33	0	0	0	9	92
4:15 AM	0	23	36	0	6	0	0	3	38	8	0	0	10	124
4:30 AM	0	29	44	0	7	0	0	2	31	10	0	0	2	125
4:45 AM	0	27	43	0	14	3	0	0	35	13	0	0	5	140
5:00 AM	0	37	57	0	12	1	0	1	39	9	0	5	7	168
5:15 AM	0	58	91	1	11	2	0	1	47	4	0	6	5	226
5:30 AM	0	68	107	0	10	5	0	2	54	8	0	2	3	259
5:45 AM	0	82	129	0	12	4	0	6	44	7	0	1	4	289
6:00 AM	0	111	173	0	15	3	0	8	46	17	0	1	7	381
6:15 AM	0	162	253	1	17	4	1	3	53	12	0	0	9	515
6:30 AM	0	179	280	0	24	8	1	2	57	26	0	0	6	583
6:45 AM	0	205	321	3	35	12	2	0	65	21	0	0	4	668
7:00 AM	1	177	276	0	26	6	2	3	51	16	0	0	9	567
7:15 AM	0	194	301	1	21	9	4	6	49	28	0	0	11	624
7:30 AM	0	235	367	2	33	10	3	4	59	15	0	1	14	743
7:45 AM	1	225	353	4	45	12	5	4	68	24	0	0	10	751
8:00 AM	0	177	277	1	21	17	4	3	62	16	0	1	12	591
8:15 AM	1	172	268	4	26	12	1	5	63	14	0	0	5	571
8:30 AM	0	173	272	2	32	12	5	3	76	22	0	0	7	604
8:45 AM	1	206	323	0	42	13	2	4	57	29	1	0	7	685
9:00 AM	1	201	315	2	36	10	6	3	66	19	2	2	9	672
9:15 AM	0	170	266	1	38	10	3	3	77	15	0	0	3	586
9:30 AM	0	190	297	1	29	8	2	3	77	23	1	2	6	639
9:45 AM	1	187	293	0	36	6	1	5	74	21	0	1	8	633
10:00 AM	0	172	268	0	35	9	2	4	76	24	1	1	5	597
10:15 AM	0	179	279	1	26	6	2	1	83	23	0	0	2	602
10:30 AM	0	184	289	0	40	7	2	3	69	24	1	1	10	630
10:45 AM	0	199	312	0	25	17	0	5	67	11	1	0	10	647
11:00 AM	0	196	308	0	29	10	1	6	65	26	1	1	4	647
11:15 AM	0	187	293	2	30	12	4	3	82	27	0	5	4	649
11:30 AM	0	193	302	2	30	8	3	7	65	18	0	0	2	630
11:45 AM	0	214	334	0	30	4	3	5	71	17	0	1	3	682
12:00 PM	1	190	297	0	32	8	3	1	73	14	0	2	4	625
12:15 PM	2	224	347	1	25	11	1	3	105	16	0	0	5	740
12:30 PM	1	235	366	2	23	10	1	3	70	15	0	2	2	730
12:45 PM	0	216	336	0	27	7	1	8	74	23	0	0	2	694
1:00 PM	0	206	320	0	23	7	1	6	92	21	0	0	2	678
1:15 PM	1	238	372	2	30	9	0	5	78	22	0	1	2	760
1:30 PM	1	239	374	0	25	7	1	6	85	21	0	0	5	764
1:45 PM	2	225	354	3	28	11	3	7	63	20	0	1	11	728
2:00 PM	2	260	406	1	34	15	1	3	66	13	0	2	6	809
2:15 PM	0	301	471	1	37	11	0	1	67	30	0	2	6	927
2:30 PM	1	252	393	0	33	9	0	2	55	11	0	0	7	763
2:45 PM	0	293	458	2	26	4	2	3	55	16	0	2	4	865
3:00 PM	3	306	478	0	30	7	0	2	72	19	0	0	3	920
3:15 PM	0	316	497	0	35	12	2	1	52	12	0	1	1	929
3:30 PM	1	323	505	0	30	8	0	1	52	17	0	0	2	939
3:45 PM	0	344	540	2	23	5	0	2	53	14	0	1	3	987
4:00 PM	1	339	529	1	25	4	1	0	38	15	0	1	6	960
4:15 PM	0	342	536	1	23	6	0	3	46	8	0	1	8	974
4:30 PM	3	352	551	1	26	9	0	1	50	14	0	1	4	1012
4:45 PM	1	345	540	0	20	6	0	1	48	12	0	1	4	978
5:00 PM	2	354	554	1	28	5	0	3	39	9	1	1	3	1000
5:15 PM	1	393	614	0	25	2	0	2	39	7	1	0	3	1087
5:30 PM	1	364	568	1	22	2	0	4	34	8	1	2	3	1010
5:45 PM	1	317	495	0	20	6	0	1	39	8	0	0	5	892
6:00 PM	3	323	506	1	18	1	0	0	40	11	0	1	2	906
6:15 PM	0	321	505	0	16	2	0	1	36	5	0	1	3	890
6:30 PM	0	300	472	2	21	0	0	0	57	7	0	0	3	862
6:45 PM	0	288	451	2	18	3	0	0	55	8	0	0	1	826
7:00 PM	0	230	359	1	12	3	0	0	34	3	1	0	4	647
7:15 PM	0	204	321	0	9	2	0	0	30	8	0	0	1	575
7:30 PM	0	181	283	1	12	4	0	0	33	4	1	1	0	520
7:45 PM	0	146	229	0	10	3	0	0	31	6	1	0	0	426
8:00 PM	0	126	195	0	4	0	0	1	14	7	0	3	4	354
8:15 PM	0	131	205	0	2	2	0	4	20	8	0	0	1	373
8:30 PM	0	121	190	0	6	0	0	3	19	5	0	1	1	346
8:45 PM	0	108	169	1	7	2	0	2	19	8	0	0	0	316
9:00 PM	0	109	169	0	3	0	0	1	18	3	1	2	4	310
9:15 PM	0	105	163	1	6	1	0	4	23	6	0	1	4	314
9:30 PM	0	82	128	0	8	1	0	2	25	6	0	1	1	254
9:45 PM	0	80	125	0	1	1	0	4	23	2	0	0	1	237
10:00 PM	0	96	148	1	0	1	0	0	17	2	1	2	1	269
10:15 PM	0	76	119	0	3	1	0	1	24	3	0	1	2	230
10:30 PM	0	60	94	2	4	0	0	0	23	1	0	2	11	197
10:45 PM	0	59	92	0	2	0	0	1	12	4	0	2	12	184
11:00 PM	0	62	95	0	0	0	0	0	16	3	0	0	5	181
11:15 PM	0	49	79	0	3	2	0	1	18	5	0	0	5	162
11:30 PM	0	37	56	0	6	0	0	1	11	4	0	0	3	118
11:45 PM	0	40	63	0	3	0	0	0	13	4	0	1	5	129
Total	34	15445	24150	59	1698	460	76	233	4203	1090	29	98	456	48031
%	0.07%	32.16%	50.28%	0.12%	3.54%	0.96%	0.16%	0.49%	8.75%	2.27%	0.06%	0.20%	0.95%	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

SB				NB	
384	106			310	122
372	108			309	129
343	113			312	135
323	114			301	141
313	118			299	149
290	126			287	141
289	123			279	141
302	134			290	146
307	137			307	142
305	135			327	147
323	153			353	147
301	143			434	165
310	155			503	185
337	180			639	204
370	201			894	233
429	224			1077	233
481	246			1336	248
557	261			1610	264
659	273			1953	278
793	305			2392	315
942	313			2779	342
1155	336			3125	371
1444	359			3269	407
1768	399			3336	415
2147	463			3310	416
2333	479			3212	421
2442	508			3107	386
2602	525			3041	399
2685	555	0.98 PHF	20.67%	2952	395
2709	579			2791	416
2656	580			2658	449
2517	598			2464	460
2451	581			2335	503
2532	599			2338	512
2547	619			2281	520
2582	612			2292	549
2530	609			2331	563
2455	611			2303	574
2471	605			2366	580
2462	610			2387	564
2476	594			2424	563
2526	580			2444	568
2573	605			2446	583
2573	583			2487	609
2608	581			2536	600
2586	575			2623	595
2677	573			2682	602
2777	566			2684	596
2789	574			2703	600
2842	589			2677	589
2862	571			2735	591
2896	593			2790	585
2930	598			2787	572
3061	587			2872	577
3228	593			2879	549
3227	560			2902	542
3364	527			2987	550
3475	519			3035	546
3477	480			3065	535
3653	473			3065	509
3775	462			3035	496
3815	420			3132	483
3860	400			3203	472
3933	396			3268	462
3924	385			3338	445
3964	384			3244	430
4077	367	0.98 PHF	9.00%	3270	430
4075	338			3230	427
3989	325			3123	411
3895	309			3034	392
3698	294			2812	391
3550	307			2619	385
3484	315			2493	392
3225	299			2346	388
2910	285			2193	374
2568	251			2036	349
2168	215			1862	331
1875	190			1734	330
1673	177			1606	293
1499	156			1503	284
1389	144			1384	272
1345	143			1214	235
1286	152			1124	236
1194	161			1075	233
1115	154			1009	208
1074	147			976	209
990	136			907	210
933	135			822	212
880	136			750	212
792	135			684	211
724	134			635	207
645	116			580	191
590	109			530	186
511	111			467	171
452	101			394	154
429	103			348	132



Quality Counts

Date Counted: 10/22/2020
Location/Intersection: I-5 south of Brooklake Interchange
Direction Counted: Northbound Thru

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	
	Motorcycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	> 6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Interval Total
12:00 AM	0	18	29	0	0	2	0	0	2	26	0	0	4	81
12:15 AM	0	20	30	0	1	1	0	0	2	25	0	0	5	84
12:30 AM	0	21	34	0	0	1	0	0	0	21	0	1	0	78
12:45 AM	0	14	22	1	3	0	0	1	10	13	0	1	2	67
1:00 AM	0	15	24	0	0	0	0	2	14	19	0	0	6	80
1:15 AM	0	18	29	0	2	0	0	1	13	19	0	0	5	87
1:30 AM	0	15	23	0	2	0	0	1	9	11	0	1	5	67
1:45 AM	0	10	16	0	1	0	0	4	9	17	0	0	8	65
2:00 AM	0	14	21	0	3	0	0	3	7	16	0	0	4	68
2:15 AM	0	15	24	0	5	2	0	1	12	18	0	0	2	79
2:30 AM	0	16	28	0	1	1	0	1	16	15	0	0	0	78
2:45 AM	0	18	29	0	2	2	0	0	14	17	0	0	0	82
3:00 AM	1	18	31	0	5	1	0	3	14	13	0	0	2	88
3:15 AM	0	26	39	0	5	1	0	1	13	15	0	0	5	105
3:30 AM	1	41	65	0	11	0	0	0	16	21	0	0	4	159
3:45 AM	0	37	59	0	9	5	0	0	22	14	0	0	5	151
4:00 AM	0	65	102	0	4	0	0	1	23	25	0	0	4	224
4:15 AM	0	113	178	0	10	1	0	2	23	28	0	0	5	360
4:30 AM	1	112	177	0	8	1	0	1	17	20	0	1	4	342
4:45 AM	0	132	208	0	11	5	0	1	20	27	0	0	6	410
5:00 AM	0	166	259	0	10	3	0	0	14	41	0	1	4	498
5:15 AM	0	242	378	1	9	3	0	0	19	42	1	2	6	703
5:30 AM	0	269	423	0	27	1	1	0	0	57	3	0	0	781
5:45 AM	0	273	427	2	27	2	0	0	0	63	3	0	0	797
6:00 AM	2	288	452	1	15	5	0	1	35	37	0	0	8	844
6:15 AM	0	283	445	0	28	2	0	7	55	22	0	1	4	847
6:30 AM	0	293	458	1	28	6	1	4	43	12	0	0	2	848
6:45 AM	0	262	411	2	26	3	1	1	48	11	0	2	4	771
7:00 AM	0	250	389	0	24	5	0	1	53	20	0	2	2	746
7:15 AM	2	256	400	3	19	3	7	0	35	15	0	0	2	742
7:30 AM	1	261	410	1	22	2	4	3	47	23	1	0	7	782
7:45 AM	1	228	359	1	23	6	9	2	35	14	0	0	4	682
8:00 AM	1	178	278	2	19	6	7	1	62	20	3	0	8	585
8:15 AM	1	191	300	0	28	4	7	2	53	20	0	0	3	609
8:30 AM	0	183	284	3	24	4	6	2	56	17	2	2	5	588
8:45 AM	0	162	254	2	37	18	0	1	63	12	1	0	3	553
9:00 AM	0	176	275	0	26	10	0	4	63	23	0	1	10	588
9:15 AM	0	166	261	3	30	13	0	0	56	17	2	1	3	552
9:30 AM	0	175	274	0	30	9	2	2	75	27	0	1	4	599
9:45 AM	1	172	268	0	35	8	1	3	79	22	0	0	3	592
10:00 AM	1	160	251	0	26	15	2	4	65	26	0	0	10	560
10:15 AM	0	189	295	2	33	4	2	3	52	28	1	0	6	615
10:30 AM	0	189	297	0	36	3	1	2	56	30	1	0	5	620
10:45 AM	0	188	291	0	21	12	0	5	89	19	0	0	4	629
11:00 AM	0	166	261	0	34	13	1	4	82	14	0	0	5	580
11:15 AM	1	183	287	0	30	8	0	4	74	23	0	0	7	617
11:30 AM	0	196	305	2	34	5	0	7	85	22	0	1	4	661
11:45 AM	1	209	327	0	22	8	0	3	82	17	0	1	8	678
12:00 PM	2	201	316	0	33	6	0	6	71	22	3	2	5	667
12:15 PM	1	204	318	1	35	11	0	5	78	15	1	0	7	676
12:30 PM	0	199	310	0	40	9	0	4	78	18	2	1	2	663
12:45 PM	1	215	336	0	30	9	0	8	68	17	1	1	11	697
1:00 PM	0	196	308	2	32	6	1	4	65	18	1	2	6	641
1:15 PM	1	226	352	1	42	10	0	3	83	13	0	0	3	734
1:30 PM	1	222	347	2	36	12	3	5	73	9	0	2	6	718
1:45 PM	0	219	343	3	25	5	3	2	68	18	1	0	7	694
2:00 PM	4	226	354	0	37	10	1	3	83	7	0	0	1	726
2:15 PM	0	240	374	0	29	3	1	4	73	10	0	2	5	741
2:30 PM	2	233	365	0	38	4	1	4	73	16	1	2	2	741
2:45 PM	2	249	388	1	33	8	0	3	72	18	1	1	3	779
3:00 PM	0	248	388	1	24	14	0	3	82	11	1	0	2	774
3:15 PM	0	255	400	0	30	5	1	3	56	19	0	0	2	771
3:30 PM	0	244	382	0	35	8	1	0	56	11	0	0	4	741
3:45 PM	0	242	380	2	47	6	0	5	57	5	1	0	4	749
4:00 PM	2	290	454	1	30	6	0	3	60	19	1	1	4	871
4:15 PM	1	286	450	2	19	7	0	5	58	9	1	2	2	842
4:30 PM	0	273	428	2	23	1	0	3	57	14	0	2	3	806
4:45 PM	0	276	433	1	24	5	0	4	62	11	0	1	2	819
5:00 PM	0	261	406	0	22	5	0	6	67	5	0	1	4	777
5:15 PM	2	296	465	1	19	0	0	7	67	6	0	0	5	868
5:30 PM	0	258	406	0	13	7	0	6	67	6	1	1	1	766
5:45 PM	0	241	377	1	11	2	0	4	62	9	2	1	2	712
6:00 PM	1	232	364	0	14	0	1	5	55	11	1	1	3	688
6:15 PM	0	212	330	0	23	0	2	4	63	7	1	1	3	646
6:30 PM	0	185	292	0	5	3	0	0	58	21	0	0	9	573
6:45 PM	1	189	295	1	19	2	0	3	60	6	0	0	10	586
7:00 PM	0	177	277	0	10	2	1	0	71	0	0	0	3	541
7:15 PM	0	157	246	1	8	3	1	0	75	0	0	0	2	493
7:30 PM	0	134	211	0	6	1	0	0	59	1	0	0	4	416
7:45 PM	1	129	199	0	12	1	0	0	63	2	0	0	5	412
8:00 PM	0	127	200	0	20	1	0	1	44	11	0	1	8	413
8:15 PM	0	122	190	1	7	2	0	0	32	6	0	0	5	365
8:30 PM	0	98	153	1	7	2	0	0	43	1	0	3	5	313
8:45 PM	0	86	136	0	7	0	0	4	46	2	1	2	9	293
9:00 PM	0	76	118	0	8	0	0	1	33	4	0	0	3	243
9:15 PM	1	86	134	0	4	0	0	1	33	6	0	1	9	275
9:30 PM	0	80	125	0	5	2	0	1	35	3	1	1	11	264
9:45 PM	2	70	109	0	8	0	0	0	29	2	0	1	6	227
10:00 PM	0	63	97	0	3	2	0	1	34	6	0	0	4	210
10:15 PM	0	59	92	0	3	0	0	1	38	5	0	0	8	206
10:30 PM	0	46	72	0	3	0	0	0	31	11	0	4	12	179
10:45 PM	0	42	67	0	4	2	0	0	29	5	0	5	1	155
11:00 PM	0	37	58	0	5	0	0	0	31	7	0	2	4	144
11:15 PM	0	42	64	0	6	0	0	0	33	5	0	5	2	157
11:30 PM	0	30	49	0	2	0	0	0	31	2	0	4	6	124
11:45 PM	0	25	39	0	2	1	0	0	26	4	1	2	5	105
Total	40	14996	23484	52	1704	387	69	211	4420	1508	41	74	437	47423
%	0.08%	31.62%	49.52%	0.11%	3.59%	0.82%	0.15%	0.44%	9.32%	3.18%	0.09%	0.16%	0.92%	
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	

Attachment C: *Analysis Methodology and Assumptions Memorandum* and Volume Development

METHODOLOGY MEMORANDUM

Traffic Methodology and Assumptions Memorandum (Task 4.1)

Date: October 15, 2020 (revised 2/2/2021)

To: Oregon Department of Transportation, Region 2

From: Angela Rogge, PE, David Evans and Associates, Inc.
Dian Mao, EIT, David Evans and Associates, Inc.

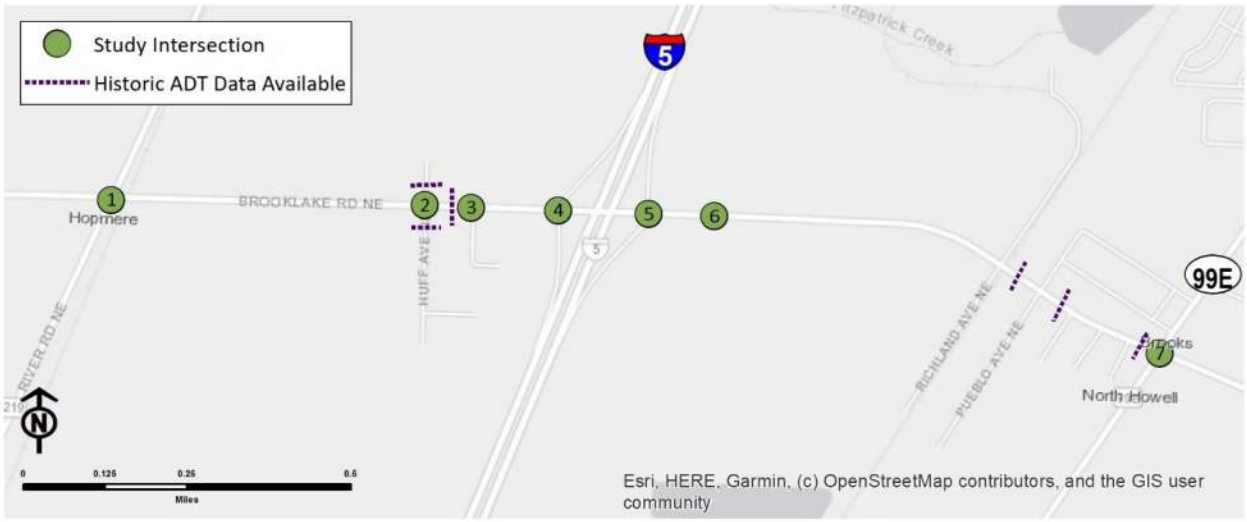
Subject: I-5: Brooks Interchange (Exit 263) – Traffic Analysis Methodology

This memorandum documents the methodology and key assumptions to be used in generating the existing and future conditions analyses for the I-5 Brooklake Road Interchange Area Management Plan (IAMP). The methodologies included in this memorandum will be used to analyze the transportation networks associated with this project. The Oregon Department of Transportation (ODOT) *Analysis Procedures Manual* (APM) will guide the methodologies and assumptions for this analysis.

Study Area

The project study area includes Brooklake Road and the intersections between River Road and OR 99E, as shown in Figure 1. This corridor primarily serves the communities of Brooks, Hopmere, Keizer and Salem.

Figure 1. Study Intersections



Study Intersections/Traffic Data Collection

The transportation and traffic analysis will be based on existing year 2020 conditions for the design hour (30th highest) volumes. Due to COVID-19 impacts on traffic patterns, the original plan for data collection will need to be modified.

The scope identified seven study intersections, as shown in Figure 1:

1. River Road at Brooklake Road
2. Huff Avenue at Brooklake Road
3. Truckman Way (Pilot Travel Center access) at Brooklake Road
4. I-5 Southbound Ramp Terminal at Brooklake Road
5. I-5 Northbound Ramp Terminal at Brooklake Road
6. 50th Avenue (NORPAC Access) at Brooklake Road
7. Portland Road (OR 99E) at Brooklake Road

Where available, historic traffic counts will serve as the basis for volume development. Where historical data is unavailable, new traffic counts will be collected. In order to understand how traffic compares to pre-pandemic conditions, new traffic counts will also be collected at a few locations where historic data is available. Table 1 summarizes the proposed source for traffic data at the study area intersections.

Table 1. Historical Data at Study Intersections

Location	Count Type Scoped	Historic Count - Source	New Traffic Count
River Rd at Brooklake Rd	16-hr turning movement	2-hr AM/PM turning movement (May 2018) - DEA	16-hour turning movement
Huff Ave at Brooklake Rd	3-hour AM/PM turning movement	2-hr PM turning movement (March 2018) – *May Trucking Study,* ODOT/Marion County	16-hour turning movement
Truckman Way (Pilot Travel Center access) at Brooklake Rd	3-hour AM/PM turning movement	2-hr PM turning movement (March 2018) – *May Trucking Study,* ODOT/Marion County	3-hour AM/PM turning movement
I-5 Southbound Ramp Terminal at Brooklake Rd	16-hr turning movement	2-hr AM/PM turning movement (May 2018) - DEA	16-hour turning movement
I-5 Northbound Ramp Terminal at Brooklake Rd	16-hr turning movement	2-hr AM/PM turning movement (May 2018) - DEA	16-hour turning movement
50th Ave (NORPAC Access) at Brooklake Rd	3-hour AM/PM turning movement	2-hr PM turning movement (March 2018) – *May Trucking Study,* ODOT/Marion County	N/A
Portland Rd (OR 99E) at Brooklake Rd	16-hr turning movement	2-hr PM turning movement (March 2018) – *May Trucking Study,* ODOT/Marion County	3-hour AM/PM turning movement
I-5 Mainline 0.5 mi north of interchange	24-hour volume, class, speed	Historic count not available	24-hour volume, class, speed
I-5 Mainline 0.5 mi south of interchange	24-hour volume, class, speed	Historic count not available	24-hour volume, class, speed

In addition to the data collection/source plan mentioned in the table above, traffic counts available from Marion County (Table 2) will be referenced to understand historic traffic conditions in the study corridor. They will not be used for intersection analysis. Their approximate locations are indicated by dashed lines in Figure 1.

Table 2. Historical Data in Study Area

Location	Historical Availability
Brooklake Rd east of Huff Ave	24-hr volume tube count, classification, speed (May 2018) – DEA
Brooklake Rd west of Pueblo Ave	Estimated ADT (September 2015) – Marion County
Brooklake Rd east of Pueblo Ave	Estimated ADT (September 2015) – Marion County
Brooklake Rd west of OR 99E	Classifier (August 2015) – Marion County
Huff Ave north of Brooklake Rd	Hose Count ADT (January 2015) – Marion County
Huff Ave south of Brooklake Rd	Hose Count ADT (July 2015) – Marion County

Volume Development

Design Hour Volumes – Existing Condition (2020)

The existing condition will be based on base year 2020. The existing volumes will be determined from the historic counts and adjusted to 30th highest hour volumes following the methodologies outlined in the ODOT Transportation Planning and Analysis Unit's (TPAU) Analysis Procedures Manual (APM) Volume 2.

Seasonal Adjustment Factors

Since traffic counts are taken during various times of the year, data from varying months may need to be converted to peak month equivalents using calculated seasonal adjustment factors. TPAU has three methods for developing seasonal factors: On-Site ATR Method, ATR Characteristic Table Method, and ATR Seasonal Trend Table Method. There is not an ATR in the study area and there is not a representative ATR within 10% of the traffic volumes in the study area.

The seasonal trend table was used. The average of the commuter and interstate urbanized trends were applied for Truckman Way and the ramp terminals and the commuter trend for the remaining intersections. For the study intersections with data from the *May Trucking Study,* the original traffic counts are not available, and the post-processed peak hour volumes will be used directly from the study. The seasonal adjustments are summarized in Table 3.

Growth Factors

All traffic counts conducted in 2018 require adjustment to the current year, 2020. Table 3 provides the growth factors that will be used at each intersection based on the historical factor methodology identified in the APM. The annual growth rate for intersections #1 and #6 was obtained from Marion County Historic Volumes.

COVID Adjustment Factor

All traffic counts conducted for 2020 were evaluated against historic counts to determine whether a "COVID adjustment" was necessary to bring volumes up pre-pandemic levels. A COVID adjustment was applied to intersections #2-#5. Intersections #1 and #3 was collected pre-COVID and intersection #7 did not require factoring up.

Table 3. Adjustment Factors

Intersection	Seasonal Adjustment Factor	Growth Factor	COVID Factor
1. River Rd at Brooklake Rd	1.02	1.05	N/A
2. Huff Ave at Brooklake Rd	1.04	N/A	1.12
3. Truckman Way at Brooklake Rd	1.05	N/A	1.12
4. I-5 SB Ramps at Brooklake Rd	1.05	N/A	1.12
5. I-5 NB Ramps at Brooklake Rd	1.05	N/A	1.12
6. 50th Ave at Brooklake Rd	1.05	1.03	N/A
7. Portland Rd (OR99E) at Brooklake Rd	1.04	N/A	N/A

Future Condition (2045) Volumes

Previous studies in the area have determined the use of the Salem-Keizer Area Transportation Study travel demand model is not be enough as a standalone forecasting tool; the study area straddles the boundary of the model and does not accurately capture current traffic trends. Future volumes will be developed through a combination of sources:

- Salem-Keizer Area Transportation Study (SKATS): Traffic trends on River Rd and Portland Rd
- Oregon Statewide Integrated Model (SWIM): I-5
- ODOT Historical Trend Table: Brooklake Rd

Balancing

The forecasted volumes will be input into Synchro and balanced accordingly. For conservative analysis, it is preferable to add traffic to the system instead of remove. This approach is taken whenever possible. Since there should be no driveways or accesses between ramp terminals or interchanges, the model will be balanced to a difference of zero vehicles between study area intersections.

Evaluation Comparison Tools

Tools and techniques used to evaluate and compare the alternatives include traffic operations analysis tools for more detailed assessment of area conditions.

Traffic Mobility Targets

For State facilities, the Oregon Highway Plan (OHP) and the Highway Design Manual (HDM) will be used in the assessment of intersection operations. Both documents base their mobility performance on the calculation of V/C; however, the standards in the HDM are based on higher performance levels than those in the OHP. The mobility targets from the OHP will be applied to the existing and future baseline (no build) analysis while the standards from the HDM will be applied to the evaluation of design alternatives.

For County facilities, the adopted mobility target will be used. Marion County bases their mobility performance on both Level of Service (LOS) and V/C. The mobility targets for each intersection are summarized in Table 4.

Table 4. Study Area Mobility Targets

	Intersection	Jurisdiction	Existing/No Build Mobility Target[1,2]	Build Mobility Target[1,3]
1	River Rd at Brooklake Rd	Marion Co.	LOS D, 0.85	LOS D, 0.85
2	Huff Ave at Brooklake Rd	Marion Co.	LOS E, 0.90	LOS E, 0.90
3	Truckman Way (Pilot Travel Center access) at Brooklake Rd	Marion Co.	LOS E, 0.90	LOS E, 0.90
4	I-5 Southbound Ramp Terminal at Brooklake Rd	ODOT	0.85	0.75
5	I-5 Northbound Ramp Terminal at Brooklake Rd	ODOT	0.85	0.75
6	50th Ave (NORPAC Access) at Brooklake Rd	Marion Co.	LOS E, 0.90	LOS E, 0.90
7	Portland Rd (OR 99E) at Brooklake Rd	ODOT	0.95	0.85

Notes:

1. Marion County Rural Transportation System Plan, Chapter 10: Policies, 2005
2. Table 6: Volume to Capacity Ratio Targets for Peak Hour Operating Conditions – Outside Metro, Oregon Highway Plan, 1999 (OHP Amendment 05-16, 2005)
3. Table 10-2: 20 Year Design-Mobility Standards (Volume-to-Capacity Ratio), Highway Design Manual, 2012

Traffic Operations

The operational analysis will evaluate volume-to-capacity (v/c) ratios and level of service (LOS) at the ramp terminal intersections/crossroads using the Synchro program (version 10). The network will be created based on the most current ODOT Synchro template. The files will be saved in a compatible version for ODOT review. Throughout the analysis process, TPAU and Region 2 Traffic staff will review modeling assumptions, analysis settings, and other assumptions to help ensure consistency of data with other studies under way.

An assessment of adding or removing traffic signals may be needed. Any assessments of new traffic signals will be reviewed using the MUTCD signal warrant analysis where the applicable data is available. If 16-hour counts are not available, ODOT's preliminary signal warrant spreadsheets will be used. In addition to traffic signals, other intersection control or modifications will be considered (e.g. roundabouts, access management, etc.) Operational analysis results will be compared with applicable mobility standards and specific recommendations for mitigation improvements will be reviewed by the agency with jurisdiction.

Traffic Operations Analysis Procedures

All analysis volumes must be adjusted to the 30th highest hour. Consultant shall use traffic analysis software programs following HCM6 methodologies and must be consistent with TPAU's analysis procedures. As outlined in the scope, signalized intersections must use HCM6 methods for obtaining intersection volume-to-capacity ratios. As for the location which HCM6 methods has limitation to generate the result, the analysis will follow the procedures in Chapter 13 of the APMV2. Traffic signal timing information will be obtained from ODOT Region 2 Traffic Section.

Consultant shall:

- Coordinate all analysis with TPAU and ODOT Region 2 Traffic Section

- Get approval of existing and future analysis methodology from TPAU and ODOT Region 2 Traffic Section via a Methodology Memorandum prior to beginning analysis
- Obtain approval of analysis and conclusions from TPAU and ODOT Region 2 Traffic Section prior to submitting draft technical memorandums
- Use inputs specified by TPAU for lane capacity, signal timing, etc.
- Use micro-simulation (SimTraffic software) analysis to evaluate the corridor delays and 95th percentile queues. The micro-simulation must be calibrated following the Agency's guidelines.

Freeway Operations

The freeway analysis will be compatible with HCM6 methods and use Oregon defaults per the APMV2.

Crash Data Analysis

Crash data for this project area will be obtained from the ODOT Crash Analysis and Reporting Unit for the most recent five complete years. The most recent Safety Priority Index System ("SPIS") data will be obtained as well as the top 10% of SPIS sites. Data will be requested for study area freeway mainline, ramps and interchange cross-roads.

The study area evaluation will include an analysis of the most recent five-year crash history on state and non-state roadways at count locations. Intersection crash rates will be calculated for each study area intersection and compared against the published 90th Percentile rates in the APM Table 4-1 (Version 2). Segment crash rates shall be compared with the ODOT Crash Rate Table II. Any crash involving a fatality or severe injury (inj A) will also be analyzed and documented.

The Highway Safety Manual Part B Network Critical Crash Rate method will be used in the screening process where enough reference populations are available. Based on the crash patterns, the analysis may identify improvements for the build alternatives that could mitigate safety issues.

METHODOLOGY MEMORANDUM ATTACHMENTS

Traffic Methodology and Assumptions Memorandum – Final (Task 4.1)

Table of Contents

Attachment A: Growth Factor

Annual Growth Rate	Growth Factor	BROOKLAKE Rd	11/23/1976	5/28/1992	6/26/1995	8/21/1995	8/18/1997	***6/21/1999***	9/8/2003	8/3/2007	8/31/2011	7/27/2015	***6/28/2019***
1.0%	1.02	W OF RIVER RD (CR 36)	762	1362	1423	1883	2198	***2294***	2366	2630	2531	2488	***2735***

			11/23/1976	12/1/1982	9/5/1990	6/26/1995	8/18/1997	***6/21/1999***	9/8/2003	7/28/2004	8/3/2007	8/31/2011	7/28/2015	***6/26/2019***	8/19/2019
7.2%	1.14	E OF RIVER RD (CR 36)	3850	2546	4915	6214	7436	***7068***	4209	8793	8399	7854	8743	***10238***	10318

			5/18/1992	***9/15/1995***	11/1/1999	9/12/2003	7/29/2004	9/17/2007	8/22/2011	***1/26/2015***
1.7%	1.03	W OF HUFF AVE (CR 6253)	5400	***6220***	7300	4750	9586	9600	8950	***8341***

			5/18/1992	***9/15/1995***	11/1/1999	9/12/2003	7/19/2004	7/28/2004	9/17/2007	8/22/2011	***1/26/2015***
1.3%	1.03	E OF HUFF AVE (CR 6253)	5600	***6980***	7200	4880	6414	9919	10000	9000	***8839***

			6/16/1982	9/5/1990	5/18/1992	6/19/1995	***8/21/1995***	8/4/1999	9/8/2003	8/2/2007	8/29/2011	***8/12/2015***	9/11/2015
0.4%	1.01	W OF I-5 INTERCHANGE	5959	7095	5775	5315	***6982***	12029	12602	14400	12662	***7518***	13000

			6/16/1982	8/28/1984	9/5/1990	9/7/1990	5/18/1992	6/19/1995	5/20/1996	***8/4/1999***	9/8/2003	8/14/2007	8/29/2011	8/12/2015	***8/19/2019***
1.6%	1.03	E OF I-5 INTERCHANGE	3201	3840	5788	5788	5279	5673	5800	***7968***	8243	7793	8394	9071	***10444***

			6/23/1989	11/17/1993	11/19/1993	***9/15/1995***	11/1/1999	9/12/2003	9/18/2007	9/6/2011	***9/10/2015***
2.4%	1.05	W OF PUEBLO AVE (CR 611)	5032	4721	4890	***5800***	7900	7110	9000	8700	***8600***

			1/1/1989	6/15/1994	***6/3/1998***	7/1/2002	7/12/2006	6/30/2010	8/4/2014	***7/10/2018***
0.1%	1.00	SE OF STATE HIGHWAY 99E (STATE)	1800	1752	***1907***	1917	1978	1824	1779	***1934***

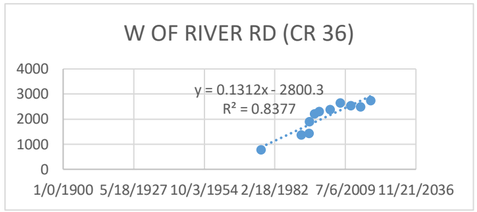
		River Road	11/23/1976	1/1/1990	9/5/1990	9/7/1990	6/26/1995	8/18/1997	***6/21/1999***	9/8/2003	7/31/2007	8/31/2011	8/12/2015	6/21/2016	***6/28/2019***
2.3%	1.05	SW OF BROOKLAKE RD (CR 609)	3870	3768	3768	3768	4206	4936	***4755***	4966	5901	5375	5847	6272	***6958***

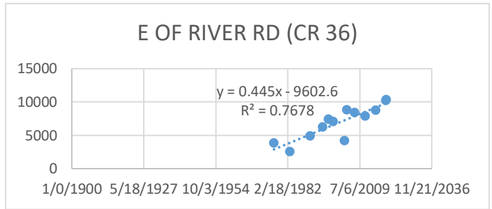
			11/23/1976	1/1/1989	6/21/1989	6/26/1995	***6/21/1999***	9/8/2003	7/31/2007	8/31/2011	7/27/2015	***6/26/2019***
3.2%	1.06	NE OF BROOKLAKE RD (CR 609)	1765	4222	4222	4606	***4001***	4348	5225	5248	5853	***6577***

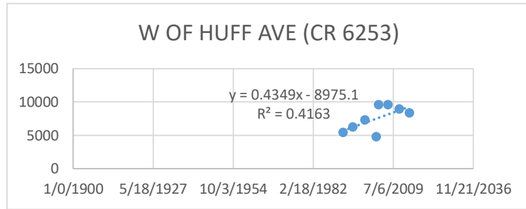
		Huff Ave	11/1/1999	***9/8/2003***	7/27/2007	8/26/2011	***7/28/2015***
4.2%	1.08	S OF BROOKLAKE RD (CR 609)	250	***768***	972	1060	***1159***

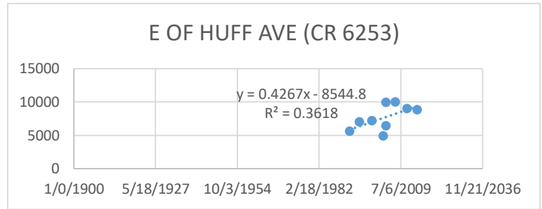
			1995	***2015***
5.0%	1.10	NORTH OF BROOKLAKE RD (CR 609)	***20***	***40***

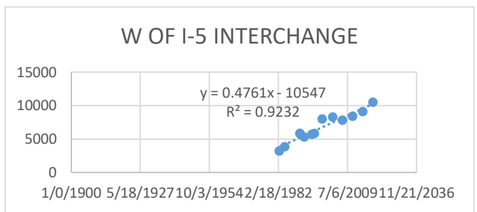
Marion County count source
Hose Count
Estimated Volume
Classifier

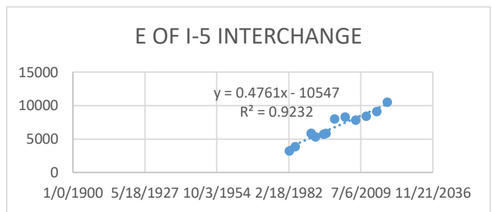

W OF RIVER RD (CR 36)
y = 0.1312x - 2800.3
R² = 0.8377
4000
3000
2000
1000
0
1/0/1900 5/18/1927 10/3/1954 2/18/1982 7/6/2009 11/21/2036

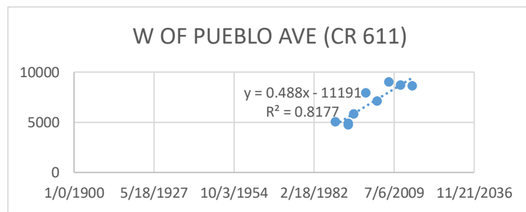

E OF RIVER RD (CR 36)
y = 0.445x - 9602.6
R² = 0.7678
15000
10000
5000
0
1/0/1900 5/18/1927 10/3/1954 2/18/1982 7/6/2009 11/21/2036


W OF HUFF AVE (CR 6253)
y = 0.4349x - 8975.1
R² = 0.4163
15000
10000
5000
0
1/0/1900 5/18/1927 10/3/1954 2/18/1982 7/6/2009 11/21/2036


E OF HUFF AVE (CR 6253)
y = 0.4267x - 8544.8
R² = 0.3618
15000
10000
5000
0
1/0/1900 5/18/1927 10/3/1954 2/18/1982 7/6/2009 11/21/2036


W OF I-5 INTERCHANGE
y = 0.4761x - 10547
R² = 0.9232
15000
10000
5000
0
1/0/1900 5/18/1927 10/3/1954 2/18/1982 7/6/2009 11/21/2036


E OF I-5 INTERCHANGE
y = 0.4761x - 10547
R² = 0.9232
15000
10000
5000
0
1/0/1900 5/18/1927 10/3/1954 2/18/1982 7/6/2009 11/21/2036


W OF PUEBLO AVE (CR 611)
y = 0.488x - 11191
R² = 0.8177
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5000
0
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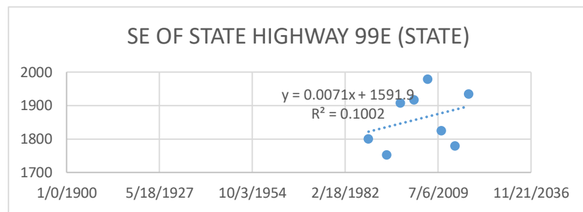
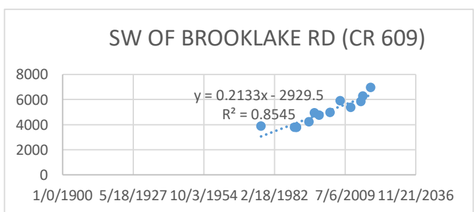
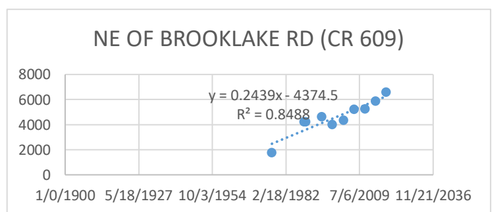
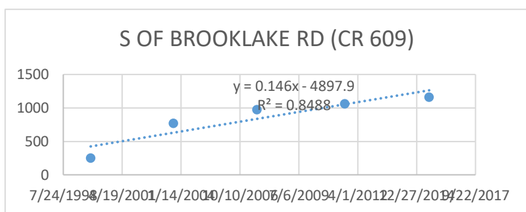
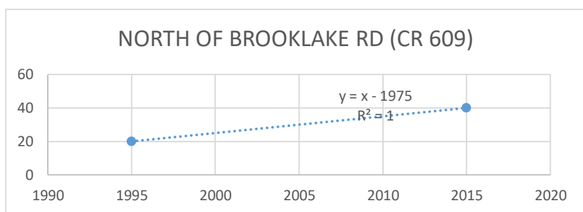

SE OF STATE HIGHWAY 99E (STATE)
y = 0.0071x + 1591.9
R² = 0.1002
2000
1900
1800
1700
1/0/1900 5/18/1927 10/3/1954 2/18/1982 7/6/2009 11/21/2036


SW OF BROOKLAKE RD (CR 609)
y = 0.2133x - 2929.5
R² = 0.8545
8000
6000
4000
2000
0
1/0/1900 5/18/1927 10/3/1954 2/18/1982 7/6/2009 11/21/2036


NE OF BROOKLAKE RD (CR 609)
y = 0.2439x - 4374.5
R² = 0.8488
8000
6000
4000
2000
0
1/0/1900 5/18/1927 10/3/1954 2/18/1982 7/6/2009 11/21/2036


S OF BROOKLAKE RD (CR 609)
y = 0.146x - 4897.9
R² = 0.8488
1500
1000
500
0
7/24/1996 8/19/2001 1/14/2007 10/10/2012 6/6/2018 1/1/2024 12/27/2029 7/22/2035


NORTH OF BROOKLAKE RD (CR 609)
y = x - 1975
R² = 1
60
40
20
0
1990 1995 2000 2005 2010 2015 2020

1.095083333

Hwy	M.P.	Description	2016	2017	2038	RSQ	2020 Growth Factor	20-year Growth Factor	Annual Growth Factor	Annual Growth Factor	Count Year
1	259.5	0.70 mile south of Chemawa Road Interchange (OR99E Bus)		91100	106600	MODEL		1.17014	0.00810	0.810%	2018
1	263.09	**0.40 mile south of Brooks Interchange**		**99700**	**118100**	**MODEL**	**1.02**	**1.18455**	**0.00879**	**0.879%**	**2018**
1	271.55	0.30 mile south of Hillsboro-Silverton Highway Interchange (OR214)		94100	105700	0.6286		1.12327	0.00587	0.587%	2018
1	278.27	0.40 mile south of Aurora-Donald Interchange (Ehlen Road)		93700	107400	0.6829		1.14621	0.00696	0.696%	2018
81	39.12	0.05 mile south of Waconda Road	11900		12900	0.4373		1.08403	0.00382	0.382%	2018
81	41.29	0.05 mile south of Brooklake Road	10000		11600	MODEL	**1.01**	1.16000	0.00727	0.727%	2019

Ideally, the Rsquared value should exceed 0.75. However, values higher than 0.50 are still acceptable, if there is nothing else available.

Attachment B: Seasonal Factors

SEASONAL TREND TABLE (Updated: 10/14/2020)																								Seasonal Trend Peak Period Factor
TREND	1-Jan	15-Jan	1-Feb	15-Feb	1-Mar	15-Mar	1-Apr	15-Apr	1-May	15-May	1-Jun	15-Jun	1-Jul	15-Jul	1-Aug	15-Aug	1-Sep	15-Sep	1-Oct	15-Oct	1-Nov	15-Nov	1-Dec	15-Dec	
INTERSTATE URBANIZED	1.0672	1.0684	1.0922	1.1160	1.0605	1.0050	0.9923	0.9796	0.9781	0.9767	0.9615	0.9463	0.9517	0.9571	0.9551	0.9531	0.9674	0.9816	0.9850	0.9884	1.0045	1.0206	1.0322	1.0438	0.9463
INTERSTATE NONURBANIZED	1.2426	1.2883	1.3750	1.4616	1.2645	1.0673	1.0382	1.0092	0.9798	0.9504	0.9005	0.8506	0.8322	0.8139	0.8221	0.8302	0.8719	0.9135	0.9441	0.9747	1.0178	1.0608	1.1123	1.1638	0.8139
COMMUTER	1.0850	1.0875	1.1183	1.1492	1.0880	1.0268	1.0014	0.9759	0.9705	0.9650	0.9503	0.9355	0.9470	0.9585	0.9509	0.9433	0.9528	0.9623	0.9614	0.9604	0.9938	1.0272	1.0474	1.0676	0.9355
COASTAL DESTINATION	1.1885	1.1712	1.2001	1.2289	1.1242	1.0194	1.0316	1.0437	1.0080	0.9723	0.9347	0.8972	0.8612	0.8252	0.8205	0.8159	0.8686	0.9214	0.9689	1.0164	1.0660	1.1156	1.1580	1.2005	0.8159
COASTAL DESTINATION ROUTE	1.3445	1.3248	1.4108	1.4968	1.2858	1.0747	1.0911	1.1076	1.0274	0.9473	0.8941	0.8409	0.7820	0.7231	0.7218	0.7205	0.8016	0.8827	0.9669	1.0511	1.1133	1.1754	1.2480	1.3206	0.7205
AGRICULTURE	1.4583	1.4827	1.5763	1.6700	1.4596	1.2492	1.1487	1.0482	0.9747	0.9011	0.8579	0.8146	0.8058	0.7970	0.7922	0.7873	0.7772	0.7670	0.8288	0.8905	0.9947	1.0989	1.2462	1.3934	0.7670
RECREATIONAL SUMMER	1.5848	1.6474	1.7861	1.9247	1.6595	1.3942	1.2973	1.2004	1.0517	0.9029	0.8256	0.7484	0.7018	0.6552	0.6708	0.6864	0.7393	0.7922	0.8898	0.9874	1.1242	1.2610	1.3965	1.5320	0.6552
RECREATIONAL SUMMER WINTER	0.8736	0.8525	0.9330	1.0135	1.0146	1.0158	1.1492	1.2825	1.1763	1.0700	0.9760	0.8821	0.8005	0.7190	0.7305	0.7420	0.8897	1.0374	1.2010	1.3645	1.5212	1.6778	1.3812	1.0847	0.7190
RECREATIONAL WINTER	0.6997	0.6389	0.6561	0.6733	0.7219	0.7704	1.0580	1.3455	1.3746	1.4038	1.2832	1.1625	0.9985	0.8344	0.8600	0.8857	1.0560	1.2262	1.4100	1.5937	1.8758	2.1580	1.5328	0.9076	0.6389
SUMMER	1.2151	1.2357	1.3129	1.3901	1.2520	1.1139	1.0620	1.0100	0.9718	0.9336	0.8976	0.8615	0.8457	0.8299	0.8354	0.8410	0.8743	0.9077	0.9357	0.9638	1.0273	1.0908	1.1322	1.1737	0.8299
SUMMER < 2500	1.3035	1.3186	1.3817	1.4448	1.2869	1.1289	1.0598	0.9906	0.9480	0.9053	0.8720	0.8387	0.8237	0.8086	0.8229	0.8373	0.8616	0.8859	0.9233	0.9607	1.0428	1.1249	1.2016	1.2783	0.8086

*** Seasonal Trend Table factors are based on previous year ATR data. The table is updated yearly.**
*** Grey shading indicates months were seasonal factor is greater than or less than 30%**
*** February 2019 snow event causing lower seasonal factors**

1.0623

	AVERAGE					AVERAGE									
		Interpolated		Peak			Interpolated		Peak						
	15-Oct	22-Oct	1-Nov	Period		15-Oct	27-Oct	1-Nov	Period						
interstate urbanized	0.9884	0.9950	1.0045	0.9463	1.051	0.9884	0.9997	1.0045	0.9463	1.056					
interstate non urbanized	0.9747	0.9924	1.0178	0.8139	1.219	0.9747	1.0051	1.0178	0.8139	1.235					
Commuter	0.9604	**0.9742**	0.9938	0.9355	1.041	0.9604	0.9840	0.9938	0.9355	1.052					

	AVERAGE				
		Interpolated		Peak	
	15-May	23-May	1-Jun	Period	
interstate urbanized	0.9767	0.9695	0.9615	0.9463	1.025
interstate non urbanized	0.9504	0.9269	0.9005	0.8139	1.139
Commuter	0.9650	0.9581	0.9503	0.9355	1.024

USE-->	**Interstate Urbanized/Commuter**	**1.05**	**Interstate Urbanized/Commuter**	**1.05**		**Interstate Urbanized/Commuter**	**1.02**		
	Interstate Non Urbanized/Commuter	1.13	Interstate Non Urbanized/Commuter	1.14		Interstate Non Urbanized/Commuter	1.08		
USE-->	Commuter	**1.04**	Commuter	1.05		Commuter	**1.02**		

Attachment C: COVID Factor

	20-Mar-18			23-May-18				22-Oct-20			
Intersection	**DKS 2018 PM Peak**	**Growth Factor**	**2018 Adjusted to 2020 PM Peak**	**Intermodal 2018 PM Peak**	**Seasonal Adj.**	**Growth Factor**	**2018 Adjusted to 2020 PM Peak**	**2020 PM Peak**	**Seasonal Adj.**	**2020 Adjusted to 2020 PM Peak**	**COVID FACTOR 1.12**
River	1308	1.05	1361	1275	1.02	1.05	1327				
Huff	1085	1.07	1129					968	1.02	987	1.143
Truckman	1172	1.05	1255					1096	1.05	1151	1.091
SB	1763	1.03	1888	1710	1.05	1.03	1831	1625	1.05	1706	1.107
NB	1305	1.03	1398	1243	1.05	1.03	1331	1188	1.05	1247	1.120
50th	910	1.03	947								
Portland	1814	1.02	1887					1824	1.02	1860	1.014

Attachment D: Correspondence

Angela Rogge

From: Angela Rogge
Sent: Tuesday, November 10, 2020 2:22 PM
To: FERBER Arielle; UPTON Dorothy J; SCHUYTEMA Peter L
Cc: FRICKE Daniel L; Dian Mao
Subject: RE: Brooks IAMP factors
Attachments: GrowthFactors_BrooksIAMP.xlsx

Thanks, all.

As we sort through all our counts, we realize the DKS doesn't have AM information and we're scoped to do AM/PM analysis.

In addition to Truckman Way and the ramp terminals, we collected counts at Huff and OR99E this October to supplement our data.

Do we have any concern using the October 2020 counts and using the historic data to balance the network up if needed? We would propose applying a "COVID adjustment factor" in addition to the seasonal adjustment. See attached for details. Revised summary table below.

Intersection	Count Date	Seasonal Adj Factor	Growth Factor	COVID Factor
River Rd	May 23, 2018	1.02	1.05	N/A
Huff Ave	October 22, 2020	1.02	N/A	1.12
Truckman Way	October 22, 2020	1.05	N/A	1.12
SB Ramp Terminal	October 22, 2020	1.05	N/A	1.12
NB Ramp Terminal	October 22, 2020	1.05	N/A	1.12
50th Ave	March 20, 2018	None – use post-processed counts from DKS study since raw counts not available	1.03	N/A
OR 99E	October 22, 2020	1.02	N/A	N/A

I'll revise the methodology memo accordingly once we are settled on the adjustment factors. Thanks for your patience as we wade through this.

Angela

From: FERBER Arielle <Arielle.FERBER@odot.state.or.us>
Sent: Tuesday, November 10, 2020 10:34 AM
To: UPTON Dorothy J <Dorothy.J.UPTON@odot.state.or.us>; SCHUYTEMA Peter L <Peter.L.SCHUYTEMA@odot.state.or.us>; Angela Rogge <Angela.Rogge@deainc.com>
Cc: FRICKE Daniel L <Daniel.L.FRICKE@odot.state.or.us>; Dian Mao <Dian.Mao@deainc.com>
Subject: RE: Brooks IAMP factors

Angela,

I have completed my review and found no issues with the seasonal adjustment and growth factors.

I did notice that the proposed seasonal adjustment factors utilize the commuter and average of the commuter and interstate urbanized seasonal trends while the final methodology memo in basecamp discusses using the average of the agricultural and commuter trends. Please be sure to document these changes/differences in the existing conditions memo for posterity.

Thanks,
Arielle Ferber, P.E.

Traffic Analysis Engineer
ODOT Region 2
455 Airport Rd. SE, Bldg. A, Salem, OR 97031
(503) 986-2857

From: UPTON Dorothy J <Dorothy.J.UPTON@odot.state.or.us>
Sent: Tuesday, November 10, 2020 10:10 AM
To: SCHUYTEMA Peter L <Peter.L.SCHUYTEMA@odot.state.or.us>; Angela Rogge <Angela.Rogge@deainc.com>
Cc: FRICKE Daniel L <Daniel.L.FRICKE@odot.state.or.us>; Dian Mao <Dian.Mao@deainc.com>; FERBER Arielle <Arielle.FERBER@odot.state.or.us>
Subject: RE: Brooks IAMP factors

I can agree with Peter's assessment of these factors.

Dorothy Upton, PE
Region 2 Traffic Operations Engineer
(503)986-5761

From: SCHUYTEMA Peter L <Peter.L.SCHUYTEMA@odot.state.or.us>
Sent: Tuesday, November 10, 2020 7:46 AM
To: Angela Rogge <Angela.Rogge@deainc.com>
Cc: FRICKE Daniel L <Daniel.L.FRICKE@odot.state.or.us>; Dian Mao <Dian.Mao@deainc.com>; UPTON Dorothy J <Dorothy.J.UPTON@odot.state.or.us>; FERBER Arielle <Arielle.FERBER@odot.state.or.us>
Subject: RE: Brooks IAMP factors

Angela,

I've reviewed the growth and seasonal factors proposed and I don't have an issue with the identified seasonal trends and the I5 growth factors. Future Volume Table entries for OR99E should be used for the N/S approaches.

Any historical counts from Marion County ideally should be used to develop 20-yr growth factors for Brooklake Road, River Road, and side-streets especially away from the interchange. These should be averaged into the Truckman Way and ramp terminal intersections.

Thanks,

Peter L. Schuytema, P.E.
Senior Transportation Analyst
ODOT- Transportation Planning Analysis Unit
555 13th St NE, Suite 2, Salem, OR 97301-4178
Email: peter.l.schuytema@odot.state.or.us
Phone: 503-986-4110

From: Angela Rogge <Angela.Rogge@deainc.com>
Sent: Monday, November 9, 2020 1:52 PM
To: UPTON Dorothy J <Dorothy.J.UPTON@odot.state.or.us>; FERBER Arielle <Arielle.FERBER@odot.state.or.us>; SCHUYTEMA Peter L <Peter.L.SCHUYTEMA@odot.state.or.us>
Cc: FRICKE Daniel L <Daniel.L.FRICKE@odot.state.or.us>; Dian Mao <Dian.Mao@deainc.com>
Subject: Brooks IAMP factors

Hello all,

Our original methodology memo for Brooks IAMP did not have seasonal adjustment or growth factor calculations because we didn't have firm dates for the data. See table below for intersection traffic count sources and our proposed factors.

We propose using the seasonal trend table and averaging the commuter and interstate urbanized for Truckman Way and the ramp terminals and the commuter trend for the remaining intersections. Detailed calculations attached.

Intersection	Count Date	Seasonal Adjustment Factor	Growth Factor
River Rd	May 23, 2018	1.02	1.02
Huff Ave	March 20, 2018	None – use post-processed counts from DKS study since raw counts not available	1.02
Truckman Way	October 22, 2020	1.05	N/A
SB Ramp Terminal	October 22, 2020	1.05	N/A
NB Ramp Terminal	October 22, 2020	1.05	N/A
50th Ave	March 20, 2018	None – use post-processed counts from DKS study since raw counts not available	1.02
OR 99E	March 20, 2018	None – use post-processed counts from DKS study since raw counts not available	1.02

Please let us know if you have any adjustments to the factors so we can proceed with the analysis.

Angela

Angela Rogge, PE | Associate, Smart Mobility
David Evans and Associates, Inc.
2100 S River Pkwy, Suite 100 | Portland, OR 97201 | www.deainc.com **OUR ADDRESS HAS CHANGED**

Methodology Memo - End

Project: Brooks IAMP 416 547 2/3/2021

Job #: ODOT0983 66

Subject: ***PM Turning Movement Volumes***

Do not edit Do not edit

N-S ID	Synchro ID	Intersection	Direction	Movement	Int ID	Existing Raw Counts 1-Hr Volume PM Peak	Existing Heavy Vehicle Count	Existing Heavy Vehicle Percentage	Base Year Adj Factor	Seasonal Adj Factor	COVID Adj Factor	30DHV Adjusted 1-Hr Volume PM Peak	Volume Balancing Adjustments	2020 Balanced Volumes PM Peak
1	10	River Rd at Brooklake Rd		EBL	10	17	0	0%	1.05	1.02	1.00	20	0	20
		3 hr PM Turning Movement Count	EB	EBT	10	86	5	6%	1.05	1.02	1.00	90	0	90
		Count Date: 5/23/2018		EBR	10	16	1	6%	1.05	1.02	1.00	15	0	15
		2018		WBL	10	253	8	3%	1.05	1.02	1.00	270	0	270
			WB	WBT	10	108	4	4%	1.05	1.02	1.00	115	0	115
				WBR	10	151	8	5%	1.05	1.02	1.00	160	0	160
		PM Peak Hour: 4:45 PM-5:45 PM		NBL	10	31	1	3%	1.05	1.02	1.00	35	0	35
		PM Peak Hour Used: 4:15 PM-5:15 PM	NB	NBT	10	102	4	4%	1.05	1.02	1.00	110	0	110
				NBR	10	114	7	6%	1.05	1.02	1.00	120	0	120
				SBL	10	236	35	15%	1.05	1.02	1.00	255	5	260
		PHF:	SB	SBT	10	128	4	3%	1.05	1.02	1.00	135	0	135
		0.95		SBR	10	21	0	0%	1.05	1.02	1.00	20	0	20
			TEV	**TEV**	10	**1263**	**77**	6%				**1345**	**5**	**1350**
2	20	Huff Ave at Brooklake Rd		EBL	20	0	0	0%	1.00	1.04	1.12	0	1	1
		16 hr Turning Movement Count	EB	EBT	20	459	27	6%	1.00	1.04	1.12	535	-30	505
		Count Date: 10/22/2020		EBR	20	1	0	0%	1.00	1.04	1.12	1	0	1
		2020		WBL	20	17	10	59%	1.00	1.04	1.12	20	0	20
			WB	WBT	20	428	26	6%	1.00	1.04	1.12	500	5	505
				WBR	20	1	0	0%	1.00	1.04	1.12	1	1	2
		PM Peak Hour: 4:30 PM-5:30 PM		NBL	20	6	1	17%	1.00	1.04	1.12	5	0	5
		PM Peak Hour Used: 4:15 PM-5:15 PM	NB	NBT	20	0	0	0%	1.00	1.04	1.12	0	0	0
				NBR	20	43	7	16%	1.00	1.04	1.12	50	10	60
				SBL	20	5	0	0%	1.00	1.04	1.12	5	0	5
		PHF:	SB	SBT	20	0	0	0%	1.00	1.04	1.12	0	0	0
		0.90		SBR	20	1	0	0%	1.00	1.04	1.12	1	0	1
			TEV	**TEV**	20	**961**	**71**	7%				**1118**	**-13**	**1105**
3	30	Truckman Way at Brooklake Rd		EBL	30	0	0	0%	1.00	1.05	1.12	0	0	0
		3 hr PM Turning Movement Count	EB	EBT	30	510	34	7%	1.00	1.05	1.12	600	-35	565
		Count Date: 10/22/2020		EBR	30	4	0	0%	1.00	1.05	1.12	5	0	5
		2020		WBL	30	61	49	80%	1.00	1.05	1.12	70	-5	65
			WB	WBT	30	446	35	8%	1.00	1.05	1.12	525	0	525
				WBR	30	0	0	0%	1.00	1.05	1.12	0	0	0
		PM Peak Hour: 4:30 PM-5:30 PM		NBL	30	2	0	0%	1.00	1.05	1.12	2	0	2
		PM Peak Hour Used: 4:15 PM-5:15 PM	NB	NBT	30	0	0	0%	1.00	1.05	1.12	0	0	0
				NBR	30	62	51	82%	1.00	1.05	1.12	75	0	75
				SBL	30	0	0	0%	1.00	1.05	1.12	0	0	0
		PHF:	SB	SBT	30	0	0	0%	1.00	1.05	1.12	0	0	0
		0.88		SBR	30	0	0	0%	1.00	1.05	1.12	0	0	0
			TEV	**TEV**	30	**1085**	**169**	16%				**1277**	**-40**	**1237**

Project: Brooks IAMP 416 547 2/3/2021

Job #: ODOT0983 66

Subject: ***PM Turning Movement Volumes***

							Do not edit						Do not edit	
N-S ID	Synchro ID	Intersection	Direction	Movement	Int ID	Existing Raw Counts 1-Hr Volume PM Peak	Existing Heavy Vehicle Count	Existing Heavy Vehicle Percentage	Base Year Adj Factor	Seasonal Adj Factor	COVID Adj Factor	30DHV Adjusted 1-Hr Volume PM Peak	Volume Balancing Adjustments	2020 Balanced Volumes PM Peak
3.5	35	May Trucking/Pilot Driveway at Brooklake Rd		EBL	35	2	0	0%	1.00	1.05	1.12	2	0	2
		3 hr PM Turning Movement Count	EB	EBT	35	462	65	14%	1.00	1.05	1.12	545	45	590
		Count Date: 10/27/2020		EBR	35	31	1	3%	1.00	1.05	1.12	35	13	48
		2020		WBL	35	121	1	1%	1.00	1.05	1.12	140	0	140
			WB	WBT	35	445	78	18%	1.00	1.05	1.12	525	15	540
				WBR	35	15	7	47%	1.00	1.05	1.12	20	0	20
		PM Peak Hour: 4:15 PM-5:15 PM		NBL	35	26	0	0%	1.00	1.05	1.12	30	0	30
		PM Peak Hour Used: 4:15 PM-5:15 PM	NB	NBT	35	0	0	0%	1.00	1.05	1.12	0	0	0
				NBR	35	147	3	2%	1.00	1.05	1.12	175	0	175
				SBL	35	35	2	6%	1.00	1.05	1.12	40	0	40
		PHF:	SB	SBT	35	0	0	0%	1.00	1.05	1.12	0	0	0
		0.96		SBR	35	19	1	5%	1.00	1.05	1.12	20	0	20
			TEV	**TEV**	35	**1303**	**158**	12%				**1532**	**73**	**1605**
4	40	I-5 SB Ramp Terminal at Brooklake Rd		EBL	40	0	0	0%	1.00	1.05	1.12	0	0	0
		16 hr Turning Movement Count	EB	EBT	40	266	37	14%	1.00	1.05	1.12	315	-10	305
		Count Date: 10/22/2020		EBR	40	429	55	13%	1.00	1.05	1.12	505	-5	500
		2020		WBL	40	286	14	5%	1.00	1.05	1.12	335	0	335
			WB	WBT	40	331	58	18%	1.00	1.05	1.12	390	0	390
				WBR	40	0	0	0%	1.00	1.05	1.12	0	0	0
		PM Peak Hour: 4:30 PM-5:30 PM		NBL	40	0	0	0%	1.00	1.05	1.12	0	0	0
		PM Peak Hour Used: 4:15 PM-5:15 PM	NB	NBT	40	0	0	0%	1.00	1.05	1.12	0	0	0
				NBR	40	0	0	0%	1.00	1.05	1.12	0	0	0
				SBL	40	39	2	5%	1.00	1.05	1.12	45	0	45
		PHF:	SB	SBT	40	0	0	0%	1.00	1.05	1.12	0	0	0
		0.95		SBR	40	265	33	12%	1.00	1.05	1.12	310	0	310
			TEV	**TEV**	40	**1616**	**199**	12%				**1900**	**-15**	**1885**
5	50	I-5 NB Ramp Terminal at Brooklake Rd		EBL	50	127	30	24%	1.00	1.05	1.12	150	-5	145
		16 hr Turning Movement Count	EB	EBT	50	185	9	5%	1.00	1.05	1.12	220	-15	205
		Count Date: 10/22/2020		EBR	50	0	0	0%	1.00	1.05	1.12	0	0	0
		2020		WBL	50	0	0	0%	1.00	1.05	1.12	0	0	0
			WB	WBT	50	419	27	6%	1.00	1.05	1.12	495	-10	485
				WBR	50	43	2	5%	1.00	1.05	1.12	50	-5	45
		PM Peak Hour: 4:00 PM-5:00 PM		NBL	50	204	46	23%	1.00	1.05	1.12	240	0	240
		PM Peak Hour Used: 4:15 PM-5:15 PM	NB	NBT	50	1	0	0%	1.00	1.05	1.12	1	0	1
				NBR	50	205	15	7%	1.00	1.05	1.12	240	0	240
				SBL	50	0	0	0%	1.00	1.05	1.12	0	0	0
		PHF:	SB	SBT	50	0	0	0%	1.00	1.05	1.12	0	0	0
		0.93		SBR	50	0	0	0%	1.00	1.05	1.12	0	0	0
			TEV	**TEV**	50	**1184**	**129**	11%				**1396**	**-35**	**1361**

Project: Brooks IAMP 416 547 2/3/2021

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Subject: ***PM Turning Movement Volumes***

Do not edit Do not edit

N-S ID	Synchro ID	Intersection	Direction	Movement	Int ID	Existing Raw Counts 1-Hr Volume PM Peak	Existing Heavy Vehicle Count	Existing Heavy Vehicle Percentage	Base Year Adj Factor	Seasonal Adj Factor	COVID Adj Factor	30DHV Adjusted 1-Hr Volume PM Peak	Volume Balancing Adjustments	2020 Balanced Volumes PM Peak
6	60	50th Ave at Brooklake Rd		EBL	60	6		0%	1.03	1.00	1.00	5	0	5
		From May Trucking Study	EB	EBT	60	389		4%	1.03	1.00	1.00	400	40	440
		Count Date: 3/20/2018		EBR	60	0		0%	1.03	1.00	1.00	0	0	0
		2018		WBL	60	0		0%	1.03	1.00	1.00	0	0	0
			WB	WBT	60	500		7%	1.03	1.00	1.00	515	0	515
				WBR	60	0		0%	1.03	1.00	1.00	0	2	2
		PM Peak Hour: 6:00 AM-7:00 AM		NBL	60	0		0%	1.03	1.00	1.00	0	0	0
		PM Peak Hour Used: 4:15 PM-5:15 PM	NB	NBT	60	0		0%	1.03	1.00	1.00	0	0	0
				NBR	60	0		0%	1.03	1.00	1.00	0	0	0
				SBL	60	2		0%	1.03	1.00	1.00	2	0	2
		PHF:	SB	SBT	60	0		0%	1.03	1.00	1.00	0	0	0
		#DIV/0!		SBR	60	13		0%	1.03	1.00	1.00	15	0	15
			TEV	**TEV**	60	**0**	**0**	#DIV/0!				**937**	**42**	**979**
7	70	OR 99E (Portland Rd) at Brooklake Rd		EBL	70	225	10	4%	1.00	1.04	1.00	235	0	235
		3 hr PM Turning Movement Count	EB	EBT	70	60	2	3%	1.00	1.04	1.00	60	0	60
		Count Date: 10/22/2020		EBR	70	126	7	6%	1.00	1.04	1.00	130	0	130
		2020		WBL	70	25	1	4%	1.00	1.04	1.00	25	0	25
			WB	WBT	70	46	3	7%	1.00	1.04	1.00	50	0	50
				WBR	70	13	1	8%	1.00	1.04	1.00	15	0	15
		PM Peak Hour: 4:15 PM-5:15 PM		NBL	70	74	10	14%	1.00	1.04	1.00	75	5	80
		PM Peak Hour Used: 4:15 PM-5:15 PM	NB	NBT	70	351	15	4%	1.00	1.04	1.00	365	0	365
				NBR	70	17	0	0%	1.00	1.04	1.00	20	0	20
				SBL	70	25	1	4%	1.00	1.04	1.00	25	0	25
		PHF:	SB	SBT	70	616	22	4%	1.00	1.04	1.00	640	0	640
		0.96		SBR	70	280	13	5%	1.00	1.04	1.00	290	10	300
			TEV	**TEV**	70	**1858**	**85**	5%				**1930**	**15**	**1945**

Attachment D: Traffic Operational Output (Synchro/SimTraffic)

To reflect field observations pre-COVID, the field observations from the May Trucking Study by DKS Associates (2018) were used for calibration.

Brooklake Road/OR-99E

The most common collision type was turning movement collisions (43%). Of the 23 collisions, eight involved rear-end collisions. Ten collisions involved turning movements, the majority of which involved vehicles turning left from the west leg of Brooklake Road onto the north leg of OR-99E.

The final severe injury collision was reported at the intersection of Brooklake Road/OR-99E, at 10:00 pm in November of 2015 under clear, dry conditions. It was a turning collision with a vehicle on OR-99E turning left onto Brooklake Road and failing to yield to oncoming north-south traffic.

Field Observations

Observations were performed during the PM peak hour period (4:00 – 6:00 pm) at the study intersections on Thursday April 19, 2018. The purpose of the site visit was to observe vehicle operations and identify queuing and general issues related to traffic congestion and safety. The following issues were observed:

- On the I-5 northbound off-ramp, left turning vehicles experienced an extended wait time while attempting to turn left onto Brooklake Road. The observed delay for a left turning passenger car turning left onto Brooklake Road was greater than 2 minutes. This led to queues around 850 feet, nearly backing up to the I-5 main line.
- Due to the long delays for left turning vehicles on the I-5 northbound off-ramp, right turning vehicles drove along the shoulder of the off-ramp in order to by-pass the line of westbound vehicles waiting to turn left onto Brooklake Road.

- On the segment of Brooklake Road between the I-5 southbound off-ramp and Truckman Way, trucks turning right from I-5 southbound off-ramp turned directly into the two-way left turn lane (TWLTL) and while in the TWLTL, passed through the intersection of Brooklake Road and May Trucking Access/Pilot Access without turning left in order to reach Truckman Way.
- At the intersection of Brooklake Road/River Road, southbound vehicles on River Road experienced excessive delay (over three minutes) causing significant queuing of up to 1,200 feet (see photo below).

Summary

Below is a summary of the findings in this technical memorandum:

- The total number of vehicles traveling along a section west of the I-5 southbound off-ramp is 19,900 vehicles (approximately equally distributed eastbound to westbound), with an 85th percentile speed of 35 mph and an average 12.1% trucks.
- Two intersections have turn movements which exceed available storage; Brooklake Road/I-5 northbound and Brooklake Road/I-5 southbound.
- Delays of over a minute were reported for the northbound approach at the I-5 northbound ramp and for the southbound approach at the I-5 southbound ramp.
- The following intersections failed to meet Marion County operating standards and ODOT mobility targets under existing conditions:
    - Brooklake Road/River Road
    - Brooklake Road/May Trucking Access/Pilot Access
    - Brooklake Road/I-5 southbound ramp terminal
    - Brooklake Road/I-5 northbound
- The following intersections exceeded critical crash rates:

Intersection	
Intersection Delay, s/veh	59.8
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	90	15	270	115	160	35	110	120	260	135	20
Future Vol, veh/h	20	90	15	270	115	160	35	110	120	260	135	20
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	0	6	6	3	4	5	3	4	6	15	3	0
Mvmt Flow	21	95	16	284	121	168	37	116	126	274	142	21
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	15.2	98.1	20.8	47.7
HCM LOS	C	F	C	E

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	13%	16%	50%	63%
Vol Thru, %	42%	72%	21%	33%
Vol Right, %	45%	12%	29%	5%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	265	125	545	415
LT Vol	35	20	270	260
Through Vol	110	90	115	135
RT Vol	120	15	160	20
Lane Flow Rate	279	132	574	437
Geometry Grp	1	1	1	1
Degree of Util (X)	0.574	0.299	1.108	0.893
Departure Headway (Hd)	7.803	8.555	6.954	7.805
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	466	422	522	467
Service Time	5.803	6.555	4.982	5.805
HCM Lane V/C Ratio	0.599	0.313	1.1	0.936
HCM Control Delay	20.8	15.2	98.1	47.7
HCM Lane LOS	C	C	F	E
HCM 95th-tile Q	3.5	1.2	18.5	9.7

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	505	1	20	505	2	5	1	60	5	1	1
Future Vol, veh/h	1	505	1	20	505	2	5	1	60	5	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	6	0	59	6	0	17	0	16	0	0	0
Mvmt Flow	1	561	1	22	561	2	6	1	67	6	1	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	563	0	0	562	0	0	1171	1171	562	1204	1170	562
Stage 1	-	-	-	-	-	-	564	564	-	606	606	-
Stage 2	-	-	-	-	-	-	607	607	-	598	564	-
Critical Hdwy	4.1	-	-	4.69	-	-	7.27	6.5	6.36	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.27	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.27	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.731	-	-	3.653	4	3.444	3.5	4	3.3
Pot Cap-1 Maneuver	1019	-	-	779	-	-	158	194	501	162	195	530
Stage 1	-	-	-	-	-	-	485	512	-	487	490	-
Stage 2	-	-	-	-	-	-	459	489	-	492	512	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1019	-	-	779	-	-	152	186	501	135	187	530
Mov Cap-2 Maneuver	-	-	-	-	-	-	152	186	-	135	187	-
Stage 1	-	-	-	-	-	-	485	511	-	487	470	-
Stage 2	-	-	-	-	-	-	438	469	-	425	511	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.4	15.4	29
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	418	1019	-	-	779	-	-	158
HCM Lane V/C Ratio	0.175	0.001	-	-	0.029	-	-	0.049
HCM Control Delay (s)	15.4	8.5	0	-	9.8	0	-	29
HCM Lane LOS	C	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0.6	0	-	-	0.1	-	-	0.2

Intersection	
Int Delay, s/veh	1.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	565	5	65	525	2	75
Future Vol, veh/h	565	5	65	525	2	75
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	7	0	80	8	0	82
Mvmt Flow	642	6	74	597	2	85

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	648	0	1390	645
Stage 1	-	-	-	-	645	-
Stage 2	-	-	-	-	745	-
Critical Hdwy	-	-	4.9	-	6.4	7.02
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.92	-	3.5	4.038
Pot Cap-1 Maneuver	-	-	656	-	158	356
Stage 1	-	-	-	-	526	-
Stage 2	-	-	-	-	473	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	656	-	140	356
Mov Cap-2 Maneuver	-	-	-	-	276	-
Stage 1	-	-	-	-	526	-
Stage 2	-	-	-	-	420	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.2	18.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	353	-	-	656	-
HCM Lane V/C Ratio	0.248	-	-	0.113	-
HCM Control Delay (s)	18.5	-	-	11.2	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	1	-	-	0.4	-

Intersection	
Int Delay, s/veh	14.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	590	48	140	540	20	30	0	175	40	0	20
Future Vol, veh/h	2	590	48	140	540	20	30	0	175	40	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	14	3	1	18	47	0	0	2	6	0	5
Mvmt Flow	2	615	50	146	563	21	31	0	182	42	0	21

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	584	0	0	665	0	0	1520	1520	640	1601	1535	574
Stage 1	-	-	-	-	-	-	644	644	-	866	866	-
Stage 2	-	-	-	-	-	-	876	876	-	735	669	-
Critical Hdwy	4.1	-	-	4.11	-	-	7.1	6.5	6.22	7.16	6.5	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.16	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.16	5.5	-
Follow-up Hdwy	2.2	-	-	2.209	-	-	3.5	4	3.318	3.554	4	3.345
Pot Cap-1 Maneuver	1001	-	-	929	-	-	98	120	475	83	117	513
Stage 1	-	-	-	-	-	-	465	471	-	342	373	-
Stage 2	-	-	-	-	-	-	346	369	-	405	459	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1001	-	-	929	-	-	83	101	475	45	98	513
Mov Cap-2 Maneuver	-	-	-	-	-	-	83	101	-	45	98	-
Stage 1	-	-	-	-	-	-	464	470	-	341	314	-
Stage 2	-	-	-	-	-	-	280	311	-	249	458	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.9	49.2	206.8
HCM LOS			E	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	281	1001	-	-	929	-	-	65
HCM Lane V/C Ratio	0.76	0.002	-	-	0.157	-	-	0.962
HCM Control Delay (s)	49.2	8.6	0	-	9.6	-	-	206.8
HCM Lane LOS	E	A	A	-	A	-	-	F
HCM 95th %tile Q(veh)	5.7	0	-	-	0.6	-	-	4.7

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	305	500	335	390	0	0	0	0	45	1	310
Future Vol, veh/h	0	305	500	335	390	0	0	0	0	45	1	310
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	350	-	-	-	-	-	-	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	14	13	5	18	0	0	0	0	5	0	12
Mvmt Flow	0	321	526	353	411	0	0	0	0	47	1	326

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	847	0	0	1701	1964	411
Stage 1	-	-	-	-	-	-	1117	1117	-
Stage 2	-	-	-	-	-	-	584	847	-
Critical Hdwy	-	-	-	4.15	-	-	6.45	6.5	6.32
Critical Hdwy Stg 1	-	-	-	-	-	-	5.45	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.45	5.5	-
Follow-up Hdwy	-	-	-	2.245	-	-	3.545	4	3.408
Pot Cap-1 Maneuver	0	-	-	777	-	0	99	64	620
Stage 1	0	-	-	-	-	0	309	285	-
Stage 2	0	-	-	-	-	0	552	381	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	777	-	-	54	0	620
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ -116	0	-
Stage 1	-	-	-	-	-	-	309	0	-
Stage 2	-	-	-	-	-	-	301	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	6.2	
HCM LOS			-

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	777	-	+	620
HCM Lane V/C Ratio	-	-	0.454	-	-	0.526
HCM Control Delay (s)	-	-	13.4	-	-	17.1
HCM Lane LOS	-	-	B	-	-	C
HCM 95th %tile Q(veh)	-	-	2.4	-	-	3.1

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

Intersection	
Int Delay, s/veh	49.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	145	205	0	0	485	45	240	1	240	0	0	0
Future Vol, veh/h	145	205	0	0	485	45	240	1	240	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	-	-	-	-	0	-	400	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	24	5	0	0	6	5	23	0	7	0	0	0
Mvmt Flow	156	220	0	0	522	48	258	1	258	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	570	0	-	-	-	0	1078	1102	220
Stage 1	-	-	-	-	-	-	532	532	-
Stage 2	-	-	-	-	-	-	546	570	-
Critical Hdwy	4.34	-	-	-	-	-	6.63	6.5	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-	5.63	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.63	5.5	-
Follow-up Hdwy	2.416	-	-	-	-	-	3.707	4	3.363
Pot Cap-1 Maneuver	902	-	0	0	-	-	~ 221	213	807
Stage 1	-	-	0	0	-	-	549	529	-
Stage 2	-	-	0	0	-	-	541	509	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	902	-	-	-	-	-	~ 183	0	807
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 183	0	-
Stage 1	-	-	-	-	-	-	454	0	-
Stage 2	-	-	-	-	-	-	541	0	-

Approach	EB	WB	NB
HCM Control Delay, s	4.1	0	136.5
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	183	807	902	-	-	-
HCM Lane V/C Ratio	1.41	0.321	0.173	-	-	-
HCM Control Delay (s)	261.9	11.6	9.8	-	-	-
HCM Lane LOS	F	B	A	-	-	-
HCM 95th %tile Q(veh)	15.6	1.4	0.6	-	-	-

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

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	440	515	2	2	15
Future Vol, veh/h	5	440	515	2	2	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	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	4	7	2	0	0
Mvmt Flow	5	478	560	2	2	16

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	562	0	-	0	1049	561
Stage 1	-	-	-	-	561	-
Stage 2	-	-	-	-	488	-
Critical Hdwy	4.12	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.218	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1009	-	-	-	254	531
Stage 1	-	-	-	-	575	-
Stage 2	-	-	-	-	621	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1009	-	-	-	252	531
Mov Cap-2 Maneuver	-	-	-	-	252	-
Stage 1	-	-	-	-	571	-
Stage 2	-	-	-	-	621	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	13
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1009	-	-	-	470
HCM Lane V/C Ratio	0.005	-	-	-	0.039
HCM Control Delay (s)	8.6	0	-	-	13
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

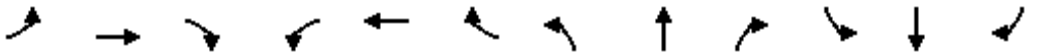
Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	435	7	5	500	17	5
Future Vol, veh/h	435	7	5	500	17	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	200	125	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	100	50	6	39	2
Mvmt Flow	473	8	5	543	18	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	481	0	1026	473
Stage 1	-	-	-	-	473	-
Stage 2	-	-	-	-	553	-
Critical Hdwy	-	-	4.6	-	6.79	6.22
Critical Hdwy Stg 1	-	-	-	-	5.79	-
Critical Hdwy Stg 2	-	-	-	-	5.79	-
Follow-up Hdwy	-	-	2.65	-	3.851	3.318
Pot Cap-1 Maneuver	-	-	872	-	222	591
Stage 1	-	-	-	-	557	-
Stage 2	-	-	-	-	509	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	872	-	221	591
Mov Cap-2 Maneuver	-	-	-	-	221	-
Stage 1	-	-	-	-	557	-
Stage 2	-	-	-	-	506	-

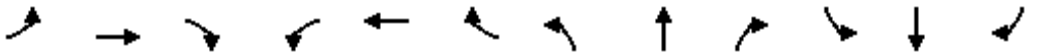
Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	20.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	258	-	-	872	-
HCM Lane V/C Ratio	0.093	-	-	0.006	-
HCM Control Delay (s)	20.4	-	-	9.2	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	235	60	130	25	50	15	80	365	20	25	640	300
Future Volume (vph)	235	60	130	25	50	15	80	365	20	25	640	300
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1622	1403		1586		1458	1673		1599	1683	1417
Flt Permitted		0.73	1.00		0.87		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1223	1403		1405		1458	1673		1599	1683	1417
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	245	62	135	26	52	16	83	380	21	26	667	312
RTOR Reduction (vph)	0	0	94	0	7	0	0	1	0	0	0	77
Lane Group Flow (vph)	0	308	41	0	87	0	83	400	0	26	667	236
Heavy Vehicles (%)	4%	3%	6%	4%	7%	8%	14%	4%	0%	4%	4%	5%
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								6
Actuated Green, G (s)		25.9	25.9		25.9		8.2	44.0		2.9	38.7	38.7
Effective Green, g (s)		26.4	26.4		26.4		8.2	45.4		2.9	40.1	40.1
Actuated g/C Ratio		0.30	0.30		0.30		0.09	0.52		0.03	0.46	0.46
Clearance Time (s)		4.5	4.5		4.5		4.0	5.4		4.0	5.4	5.4
Vehicle Extension (s)		2.5	2.5		2.5		2.5	4.0		2.5	4.0	4.0
Lane Grp Cap (vph)		372	427		427		137	876		53	778	655
v/s Ratio Prot							c0.06	0.24		0.02	c0.40	
v/s Ratio Perm		c0.25	0.03		0.06							0.17
v/c Ratio		0.83	0.10		0.20		0.61	0.46		0.49	0.86	0.36
Uniform Delay, d1		28.0	21.6		22.4		37.7	12.9		41.2	20.8	15.0
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		13.8	0.1		0.2		6.2	0.5		5.1	9.6	0.5
Delay (s)		41.8	21.7		22.5		43.9	13.4		46.3	30.3	15.5
Level of Service		D	C		C		D	B		D	C	B
Approach Delay (s)		35.7			22.5			18.7			26.1	
Approach LOS		D			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	26.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	86.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
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 (veh/h)	235	60	130	25	50	15	80	365	20	25	640	300
Future Volume (veh/h)	235	60	130	25	50	15	80	365	20	25	640	300
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1695	1709	1668	1695	1654	1641	1559	1695	1750	1695	1695	1682
Adj Flow Rate, veh/h	245	62	0	26	52	16	83	380	21	26	667	312
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	3	6	4	7	8	14	4	0	4	4	5
Cap, veh/h	392	76		146	258	70	103	875	48	29	846	711
Arrive On Green	0.26	0.26	0.00	0.26	0.26	0.26	0.07	0.55	0.53	0.02	0.50	0.50
Sat Flow, veh/h	1143	289	1414	309	981	265	1485	1592	88	1615	1695	1425
Grp Volume(v), veh/h	307	0	0	94	0	0	83	0	401	26	667	312
Grp Sat Flow(s),veh/h/ln	1432	0	1414	1555	0	0	1485	0	1680	1615	1695	1425
Q Serve(g_s), s	11.0	0.0	0.0	0.0	0.0	0.0	3.9	0.0	10.0	1.1	23.0	10.0
Cycle Q Clear(g_c), s	14.2	0.0	0.0	3.3	0.0	0.0	3.9	0.0	10.0	1.1	23.0	10.0
Prop In Lane	0.80		1.00	0.28		0.17	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	458	0		462	0	0	103	0	924	29	846	711
V/C Ratio(X)	0.67	0.00		0.20	0.00	0.00	0.81	0.00	0.43	0.90	0.79	0.44
Avail Cap(c_a), veh/h	602	0		618	0	0	440	0	972	479	981	825
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.5	0.0	0.0	20.5	0.0	0.0	32.5	0.0	9.4	34.7	14.7	11.4
Incr Delay (d2), s/veh	1.4	0.0	0.0	0.2	0.0	0.0	10.5	0.0	0.5	44.4	4.2	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	0.0	0.0	1.1	0.0	0.0	1.6	0.0	3.0	0.8	8.2	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.9	0.0	0.0	20.7	0.0	0.0	43.1	0.0	9.9	79.1	18.9	12.0
LnGrp LOS	C	A		C	A	A	D	A	A	E	B	B
Approach Vol, veh/h		307	A		94			484			1005	
Approach Delay, s/veh		25.9			20.7			15.6			18.3	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.3	43.0		22.6	8.9	39.3		22.6				
Change Period (Y+Rc), s	4.0	* 5.4		4.5	4.0	* 5.4		4.5				
Max Green Setting (Gmax), s	21.0	* 40		25.5	21.0	* 40		25.5				
Max Q Clear Time (g_c+I1), s	3.1	12.0		16.2	5.9	25.0		5.3				
Green Ext Time (p_c), s	0.0	6.2		1.9	0.2	8.9		0.2				

Intersection Summary		
HCM 6th Ctrl Delay		19.0
HCM 6th LOS		B

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

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

Signalized Intersection Operations - "Hand" Calculations

Xc = Sum of critical flow ratios * C/(C-L)

C	Cycle Length	
L	Lost time per phase	4s
Total Lost time	16	

			Adj. Flow	Sat. Flow	
PM	**7**	**EBT**	62	289	0.214533
		NBL	83	1485	0.055892
		SBT	667	1695	0.39351
					0.663935
		c	100		
		L	12		
		0.79			
		B			
		19			

10: River Rd /River Rd & Brooklake Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	20	89	19	281	125	165	32	108	118	269	135	25
Vehicles Exited	20	90	18	279	125	165	32	109	119	269	134	25
Hourly Exit Rate	20	90	18	279	125	165	32	109	119	269	134	25
Input Volume	20	90	15	270	125	160	35	110	120	260	135	20
% of Volume	99	100	118	103	100	103	92	99	99	104	99	123
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

10: River Rd /River Rd & Brooklake Rd Performance by movement

Movement	All
Vehicles Entered	1386
Vehicles Exited	1385
Hourly Exit Rate	1385
Input Volume	1360
% of Volume	102
Denied Entry Before	0
Denied Entry After	0

20: Huff Ave & Brooklake Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	0	533	1	21	522	3	4	1	58	4	1	2
Vehicles Exited	0	533	1	21	523	3	4	1	57	4	2	2
Hourly Exit Rate	0	533	1	21	523	3	4	1	57	4	2	2
Input Volume	1	526	1	20	508	2	5	1	60	5	1	1
% of Volume	0	101	100	106	103	150	76	100	95	76	200	200
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

20: Huff Ave & Brooklake Rd Performance by movement

Movement	All
Vehicles Entered	1150
Vehicles Exited	1151
Hourly Exit Rate	1151
Input Volume	1132
% of Volume	102
Denied Entry Before	0
Denied Entry After	0

30: Truckman Way & Brooklake Rd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	568	5	63	555	1	74	1266
Vehicles Exited	568	5	63	555	1	73	1265
Hourly Exit Rate	568	5	63	555	1	73	1265
Input Volume	568	5	65	539	2	75	1255
% of Volume	100	95	97	103	50	97	101
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

35: Driveway/Maytrucking & Brooklake Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR	All
Vehicles Entered	2	610	49	135	547	21	33	181	34	25	1637
Vehicles Exited	2	610	49	135	546	21	33	182	34	25	1637
Hourly Exit Rate	2	610	49	135	546	21	33	182	34	25	1637
Input Volume	2	616	48	140	542	20	30	175	40	20	1634
% of Volume	100	99	103	96	101	104	109	104	86	123	100
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0

40: I-5 SB On-Ramp/I-5 SB Off-Ramp & Brooklake Rd Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Vehicles Entered	324	495	322	393	48	1	311	1894
Vehicles Exited	323	494	321	393	50	1	312	1894
Hourly Exit Rate	323	494	321	393	50	1	312	1894
Input Volume	326	500	335	394	45	1	310	1911
% of Volume	99	99	96	100	112	100	101	99
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0

50: I-5 NB Off-Ramp/I-5 NB On-Ramp & Brooklake Rd Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Vehicles Entered	152	208	478	46	233	1	233	1351
Vehicles Exited	152	209	479	45	235	1	236	1357
Hourly Exit Rate	152	209	479	45	235	1	236	1357
Input Volume	145	207	490	45	240	1	240	1368
% of Volume	105	101	98	100	98	100	98	99
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0

60: Brooklake Rd & 50th Ave Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	3	448	507	3	1	12	974
Vehicles Exited	3	448	507	3	1	12	974
Hourly Exit Rate	3	448	507	3	1	12	974
Input Volume	5	449	516	2	2	15	989
% of Volume	60	100	98	150	50	79	98
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

61: S/S Covanta & Brooklake Rd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	438	7	4	492	19	7	967
Vehicles Exited	438	7	4	491	18	7	965
Hourly Exit Rate	438	7	4	491	18	7	965
Input Volume	442	7	5	500	17	5	976
% of Volume	99	97	80	98	104	140	99
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

70: Portland Rd NE & Brooklake Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	229	81	130	24	49	13	82	369	18	23	634	288
Vehicles Exited	228	81	131	24	48	13	83	369	18	23	637	289
Hourly Exit Rate	228	81	131	24	48	13	83	369	18	23	637	289
Input Volume	235	76	130	25	50	15	80	365	20	25	640	300
% of Volume	97	106	101	95	96	85	104	101	89	91	100	96
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

70: Portland Rd NE & Brooklake Rd Performance by movement

Movement	All
Vehicles Entered	1940
Vehicles Exited	1944
Hourly Exit Rate	1944
Input Volume	1962
% of Volume	99
Denied Entry Before	0
Denied Entry After	0

Total Network Performance

Vehicles Entered	3870
Vehicles Exited	3886
Hourly Exit Rate	3886
Input Volume	21753
% of Volume	18
Denied Entry Before	1
Denied Entry After	0

Intersection: 10: River Rd /River Rd & Brooklake Rd

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	115	895	158	396
Average Queue (ft)	47	474	63	159
95th Queue (ft)	85	1045	113	342
Link Distance (ft)	2435	2452	4239	4358
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 20: Huff Ave & Brooklake Rd

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	5	129	116	35
Average Queue (ft)	0	18	39	8
95th Queue (ft)	4	77	80	31
Link Distance (ft)	2452	324	1075	1324
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 30: Truckman Way & Brooklake Rd

Movement	EB	WB	NB
Directions Served	TR	L	LR
Maximum Queue (ft)	32	127	136
Average Queue (ft)	2	50	62
95th Queue (ft)	17	109	113
Link Distance (ft)	324		311
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		150	
Storage Blk Time (%)		0	
Queuing Penalty (veh)		1	

Intersection: 35: Driveway/Maytrucking & Brooklake Rd

Movement	EB	WB	NB	SB
Directions Served	LTR	L	LTR	LTR
Maximum Queue (ft)	32	96	290	152
Average Queue (ft)	1	45	137	53
95th Queue (ft)	12	77	268	115
Link Distance (ft)	251		267	204
Upstream Blk Time (%)			7	0
Queuing Penalty (veh)			0	0
Storage Bay Dist (ft)		150		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 40: I-5 SB On-Ramp/I-5 SB Off-Ramp & Brooklake Rd

Movement	EB	EB	WB	WB	SB	SB	B29
Directions Served	T	R	L	T	LT	R	T
Maximum Queue (ft)	74	77	394	376	706	368	187
Average Queue (ft)	3	32	156	40	218	125	23
95th Queue (ft)	32	67	338	273	691	304	235
Link Distance (ft)	341			684	1077		3169
Upstream Blk Time (%)				0	4		
Queuing Penalty (veh)				2	0		
Storage Bay Dist (ft)		25	350			250	
Storage Blk Time (%)	0	2	5	0	17	5	
Queuing Penalty (veh)	0	5	21	0	54	2	

Intersection: 50: I-5 NB Off-Ramp/I-5 NB On-Ramp & Brooklake Rd

Movement	EB	EB	WB	WB	NB	NB	B28
Directions Served	L	T	T	R	L	TR	T
Maximum Queue (ft)	109	5	52	26	760	416	108
Average Queue (ft)	44	0	2	1	397	178	13
95th Queue (ft)	92	3	27	11	947	513	117
Link Distance (ft)		684	474		1092		1937
Upstream Blk Time (%)					4		
Queuing Penalty (veh)					0		
Storage Bay Dist (ft)	250			50		400	
Storage Blk Time (%)			0		27		
Queuing Penalty (veh)			0		66		

Intersection: 60: Brooklake Rd & 50th Ave

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	42	28
Average Queue (ft)	2	8
95th Queue (ft)	20	24
Link Distance (ft)	474	1343
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 61: S/S Covanta & Brooklake Rd

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	47	80
Average Queue (ft)	3	22
95th Queue (ft)	22	61
Link Distance (ft)		490
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	125	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 70: Portland Rd NE & Brooklake Rd

Movement	EB	EB	WB	NB	NB	SB	SB	SB	B24
Directions Served	LT	R	LTR	L	TR	L	T	R	T
Maximum Queue (ft)	384	158	128	182	266	211	521	175	642
Average Queue (ft)	195	5	52	70	107	32	335	116	205
95th Queue (ft)	325	81	102	136	204	130	591	227	861
Link Distance (ft)	516		2912		618		434		2173
Upstream Blk Time (%)							11		
Queuing Penalty (veh)							0		
Storage Bay Dist (ft)		300		180		175		100	
Storage Blk Time (%)	2				1		28	1	
Queuing Penalty (veh)	3				1		91	8	

Network Summary

Network wide Queuing Penalty: 254

Attachment E: Freeway Facilities Output (HCS7)

HCS7 Freeway Facilities Report

Project Information

Analyst	DIMA	Date	11/10/2020
Agency	David Evans and Associates, Inc	Analysis Year	2020
Jurisdiction	ODOT	Time Period Analyzed	700 to 800
Project Description	Brooklake IAMP NB AM	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	5
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	2.85		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-5 NB Mainline	5280	3
2	Diverge	Diverge	Brooklake off-ramp	1500	3
3	Basic	Basic	I-5 NB Mainline	2340	3
4	Merge	Basic	Brooklake on-ramp	625	4
5	Basic	Basic	I-5 NB Mainline	5280	3

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.882	4279	6882	0.62	66.5	21.4	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.92	0.90	0.882	0.882	4279	645	6824	2033	0.63	0.32	62.6	58.5	22.8	25.6	C

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.882	3648	6882	0.53	66.8	18.1	C

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.92	0.90	0.882	0.836	3648	0	9223	2100	0.40	0.00	68.1	68.2	13.4	13.4	B

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS

1	0.94	0.878	3586	6882	0.52	67.0	17.8	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	66.3	19.4	17.0	2.60	C

Facility Overall Results

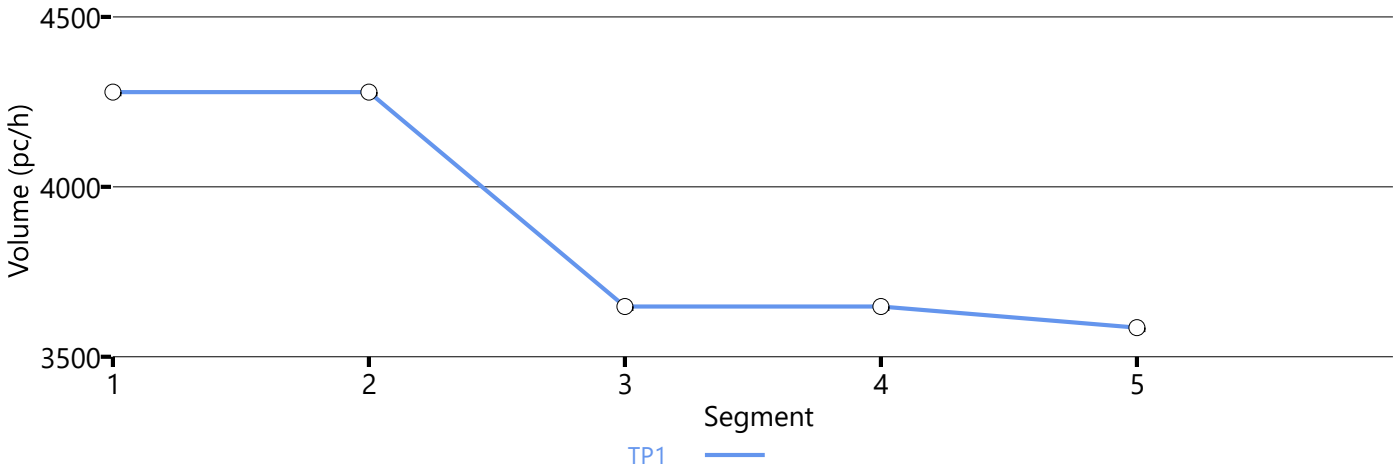
Space Mean Speed, mi/h	66.3	Density, veh/mi/ln	17.0
Average Travel Time, min	2.60	Density, pc/mi/ln	19.4

Messages

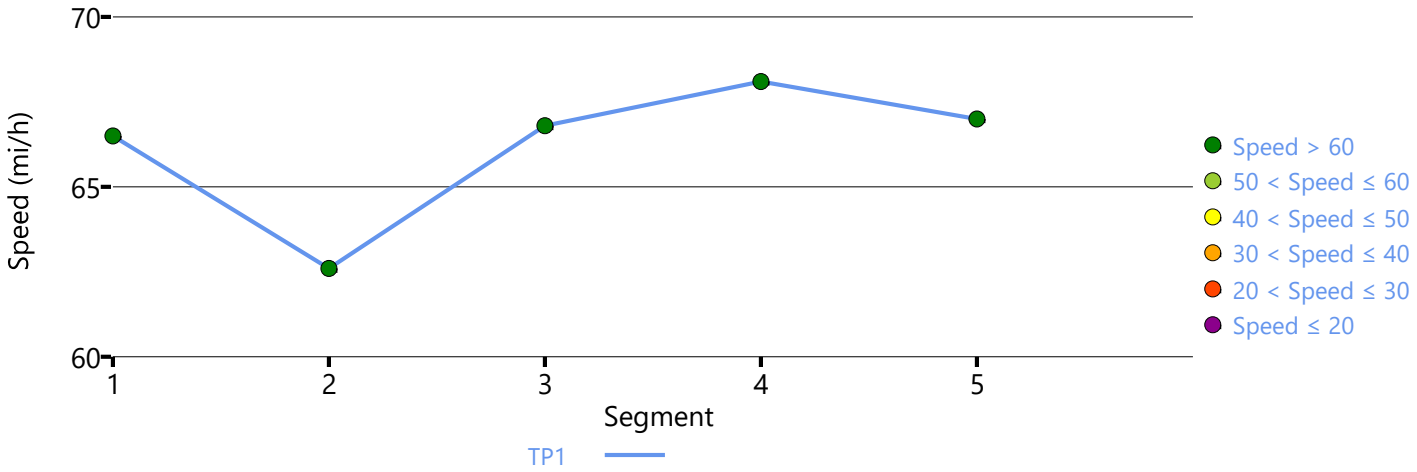
ERROR 1	Acceleration lane length is longer than the segment length for merge segment 4.

Comments

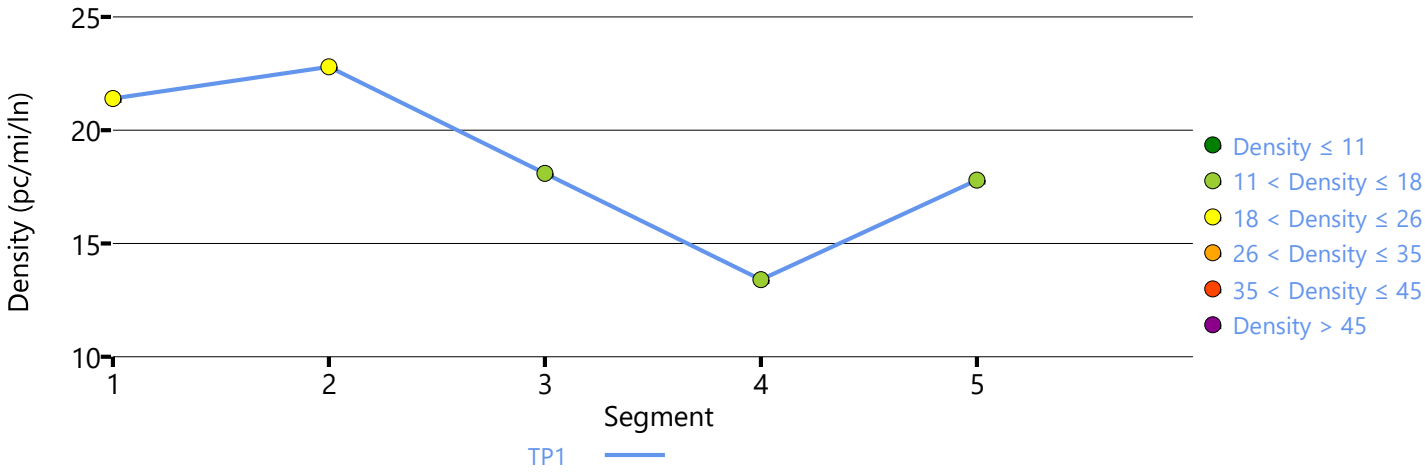
Volume Distribution



Speed Distribution



Density Distribution



HCS7 Freeway Facilities Report

Project Information

Analyst	DIMA	Date	11/10/2020
Agency	David Evans and Associates, Inc.	Analysis Year	2020
Jurisdiction	ODOT	Time Period Analyzed	0700 to 0800
Project Description	Brooklake IAMP SB AM	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	5
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	2.84		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-5 SB Mainline	5280	3
2	Diverge	Diverge	Brooklake off-ramp	1500	3
3	Basic	Basic	I-5 SB Mainline	2260	3
4	Merge	Basic	Brooklake on-ramp	650	4
5	Basic	Basic	I-5 SB Mainline	5280	3

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.833	3381	6853	0.49	66.0	17.1	B

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.833	0.750	3381	232	6824	2100	0.50	0.11	63.7	59.8	17.7	17.1	B

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.833	3179	6882	0.46	66.8	15.8	B

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.833	0.819	3944	765	9223	2033	0.43	0.38	68.1	68.2	14.5	14.5	B

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS

1	0.98	0.829	3927	6882	0.57	66.9	19.6	C

Facility Time Period Results

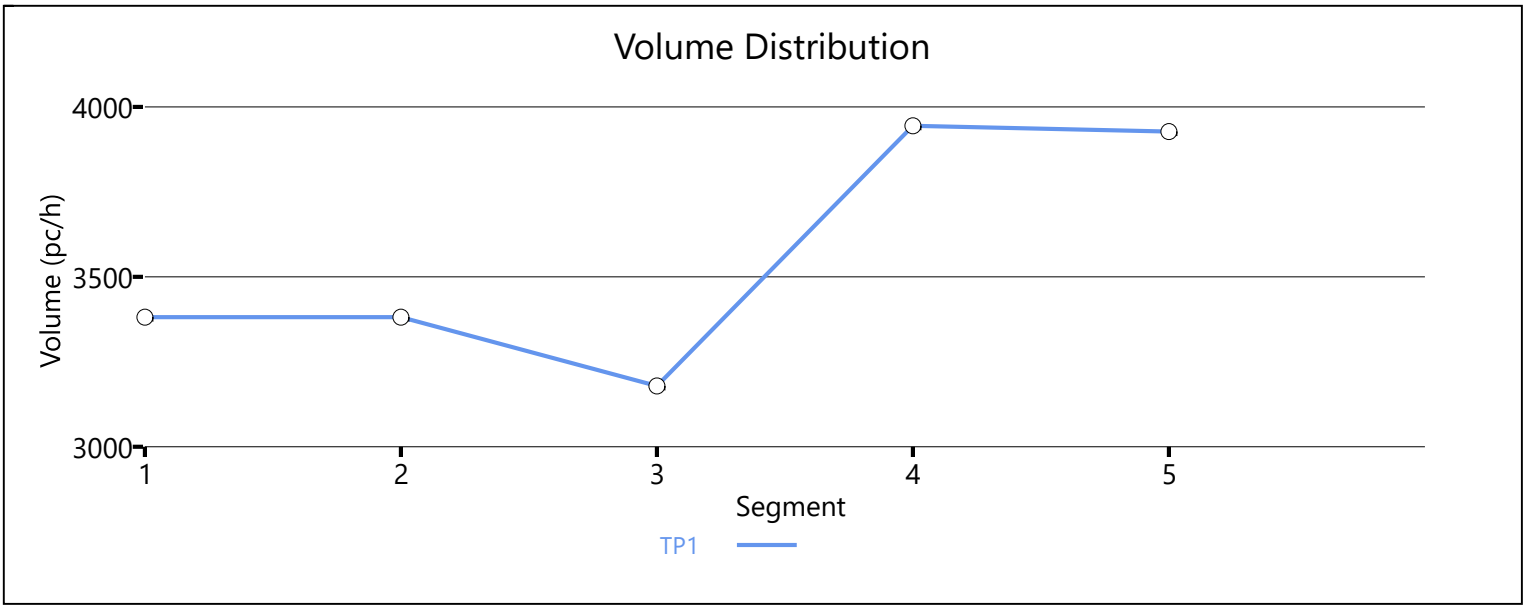
T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	66.3	17.7	14.7	2.60	C

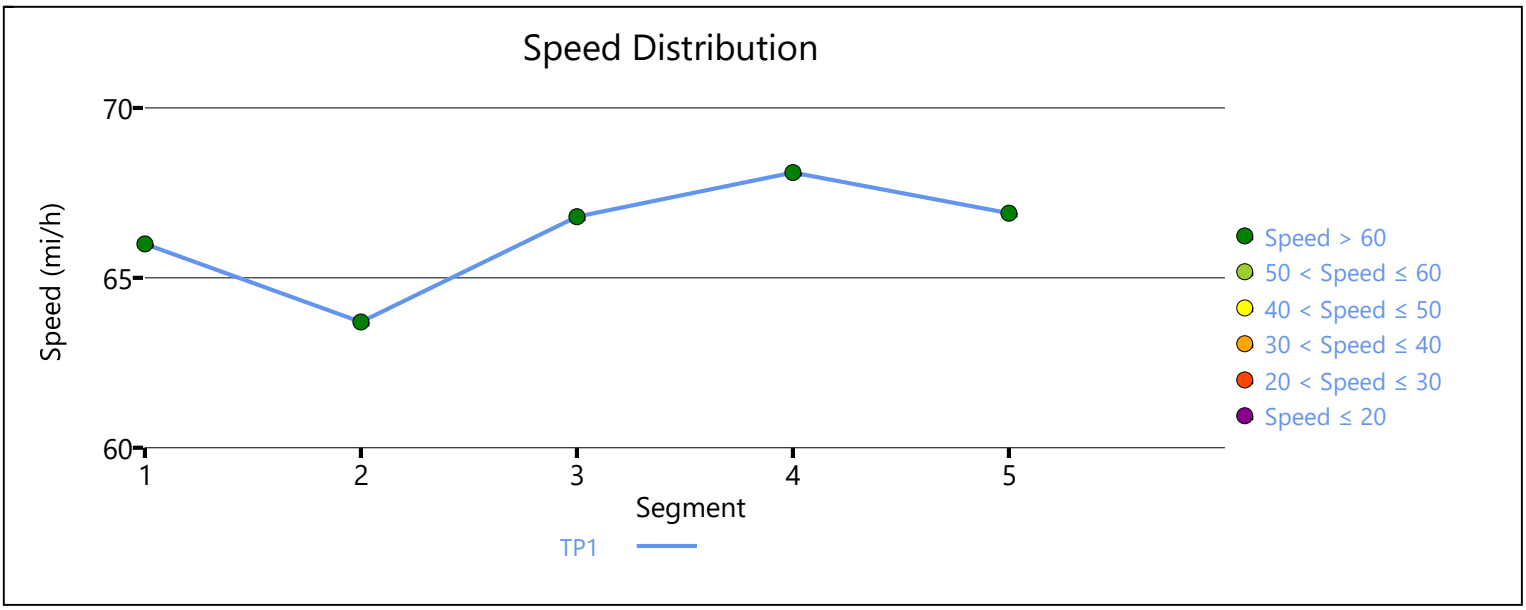
Facility Overall Results

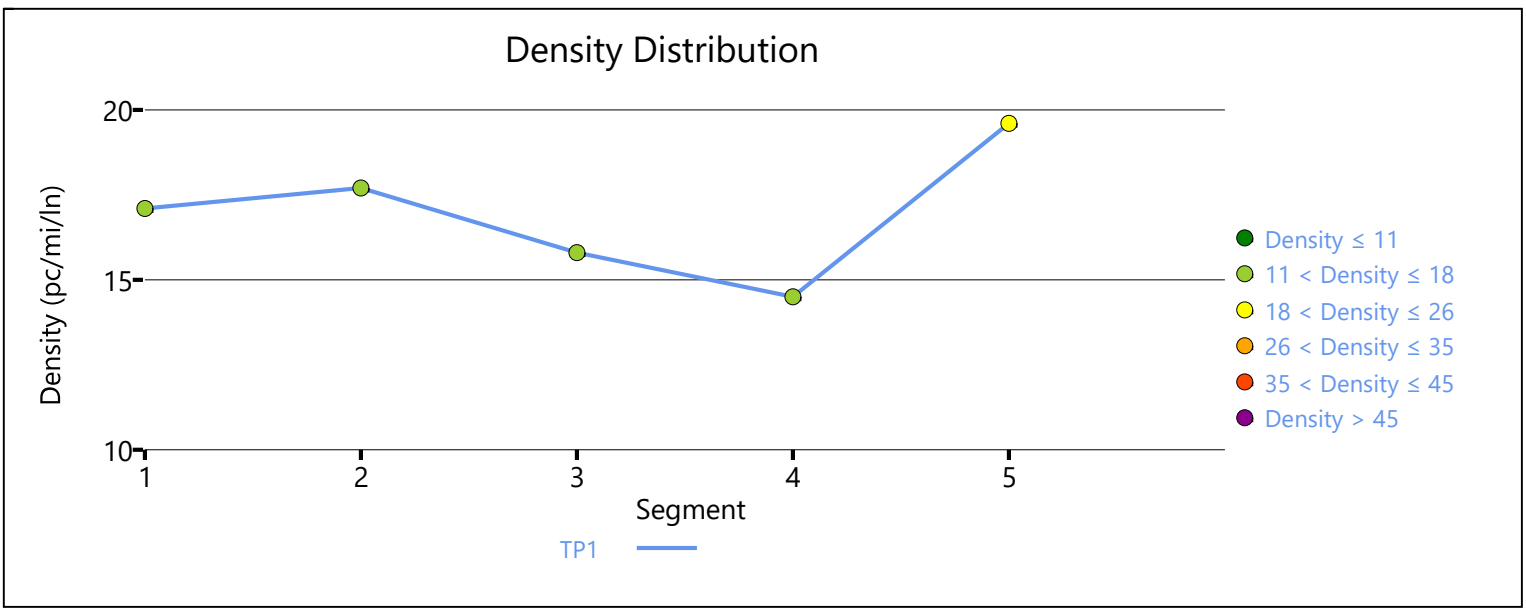
Space Mean Speed, mi/h	66.3	Density, veh/mi/ln	14.7
Average Travel Time, min	2.60	Density, pc/mi/ln	17.7

Messages

Comments







HCS7 Freeway Facilities Report

Project Information

Analyst	DIMA	Date	11/10/2020
Agency	David Evans and Associates, Inc	Analysis Year	2020
Jurisdiction	ODOT	Time Period Analyzed	1630 to 1730
Project Description	Brooklake IAMP NB PM	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	5
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	2.85		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-5 NB Mainline	5280	3
2	Diverge	Diverge	Brooklake off-ramp	1500	3
3	Basic	Basic	I-5 NB Mainline	2340	3
4	Merge	Basic	Brooklake on-ramp	625	4
5	Basic	Basic	I-5 NB Mainline	5280	3

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.97	0.884	4485	6882	0.65	66.0	22.7	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.97	0.93	0.884	0.870	4485	594	6824	2033	0.66	0.29	62.7	58.6	23.8	26.4	C

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.97	0.884	3924	6882	0.57	66.8	19.6	C

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.97	0.93	0.884	0.842	4167	243	9223	2100	0.45	0.12	68.1	68.2	15.3	15.3	B

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS

1	0.97	0.884	4146	6882	0.60	66.7	20.7	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	66.1	21.2	18.8	2.60	C

Facility Overall Results

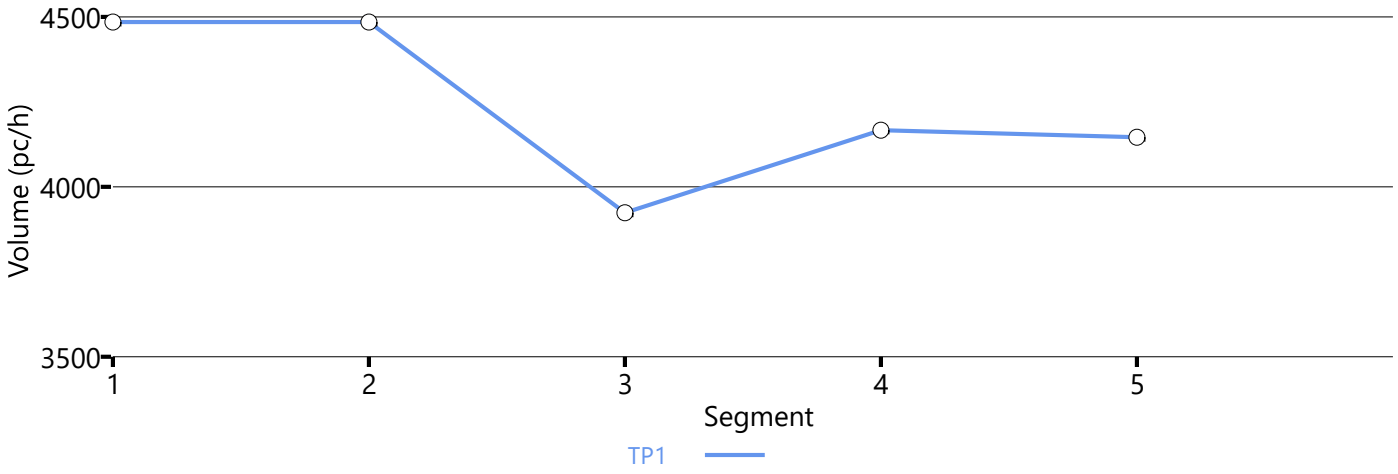
Space Mean Speed, mi/h	66.1	Density, veh/mi/ln	18.8
Average Travel Time, min	2.60	Density, pc/mi/ln	21.2

Messages

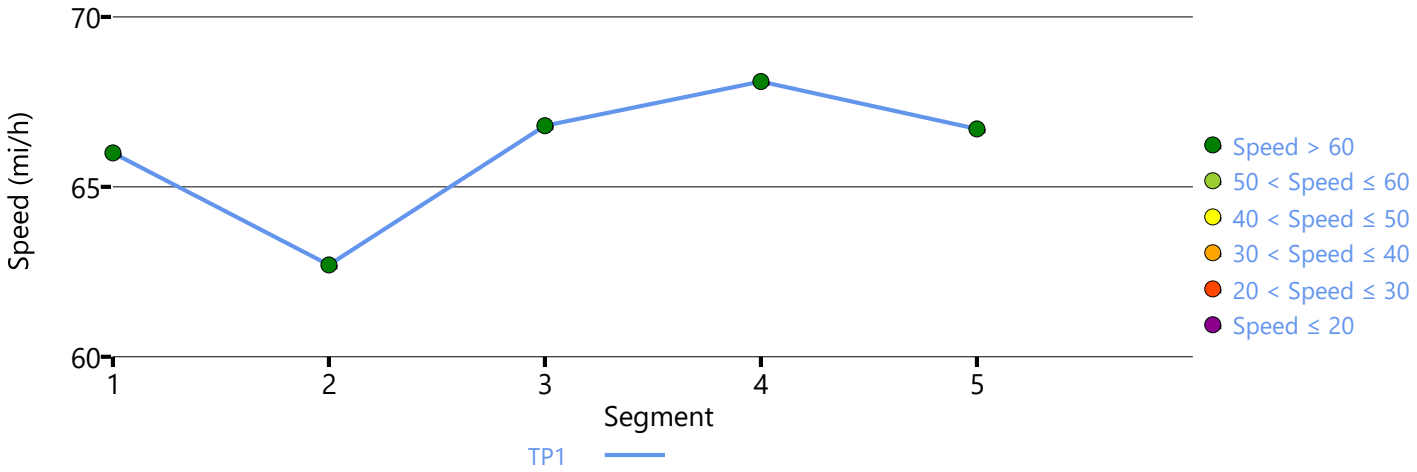
ERROR 1	Acceleration lane length is longer than the segment length for merge segment 4.

Comments

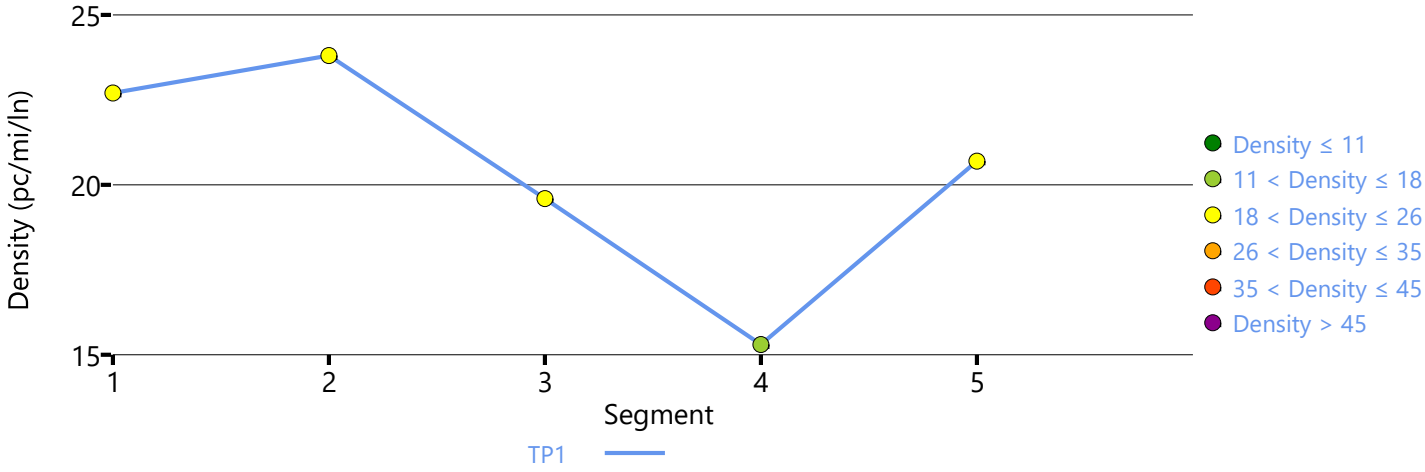
Volume Distribution



Speed Distribution



Density Distribution



HCS7 Freeway Facilities Report

Project Information

Analyst	DIMA	Date	11/10/2020
Agency	David Evans and Associates, Inc.	Analysis Year	2020
Jurisdiction	ODOT	Time Period Analyzed	1630 to 1730
Project Description	Brooklake IAMP SB PM	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	5
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	2.84		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-5 SB Mainline	5280	3
2	Diverge	Diverge	Brooklake off-ramp	1500	3
3	Basic	Basic	I-5 SB Mainline	2260	3
4	Merge	Basic	Brooklake on-ramp	650	4
5	Basic	Basic	I-5 SB Mainline	5280	3

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.99	0.916	4773	6882	0.69	65.2	24.4	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.97	0.95	0.916	0.897	4871	417	6824	2100	0.71	0.20	63.3	59.4	25.7	24.3	C

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.99	0.916	4381	6882	0.64	66.3	22.0	C

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.99	0.95	0.916	0.912	5345	964	9223	2033	0.58	0.47	67.9	67.9	19.7	19.7	C

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS

1	0.98	0.917	5350	6882	0.78	62.7	28.4	D

Facility Time Period Results

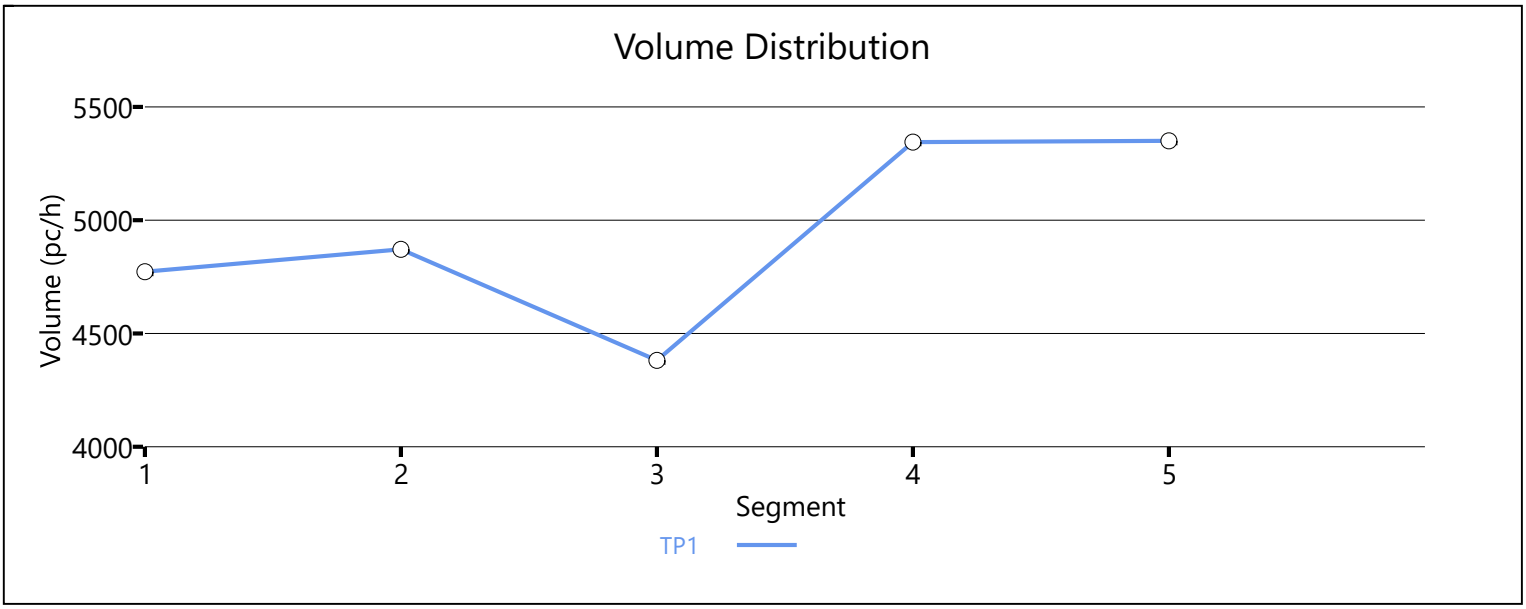
T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	64.3	25.3	23.2	2.60	D

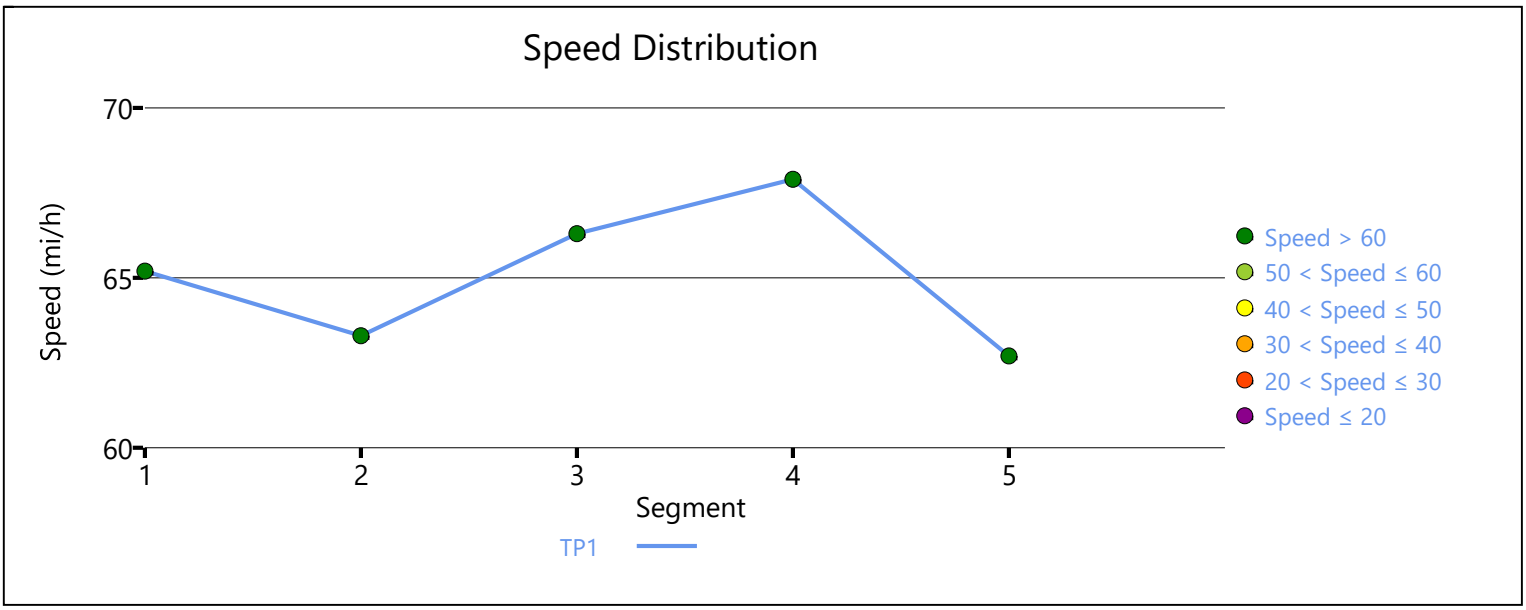
Facility Overall Results

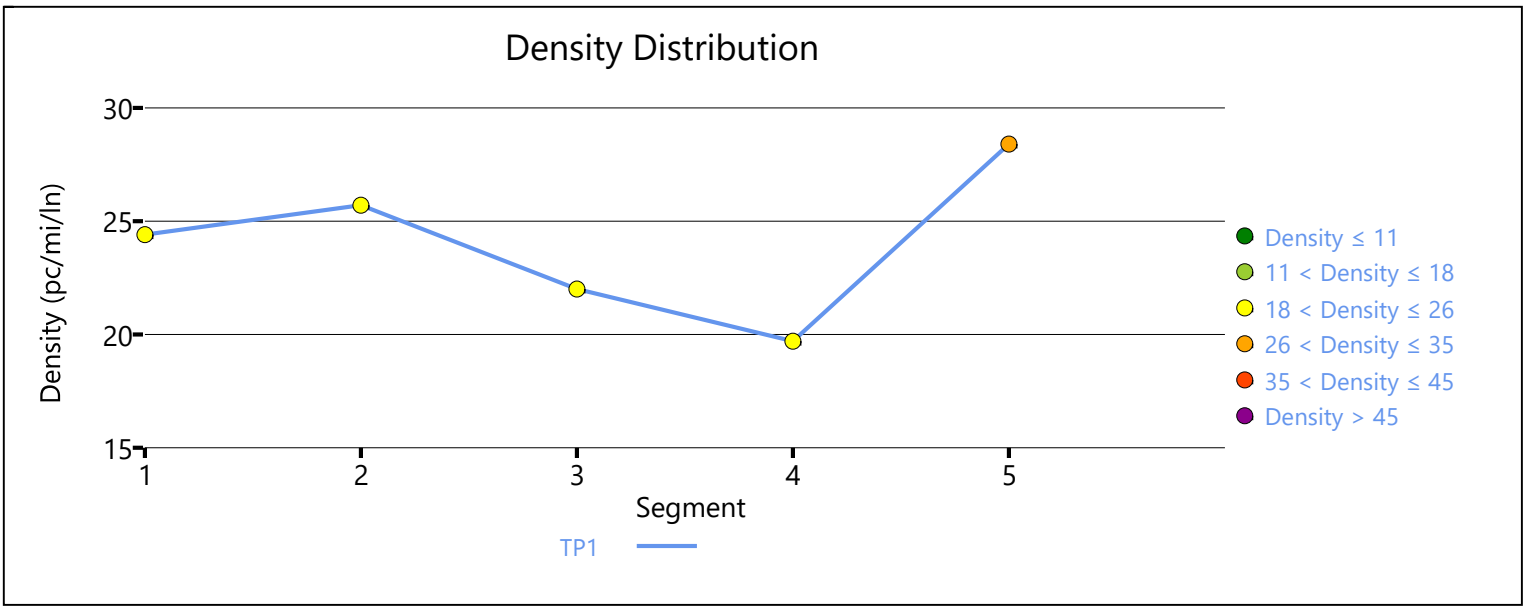
Space Mean Speed, mi/h	64.3	Density, veh/mi/ln	23.2
Average Travel Time, min	2.60	Density, pc/mi/ln	25.3

Messages

Comments







Attachment F: Crash Calculations

General & Site Information	
Analyst:	AARO
Agency/Company:	David Evans and Associates
Date:	12/22/2020
Project Name:	Brooks IAMP

Intersection Crash Data

Intersection	Intersection Type	Year					Total
		2014	2015	2016	2017	2018	
River Rd	Rural 4ST	4	4	2	4	5	19
Huff Ave	Rural 4ST	4	2	0	1	0	7
Truckman Way	Rural 3ST	0	0	0	2	2	4
I-5 SB Ramps	Rural 3ST	9	5	6	4	5	29
I-5 NB Ramps	Rural 3ST	8	10	11	14	11	54
50th Ave	Rural 3ST	2	0	5	4	3	14
Portland Rd (OR99E)	Rural 4SG	11	4	5	4	4	28
							0
							0
							0
							0
	Total	38	25	29	33	30	155

Intersection Population Type Crash Rate

Average Crash Rate per intersection type

Intersection Pop. Type	Sum of Crashes	Sum of 5-year MEV	Avg Crash Rate for Ref Pop.	INT in Pop
Rural 3SG	0	0		
Rural 3ST	101	150	0.6744	4
Rural 4SG	28	50	0.5560	1
Rural 4ST	26	45	0.5810	2
Urban 3ST	0	0		
Urban 3SG	0	0		
Urban 4ST	0	0		
Urban 4SG	0	0		

Intersection	90th %ile
Rural 3SG	0.464
Rural 3ST	0.475
Rural 4SG	0.579
Rural 4ST	1.08

Critical Rate Calculation

Intersection	AADT Entering Intersection	5-year MEV	Crash Total	Intersection Population Type	Intersection Crash Rate	Reference Population Crash Rate	Critical Rate	Over Critical	Over 90th %
River Rd	12,454	22.7	19	Rural 4ST	0.84	APM Exhibit 4-1			Under
Huff Ave	12,066	22.0	7	Rural 4ST	0.32	APM Exhibit 4-1			Under
Truckman Way	17,342	31.7	4	Rural 3ST	0.13	APM Exhibit 4-1			Under
I-5 SB Ramps	22,619	41.3	29	Rural 3ST	0.70	APM Exhibit 4-1			**Over**
I-5 NB Ramps	18,865	34.4	54	Rural 3ST	1.57	APM Exhibit 4-1			**Over**
50th Ave	23,230	42.4	14	Rural 3ST	0.33	APM Exhibit 4-1			Under
Portland Rd (OR99E)	27,594	50.4	28	Rural 4SG	0.56	APM Exhibit 4-1			Under
			0						
			0						
			0						
			0						

General & Site Information	
Analyst:	AARO
Agency/Company:	David Evans and Associates, Inc.
Date:	1/15/2021
Project Name:	Brooks IAMP

Reference Population Type Crash Rates

Segment Reference Population Type	Population Type Number	No. of Segs in Reference Population	Sum of Crashes	Sum of MVMT	Avg Crash Rate for Ref Pop.
Rural Interstate Freeway	1	2	114	464.4	0.25
	2				
	3				
	4				
	5				
	6				

Critical Rate Calculation

Segment	Ref. Pop. Type	Begin Milepoint	End Milepoint	5 Year Crash Total	AADT	Segment Length	Pop. Type Number	MVMT	Segment Crash Rate	Ref. Pop. Crash Rate	Critical Rate	Over Critical	Over State Hwy	Table II		
100	Rural Interstate Freeway	262.2	263.5	54	103400	1.26	1	237.77	0.23				Under	0.38	I-5	1
200	Rural Interstate Freeway	263.5	264.8	60	97800	1.27	1	226.68	0.26				Under	0.38	I-5	1

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4 TECHNICAL MEMORANDUM #4

Evaluate Future Conditions

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TECHNICAL MEMORANDUM #4

Evaluate Future Conditions (Task 4.5)

Date: May 4, 2021

To: Oregon Department of Transportation, Region 2
Marion County

From: David Evans and Associates, Inc.

Subject: I-5: Brooks Interchange Area Management Plan (Exit 263)

Contents

Overview

This memorandum summarizes future year 2043 no-build (baseline) traffic conditions in the study area for the Brooks Interchange Area Management Plan (IAMP). It includes a review of the future demand the interchange is expected to serve and the results of the future baseline traffic analysis. The information presented in this memorandum will identify future deficiencies and inform the development of transportation concepts and strategies for the IAMP. The documentation of potential land use and environmental constraints are in a separate memorandum (*Technical Memorandum #5*).

Future Population and Employment

The Brooks-Hopmere Community Plan reviewed the anticipated growth in population and employment in the Brooks-Hopmere area through year 2040. The Brooks interchange serves the unincorporated community, which expects a relatively modest residential growth and more significant growth in employment lands (commercial, industrial, institutional uses).

Table 1. Brooks-Hopmere Unincorporated Community Population and Employment Forecast

Description	Year 2020	Year 2040[1]
Population	543	595 - 650
Employment	1,567	1,870 – 2,420

Source: *Draft Brooks-Hopmere Community Plan*, May 2020

Note:
1. Future 2040 estimates reflect rounded numbers

Currently, there are approximately 543 residents and 1,567 employees in the Brooks-Hopmere community and Table 1 summarizes the future population and employment estimates. This estimate reflects employment projections for the region, as well as short and potential longer-term expansion plans of several key businesses in the interchange area, further described below. The estimate does not preclude other existing or new businesses from further developing or expanding in the community.

Potential for Growth in IAMP study area:

- May Trucking – The freight company has space available for growth on its site and neighboring parcels.
- NORPAC/Oregon Potato – The site known as NORPAC was purchased by Oregon Potato, and they plan to continue to operate and expand the facility's workforce.
- Chemeketa Community College – The community college has seen continued success with its various programs and has opportunities with local businesses and public entities to continue to operate and enhance existing programs and to establish new programs. The site includes several acres of land that can serve potential future expansion needs.
- Curry and Company – The company exports agricultural products internationally and intends to continue to use their 6-acre facility for its highest and best use.
- Pilot Travel Center – The facility provides services for freight and I-5 travelers, serving approximately 35,000 customers a week.

The City of Keizer also uses the interchange as a "backdoor" to their community. The city is considering an expansion of their Urban Growth Boundary (UGB), north of their city limits. If the UGB expansion occurs, traffic generated would have an impact on the Brooklake interchange and surrounding roadways. Specifically, the interchange ramp terminals, the intersection of River Road at Brooklake Road, and Brooklake Road between River Road and the interchange.[1]

Future (2043) Baseline Traffic Analysis

The future baseline traffic operations analysis identifies how the study intersections will operate under year 2043 traffic conditions during the weekday PM peak hour, assuming no improvements have been made to the transportation system in the study area beyond any currently planned and programmed projects.

[1] Keizer Growth Transportation Impacts Study, October 2020.

Traffic Volume Development

Forecast traffic volumes were developed for the study intersections located within the study area based on the existing traffic counts and information provided in the Oregon Statewide Integrated Model (SWIM) and historic Marion County traffic counts.

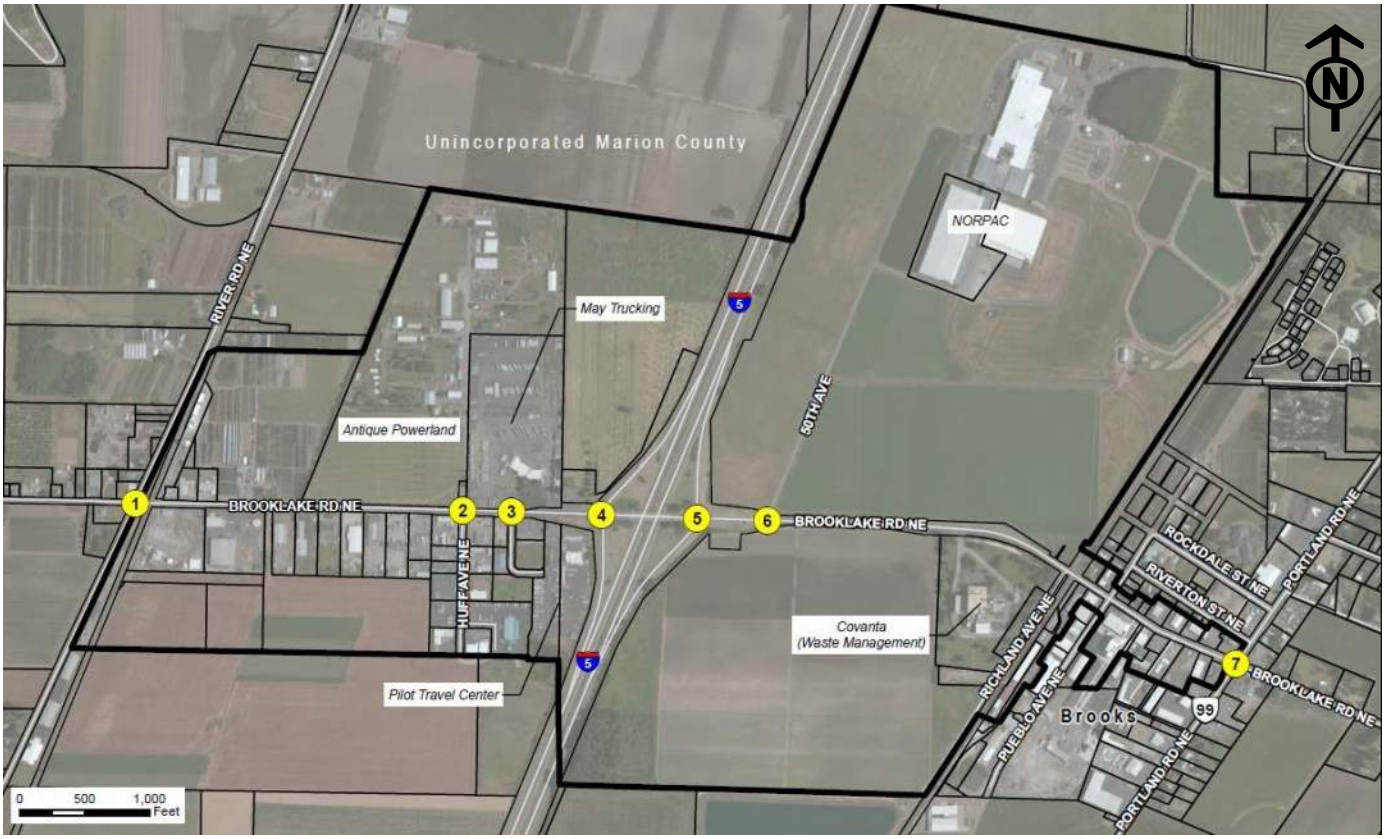
Original methodology coordination with ODOT suggested the use of ODOT's published future volume tables for development of growth factors. However, the following issues were determined to be associated with the future volume table method:

- PM trends were requested, and the future volume tables are daily.
- The Brooks Interchange is on the external boundary of the Salem-Keizer Area Transportation Study (SKATS) model. External stations in travel demand models are typically unreliable for modeled projections.

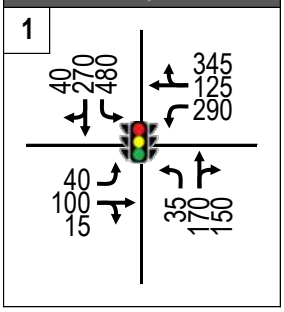
Because of these conditions, the ODOT Transportation Planning Analysis Unit (TPAU) suggested trends from the Statewide Integrated Model (SWIM) be provided for the study area. The 2010 and 2040 model volumes were originally requested, however SWIM years equivalent to Statewide Population estimates for years 2011 and 2044 were used to calculate an annual growth rates for roadway segments in the study area. 2011 and 2044 were the closest years available to those requested. The TPAU methodology memo and SWIM growth rate estimates are available as an attachment.

The annual growth rate was applied to the existing link volumes and the 2043 forecast traffic turning movement volumes were developed by applying the post-processing methodology presented in the National Cooperative Highway Research Program (NCHRP) Report 765, in conjunction with engineering judgment and knowledge of the study area. Figure 1 summarizes the year 2043 traffic volumes developed at the study intersections for the traffic operations analysis.[2]

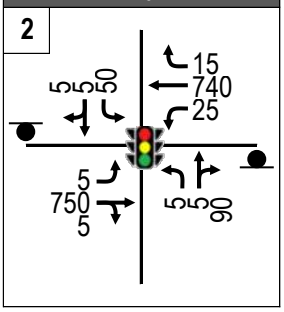
[2] Traffic volumes consider existing land uses and approved developments.



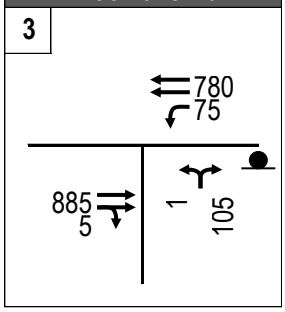
River Rd at Brooklake Rd



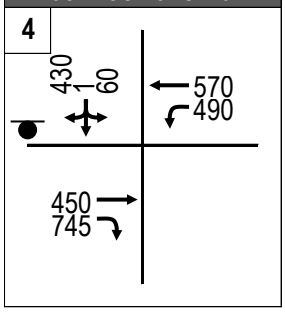
Huff Ave at Brooklake Rd



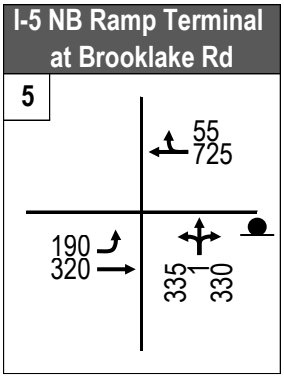
Truckman Way at Brooklake Rd



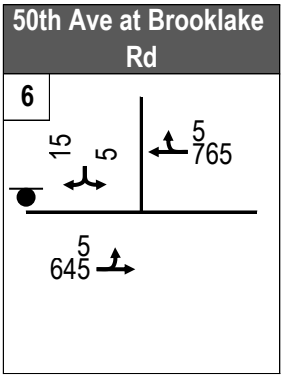
I-5 SB Ramp Terminal at Brooklake Rd



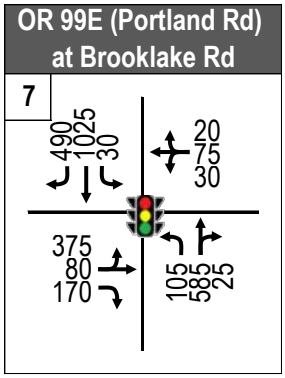
I-5 NB Ramp Terminal at Brooklake Rd



50th Ave at Brooklake Rd



OR 99E (Portland Rd) at Brooklake Rd



Brooks Interchange Area Management Plan

Legend

(##) Study Area Intersection

Turning Movement Volume

Lane Configuration

STOP Controlled Approach

Signalized Intersection

Figure 1

Future Baseline *(2043)*
PM Peak Hour
Turning Movement Volumes

Operations Analysis

Planned Projects

The transportation network used to evaluate the future conditions includes projects that are expected to occur by year 2043. These projects have known funding sources or are programmed to be funded through the planning horizon.

There are three projects expected to impact the future traffic operations analysis within the study area. The SKATS Regional Transportation System Plan (RTSP) identifies two new traffic signals and a roadway widening project for a section of Brooklake Road. The conceptual details for the purpose of analysis were developed through coordination with ODOT, SKATS and Marion County and are summarized in Table 2.

Table 2. Planned Projects

Project Name/ Location	Description	Category[1]	Brooks IAMP Analysis Assumptions[2]
River Rd NE at Brooklake Rd NE	Signalize and realign intersection. Assume 50 percent developer funded.	Included	• Signalize intersection • Dedicated left-turn lanes on all approaches
Brooklake Rd N at Huff Ave	Add traffic signal and turn lanes. Assume 50 percent developer funded.[3]	Included	• Signalize intersection • Dedicated left-turn lanes on all approaches • Drop westbound right-turn lane
Brooklake Rd: River Rd to Huff Ave	Widen to two lanes each direction with turn lanes. Assume 50 percent is developer funded	Included	• 5-lane between Huff Ave and SB Ramp Terminal • Westbound right-turn is a drop lane at Huff Ave • Eastbound right-turn is a drop lane at SB Ramp Terminal • 3-lanes between River Rd and Huff Ave

Source: Project List for the SKATS 2019 – 2043 RTSP

Notes:

1. Category: A committed project is one that has funding identified (including local match) and will be built within the next five years. The project is typically also in the TIP. Projects that are listed as included have the highest priority to be constructed in the next 20 years, and funding is reasonably anticipated to be available.
2. Brooks IAMP Analysis Assumptions: Conceptual details assumed for the Brooks IAMP analysis.
3. Assumes signal warrants are met.

Intersection Operations

Table 3 summarizes the results of the intersection operations analysis. The analysis reflects the calibrated conditions developed as part of the existing conditions analysis with peak hour. The signal timing for the new traffic signals follows guidance from the ODOT Analysis Procedures Manual version 2 (APMv2) and the splits at existing signals were optimized while maintaining the existing cycle length. Field observations indicate that during the peak hour, the single lane northbound exit ramp and single lane southbound exit ramp each operate as if they had a two-lane approach. The analysis reflects the field observations.

Table 3. Future (Year 2043) PM Peak Hour Traffic Operations Analysis Results

Intersection (Control Type)	Critical Movement[1]	V/C Ratio	LOS	Jurisdiction	Mobility Target[2,3]
1. River Rd at Brooklake Rd (Signal)	Overall	0.74	C	Marion Co.	LOS D, 0.85
2. Huff Ave at Brooklake Rd (Signal)	Overall	0.69	B	Marion Co.	LOS E, 0.90
3. Truckman Way at Brooklake Rd (TWSC)	WB L	0.23	C	Marion Co.	LOS E, 0.90
	NB L/T/R	0.34	C		
4. I-5 SB Ramps at Brooklake Rd (TWSC)	WB L	**0.86**	E	ODOT	0.85
	SB L	**>2.00**	F		
5. I-5 NB Ramps at Brooklake Rd (TWSC)	EB L	0.25	B	ODOT	0.85
	NB L	**>2.00**	F		
6. 50th Ave at Brooklake Rd (TWSC)	EB L	0.01	A	Marion Co.	LOS E, 0.90
	SB L/R	0.09	C		
7. Portland Rd (OR 99E) at Brooklake Rd (Signal)	Overall	**1.63**	E	ODOT	0.95

Acronyms: EB = eastbound; WB = westbound; NB = northbound; and SB = southbound. L = left; T = through; and R = right. AWSC = all-way stop control; TWSC = two-way stop control; Signal = signal control.
Intersections exceeding the applicable mobility target are **bold and shaded.**

Notes:
1. At signalized intersections, the overall results are reported; at all-way stop-controlled intersections, the results are reported for the worst movements; and at unsignalized intersections the results are reported for the worst major and minor movements that must stop or yield the right of travel to other traffic flows.
2. 1999 Oregon Highway Plan (OHP), Table 6, Policy 1F applies to existing and no build conditions.
3. The Marion County Rural Transportation System Plan (TSP) designates the traffic operations standard on County facilities and defers to ODOT standards for intersections with state highways within the County.

Source: David Evans and Associates, Inc

As shown in Table 3, three study intersections are expected to exceed applicable mobility targets by year 2043 in the PM peak hour. Both stop-controlled interchange ramp terminals and the signalized intersection of Portland Road (OR 99E) are expected to exceed their available capacity and also exceed the applicable Oregon Highway Plan (OHP) mobility targets.

At the intersection of Brooklake Road at River Road, the future condition assumes this is signalized, as opposed to the all-way stop-control that exists today, which explains the improvement in operations from the existing conditions analysis. The intersection of Brooklake Road at Huff Avenue is assumed signalized by 2043, however this will only be necessary if signal warrants are met by then.

95th Percentile Queues

Table 4 summarizes the 95th percentile queues by movement at each study area intersection. The table also highlights the locations where the 95th percentile queues either exceed available storage or extend beyond the nearest upstream intersection. There are three intersections with movements exceeding their available storage: Brooklake Road at the I-5 southbound ramp terminal, Brooklake Road at the I-5 northbound ramp terminal and Brooklake Road at Portland Road (OR 99E). This aligns with the same intersections that exceed their available capacity and mobility targets.

Both ramp terminals are expected to have queues that regularly back up onto the I-5 mainline. The stop-control cannot serve the anticipated demand. The queuing for the westbound left-turn at the southbound ramp terminal is also expected to spill out of its storage bay, blocking westbound through traffic and compounding the congestion at the northbound ramp terminal. This congestion is expected to create queues along Brooklake Road east of the interchange.

The queuing concerns that existed at Portland Road (OR 99E) at Brooklake Road in existing conditions are expected to worsen and create significant backups along Portland Road (OR 99E) in both directions.

Table 4. Future (2043) 95th Percentile Queues

Intersection	Approach & Movement	95th Percentile Queue (ft.)	Available Storage (ft.)[1]
1. River Rd at Brooklake Rd	EB L	100	250
	EB T/R	*275*	>2,000
	WB L	*400*	400
	WB T/R	*400*	>2,000
	NB L	150	250
	NB T/R	400	>2,000
	SB L	375	500
	SB T/R	175	>2,000
2. Huff Ave at Brooklake Rd	EB L	25	50
	EB T/R	300	>2,000
	WB L	75	200
	WB T	200	325
	WB R	25	325
	NB L	25	100
	NB T/R	100	1,000
	SB L	75	100
	SB T/R	25	1,000
3. Truckman Way at Brooklake Rd	EB T/R	25	325
	WB L	125	250
	NB L/R	175	650
4. I-5 SB Ramps at Brooklake Rd	EB T	<25	350
	EB R	75	100
	WB L	**575**	350
	WB T	**975**[2]	650
	SB L/T	**>2,000**	1,150
	SB R	150[2]	250
5. I-5 NB Ramps at Brooklake Rd	EB L	125	250
	WB T	**550**	500
	WB R	**75**	50

	NB L	**>2,000**	1,150
	NB T/R	150[2]	400
6. 50th Ave at Brooklake Rd	EB L/T WB T/R	50 775	475 1,400
	SB L/R	50	1,350
7. Portland Rd (OR99E) at Brooklake Rd (Signal)	EB L/T	**675**	516
	EB R	**450**	300
	WB L/T/R	150	>2,000
	NB L	**425**	180
	NB T/R	**>2000**	618
	SB L	*175*	175
	SB T	**>2,000**	434
	SB R	**250**	100

Bold and highlighted indicates queue exceeds available storage; ***Italic and underlined*** indicates queue is excessive and/or may impact upstream traffic

Notes:

1. Storage distance is reported as either the length of the turn pocket or the distance to the next intersection, as applicable.
2. Traffic is blocked by the queuing in the adjacent lane.

Freeway Operations

It is also important to evaluate how the interchange ramps interact with the mainline highway traffic on I-5 through an analysis of the points where traffic enters or merges onto the highway and where it exits or diverges from the highway. These analyses were conducted in accordance with the methodology prescribed in ODOT's APM to determine v/c ratio performance. The results of the analysis are summarized in Table 5**.**

The merge and diverge analyses for the design hour between 4:15 PM and 5:15 PM show that the traffic operations for the freeway and the merge and diverge points associated with the Brooks interchange ramps will worsen by 2043. The southbound direction in the PM peak hour is expected to exceed operational targets at the diverge point and for the mainline section south of the interchange between the Chemawa interchange and the Brooks southbound entrance ramp.

An alternate hour (7:00 AM to 8:00 AM) was also analyzed to evaluate conditions when the northbound direction has the higher directional flow. The alternate hour analysis shows that freeway operations are expected to operate under the state's mobility target.

Table 5. Future (2043) Freeway Operations

Direction/Location	V/C Ratio[1]		OHP Target[4]
	Design Hour[2]	Alternate Hour[3]	
I-5 Northbound			
Mainline South of IC 263	0.78	0.75	0.85
Diverge: IC 263 Northbound Exit Ramp	0.79	0.75	0.85
Mainline between Exit and Entrance Ramps	0.67	0.62	0.85
Merge: IC 263 Northbound Entrance Ramp	0.54	0.53	0.85
Mainline North of IC 263	0.71	0.69	0.85
I-5 Southbound			
Mainline North of IC 263	0.83	0.59	0.85
Diverge: IC 263 Southbound Exit Ramp	**0.86**	0.60	0.85
Mainline between Exit and Entrance Ramps	0.75	0.55	0.85
Merge: IC 263 Southbound Entrance Ramp	0.72	0.53	0.85
Mainline South of IC 263	**0.96**	0.71	0.85

Acronyms: IC = Interchange, NA = Not Applicable

Notes:
1. The v/c ratios for the merge/diverge analysis are calculated based on the methodologies outlined in ODOT's Analysis Procedures Manual, using HCS 7 software.
2. The design hour is the system peak hour.
3. The alternate hour is AM peak hour.
4. 1999 Oregon Highway Plan (OHP), Table 6, Policy 1F applies to existing conditions.

Summary of Future Deficiencies

Three study area intersections are anticipated to exceed their available capacity and applicable mobility targets under the future baseline scenario. The rest of the study area intersections operate within operational standards, however the congestion around the interchange creates queuing that impacts adjacent intersections and accesses.

Future operational issues are summarized below:

- I-5 Southbound Ramp Terminal at Brooklake Road: Expected to exceed mobility targets and experience significant queuing on the exit ramp and for the westbound left-turn onto the freeway entrance ramp. Overall traffic demand is expected to exceed intersection capacity. Extensive queuing would create safety concerns on the interstate mainline diverge area.
- I-5 Northbound Ramp Terminal at Brooklake Road: The northbound ramp terminal was at capacity under existing conditions and without improvements, is expected to operate significantly worse in 2043 and continually back up onto the I-5 mainline.
- Portland Road (OR 99E) at Brooklake Road: The traffic volume growth along the state highway and along the west leg of the intersection is expected to cause the signalized intersection to exceed available capacity and its mobility target by 2043.
- The southbound diverge point and mainline south of the southbound entrance ramp are expected to exceed applicable mobility targets for the freeway.
- The anticipated traffic growth and lack of improvements to the existing interchange ramps is expected to overburden the Brooks interchange by the end of the planning horizon. The resulting queues are expected to limit mobility through the interchange and hinder access to land uses along the corridor while impacting safety and creating a potentially dangerous situation at the connections with the I-5 mainline.

Attachments:

A. TPAU Methodology Memo and SWIM Growth Rates
B. Volume Development
C. Traffic Operational Output (Synchro/SimTraffic and HCS)

TECHNICAL MEMORANDUM #4 ATTACHMENTS

Evaluate Future Conditions (Task 4.4)

Table of Contents

Attachment A

STATE OF OREGON **MODEL REQUEST MEMO**

Department of Transportation
Transportation Development Division
Mill Creek Office Park
555 13th Street NE Suite 2
Salem, Oregon 97301-4178
(503) 986-4104 Date: 12/4/2020

TO: **Angela Rogge, P.E., Associate**
David Evans and Associates, Inc.

FROM: **Alex Bettinardi, P.E., Senior Integrated Analysis Engineer**
Becky Knudson, Senior Transportation Economist
Transportation Planning Analysis Unit

SUBJECT: SWIM Growth Rate Estimates for Brooklake IAMP

Model Request Summary

In November 2020, Angela Rogge from DEA submitted a request for existing and future year baseline (reference) PM (peak hour) SWIM model results. The purpose of this information was:

> "to develop future volumes along I-5 in support of the Brooks Interchange Area Management Plan Project" for ODOT Region 2."

A project area map was provided (screenshot below) to show the extent of the intersections being analyzed for the IAMP.

TPAU initially suggested that the project might be able to use ODOT's published future volume tables - https://www.oregon.gov/odot/Planning/Pages/APM.aspx#futureHighwayVolume. However, there were a couple of issues with that source that brought it into question for this use:

1. PM trends were requested and the future volume tables are daily.
2. The interchange in question (exit 263 at Brooklake) is right at the external boundary of the Salem-Keizer area model. External stations in travel demand models aren't actually modeled projections, they are just historically grown counts (typically).

Because of these conditions, it was decided on 12-2-20 that it would be best to pull and provide trends from the Statewide Integrated Model (SWIM) to provide in addition to the future volume trends already produced.

Analysis Approach

SWIM covers the entire state of Oregon (plus a small "halo" in the surrounding states). The SWIM network includes the main roadways in the Brooklake IAMP study area:

- I-5 (plus on and off ramps at Brooklake),
- Brooklake Road,
- River Road, and
- 99E

The SWIM network does not include the other minor driveways / intersections along Brooklake between River and 99E. More information on SWIM can be found here: https://www.oregon.gov/ODOT/Planning/Pages/Technical-Tools.aspx#SWIM.

Existing reference SWIM scenarios are available as needed. The current reference scenario was accessed to develop growth rates for all the sections of roadway within the project area. SWIM years equivalent to Statewide Population estimates for years 2011 and 2044 (a 33 year spread) were used to calculate an annual growth rate for each segment. 2011 and 2044 were the closest years available to those requested.

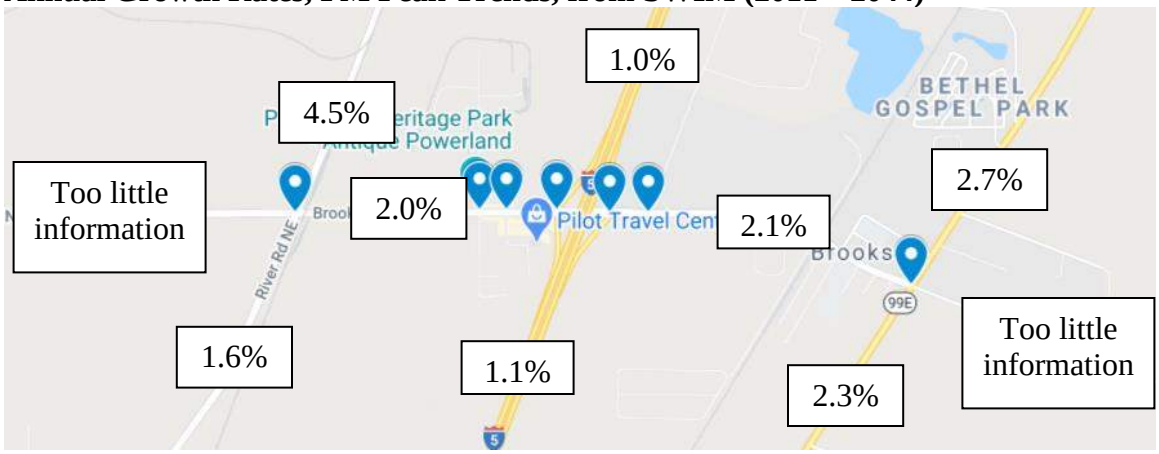
2010 and 2040 model volumes were originally requested. However, TPAU's practice is to use SWIM to provide growth rate trends for requested areas as opposed to providing absolute modeled volumes. The growth rates provided for this request are linear annual growth rates. Below is the equation used to calculate the growth rates. This equation should be understood when applying the provided growth rates to grow existing volumes to future volumes for the project area:

Annual Growth Rate = ((2044 segment volume / 2011 segment volume) – 1) / 33 years

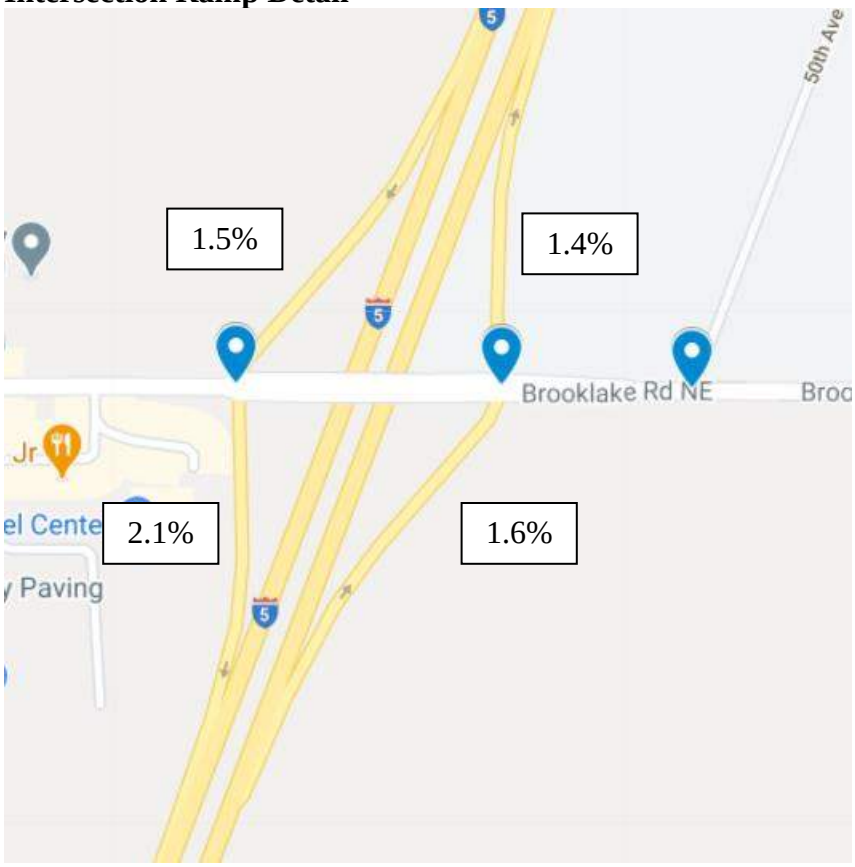
Requested Output / Next Steps / Follow-up

The following map is a screenshot of the project area provided in the request. The map has been augmented with the annual growth rates estimated from SWIM.

Annual Growth Rates, PM Peak Trends, from SWIM (2011 – 2044)



Annual Growth Rates, PM Peak Trends, from SWIM (2011 – 2044), Intersection Ramp Detail



If there are any questions or comments, please contact Alex Bettinardi at 503-986-4104 or Becky Knudson at 503-986-4113.

Cc: Brian Dunn, P.E., Transportation Planning Analysis Unit
Dan Fricke, ODOT Region 2
Kristie Gladhill, P.E., Transportation Planning Analysis Unit
Peter Schuytema, P.E., Transportation Planning Analysis Unit
File

Attachment B

Marion County Historical Volumes - Growth Factor Calculations

		Intersection		West							East							South							North							
1	10	River Rd at Brooklake Rd	x	**1999**	**2019**	**2020**	**2043**	**23-Year Growth Factor**			**1999**	**2019**	**2020**	**2043**	**23-Year Growth Factor**			**1999**	**2019**	**2020**	**2043**	**23-Year Growth Factor**			**2007**	**2019**	**2020**	**2043**	**23-Year Growth Factor**			
			y	2294	2735	2757	3264	1.184	18.4%	0.8%	7068	10238	10397	14042	1.351	35.1%	1.5%	4755	6958	7068	9602	1.358	35.8%	1.6%	5225	6577	6690	9281	1.387	38.7%	1.7%	**1.320**
2	20	Huff Ave at Brooklake Rd*	x	**1995**	**2015**	**2020**	**2043**	**Growth Factor**			**1995**	**2015**	**2020**	**2043**	**Growth Factor**			**2011**	**2015**	**2020**	**2043**	**Growth Factor**										
			y	6220	8341	8871	11310	1.275	27.5%	1.2%	6980	8839	9304	11442	1.230	23.0%	1.0%	1060	1159	1283	1852	1.444	44.4%	1.9%								**1.316**
3	30	Truckman Way at Brooklake Rd*	x	**1995**	**2015**	**2020**	**2043**	**Growth Factor**			**1995**	**2015**	**2020**	**2043**	**Growth Factor**																	
			y	6980	8839	9304	11442	1.230	23.0%	1.0%	6980	8839	9304	11442	1.230	23.0%	1.0%															**1.230**
3.5	35	May Trucking/Pilot Driveway at Brooklake Rd*	x	**1995**	**2015**	**2020**	**2043**	**Growth Factor**			**1999**	**2011**	**2020**	**2043**	**Growth Factor**																	
			y	6980	8839	9304	11442	1.230	23.0%	1.0%	12029	12662	13137	14350	1.092	9.2%	0.4%															**1.161**
4	40	I-5 SB Ramp Terminal at Brooklake Rd*	x	**1999**	**2011**	**2020**	**2043**	**Growth Factor**			**1999**	**2019**	**2020**	**2043**	**Growth Factor**			**2017**	**2038**	**2020**	**2043**	**Growth Factor**			**2017**	**2038**	**2020**	**2043**	**Growth Factor**			
			y	12029	12662	13137	14350	1.092	9.2%	0.4%	7968	10444	10568	13415	1.269	26.9%	1.2%	99700	118100	102329	122481	1.197	19.7%	0.9%	99700	118100	102329	122481	1.197	19.7%	0.9%	**1.189**
5	50	I-5 NB Ramp Terminal at Brooklake Rd*		**1999**	**2011**	**2020**	**2043**	**Growth Factor**			**1999**	**2019**	**2020**	**2043**	**Growth Factor**			**2017**	**2038**	**2020**	**2043**	**Growth Factor**			**2017**	**2038**	**2020**	**2043**	**Growth Factor**			
				12029	12662	13137	14350	1.092	9.2%	0.4%	7968	10444	10568	13415	1.269	26.9%	1.2%	99700	118100	102329	122481	1.197	19.7%	0.9%	99700	118100	102329	122481	1.197	19.7%	0.9%	**1.189**
6	60	50th Ave at Brooklake Rd		**1999**	**2019**	**2020**	**2043**	**Growth Factor**			**1995**	**2015**	**2020**	**2043**	**Growth Factor**																	
				7968	10444	10568	13415	1.269	26.9%	1.2%	5800	8600	9300	12520	1.346	34.6%	1.5%															**1.308**
7	70	OR 99E (Portland Rd) at Brooklake Rd		**1995**	**2015**	**2020**	**2043**	**Growth Factor**			**1998**	**2018**	**2020**	**2043**	**Growth Factor**			**2016**	**2038**	**2020**	**2043**	**Growth Factor**			**2016**	**2038**	**2020**	**2043**	**Growth Factor**			
				5800	8600	9300	12520	1.346	34.6%	1.5%	1907	1934	1937	1968	1.016	1.6%	0.1%	10000	11600	10291	11964	1.163	16.3%	0.7%	10000	11600	10291	11964	1.163	16.3%	0.7%	**1.172**

Attachment C

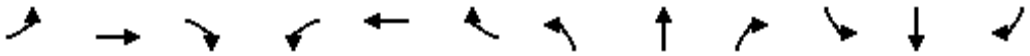
Signalized Intersection Operations - "Hand" Calculations

Xc = Sum of critical flow ratios * C/(C-L)
C Cycle Length
L Lost time per phase 4s
Total Lost time 16

			Adj. Flow	Sat. Flow		River Rd
PM	1	WBL	305	1628	0.187346	
		WBTR	132	1695	0.077876	
		SBL	505	1472	0.343071	
					0.608293	
		c	90			
		L	16			
		0.74				
		C				
		19.9				

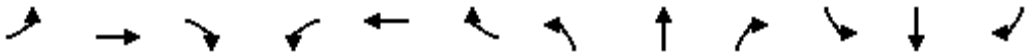
			Adj. Flow	Sat. Flow		Huff
PM	2	EBTR	833	1654	0.503628	
		WBL	28	900	0.031111	
		SBL	56	1667	0.033593	
					0.568332	
		c	90			
		L	16			
		0.69				
		B				
		15.9				

			Adj. Flow	Sat. Flow		OR 99E
PM	7	EBLT	391	1123	0.348175	
		NBL	109	1612	0.067618	
		NBTR	609	1752	0.347603	
		SBT	1068	1841	0.58012	
					1.343515	
		c	90			
		L	16			
		1.63				
		65.5				
		E				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	100	15	290	125	345	35	170	150	480	270	40
Future Volume (vph)	40	100	15	290	125	345	35	170	150	480	270	40
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.89		1.00	0.93		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)	1662	1618		1614	1487		1614	1550		1446	1672	
Flt Permitted	0.31	1.00		0.46	1.00		0.56	1.00		0.18	1.00	
Satd. Flow (perm)	534	1618		787	1487		957	1550		278	1672	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	42	105	16	305	132	363	37	179	158	505	284	42
RTOR Reduction (vph)	0	7	0	0	110	0	0	35	0	0	5	0
Lane Group Flow (vph)	42	114	0	305	385	0	37	302	0	505	321	0
Heavy Vehicles (%)	0%	6%	6%	3%	4%	5%	3%	4%	6%	15%	3%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	15.4	13.1		29.7	23.4		21.9	19.6		50.8	44.5	
Effective Green, g (s)	15.4	13.1		29.7	23.4		21.9	19.6		50.8	44.5	
Actuated g/C Ratio	0.17	0.15		0.34	0.26		0.25	0.22		0.57	0.50	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	122	239		381	393		253	343		518	840	
v/s Ratio Prot	0.01	0.07		c0.11	c0.26		0.00	0.19		c0.30	0.19	
v/s Ratio Perm	0.05			0.15			0.03			c0.26		
v/c Ratio	0.34	0.48		0.80	0.98		0.15	0.88		0.97	0.38	
Uniform Delay, d1	31.5	34.6		24.7	32.3		25.6	33.3		22.2	13.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2	1.1		11.1	39.3		0.2	22.0		32.9	0.2	
Delay (s)	32.7	35.7		35.9	71.6		25.8	55.3		55.1	13.7	
Level of Service	C	D		D	E		C	E		E	B	
Approach Delay (s)		34.9			58.0			52.4			38.9	
Approach LOS		C			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	48.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	88.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	94.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



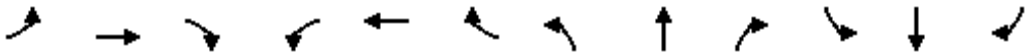
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	100	15	290	125	345	35	170	150	480	270	40
Future Volume (veh/h)	40	100	15	290	125	345	35	170	150	480	270	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1668	1668	1709	1695	1682	1709	1695	1668	1545	1709	1750
Adj Flow Rate, veh/h	42	105	0	305	132	0	37	179	158	505	284	42
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	6	6	3	4	5	3	4	6	15	3	0
Cap, veh/h	269	159		379	352		393	209	184	553	728	108
Arrive On Green	0.03	0.10	0.00	0.14	0.21	0.00	0.03	0.25	0.25	0.28	0.50	0.50
Sat Flow, veh/h	1667	1668	0	1628	1695	0	1628	830	733	1472	1455	215
Grp Volume(v), veh/h	42	105	0	305	132	0	37	0	337	505	0	326
Grp Sat Flow(s),veh/h/ln	1667	1668	0	1628	1695	0	1628	0	1563	1472	0	1670
Q Serve(g_s), s	1.6	4.2	0.0	10.0	4.6	0.0	1.2	0.0	14.3	16.0	0.0	8.4
Cycle Q Clear(g_c), s	1.6	4.2	0.0	10.0	4.6	0.0	1.2	0.0	14.3	16.0	0.0	8.4
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.47	1.00		0.13
Lane Grp Cap(c), veh/h	269	159		379	352		393	0	393	553	0	836
V/C Ratio(X)	0.16	0.66		0.80	0.38		0.09	0.00	0.86	0.91	0.00	0.39
Avail Cap(c_a), veh/h	312	433		379	586		439	0	428	715	0	1011
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.1	30.3	0.0	24.1	23.6	0.0	18.4	0.0	24.8	12.9	0.0	10.8
Incr Delay (d2), s/veh	0.2	3.4	0.0	11.6	0.5	0.0	0.1	0.0	14.5	13.0	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	1.7	0.0	5.2	1.7	0.0	0.4	0.0	6.1	5.4	0.0	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.3	33.7	0.0	35.7	24.1	0.0	18.5	0.0	39.4	25.8	0.0	11.0
LnGrp LOS	C	C		D	C		B	A	D	C	A	B
Approach Vol, veh/h		147	A		437	A		374			831	
Approach Delay, s/veh		31.9			32.2			37.3			20.0	
Approach LOS		C			C			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.0	38.7	6.2	18.4	23.3	21.4	14.0	10.6
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	4.0	42.0	4.0	24.0	27.0	19.0	10.0	18.0
Max Q Clear Time (g_c+I1), s	3.2	10.4	3.6	6.6	18.0	16.3	12.0	6.2
Green Ext Time (p_c), s	0.0	6.8	0.0	0.8	1.4	1.1	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	27.6
HCM 6th LOS	C

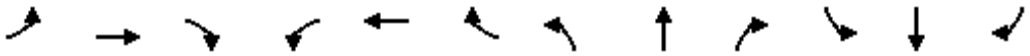
Notes

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	750	5	25	740	15	5	5	90	50	5	5
Future Volume (vph)	5	750	5	25	740	15	5	5	90	50	5	5
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.86		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	1650		1046	1651	1488	1421	1305		1662	1619	
Flt Permitted	0.19	1.00		0.16	1.00	1.00	0.75	1.00		0.59	1.00	
Satd. Flow (perm)	329	1650		180	1651	1488	1121	1305		1033	1619	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	6	833	6	28	822	17	6	6	100	56	6	6
RTOR Reduction (vph)	0	0	0	0	0	7	0	87	0	0	5	0
Lane Group Flow (vph)	6	839	0	28	822	10	6	19	0	56	7	0
Heavy Vehicles (%)	0%	6%	0%	59%	6%	0%	17%	0%	16%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4		4	6			2		
Actuated Green, G (s)	38.9	38.3		40.1	38.9	38.9	9.0	8.4		11.8	9.8	
Effective Green, g (s)	38.9	38.3		40.1	38.9	38.9	9.0	8.4		11.8	9.8	
Actuated g/C Ratio	0.59	0.58		0.61	0.59	0.59	0.14	0.13		0.18	0.15	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	206	958		125	974	878	155	166		204	240	
v/s Ratio Prot	0.00	c0.51		c0.00	0.50		0.00	0.01		c0.01	0.00	
v/s Ratio Perm	0.02			0.13		0.01	0.00			c0.04		
v/c Ratio	0.03	0.88		0.22	0.84	0.01	0.04	0.11		0.27	0.03	
Uniform Delay, d1	8.1	11.8		8.7	11.0	5.6	24.7	25.5		23.0	24.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	8.9		0.7	6.7	0.0	0.1	0.2		0.5	0.0	
Delay (s)	8.1	20.7		9.4	17.7	5.6	24.7	25.7		23.5	24.0	
Level of Service	A	C		A	B	A	C	C		C	C	
Approach Delay (s)		20.6			17.2			25.6			23.6	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	65.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	59.5%	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 (veh/h)	5	750	5	25	740	15	5	5	90	50	5	5
Future Volume (veh/h)	5	750	5	25	740	15	5	5	90	50	5	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1668	1750	945	1668	1750	1518	1750	1532	1750	1750	1750
Adj Flow Rate, veh/h	6	833	6	28	822	17	6	6	100	56	6	6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	6	0	59	6	0	17	0	16	0	0	0
Cap, veh/h	256	969	7	188	1008	896	238	9	146	219	109	109
Arrive On Green	0.01	0.59	0.59	0.02	0.60	0.60	0.01	0.10	0.10	0.04	0.14	0.14
Sat Flow, veh/h	1667	1654	12	900	1668	1483	1446	85	1411	1667	803	803
Grp Volume(v), veh/h	6	0	839	28	822	17	6	0	106	56	0	12
Grp Sat Flow(s),veh/h/ln	1667	0	1666	900	1668	1483	1446	0	1496	1667	0	1606
Q Serve(g_s), s	0.1	0.0	27.2	0.8	24.9	0.3	0.2	0.0	4.4	1.9	0.0	0.4
Cycle Q Clear(g_c), s	0.1	0.0	27.2	0.8	24.9	0.3	0.2	0.0	4.4	1.9	0.0	0.4
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.94	1.00		0.50
Lane Grp Cap(c), veh/h	256	0	976	188	1008	896	238	0	155	219	0	219
V/C Ratio(X)	0.02	0.00	0.86	0.15	0.82	0.02	0.03	0.00	0.69	0.26	0.00	0.05
Avail Cap(c_a), veh/h	349	0	1234	222	1236	1099	318	0	416	256	0	446
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.8	0.0	11.2	11.3	10.0	5.1	25.8	0.0	28.0	24.7	0.0	24.3
Incr Delay (d2), s/veh	0.0	0.0	4.8	0.3	3.3	0.0	0.0	0.0	3.9	0.5	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	7.9	0.1	6.7	0.1	0.1	0.0	1.7	0.8	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.8	0.0	16.0	11.6	13.3	5.1	25.8	0.0	32.0	25.1	0.0	24.4
LnGrp LOS	A	A	B	B	B	A	C	A	C	C	A	C
Approach Vol, veh/h		845			867			112			68	
Approach Delay, s/veh		16.0			13.1			31.6			25.0	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.4	12.8	4.4	43.1	6.5	10.7	5.6	42.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	4.0	18.0	4.0	48.0	4.0	18.0	4.0	48.0
Max Q Clear Time (g_c+I1), s	2.2	2.4	2.1	26.9	3.9	6.4	2.8	29.2
Green Ext Time (p_c), s	0.0	0.0	0.0	9.2	0.0	0.3	0.0	8.8

Intersection Summary	
HCM 6th Ctrl Delay	15.9
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	885	5	75	780	1	105
Future Vol, veh/h	885	5	75	780	1	105
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	7	0	80	8	0	82
Mvmt Flow	983	6	83	867	1	117

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	989	0	1586	495
Stage 1	-	-	-	-	986	-
Stage 2	-	-	-	-	600	-
Critical Hdwy	-	-	5.7	-	6.8	8.54
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	3	-	3.5	4.12
Pot Cap-1 Maneuver	-	-	368	-	101	354
Stage 1	-	-	-	-	327	-
Stage 2	-	-	-	-	516	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	368	-	78	354
Mov Cap-2 Maneuver	-	-	-	-	199	-
Stage 1	-	-	-	-	327	-
Stage 2	-	-	-	-	399	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.5	20.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	351	-	-	368	-
HCM Lane V/C Ratio	0.336	-	-	0.226	-
HCM Control Delay (s)	20.3	-	-	17.6	-
HCM Lane LOS	C	-	-	C	-
HCM 95th %tile Q(veh)	1.4	-	-	0.9	-

Intersection	
Int Delay, s/veh	13.6

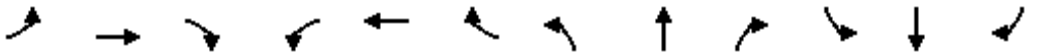
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↱	↰	↑						↰	↱
Traffic Vol, veh/h	0	450	745	490	570	0	0	0	0	60	1	430
Future Vol, veh/h	0	450	745	490	570	0	0	0	0	60	1	430
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	350	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	14	13	5	18	0	0	0	0	5	0	12
Mvmt Flow	0	450	745	490	570	0	0	0	0	60	1	430

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	1195	0	0	2373	2745	570
Stage 1	-	-	-	-	-	-	1550	1550	-
Stage 2	-	-	-	-	-	-	823	1195	-
Critical Hdwy	-	-	-	4.15	-	-	6.45	6.5	6.32
Critical Hdwy Stg 1	-	-	-	-	-	-	5.45	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.45	5.5	-
Follow-up Hdwy	-	-	-	2.245	-	-	3.545	4	3.408
Pot Cap-1 Maneuver	0	-	-	574	-	0	~ 37	20	502
Stage 1	0	-	-	-	-	0	190	177	-
Stage 2	0	-	-	-	-	0	426	262	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	574	-	-	~ 5	0	502
Mov Cap-2 Maneuver	-	-	-	-	-	-	299	0	-
Stage 1	-	-	-	-	-	-	190	0	-
Stage 2	-	-	-	-	-	-	62	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	17.3	38.9
HCM LOS			E

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	574	-	299	502
HCM Lane V/C Ratio	-	-	0.854	-	0.204	0.857
HCM Control Delay (s)	-	-	37.5	-	20.1	41.6
HCM Lane LOS	-	-	E	-	C	E
HCM 95th %tile Q(veh)	-	-	9.3	-	0.8	9

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	450	745	490	570	0	0	0	0	60	1	430
Future Volume (Veh/h)	0	450	745	490	570	0	0	0	0	60	1	430
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	450	745	490	570	0	0	0	0	60	1	430
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (ft)		1067										
pX, platoon unblocked												
vC, conflicting volume	570			1195			2430	2000	450	2000	2745	570
vC1, stage 1 conf vol							450	450		1550	1550	
vC2, stage 2 conf vol							1980	1550		450	1195	
vCu, unblocked vol	570			1195			2430	2000	450	2000	2745	570
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.3
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.4
p0 queue free %	100			15			100	100	100	0	66	14
cM capacity (veh/h)	1013			574			2	25	613	20	3	502

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	450	745	490	570	61	430
Volume Left	0	0	490	0	60	0
Volume Right	0	745	0	0	0	430
cSH	1700	1700	574	1700	18	502
Volume to Capacity	0.26	0.44	0.85	0.34	3.36	0.86
Queue Length 95th (ft)	0	0	233	0	Err	224
Control Delay (s)	0.0	0.0	37.5	0.0	Err	41.4
Lane LOS			E		F	E
Approach Delay (s)	0.0		17.4		1278.5	
Approach LOS					F	

Intersection Summary				
Average Delay	235.3			
Intersection Capacity Utilization	86.7%	ICU Level of Service		E
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	211.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	190	320	0	0	725	55	335	1	330	0	0	0
Future Vol, veh/h	190	320	0	0	725	55	335	1	330	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	-	-	-	-	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	24	5	0	0	6	5	23	0	7	0	0	0
Mvmt Flow	190	320	0	0	725	55	335	1	330	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	780	0	-	-	-	0	1453	1480	320
Stage 1	-	-	-	-	-	-	700	700	-
Stage 2	-	-	-	-	-	-	753	780	-
Critical Hdwy	4.34	-	-	-	-	-	6.63	6.5	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-	5.63	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.63	5.5	-
Follow-up Hdwy	2.416	-	-	-	-	-	3.707	4	3.363
Pot Cap-1 Maneuver	747	-	0	0	-	-	~ 129	127	709
Stage 1	-	-	0	0	-	-	456	444	-
Stage 2	-	-	0	0	-	-	430	409	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	747	-	-	-	-	-	~ 96	0	709
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 96	0	-
Stage 1	-	-	-	-	-	-	340	0	-
Stage 2	-	-	-	-	-	-	430	0	-

Approach	EB	WB	NB
HCM Control Delay, s	4.3	0	$ 617.3
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	96	709	747	-	-	-
HCM Lane V/C Ratio	3.49	0.467	0.254	-	-	-
HCM Control Delay (s)	$ 1213.1	14.4	11.5	-	-	-
HCM Lane LOS	F	B	B	-	-	-
HCM 95th %tile Q(veh)	33.6	2.5	1	-	-	-

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

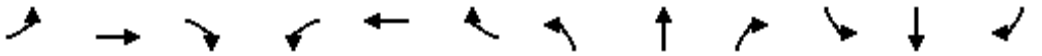
Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	645	765	5	5	15
Future Vol, veh/h	5	645	765	5	5	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	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	4	7	2	0	0
Mvmt Flow	5	701	832	5	5	16

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	837	0	-	0	1546	835
Stage 1	-	-	-	-	835	-
Stage 2	-	-	-	-	711	-
Critical Hdwy	4.12	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.218	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	797	-	-	-	127	371
Stage 1	-	-	-	-	429	-
Stage 2	-	-	-	-	490	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	797	-	-	-	126	371
Mov Cap-2 Maneuver	-	-	-	-	126	-
Stage 1	-	-	-	-	425	-
Stage 2	-	-	-	-	490	-

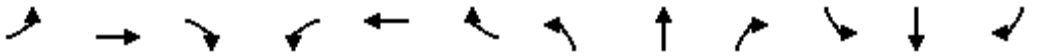
Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	20.8
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	797	-	-	-	250
HCM Lane V/C Ratio	0.007	-	-	-	0.087
HCM Control Delay (s)	9.5	0	-	-	20.8
HCM Lane LOS	A	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)	375	80	170	30	75	20	105	585	25	30	1025	490
Future Volume (vph)	375	80	170	30	75	20	105	585	25	30	1025	490
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1758	1524		1725		1583	1819		1736	1827	1538
Flt Permitted		0.66	1.00		0.59		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1199	1524		1029		1583	1819		1736	1827	1538
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	391	83	177	31	78	21	109	609	26	31	1068	510
RTOR Reduction (vph)	0	0	98	0	7	0	0	1	0	0	0	84
Lane Group Flow (vph)	0	474	79	0	123	0	109	634	0	31	1068	426
Heavy Vehicles (%)	4%	3%	6%	4%	7%	8%	14%	4%	0%	4%	4%	5%
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								6
Actuated Green, G (s)		31.5	31.5		31.5		5.0	53.8		2.4	51.2	51.2
Effective Green, g (s)		32.0	32.0		32.0		5.0	55.2		2.4	52.6	52.6
Actuated g/C Ratio		0.31	0.31		0.31		0.05	0.54		0.02	0.52	0.52
Clearance Time (s)		4.5	4.5		4.5		4.0	5.4		4.0	5.4	5.4
Vehicle Extension (s)		2.5	2.5		2.5		2.5	4.0		2.5	4.0	4.0
Lane Grp Cap (vph)		377	480		324		77	988		41	945	796
v/s Ratio Prot							c0.07	c0.35		0.02	c0.58	
v/s Ratio Perm		c0.40	0.05		0.12							0.28
v/c Ratio		1.26	0.16		0.38		1.42	0.64		0.76	1.13	0.53
Uniform Delay, d1		34.8	25.1		27.1		48.3	16.3		49.3	24.5	16.3
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		135.7	0.1		0.5		247.2	1.6		53.2	72.0	0.9
Delay (s)		170.5	25.3		27.6		295.5	17.9		102.5	96.5	17.2
Level of Service		F	C		C		F	B		F	F	B
Approach Delay (s)		131.0			27.6			58.5			71.5	
Approach LOS		F			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	79.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	101.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	101.4%	ICU Level of Service	G
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 (veh/h)	375	80	170	30	75	20	105	585	25	30	1025	490
Future Volume (veh/h)	375	80	170	30	75	20	105	585	25	30	1025	490
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1856	1811	1841	1796	1781	1693	1841	1900	1841	1841	1826
Adj Flow Rate, veh/h	391	83	0	31	78	21	109	609	26	31	1068	510
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	3	6	4	7	8	14	4	0	4	4	5
Cap, veh/h	425	76		149	356	89	81	943	40	38	939	789
Arrive On Green	0.31	0.32	0.00	0.31	0.32	0.31	0.05	0.54	0.52	0.02	0.51	0.51
Sat Flow, veh/h	1123	238	1535	326	1113	277	1612	1752	75	1753	1841	1547
Grp Volume(v), veh/h	474	0	0	130	0	0	109	0	635	31	1068	510
Grp Sat Flow(s),veh/h/ln	1361	0	1535	1717	0	0	1612	0	1827	1753	1841	1547
Q Serve(g_s), s	26.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	24.6	1.8	51.0	24.1
Cycle Q Clear(g_c), s	31.5	0.0	0.0	5.5	0.0	0.0	5.0	0.0	24.6	1.8	51.0	24.1
Prop In Lane	0.82		1.00	0.24		0.16	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	495	0		585	0	0	81	0	984	38	939	789
V/C Ratio(X)	0.96	0.00		0.22	0.00	0.00	1.35	0.00	0.65	0.81	1.14	0.65
Avail Cap(c_a), veh/h	495	0		585	0	0	81	0	984	70	939	789
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	0.0	0.0	25.1	0.0	0.0	47.5	0.0	16.4	48.7	24.5	17.9
Incr Delay (d2), s/veh	30.0	0.0	0.0	0.1	0.0	0.0	220.3	0.0	1.7	25.5	75.0	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.8	0.0	0.0	2.1	0.0	0.0	6.9	0.0	9.7	1.0	39.3	8.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.5	0.0	0.0	25.2	0.0	0.0	267.8	0.0	18.0	74.2	99.5	20.0
LnGrp LOS	E	A		C	A	A	F	A	B	E	F	C
Approach Vol, veh/h		474	A		130			744			1609	
Approach Delay, s/veh		65.5			25.2			54.6			73.8	
Approach LOS		E			C			D			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.2	57.8		36.0	9.0	55.0		36.0				
Change Period (Y+Rc), s	4.0	* 5.4		4.5	4.0	* 5.4		4.5				
Max Green Setting (Gmax), s	4.0	* 51		31.5	5.0	* 50		31.5				
Max Q Clear Time (g_c+I1), s	3.8	26.6		33.5	7.0	53.0		7.5				
Green Ext Time (p_c), s	0.0	10.2		0.0	0.0	0.0		0.4				

Intersection Summary		
HCM 6th Ctrl Delay		65.5
HCM 6th LOS		E

Notes

User approved pedestrian interval to be less than phase max green.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	40.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	945	40	170	805	25	30	0	200	50	0	20
Future Vol, veh/h	5	945	40	170	805	25	30	0	200	50	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	14	3	1	18	47	0	0	2	6	0	5
Mvmt Flow	5	984	42	177	839	26	31	0	208	52	0	21

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	865	0	0	1026	0	0	1789	2234	513	1708	2242	433
Stage 1	-	-	-	-	-	-	1015	1015	-	1206	1206	-
Stage 2	-	-	-	-	-	-	774	1219	-	502	1036	-
Critical Hdwy	4.1	-	-	4.12	-	-	7.5	6.5	6.94	7.62	6.5	7
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.62	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.62	5.5	-
Follow-up Hdwy	2.2	-	-	2.21	-	-	3.5	4	3.32	3.56	4	3.35
Pot Cap-1 Maneuver	787	-	-	679	-	-	52	43	506	56	43	563
Stage 1	-	-	-	-	-	-	259	318	-	188	259	-
Stage 2	-	-	-	-	-	-	362	255	-	510	311	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	787	-	-	679	-	-	40	32	506	~ 26	32	563
Mov Cap-2 Maneuver	-	-	-	-	-	-	40	32	-	~ 26	32	-
Stage 1	-	-	-	-	-	-	257	316	-	187	191	-
Stage 2	-	-	-	-	-	-	258	188	-	298	309	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2.1	173.2	$ 715.7
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	201	787	-	-	679	-	-	36
HCM Lane V/C Ratio	1.192	0.007	-	-	0.261	-	-	2.025
HCM Control Delay (s)	173.2	9.6	-	-	12.2	-	-	$ 715.7
HCM Lane LOS	F	A	-	-	B	-	-	F
HCM 95th %tile Q(veh)	12.2	0	-	-	1	-	-	8

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

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	640	10	5	750	20	5
Future Vol, veh/h	640	10	5	750	20	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	200	125	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	100	50	6	39	2
Mvmt Flow	696	11	5	815	22	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	707	0	1521	696
Stage 1	-	-	-	-	696	-
Stage 2	-	-	-	-	825	-
Critical Hdwy	-	-	4.6	-	6.79	6.22
Critical Hdwy Stg 1	-	-	-	-	5.79	-
Critical Hdwy Stg 2	-	-	-	-	5.79	-
Follow-up Hdwy	-	-	2.65	-	3.851	3.318
Pot Cap-1 Maneuver	-	-	706	-	107	442
Stage 1	-	-	-	-	433	-
Stage 2	-	-	-	-	373	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	706	-	106	442
Mov Cap-2 Maneuver	-	-	-	-	106	-
Stage 1	-	-	-	-	433	-
Stage 2	-	-	-	-	370	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	41.6
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	125	-	-	706	-
HCM Lane V/C Ratio	0.217	-	-	0.008	-
HCM Control Delay (s)	41.6	-	-	10.1	-
HCM Lane LOS	E	-	-	B	-
HCM 95th %tile Q(veh)	0.8	-	-	0	-

10: River Rd /River Rd & Brooklake Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	40	100	14	205	102	245	33	166	154	464	261	38
Vehicles Exited	41	100	15	212	103	245	33	167	156	467	259	38
Hourly Exit Rate	41	100	15	212	103	245	33	167	156	467	259	38
Input Volume	40	100	15	290	144	345	35	170	150	480	270	40
% of Volume	103	100	98	73	72	71	95	98	104	97	96	96
Denied Entry Before	0	0	0	0	0	0	0	0	0	1	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

10: River Rd /River Rd & Brooklake Rd Performance by movement

Movement	All
Vehicles Entered	1822
Vehicles Exited	1836
Hourly Exit Rate	1836
Input Volume	2078
% of Volume	88
Denied Entry Before	1
Denied Entry After	0

20: Huff Ave & Brooklake Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	3	780	6	15	517	11	2	6	93	51	5	7
Vehicles Exited	3	780	6	15	519	11	2	6	93	51	5	7
Hourly Exit Rate	3	780	6	15	519	11	2	6	93	51	5	7
Input Volume	5	792	5	25	743	15	5	5	90	50	5	5
% of Volume	57	98	114	60	70	75	38	114	103	102	95	133
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

20: Huff Ave & Brooklake Rd Performance by movement

Movement	All
Vehicles Entered	1496
Vehicles Exited	1498
Hourly Exit Rate	1498
Input Volume	1747
% of Volume	86
Denied Entry Before	0
Denied Entry After	0

30: Truckman Way & Brooklake Rd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	882	5	45	551	0	107	1590
Vehicles Exited	883	5	45	552	0	107	1592
Hourly Exit Rate	883	5	45	552	0	107	1592
Input Volume	888	5	75	804	1	105	1878
% of Volume	99	95	60	69	0	102	85
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

40: I-5 SB On-Ramp/I-5 SB Off-Ramp & Brooklake Rd Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBR	All
Vehicles Entered	467	742	305	351	43	296	2204
Vehicles Exited	467	742	290	349	5	299	2152
Hourly Exit Rate	467	742	290	349	5	299	2152
Input Volume	470	745	490	577	60	430	2772
% of Volume	99	100	59	60	8	70	78
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

50: I-5 NB Off-Ramp/I-5 NB On-Ramp & Brooklake Rd Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBR	All
Vehicles Entered	166	288	558	38	145	151	1346
Vehicles Exited	166	289	547	37	125	153	1317
Hourly Exit Rate	166	289	547	37	125	153	1317
Input Volume	190	324	746	55	335	330	1980
% of Volume	87	89	73	67	37	46	67
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	3	0	0	0	3

60: Brooklake Rd & 50th Ave Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	4	449	596	2	3	17	1071
Vehicles Exited	4	450	567	2	3	16	1042
Hourly Exit Rate	4	450	567	2	3	16	1042
Input Volume	5	662	765	5	5	15	1457
% of Volume	80	68	74	40	60	105	72
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

70: Portland Rd NE & Brooklake Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	262	71	119	28	74	18	94	540	27	20	733	343
Vehicles Exited	269	72	120	28	74	18	90	543	27	20	738	343
Hourly Exit Rate	269	72	120	28	74	18	90	543	27	20	738	343
Input Volume	375	101	170	30	75	20	105	585	25	30	1025	490
% of Volume	72	71	70	93	99	89	86	93	107	66	72	70
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

70: Portland Rd NE & Brooklake Rd Performance by movement

Movement	All
Vehicles Entered	2329
Vehicles Exited	2342
Hourly Exit Rate	2342
Input Volume	3033
% of Volume	77
Denied Entry Before	0
Denied Entry After	0

80: Driveway/Maytrucking & Brooklake Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR	All
Vehicles Entered	4	968	39	113	525	18	30	192	53	22	1964
Vehicles Exited	4	968	39	114	527	18	31	194	54	22	1971
Hourly Exit Rate	4	968	39	114	527	18	31	194	54	22	1971
Input Volume	5	971	40	170	816	25	30	200	50	20	2328
% of Volume	80	100	98	67	65	71	102	97	109	109	85
Denied Entry Before	0	0	0	0	0	0	0	3	0	0	3
Denied Entry After	0	0	0	0	0	0	1	5	0	0	6

90: S/S Covanta & Brooklake Rd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	445	9	3	586	18	6	1067
Vehicles Exited	446	9	3	579	18	6	1061
Hourly Exit Rate	446	9	3	579	18	6	1061
Input Volume	650	10	5	750	20	5	1440
% of Volume	69	88	60	77	91	120	74
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

Total Network Performance

Vehicles Entered	4906
Vehicles Exited	4647
Hourly Exit Rate	4647
Input Volume	32521
% of Volume	14
Denied Entry Before	31
Denied Entry After	841

Intersection: 10: River Rd /River Rd & Brooklake Rd

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	126	278	392	543	290	463	438	240
Average Queue (ft)	30	172	177	148	31	236	189	54
95th Queue (ft)	85	268	393	400	133	398	370	160
Link Distance (ft)		2426		2436		4230		4348
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	250		400		250		500	
Storage Blk Time (%)		1	6	1		13	1	
Queuing Penalty (veh)		0	27	2		5	2	

Intersection: 20: Huff Ave & Brooklake Rd

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	T	R	L	TR	L	TR
Maximum Queue (ft)	35	358	82	249	30	22	128	73	45
Average Queue (ft)	3	161	19	90	3	2	49	27	6
95th Queue (ft)	18	292	59	186	19	13	100	59	25
Link Distance (ft)		2436		318	318		1057		1305
Upstream Blk Time (%)				0					
Queuing Penalty (veh)				0					
Storage Bay Dist (ft)	50		200			100		100	
Storage Blk Time (%)	0	24		1			1	0	
Queuing Penalty (veh)	0	1		0			0	0	

Intersection: 30: Truckman Way & Brooklake Rd

Movement	EB	EB	WB	WB	NB
Directions Served	T	TR	L	T	LR
Maximum Queue (ft)	14	31	147	44	219
Average Queue (ft)	0	2	40	0	84
95th Queue (ft)	8	15	112	5	156
Link Distance (ft)	318	318		250	299
Upstream Blk Time (%)					0
Queuing Penalty (veh)					0
Storage Bay Dist (ft)			150		
Storage Blk Time (%)			1	0	
Queuing Penalty (veh)			3	0	

Intersection: 40: I-5 SB On-Ramp/I-5 SB Off-Ramp & Brooklake Rd

Movement	EB	EB	WB	WB	SB	SB	B29
Directions Served	T	R	L	T	LT	R	T
Maximum Queue (ft)	9	71	450	716	1134	175	2667
Average Queue (ft)	0	32	384	441	765	62	657
95th Queue (ft)	6	62	557	963	1346	138	2548
Link Distance (ft)	340	340		684	1079	1079	3169
Upstream Blk Time (%)				25	35		11
Queuing Penalty (veh)				261	0		0
Storage Bay Dist (ft)			350				
Storage Blk Time (%)			65	0			
Queuing Penalty (veh)			368	1			

Intersection: 50: I-5 NB Off-Ramp/I-5 NB On-Ramp & Brooklake Rd

Movement	EB	WB	WB	NB	NB	B28
Directions Served	L	T	R	L	TR	T
Maximum Queue (ft)	169	488	75	1207	180	2000
Average Queue (ft)	44	182	17	1108	45	1421
95th Queue (ft)	105	529	66	1370	135	2749
Link Distance (ft)		474		1092	1092	1937
Upstream Blk Time (%)		9		84		64
Queuing Penalty (veh)		68		0		0
Storage Bay Dist (ft)	250		50			
Storage Blk Time (%)		30	0			
Queuing Penalty (veh)		17	1			

Intersection: 60: Brooklake Rd & 50th Ave

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	76	1131	59
Average Queue (ft)	3	167	13
95th Queue (ft)	36	763	40
Link Distance (ft)	474	1408	1343
Upstream Blk Time (%)		1	
Queuing Penalty (veh)		11	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 70: Portland Rd NE & Brooklake Rd

Movement	EB	EB	B23	B27	WB	NB	NB	B26	SB	SB	SB	B24
Directions Served	LT	R	T	T	LTR	L	TR	T	L	T	R	T
Maximum Queue (ft)	616	400	667	64	164	309	653	1950	215	536	175	2247
Average Queue (ft)	349	128	153	4	74	278	556	1252	39	504	146	2122
95th Queue (ft)	658	432	578	52	133	419	910	3034	161	548	231	2573
Link Distance (ft)	516		780	922	2912		618	2563		434		2173
Upstream Blk Time (%)	21		2				45	19		34		44
Queuing Penalty (veh)	139		11				0	0		0		0
Storage Bay Dist (ft)		300				180			175		100	
Storage Blk Time (%)	28					80	10			37	2	
Queuing Penalty (veh)	49					486	11			193	18	

Intersection: 80: Driveway/Maytrucking & Brooklake Rd

Movement	EB	EB	EB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	LTR	LTR
Maximum Queue (ft)	32	14	29	161	121	292	186
Average Queue (ft)	2	0	2	53	4	202	71
95th Queue (ft)	13	10	14	113	53	339	153
Link Distance (ft)		250	250		340	255	192
Upstream Blk Time (%)						44	4
Queuing Penalty (veh)						0	0
Storage Bay Dist (ft)	50			150			
Storage Blk Time (%)	0	0		1	0		
Queuing Penalty (veh)	0	0		3	0		

Intersection: 90: S/S Covanta & Brooklake Rd

Movement	EB	WB	WB	NB
Directions Served	T	L	T	LR
Maximum Queue (ft)	5	53	234	69
Average Queue (ft)	0	3	8	19
95th Queue (ft)	4	24	102	51
Link Distance (ft)	1408		922	490
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		125		
Storage Blk Time (%)			2	
Queuing Penalty (veh)			0	

Network Summary

Network wide Queuing Penalty: 1678

HCS7 Freeway Facilities Report

Project Information

Analyst	DIMA	Date	11/10/2020
Agency	David Evans and Associates, Inc	Analysis Year	2043
Jurisdiction	ODOT	Time Period Analyzed	700 to 800
Project Description	Brooklake IAMP NB AM	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	5
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	2.85		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-5 NB Mainline	5280	3
2	Diverge	Diverge	Brooklake off-ramp	1500	3
3	Basic	Basic	I-5 NB Mainline	2340	3
4	Merge	Basic	Brooklake on-ramp	625	4
5	Basic	Basic	I-5 NB Mainline	5280	3

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.882	5143	6882	0.75	63.7	26.9	D

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.92	0.90	0.882	0.882	5143	892	6824	2033	0.75	0.44	62.0	57.9	27.7	29.8	D

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.882	4270	6882	0.62	66.5	21.4	C

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.92	0.90	0.882	0.836	4849	579	9223	2100	0.53	0.28	68.0	68.2	17.8	17.8	B

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS

1	0.94	0.878	4727	6882	0.69	65.4	24.1	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	64.6	24.7	21.7	2.60	D

Facility Overall Results

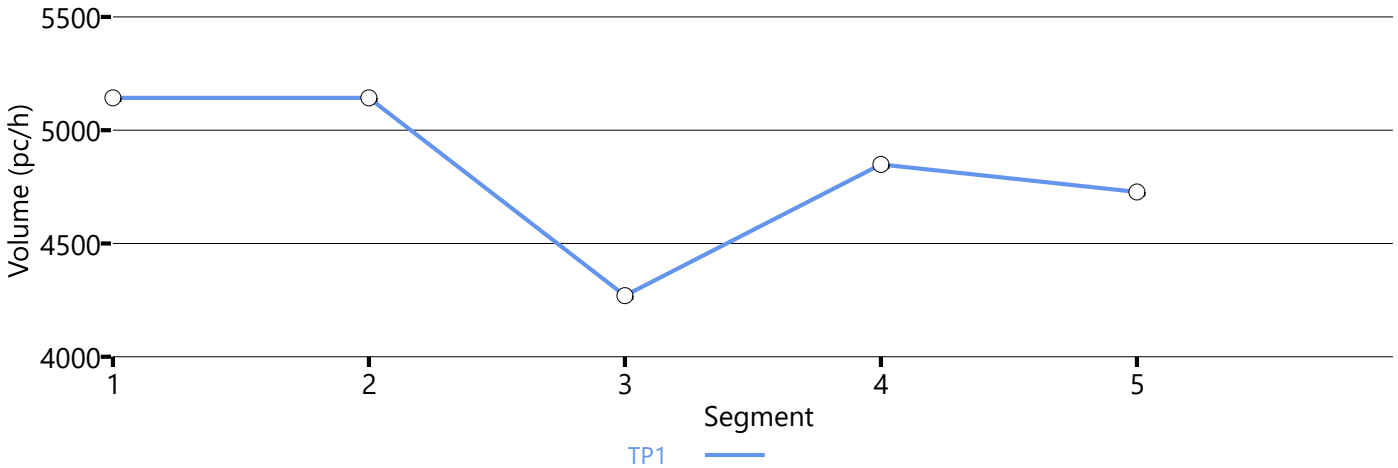
Space Mean Speed, mi/h	64.6	Density, veh/mi/ln	21.7
Average Travel Time, min	2.60	Density, pc/mi/ln	24.7

Messages

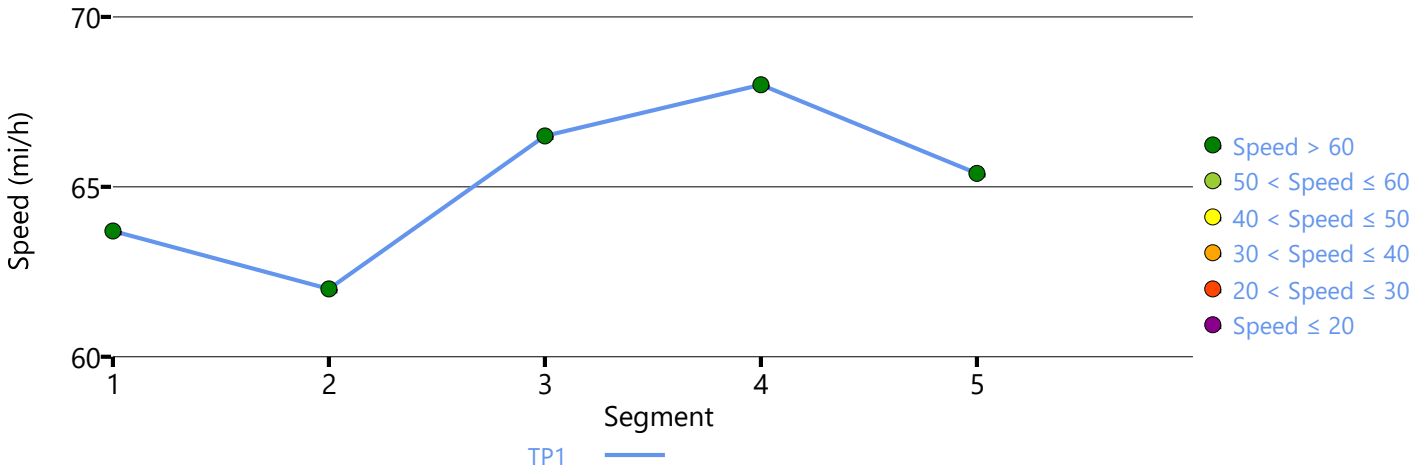
ERROR 1	Acceleration lane length is longer than the segment length for merge segment 4.

Comments

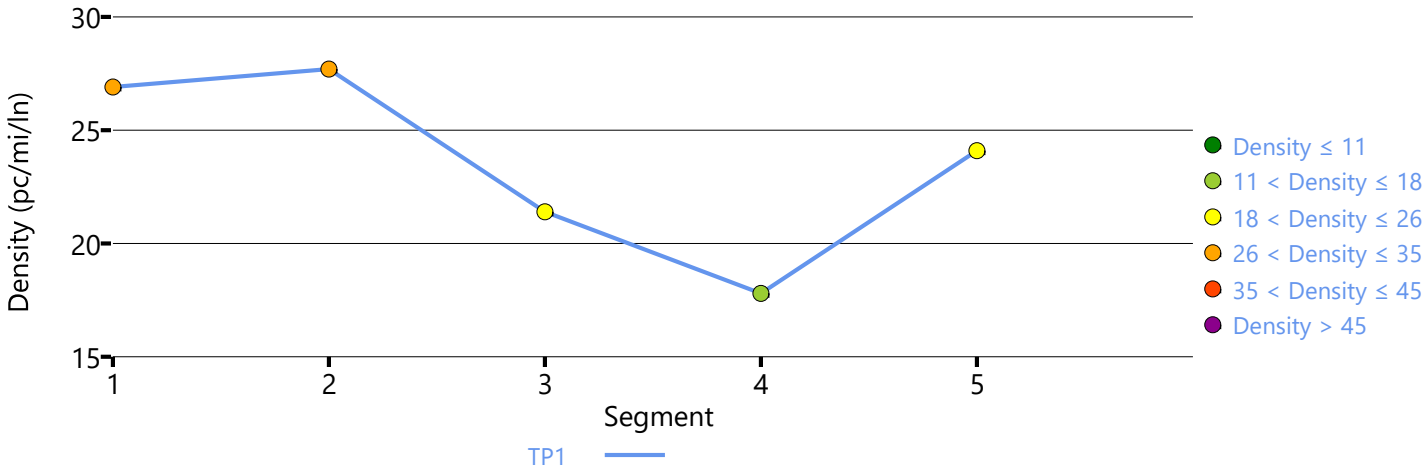
Volume Distribution



Speed Distribution



Density Distribution



HCS7 Freeway Facilities Report

Project Information

Analyst	DIMA	Date	11/10/2020
Agency	David Evans and Associates, Inc.	Analysis Year	2043
Jurisdiction	ODOT	Time Period Analyzed	0700 to 0800
Project Description	Brooklake IAMP SB AM	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	5
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	2.84		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-5 SB Mainline	5280	3
2	Diverge	Diverge	Brooklake off-ramp	1500	3
3	Basic	Basic	I-5 SB Mainline	2260	3
4	Merge	Basic	Brooklake on-ramp	650	4
5	Basic	Basic	I-5 SB Mainline	5280	3

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.833	4063	6853	0.59	65.9	20.5	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.833	0.750	4063	319	6824	2100	0.60	0.15	63.5	59.6	21.3	20.5	C

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.833	3785	6882	0.55	66.8	18.8	C

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.833	0.819	4920	1135	9223	2033	0.53	0.56	68.1	68.2	18.0	18.0	B

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS

1	0.98	0.829	4890	6882	0.71	64.8	25.2	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	65.5	21.8	18.2	2.60	C

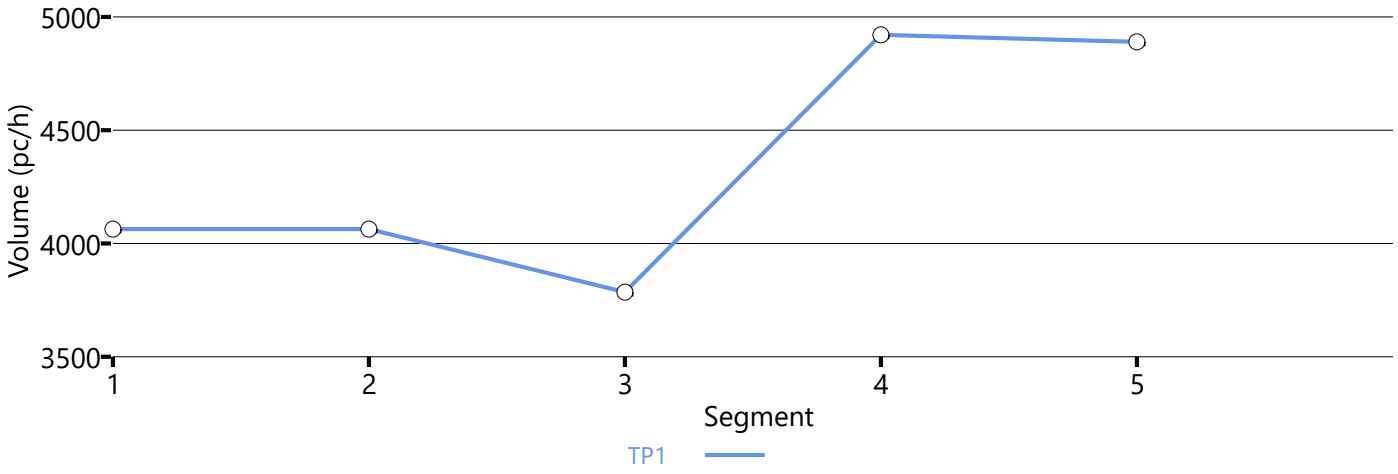
Facility Overall Results

Space Mean Speed, mi/h	65.5	Density, veh/mi/ln	18.2
Average Travel Time, min	2.60	Density, pc/mi/ln	21.8

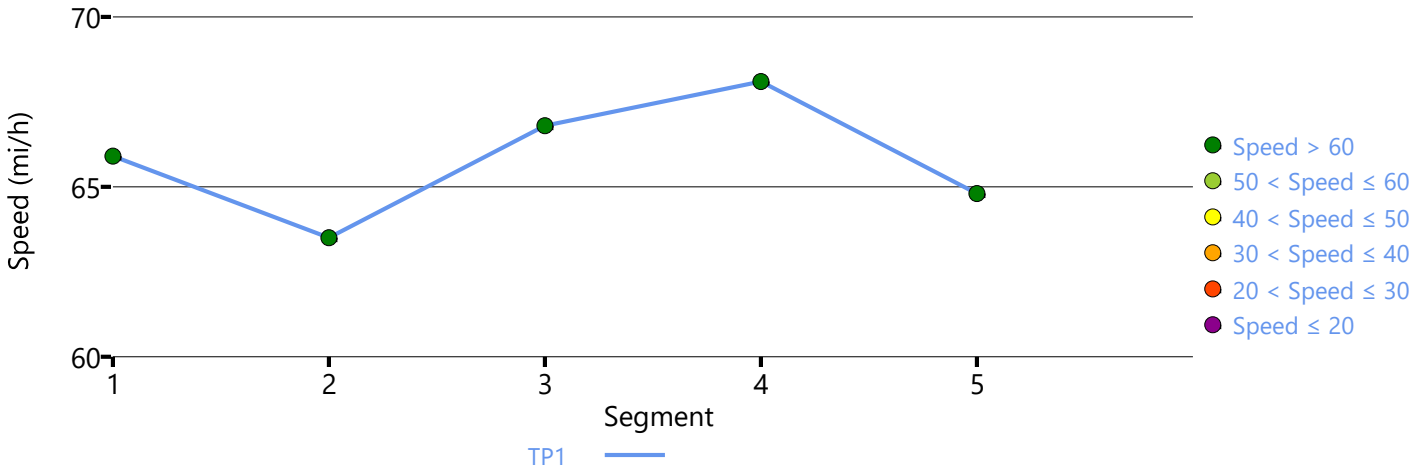
Messages

Comments

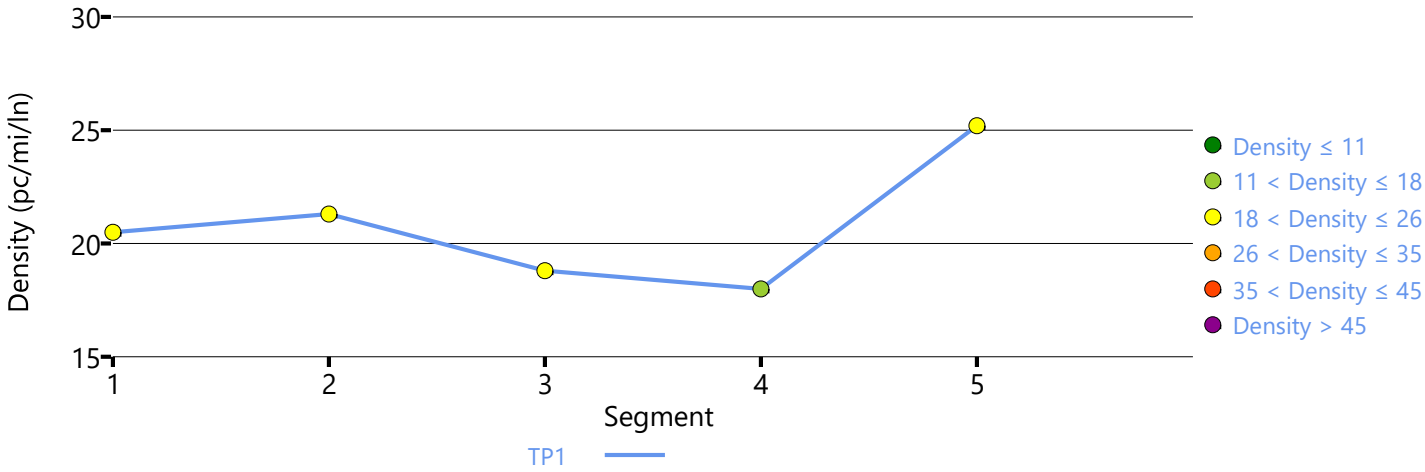
Volume Distribution



Speed Distribution



Density Distribution



HCS7 Freeway Facilities Report

Project Information

Analyst	DIMA	Date	11/10/2020
Agency	David Evans and Associates, Inc	Analysis Year	2043
Jurisdiction	ODOT	Time Period Analyzed	1630 to 1730
Project Description	Brooklake IAMP NB PM	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	5
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	2.85		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-5 NB Mainline	5280	3
2	Diverge	Diverge	Brooklake off-ramp	1500	3
3	Basic	Basic	I-5 NB Mainline	2340	3
4	Merge	Basic	Brooklake on-ramp	625	4
5	Basic	Basic	I-5 NB Mainline	5280	3

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.97	0.884	5391	6882	0.78	62.5	28.8	D

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.97	0.93	0.884	0.870	5391	823	6824	2033	0.79	0.40	62.2	58.1	28.9	30.7	D

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.97	0.884	4615	6882	0.67	65.7	23.4	C

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.97	0.93	0.884	0.842	4936	321	9223	2100	0.54	0.15	68.0	68.2	18.1	18.1	C

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS

1	0.97	0.884	4907	6882	0.71	64.7	25.3	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	63.9	26.2	23.2	2.70	D

Facility Overall Results

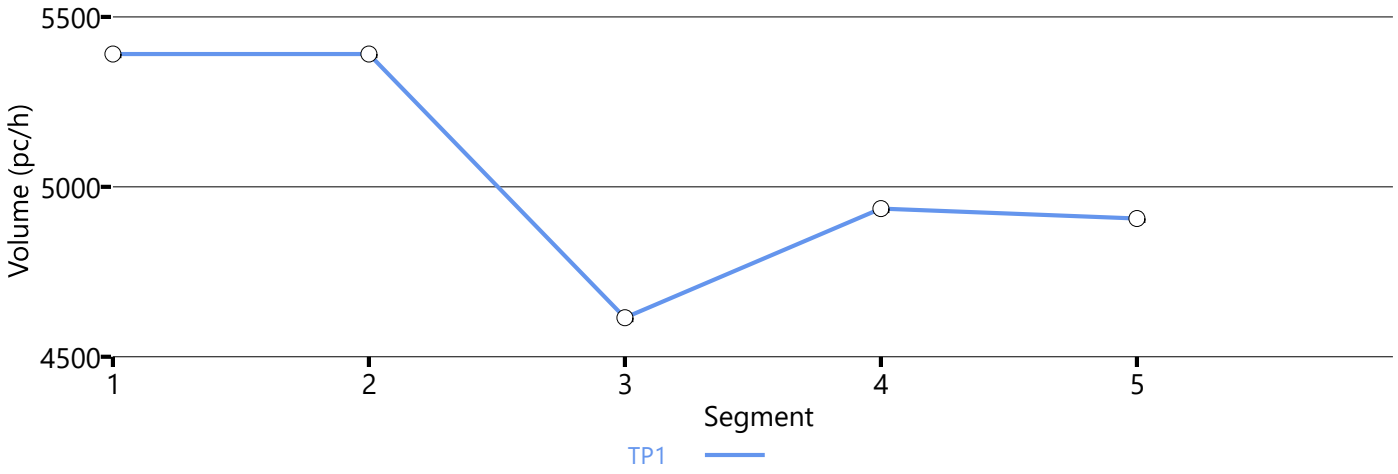
Space Mean Speed, mi/h	63.9	Density, veh/mi/ln	23.2
Average Travel Time, min	2.70	Density, pc/mi/ln	26.2

Messages

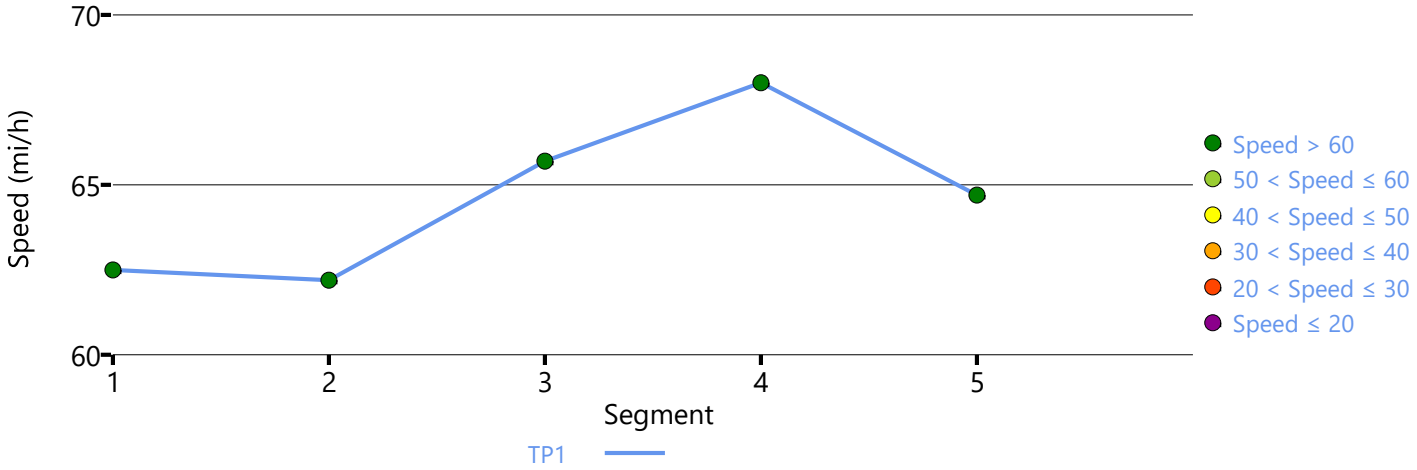
ERROR 1	Acceleration lane length is longer than the segment length for merge segment 4.

Comments

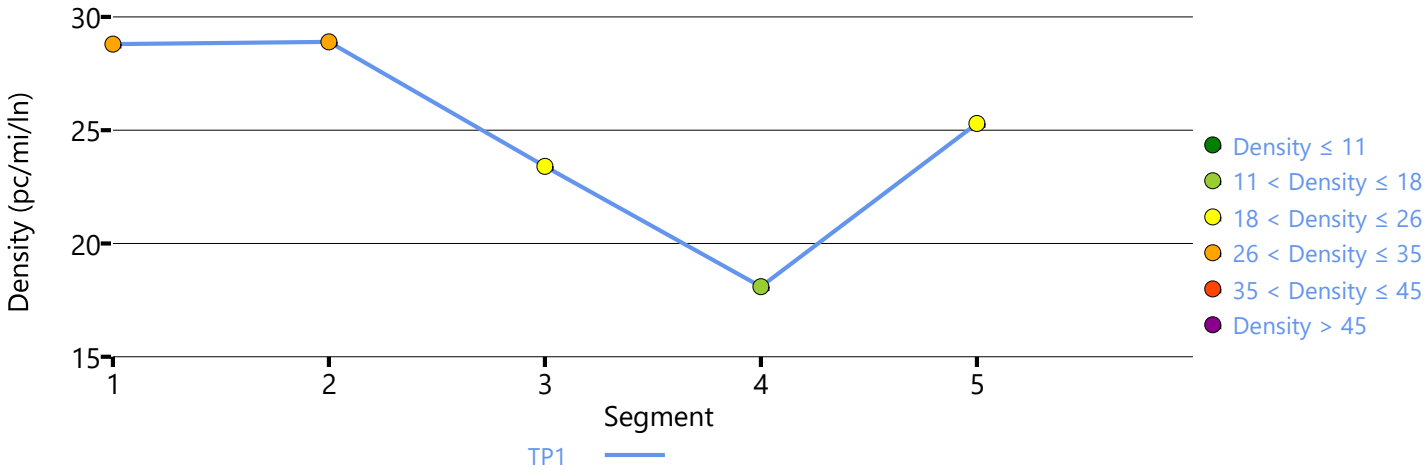
Volume Distribution



Speed Distribution



Density Distribution



HCS7 Freeway Facilities Report

Project Information

Analyst	DIMA	Date	11/10/2020
Agency	David Evans and Associates, Inc.	Analysis Year	2043
Jurisdiction	ODOT	Time Period Analyzed	1630 to 1730
Project Description	Brooklake IAMP SB PM	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	5
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	2.84		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-5 SB Mainline	5280	3
2	Diverge	Diverge	Brooklake off-ramp	1500	3
3	Basic	Basic	I-5 SB Mainline	2260	3
4	Merge	Basic	Brooklake on-ramp	650	4
5	Basic	Basic	I-5 SB Mainline	5280	3

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.99	0.916	5736	6882	0.83	60.5	31.6	D

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.97	0.95	0.916	0.897	5855	576	6824	2100	0.86	0.27	62.7	59.0	31.1	28.7	D

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.99	0.916	5195	6882	0.75	63.5	27.3	D

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.99	0.95	0.916	0.912	6627	1432	9223	2033	0.72	0.70	65.2	65.2	25.4	25.4	C

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS

1	0.98	0.917	6623	6882	0.96	53.5	41.3	E

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	58.3	33.9	31.1	2.90	E

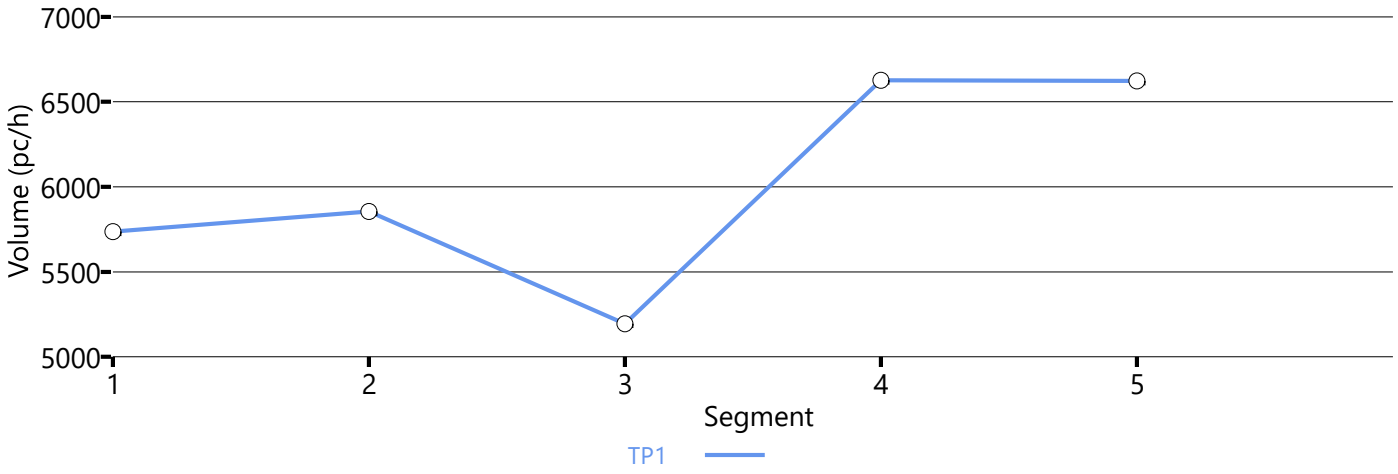
Facility Overall Results

Space Mean Speed, mi/h	58.3	Density, veh/mi/ln	31.1
Average Travel Time, min	2.90	Density, pc/mi/ln	33.9

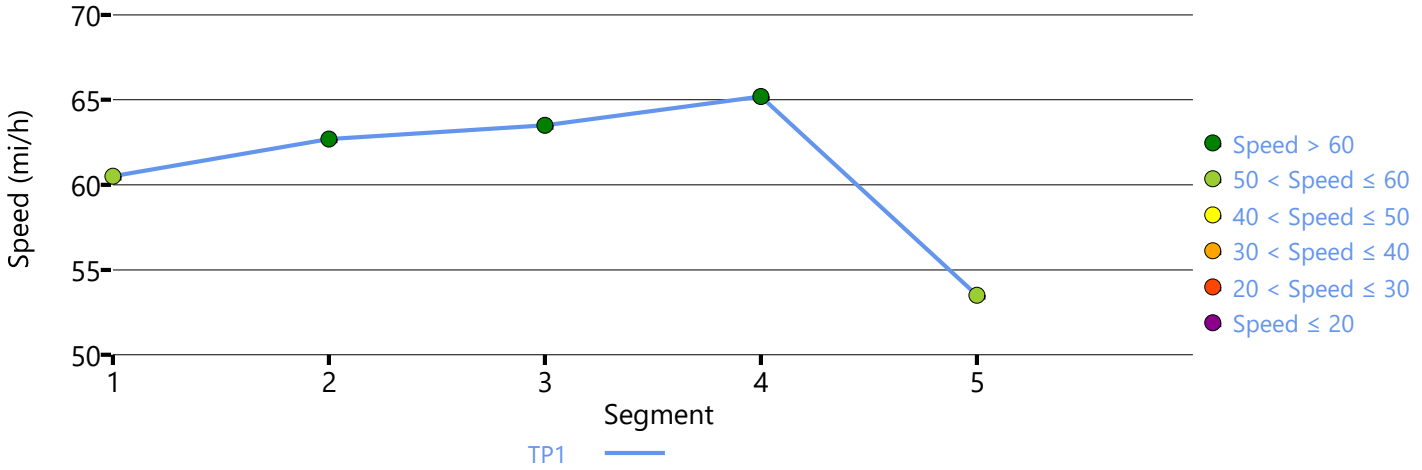
Messages

Comments

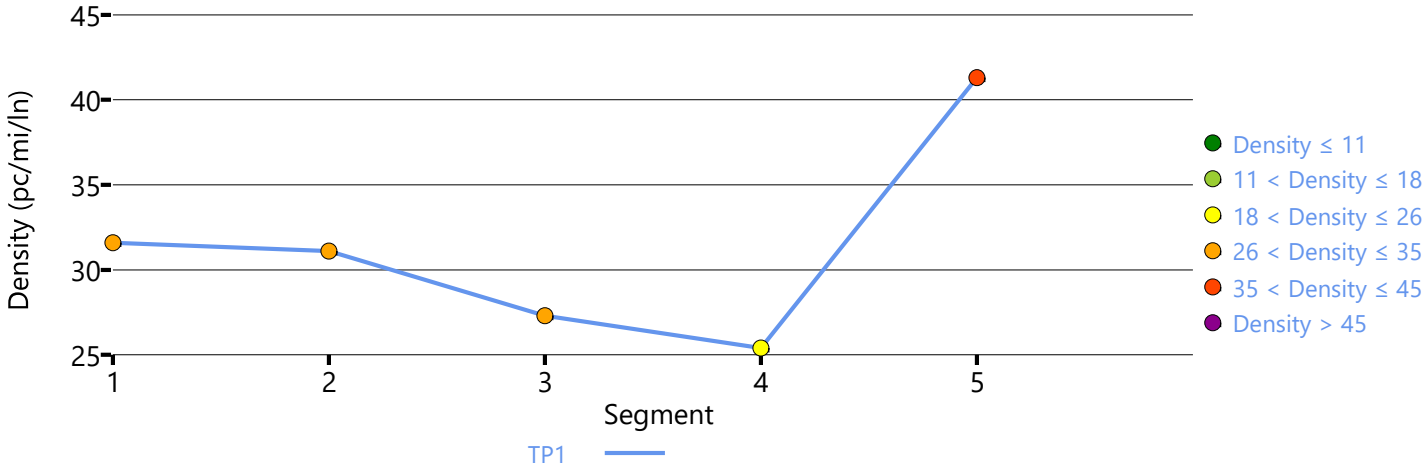
Volume Distribution



Speed Distribution



Density Distribution



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5 TECHNICAL MEMORANDUM #5

Determine Potential Environmental Constraints

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TECHNICAL MEMORANDUM #5

Determine Potential Environmental Constraints (Task 4.5)

Date: April 27, 2021

To: Oregon Department of Transportation, Region 2
Marion County

From: David Evans and Associates, Inc.

Subject: I-5: Brooks Interchange Area Management Plan (Exit 263)

Contents

Overview

This memorandum identifies and reviews the land use and environmental conditions of the I-5 Brooks Interchange Area Management Plan (IAMP) study area. This review is intended to understand the land uses that rely on the interchange and surrounding transportation system and identify environmental features and community resources that may pose potential challenges or barriers to transportation improvements. The information gathered was taken primarily from published documents, websites, and GIS data. This memorandum considers federal regulations and standards because potential projects identified in the IAMP may be partially federally funded or require federal permits, and therefore would need to comply with federal regulations and standards.

Location

The Brooks IAMP study area is within the unincorporated community of Brooks-Hopmere in Marion County. A portion of the study area is included in the Salem-Keizer Area Transportation Study (SKATS), which is the designated Metropolitan Planning Organization (MPO) for the Salem-Keizer area. The I-5 Brooks Interchange is located at Exit 263 at Brooklake Road NE (Figure 1). The adjacent interchanges on I-5 are at Exit 271 (Woodburn) nearly eight miles to the north, and at Exit 260 (Chemawa Road) approximately three miles to the south.

The IAMP study area is approximately 740 acres. The approximate coverage of the most prevalent current uses are as follows:

- Industrial – 320 acres
- Agriculture – 250 acres
- Commercial – 70 acres

There are 75 tax lots located in the study area boundary; not all the tax lots are entirely within the boundary of the study area. Appendix A includes an analysis of all the tax lots, noting for each tax lot listing acreage, building area, zone(s), overlay(s) and comprehensive plan designation.

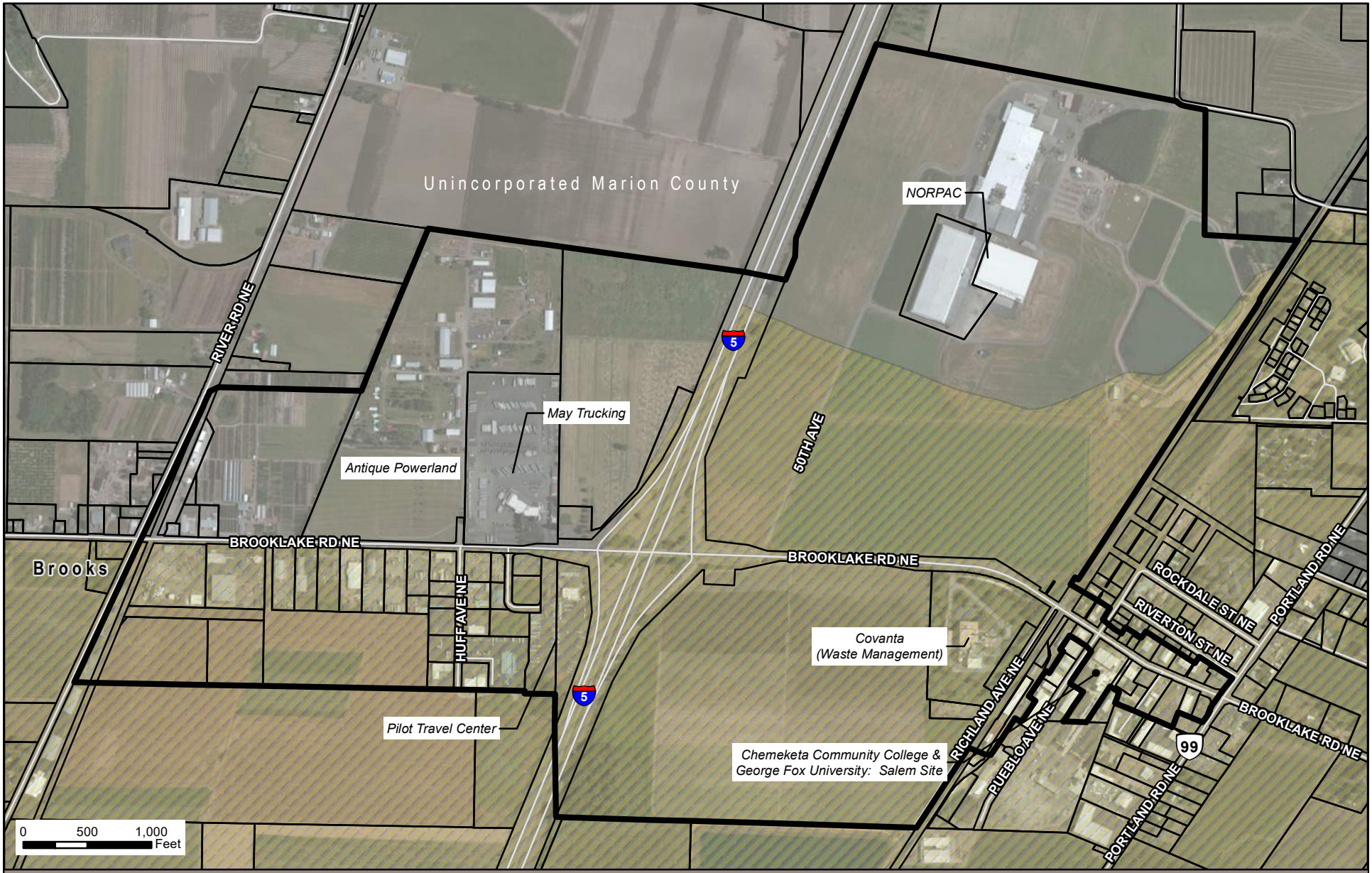
Land Use and Zoning

There are a variety of uses in the study area ranging from commercial and industrial to public. The commercial uses in the area are primarily for travelers using I-5 and include gas stations and travel stops. Additionally, Brooklake Road provides access to residential neighborhoods in Brooks and community resources such as Chemeketa Community College.

The Marion County Comprehensive Plan is the planning goal and policy guide for the County. The Marion County Code, Title 17 Rural Zoning, dictates development standards through zoning, overlay provisions, and additional development standards. This memorandum provides an analysis of both governing land use documents, the Comprehensive Plan and Title 17 Rural Zoning, highlighting relevant standards for the Brooks IAMP.

Comprehensive Plan

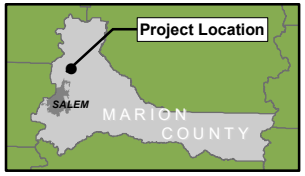
As shown in Figure 2, the study area includes five comprehensive plan designations: Commercial, Industrial, Primary Agriculture, Public and Rural Residential.



Brooks Interchange Area Management Plan

N

Data Sources: Marion County, 2020



Study Area
Tax Parcel
SKATS Boundary

Figure 1
Study Area

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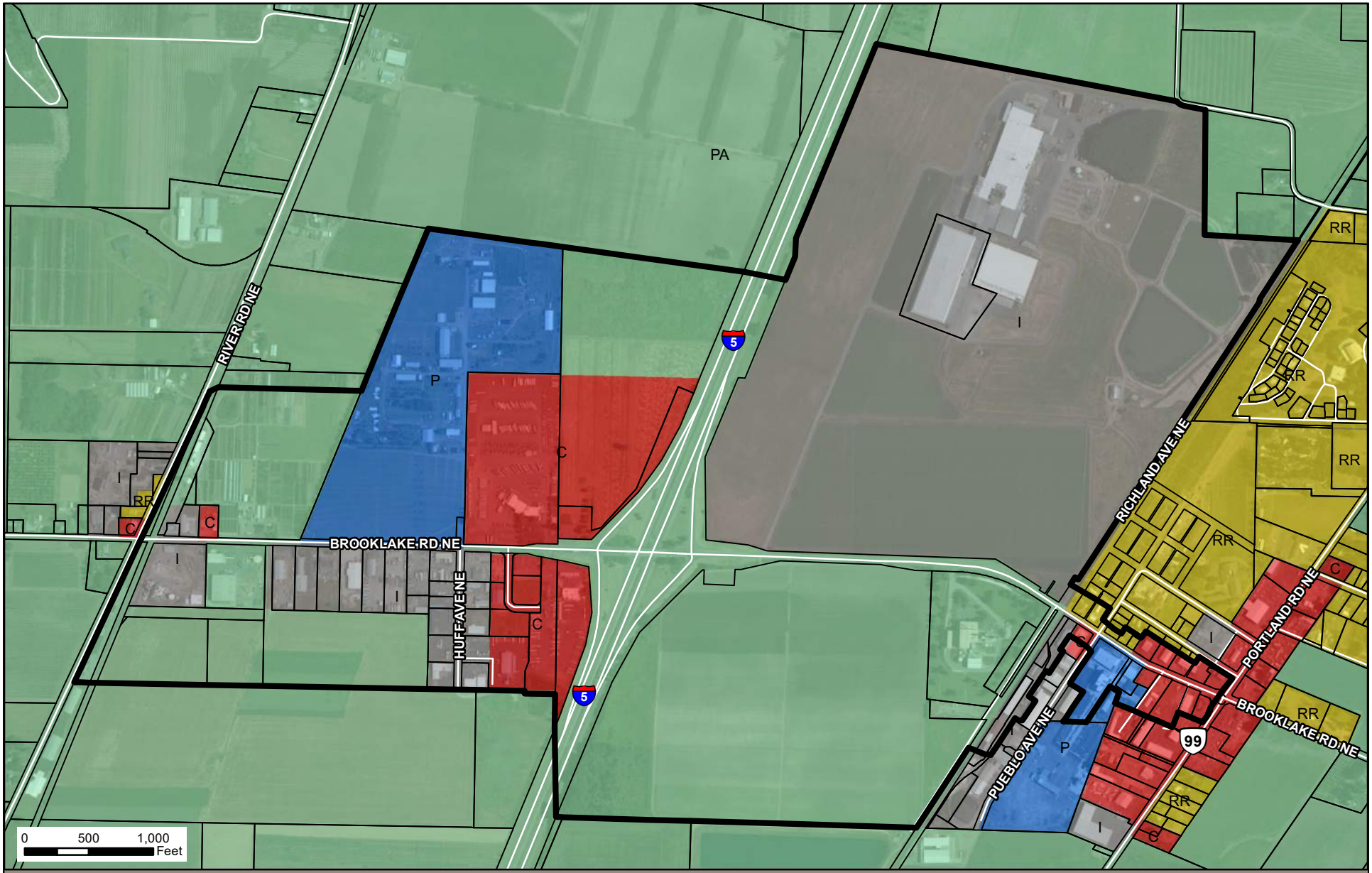

Brooks Interchange Area Management Plan

N

Study Area
Tax Parcel
Road

Comprehensive Land Use Plan Designation

Commercial (C)
Industrial (I)
Primary Agriculture (PA)
Public (P)
Rural Residential (RR)

Data Sources: Marion County, 2020

Figure 2
Marion County Comprehensive Plan Designations

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Brooks-Hopmere Community

The Brooks IAMP study area also overlaps with Brooks-Hopmere Community (BHC) between River Road and OR 99E (Portland Road). The BHC is a designated Urban Unincorporated Community[1] in the Marion County Comprehensive Plan and it is the largest unincorporated community in Marion County.

Pursuant to OAR 660-022-0040(2), the existing boundary of the BHC cannot be expanded since it is located within 10 miles of the City of Keizer's Urban Growth Boundary. Within the boundary that delineates the BHC, uses are limited by provisions of OAR 660-022-0030. Based on those provisions the following various types of development permitted in the BHC are the following:

- Residential development is permitted.
- Industrial development is subject to the provisions of OAR 660-022 -0030(3). The provisions allow development of industrial uses given various requirements.
    - New or expansion of existing industrial uses are permitted, provided they meet one or more of the following use criteria:
        - A use related to agricultural or forest lands, as authorized under Goal 3 (OAR 660-015-0000(3)) and Goal 4 (OAR 660-015-0000(4)).
        - A use that is an expansion of an existing use as of 1994.
        - It is a small scale, low impact use.[2]
        - Uses that require proximity to rural resources, as defined by 660-004-002(3)(a)
        - A new use that will not exceed the capacity of water and sewer service available to the site as of 1994.
        - A new use more intensive that those previously mentioned may be permitted given they can provide necessary employment for the area that is coordinated with neighboring UGB and rural area employment.
        - Development of an industrial use or accessory uses on an abandoned or diminished industrial mill site[3] that is zoned for industrial use.
- New commercial development is required to meet the following criteria:
    - Uses authorized under Goals 3 and 4.
    - Small scale, low impact uses.[4]
    - Uses intended to serve the community and surrounding rural area or travel needs of people passing through the area.
- Development of new hotels or motels are permitted, given they are served by a community sewer system. Based on the conditions of the BHC a new hotel or motel in the area is limited to 35 units.

The Brooks-Hopmere Community Plan, adopted in 2000, has been undergoing an update. The original plan inventoried existing conditions, created comprehensive plan policies, and established the

[1] Definition and standards for Urban Unincorporated Community are found in Oregon Administrative Rules (OAR) Chapter 660, Division 22.

[2] Small scale, low impact industrial use in the case of BHC is defined as, "one which takes place in a building or buildings not exceeding 60,000 square feet of floor space."

[3] Abandoned or diminished industrial mill site is defined in ORS 197.719

[4] For this section "small scale, low impact commercial use" is defined as, "one which takes place ... a building or buildings not exceeding 8,000 square feet of floor space."

community boundary. The purpose of the BHC plan update is to identify opportunities and a plan for capitalizing on the opportunities and resources in the BHC.

Rural Zoning Code

The County's Rural Zoning Code includes multiple zones and one overlay district that cover the IAMP study area. Figure 3 shows the current zoning within the study area. Descriptions of the applicable zones and overlays in the study area are detailed in Table 1.

Table 1. Regulations of Marion County Zones in Brooks IAMP Study Area

Zone	Permitted Uses and Lot Standards*
Acreage Residential (AR)	• Permitted uses – single family dwellings, farm uses, public facilities • Height – Maximum building height, 35 ft. • Minimum lot size – For subdivisions, partitions, or planned use developments, 2 acres.
Community Commercial (CC)	• Permitted uses – restaurant, small scale retail stores, auto repair, grocery store, and agricultural services, used car sales. • Lot area – New parcels must be a minimum of one acre • Parcel coverage – No more than 75% of a parcel shall be covered by buildings • Traffic – A traffic impact analysis is required for development in the zone.
Exclusive Farm Use (EFU)	• Permitted uses – farm uses, buildings (farm), minerals/geothermal exploration operations, widening of roads, composting, on-site filming, creation/restoration/enhancement of wetlands, single agri-tourism or other commercial event. • Lot area – New parcels must be a minimum of 80 acres • Height – Dwellings, maximum building height is 35 feet; farm-related structures, no maximum height; nonresidential and non-farm structures, maximum building height is 35 feet unless given exception.
Interchange District (ID)	• Permitted uses – service station, hotels/motels (up to 35 units), restaurants, RV park, retail, and wholesale. • Height – Industrial uses, maximum building height is 45 feet • Sewage disposal – New or expanded uses must not exceed carrying capacity of community sewage disposal or on-site disposal. • Traffic – A traffic impact analysis may be required for development in the zone.
Multifamily Residential (RM)	• Permitted uses – housing (duplexes, and single family dwellings), planned development, public facilities. • Lot area – Minimum lot area is 5,000 s.f. • Lot coverage – Main building(s) shall not occupy more than 40% of the lot area

Zone	Permitted Uses and Lot Standards*

Public (P)	• Permitted uses – public uses such as schools, cemeteries, religious organizations, and public service buildings.
	• Height – Maximum building height, 70 feet
	• Lot coverage –
	  ○ No main building shall occupy more than 30% of the lot
	  ○ Commercial uses must be limited to 3,500 s.f.
	• Sewage disposal – New or expanded uses must not exceed carrying capacity of community sewage disposal or on-site disposal
	• Traffic – A traffic impact analysis may be required for development in the zone.

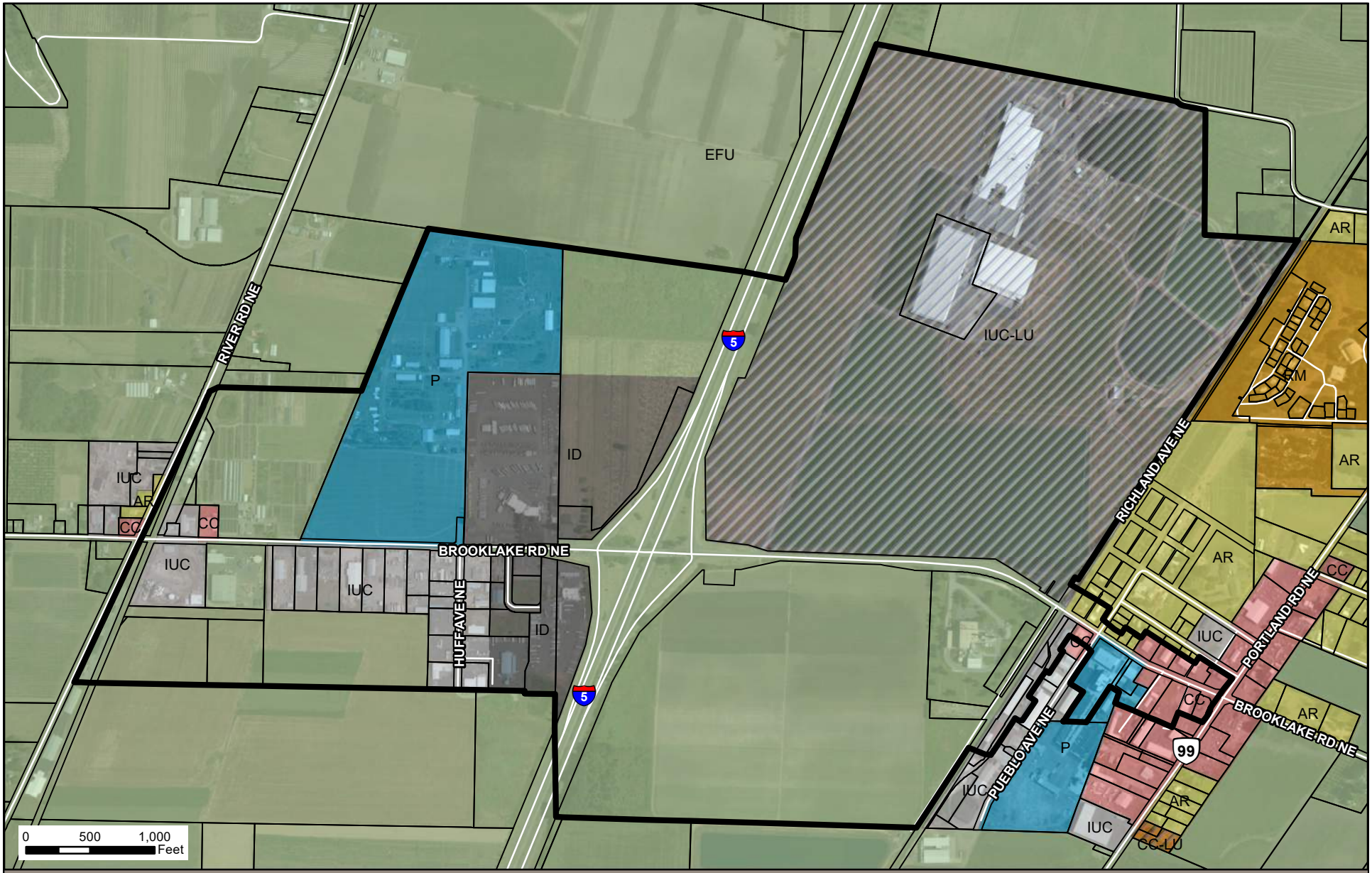
Unincorporated Community Industrial (IUC)	• Permitted uses – offices, agricultural services, manufacturing and processing, trucking, wholesale distribution. • Parcel Coverage – No more than 40% of a lot or parcel shall be covered by buildings • Sewage disposal – New or expanded uses must not exceed carrying capacity of community sewage disposal or on-site disposal • Traffic – A traffic impact analysis may be required, is required for buildings over 60,000 s.f.
Limited Use Overlay (-LU)	• Applies to three properties in the community. • Is used to implement requirements associated with goal exceptions for the properties and to ensure properties do not exceed the capacity of local sewer and water systems. • Limits permitted uses on the site • For the NORPAC (now Oregon Potato) site, establishes specific performance metrics for the sewage disposal and transportation facility requirements.

*Note: In addition to the zone standards described in the MCC, state regulations for Urban Unincorporated Communities also apply to the parcels in the Brooks-Hopmere Community boundary.

Community Features

Community features within the study area are listed below:

- Marion County Rural Fire District Station
- Chemeketa Community College Brooks Campus /George Fox University Salem Site
- Antique Powerland
- Post Office



Brooks Interchange Area Management Plan

N

Study Area
Tax Parcel
Road

Marion County Zoning

- Acreage Residential (AR)
- Community Commercial (CC)
- Community Commercial - Limited Use (CC-LU)
- Exclusive Farm Use (EFU)
- Interchange District (ID)
- Multiple Family Residential (RM)
- Public (P)
- Unincorporated Community Industrial (IUC)
- Unincorporated Community Industrial - Limited Use (IUC-LU)

Data Sources: Marion County, 2020

Figure 3
Marion County Zoning

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Cultural Resources

Historic and Archaeological Resources

Under Section 106 of the National Historic Preservation Act of 1966 (Public Law 89-665), 16 USC 470-470m, and under federal regulations governing the protection of historic and cultural resources (36 Code of Federal Regulations [CFR] 800), federal agencies, and the state and local agencies to which the federal agency has delegated responsibility, are directed to avoid undertakings that adversely affect properties that are included in or are eligible for inclusion in the National Register of Historic Places (NRHP). The NRHP identifies and documents (in partnership with state, federal, and tribal preservation programs) districts, sites, buildings, structures, and objects that are significant in American history, architecture, archaeology, engineering, and culture.

The State Historic Preservation Office database does not indicate any potential historical resource listed in the study area. Additional historical resources may exist that have not yet been surveyed, although given that much of the land in the study area is either used for exclusive farm use and commercial uses, there are no obvious potential resources. However, the entire study area has not been surveyed for historical resources.

There may be additional historical and archeological resources in the management area that have not been identified or entered into the SHPO database.

IAMP Considerations: It is unlikely that the study area has been completely surveyed for historical and archaeological resources. Before any ground disturbing actions, ODOT must conduct an archaeological field investigation. Additionally, if right-of-way acquisition is necessary for any proposed projects, ODOT must conduct a cultural resource surveys determining the eligibility of buildings or structures more than 50 years of age.

Section 4(f) Resources

Section 4(f) refers to a part of federal law that protects public parks, recreation lands, wildlife and waterfowl refuges, and public or private historic sites. Section 4(f) applies only to Departments of Transportation (DOTs) and their agencies. Highway projects that "use" public parks or other protected land must fulfill the requirements of Title 23, USC, Section 138, Section 4(f) of the Department of Transportation Act of 1966, as amended.

To qualify as a park, recreation area, or refuge under the statute, a property must meet all the following criteria:

- It must be publicly owned
- It must be open to the public (some exceptions for refuges)
- Its major purpose must be for park, recreation, or refuge activities
- It must be significant as a park, recreation area or refuge

There are no publicly owned parks or other recreation resources, including trails and wildlife refuges within the study area or within one mile of the study area. The interchange is one of many ways to access Willamette Mission State Park, approximately four miles to the northwest of the interchange, but interchange improvements are not expected to affect the park. Additionally, there are no planned parks or recreation projects within or near the study area identified in the 2010 Marion County Parks Master Plan.

A historic site is considered significant, for Section 4(f) purposes, if it is on or determined eligible for listing on the NRHP. To be considered eligible for the NRHP, a historic site must retain adequate integrity to convey its significance and meet one or more of the following criteria at the state, local, or national level:

- Be associated with events that have made a significant contribution to the broad patterns of our history;
- Be associated with the lives of persons significant in our past;
- Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- Have yielded, or may be likely to yield, information important in history or prehistory.

Powerland Heritage Park (Antique Powerland) is an important community feature within the study area and provides 14 museums exhibiting antique farming, rail and truck transportation equipment. However, museums are not normally subject to Section 4(f) unless deemed significant (eligible for NRHP). Antique Powerland is not currently listed on the NRHP. To determine eligibility, FHWA in cooperation with the applicant, consults with the SHPO, tribes that may attach religious and cultural significance to the property, and when appropriate, with local officials to determine whether a site is eligible for the NRHP.

If a site is determined not to be on or eligible for the NRHP, FHWA still may determine that the application of Section 4(f) is appropriate when an official (such as the Mayor, president of the local historic society, etc.) formally provides information to indicate that the historic site is of local significance. In rare cases such as this, FHWA may determine that it is appropriate to apply Section 4(f) to that property. If Section 4(f) is found inapplicable, the FHWA Division Office should document the basis for not applying Section 4(f). Such documentation might include the reasons why the historic site was not eligible for the NRHP.

IAMP Considerations: In general, transportation improvements should try to avoid park areas. Additional cultural resources surveys should be completed to ensure there is no disturbance to any protected resource. A Section 4(f) evaluation will require ODOT to assess all reasonable alternatives that adversely affect protected lands. If every potential alternative that can meet the project objective would impact some Section 4(f) property, then the alternative with the least impact must be selected unless it is not feasible and prudent.

Section 6(f) Resources

The Land and Water Conservation Fund (LWCF) Act of 1965 established grants-in-aid funding to assist states in the planning, acquisition, and development of outdoor recreational land and water areas and facilities. Section 6(f) of the LWCF Act prohibits the conversion of property acquired or developed with the assistance of the LWCF to anything other than public outdoor recreation use without the approval of the Secretary of the U.S. Department of the Interior. No LWCF resource lands were identified in the study area.

IAMP Considerations: None.

Natural Resources

This section documents three categories of regulated environmental conditions: 1) jurisdictional waters including ditches, 2) wetlands, and 3) federally listed threatened and endangered species at the site. The report also includes a general discussion of relevant environmental regulatory requirements. Information on biological resources in the study area was gathered from existing documentation and references. No field surveys were conducted.

Physical Setting

The site is situated within the broad, flat plain of the mid-Willamette Valley. Although the landscape in the vicinity is generally flat, the site sits on a drainage divide between the mainstem Willamette River and the Pudding River sub basin, which is a tributary to the Willamette. The study area is generally centered on I-5 at the Brooklake Road overpass and includes a truck stop, trucking-related businesses, light industrial, public, and agricultural fields, commercial, public, and residential land uses.

Floodplains

The Federal Emergency Management Agency (FEMA), acting through local planning authority, regulates development within floodplains. The entire study area is identified as an Area of Minimal Flood Hazard within the 41047CO225G FEMA floodmap, as depicted in Figure 4.

Surface Waters and Wetlands

Both the National Wetlands Inventory (NWI), and the Local Wetland Inventories (LWI) were examined. The LWI is presented in Figure 4 along with the FEMA floodplain data, and the NWI is presented in Figure 5 with the soil survey data. An LWI is a more refined wetland inventory than the NWI, therefore the discussion focuses on the LWI.

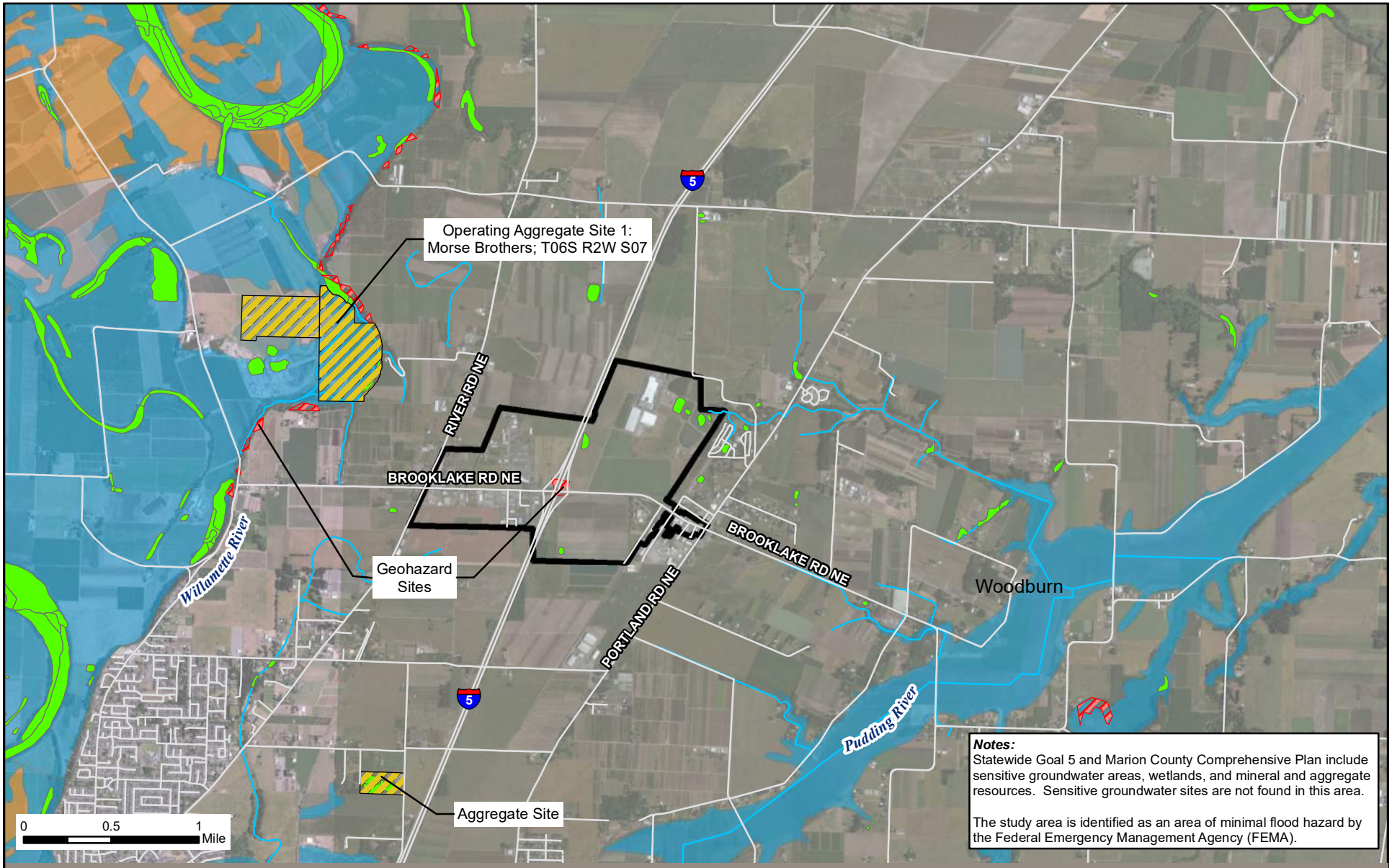
The LWI shows one creek and multiple wetlands within the study area. The uppermost headwater of Fitzpatrick Creek is shown originating in the far northeast portion of the site and flowing east to the Pudding River basin. This creek is mapped as year-round use for coastal cutthroat trout (ODFW 2021).

The LWI also shows a wetland along the eastern side of I-5 in the northern quadrant of the study area, a wetland in the southeast quadrant, and a series of ponds in the northeast corner which are associated with Norpac Foods. Color signatures on aerial photos suggest these wetlands are present, but in the south eastern quadrant of the study area wetlands in the agricultural field appear to be more extensive than is shown on the LWI.

Two additional potential wetlands that are not shown on the LWI or NWI are located on either side of I-5 at the southern portion of the study area. On the east side of I-5 lies what appears to be a cottonwood-forested wetland, and on the west side lies what appears to be a stormwater pond associated with the adjacent trucking facilities. Roadside ditches which may be regulated as wetlands or waters depending on specific site conditions are also present throughout the study area.

This should be considered a preliminary estimate of potential streams, ditches, and wetland areas, and a formal wetland delineation would be required to obtain development permits. Much of the site lies in an agricultural setting, which has undergone ongoing agricultural activity including plowing, and possibly tiling, and irrigation. These activities may obscure or otherwise alter field indicators of hydric soils and hydrology; therefore, the site may be difficult to evaluate for wetland presence. Because of the highly

altered agricultural conditions on the site, we recommend that a wetland delineation of the site should be scheduled for the wet part of the growing season (mid-march through mid-April), when wetland hydrology can be more accurately determined. That delineation would be reviewed and verified or adjusted by Oregon Department of State Lands (DSL). A DSL-approved delineation would be valid for up to five years.



Brooks Interchange Area Management Plan

N

Study Area
Stream/River
Road

Marion County
Aggregate Site
Geohazard Site
Local Wetlands Inventory (LWI) Wetland

Flood Hazard Zones
1% Annual Chance Flood Hazard (100-year flood)
0.2% Annual Chance Flood Hazard (500-year flood)

Figure 4
FEMA Floodplains and Goal 5 Resources

Data Sources:
41047CO225G FEMA floodmap;
Marion County, USGS, USFWS

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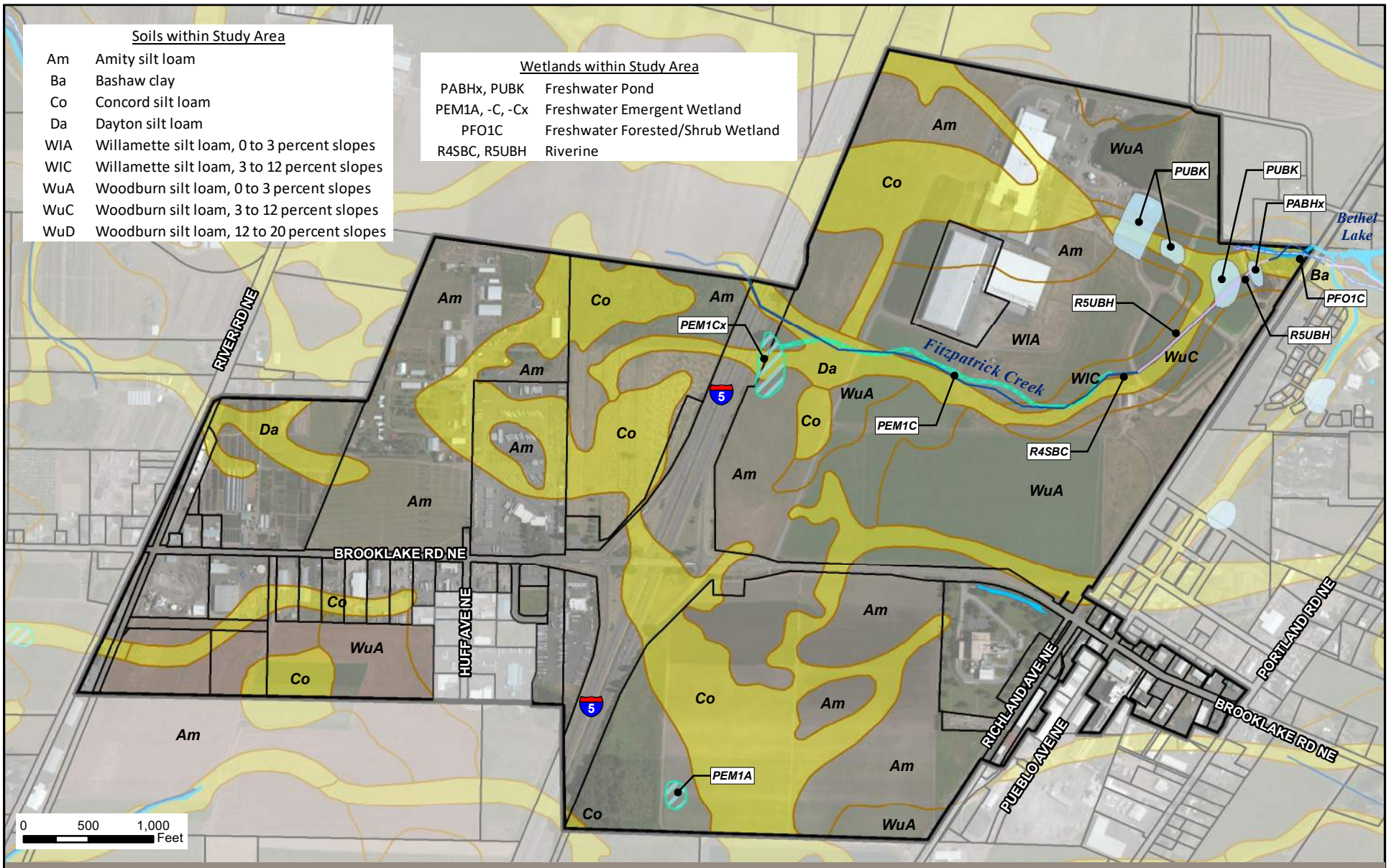

Brooks Interchange Area Management Plan

Figure 5
Soils, Wetlands, and Streams

Biological Resources and Habitat

Table 2 displays federally listed or proposed threatened or endangered species that are shown to potentially occur at this location according to USFWS Information, Planning, and Conservation System database, and any reported occurrence in the vicinity according to ORBIC database and ODFW fish habitat distribution maps (USFWS 2021c; ORBIC 2020; ODFW 2021).

One Endangered Species Act (ESA)-listed bird species, the streaked horned lark, has the potential to be present in the study area. Potential nesting habitats include fallow and active agricultural fields, sparsely vegetated edges of grass fields, row crop fields, heavily grazed pasture, and airports. In the Willamette Valley, breeding habitat characteristics include large expanses (300 acres or more) of herbaceous dominated habitat dominated by short grass (less than 6 inches) with relatively high percentage of bare ground (Pearson and Altman 2005). Although there are no current reports of streaked horned larks in the study area, agricultural areas can provide suitable habitat and the species is known to occur in the vicinity.

Three listed plant species Kincaid's lupine, Nelson's checkermallow, and Willamette daisy, are unlikely to occur due to extensive disturbance, but cannot be ruled out from presence in the study area based on habitat.

There is no potential habitat for fish in the study area, however federally listed Upper Willamette chinook salmon and steelhead trout are present several miles downstream to the east in the Little Pudding River and downstream to the west in the Willamette River (ODFW 2021). If federal permits become necessary for project development, then stormwater management for the project would be required to conform to NMFS standards.

The project would cause no effect to other terrestrial listed or proposed plant and wildlife species addressed here because none are known to occur in the study area, and there is no potential habitat for them.

No critical habitat has been designated within the study area.

Table 2. Federally Listed, Proposed, and Candidate Species with the Potential to Occur in Project Vicinity*

Common Name and ESU	Scientific Name	Agency with Jurisdiction	Federal Status	Reported Occurrence**	Actual Occurrence in Action Area
WILDLIFE					
Marbled Murrelet	*Brachyramphus marmoratus*	USFWS	Threatened	None	None, no suitable habitat
Northern Spotted Owl	*Strix occidentalis caurina*	USFWS	Threatened	None	None, no suitable habitat
Streaked Horned Lark	*Eremophilia alpestris strigata*	USFWS	Threatened	None, although they are known to occur in the vicinity.	Unknown. Habitat may be suitable depending on vegetation height in ag fields during the nesting season.
Yellow Billed Cuckoo	*Coccyzus americanus*	USFWS	Threatened	None	None, no suitable habitat

Common Name and ESU	Scientific Name	Agency with Jurisdiction	Federal Status	Reported Occurrence**	Actual Occurrence in Action Area
PLANTS					
Kincaid's Lupine	*Lupinus Sulphureus Kincaidii*	USFWS	Threatened	None	Unknown. Habitat may be suitable.
Bradshaw's lomatium	*Lomatium bradshawii*	USFWS	Endangered	None	None, no suitable habitat
Nelson's checkermallow	*Sidalcea nelsoniana*	USFWS	Endangered	None	Unknown. Habitat may be suitable.
Water Howellia	*Howellia aquitalis*	USFWS	Threatened	None	None, no suitable habiat; historically found,but considered extirpated from Oregon
Willamette Daisy	*Erigeron decumbens*	USFWS	Endangered	None	Unknown. Habitat may be suitable.

* USFWS 2021

** ORBIC 2020

Regulatory Requirements

Wetlands and Waters

Table 3 summarizes regulations applicable to work in wetlands and waters on this site. Filling of wetlands would require State and Federal permits. Application for both permits can be made with the Joint Permit Application (JPA) form, which describes project design, impacts, and mitigation. Completion of this form requires information including estimated earthwork quantities and project footprint, and typically requires approximately at least 30% level of project design. The proposed project would likely fit within Nationwide Permit 39: Commercial and Institutional Developments, in which case US Army Corps of Engineers (USACE) review time for the Clean Water Act Section 404 would be 45 days. Oregon Department of State lands (ODSL) review time for the Removal/Fill permit would be up to 120 days.

If a project within the Brooks IAMP study area will result in removal and/or fill of wetlands, mitigation may be required by Oregon Department of State Lands (DSL) prior to issuance of a removal-fill permit. Compensatory wetland mitigation options include purchasing credits from a mitigation bank or In-Lieu Fee (ILF) project, permittee-responsible mitigation, or payment in-lieu mitigation when no ILF credits are available and the permittee cannot identify a suitable mitigation project. The Brooks IAMP study area lies within the Banks service area for the Garret Creek wetland mitigation bank. Wetland mitigation can be accomplished by purchasing credit from this bank as a first choice, however wetland mitigation credits will need to be verified for availability and type of wetland when a project need is identified.

Any project replacing a culvert or bridge over a fish-bearing stream may be required to meet ODFW fish passage criteria, including spanning the entire active channel width, and would include preparation of a fish passage plan.

Federally Listed and Proposed Species

Any project with a "federal nexus" (e.g., federal funding, federal permits, etc.) will trigger federal ESA consultation requirements for streaked horned larks, Kincaid's lupine, Nelson's checkermallow, and Willamette daisy with USFWS, and Upper Willamette chinook salmon and steelhead trout with NMFS.

For USFWS this would most likely entail field surveys to confirm no ESA-listed species are present on site, followed by production of a brief "No Effects Memorandum" to document their absence. The standard USFWS protocol surveys for streaked horned larks involve inspecting the site three separate times during the April – July nesting season. Surveys for listed plants would also occur during the spring and summer months during their respective peak flowering periods. ESA consultation for NMFS would be needed for stormwater impacts to downstream ESA-listed fish habitats. This would require stormwater management that conforms to NMFS standards, which could be achieved by way of the ODOT FAHP programmatic agreement, if applicable, or a more extensive Biological Assessment.

Migratory Birds

The Migratory Bird Treaty Act (MBTA) protects most wild bird species in Oregon, excluding a few non-native species such as pigeons and starlings, and makes it illegal to injure or kill migratory birds without a permit, including disturbance of active nests (those containing eggs or chicks). Construction activities such as vegetation removal have the potential to affect migratory birds directly and indirectly. MBTA compliance may be accomplished most effectively by performing all tree and shrub clearing outside of the nesting season, which generally occurs within the window of March through August. If seasonal restrictions are not practicable, a pre-construction survey to identify active nests would be required prior to any disturbance activities. If an active bird nest is found, it is recommended to work around it while leaving a species-specific buffer and avoid removing it until the nest is inactive. Removing or damaging a known active bird nest is a violation of the MBTA.

Table 3. Summary of Natural Resources Regulations

Regulation	Agency	Applicability	Application Fees	Agency Review Duration
Section 404 of the federal Clean Water Act (404)	US Army Corps of Engineers (USACE)	Fill or structure below OHW mark of Waters of U.S., or in adjacent wetlands. Not required for projects involving only excavation.	None	45 days in case of Nationwide Permit coverage. 3 to 12 months for individual permit; but often delayed if ESA standard consultation is necessary.
Section 401 of the federal Clean Water Act (401)	Oregon Department of Environmental Quality (ODEQ)	Discharge of pollutants to waterways, including runoff from roadway pavement.	Variable, but $985 for typical roadway project	30 days public notice, then typically 3 to 6 months
Federal Endangered Species Act (ESA)	National Marine Fisheries Service (NMFS) and/or US Fish and Wildlife Service (USFWS)	Consultation (documentation) required only if the project includes a federal nexus (funding or permits).	No Fee	BA not likely to affect species: 3 to 6 months typical. BA likely to adversely affect: 6 to 12 months typical. No effects documentation: concurrent with 404 review. Programmatic consultation for fish species: concurrent with 404 review.
Oregon Removal/Fill Act	Oregon Department of State Lands (DSL).	Earthwork or structure in excess of 50 cubic yards installed or removed in wetlands or waters of the State	Range from $720 for less than 500 yards of proposed fill below OHWM up to $1155 for over 10,000 yards	40 days in case of General Permit coverage. Otherwise 120 days for individual permit.

Hazardous Materials

A search through web-based databases was conducted to review the available federal and state records for identified hazardous waste sites within the study area. Several hazardous material sites were identified within and adjacent to the study area. A summary of the relevant databases is shown in the table below.

Table 4. Environmental Records Review Summary (Hazardous Materials)

Database Record	Sites within Study Area[1]	Sites Adjacent to Study Area (within 500 feet)
Environmental Cleanup Site Information System (ECSI)	4	1
Hazardous Waste (HAZWASTE)	6	0
Leaking Underground Storage Tanks (LUST)	6	2
Solid Waste Information Facility Tracking (SWIFT)	2	0
Underground Storage Tanks (UST)	4	0
Oregon State Fire Marshall (OSFM) Hazardous Substance Incidents	12	0

1. Sites may be listed in more than one database.

Environmental Cleanup Site Information (ECSI) System

The Oregon Department of Environmental Quality (DEQ) ECSI-listed sites are summarized below. The sites include suspected and confirmed hazardous waste sites.

- Western Farm Services, 3630 Brooklake Rd NE – Contaminated Site, Suspect site requiring further investigation (Site ID 4030)
- Pacific Custom Products, 3501 Brooklake Rd NE – Contaminated Site, Suspect site requiring further investigation (Site ID 859)
- Bingo Truck Stop, 4220 Brooklake Rd NE – Contaminated Site, Suspect site requiring further investigation (Site ID 729)
- PGE - Brooks, 8855 Pueblo Ave (adjacent to study area) – Contaminated Site, No further action required (Site ID 1539)

Hazardous Waste (HAZWASTE)

Hazardous waste sites are facilities that generate or store hazardous waste. There are six facilities in the study area that have generated hazardous waste.

- Western Farm Services, 3630 Brooklake Rd NE
- Marion Recycling Center Inc, 3680 Brooklake Rd NE
- May Trucking Company, 4185 Brooklake Rd NE
- Pilot Travel Center, 4220 Brooklake Rd NE
- Covanta Marion Inc, 4850 Brooklake Rd NE
- Norpac Foods Inc Brooks Plt 5, 4755 Brooklake Rd NE

Leaking Underground Storage Tanks (LUST)

The LUST Incident Report contains an inventory of reported leaking UST incidents. The data was obtained from the DEQ LUST Database. A review of the LUST database revealed that there are six LUST sites within the study area and two LUST sites within 500 feet of the study area boundary.

- Ross Brothers Construction, 3501 Brooklake Rd NE (adjacent to study area) – Regulated LUST, Cleanup completed
- Former Exxon Service Station, 4221 Brooklake Rd NE – Regulated LUST, Cleanup completed
- May Trucking Company, 4185 Brooklake Rd NE – Regulated LUST, Reported
- Bingo Truck Stop, 4220 Brooklake Rd NE – Regulated LUST, Cleanup started
- Dallwig Brother Building Supply, 8891 Huff Ave NE – Regulated LUST, Cleanup completed
- Automated Batting Cages, 8811 Huff Ave NE – Regulated LUST, Cleanup completed
- Curry and Company, 8765 Pueblo Ave NE (adjacent to study area) – Regulated LUST, Cleanup completed
- Brooks Post Office, 5000 Brooklake Rd – Regulated LUST, Cleanup completed

Solid Waste Information Facility Tracking (SWIFT)

There are two solid waste sites within the study area. A review of the DEQ SWIFT detail reports indicate both sites provide municipal services. Marion Resource Recovery (also known as the Marion Recycling Center) operates at the west end of the study area, and Covanta Marion Inc. operates on the east side of the study area. Both have site addresses on Brooklake Road.

Underground Storage Tanks (UST)

A review of DEQ's active UST list indicates that there are four DEQ-permitted UST facilities within the study area:

- May Trucking Company, 4185 Brooklake Rd NE
- Bingo Truck Stop, 4220 Brooklake Rd NE
- Brooks Grocery & Deli, 8975 NE Portland Rd
- Site name undefined, 4150 Brooklake Rd NE

Oregon State Fire Marshall (OSFM) Hazardous Substance Incidents

The OSFM Incident Information Database was reviewed to identify potential releases in the vicinity of the project site. Eleven hazardous substance instances were reported in the study area and are summarized in Table 4. The most recent incident in the study area occurred 18 years ago (2003) when possible vandals allowed contents of an above ground diesel tank to run out on the ground.

Table 5. Environmental Records Review Summary (Hazardous Materials)

Location	Date	Chemical
4850 Brooklake Rd NE	7/23/1987	Sulfuric Acid
4301 Brooklake Rd NE	8/18/1987	Unknown Chemical
I-5 Southbound Mile Post 263	12/12/1989	Petroleum Naphtha
4220 Brooklake Rd NE	12/1/1991	Gasoline
I-5 Northbound Mile Post 267-269	5/18/1992	Diesel Fuel
4220 Brooklake Rd NE	9/9/1992	Diesel
I-5 NB Brooklake Rd NE	10/6/1994	Drug Lab Chemicals

Location	Date	Chemical
3501 Brooklake Rd NE	2/7/1995	Gasoline
4220 Brooklake Rd NE	2/16/1995	Gasoline
Pacific Railroad at Brooklake Rd	4/28/1995	Epoxy
3655 Brooklake Rd NE	4/29/2003	Diesel Fuel

Source: OSFM Hazardous Incident Searchable Database, March 2021.

In general, the hazardous sites appear to be consistent, both in type and quantity, with uses within the study area. More detailed site-specific hazardous materials surveys will be necessary once specific transportation improvements are identified.

Potential Design Constraints

While this review did not identify any "red flags," the baseline data identifies several land use and environmental conditions that could potentially be affected by transportation improvements. Table 6 summarizes resource issues that may present potential design constraints.

Table 6. Land Use and Environmental Summary

Feature	Summary of Key Resources and Concept Guidance	Key Potential Conflict Location(s)	Potential Approval/Permit If Resource Impacted
Land Use and Zoning	Improvements may be limited in EFU	East and west side of I-5	▪ Local land use approvals
Historical and Archaeological Resources	Historical and cultural resources - Further surveys will need to be completed, especially if improvements will include ground-disturbing activities and or right-of-way acquisition of property with potential historical resources.	Throughout study area	▪ National Historic Preservation Act ▪ FHWA – 4(f) ▪ State Historic Preservation Office ▪ Local land use approvals
Parks and Recreation and Section 4(f) Resources	Avoid resources if possible. Any "use" of Section 4(f) lands will need to demonstrate that it is either a "de minimis" impact or that there was no alternative for the impact.	4(f) potential for Antique Powerland and throughout study area	▪ FHWA – 4(f) ▪ Oregon Parks and Recreation ▪ Local land use approvals
Section 6(f) Resources	None identified	N/A	N/A
Floodplains and Floodways	Fill in floodways and floodplains should be avoided. The study area is identified as an area of minimal flood hazard by FEMA.	N/A	FEMA regulations administered through local land use approvals
Wildlife Habitat & Wetlands	Disturbance to undeveloped areas should be avoided if possible. Wetland delineations should be conducted once concept footprints are identified. Impacts to wetlands should be avoided.	East of interchange	▪ U.S. Army Corps of Engineers ▪ Oregon Department of State Lands ▪ Oregon Department of Fish and Wildlife ▪ Local land use approvals
Threatened and	Concepts should avoid disturbance of areas where the species habitat is present. Water	N/A	▪ National Marine Fisheries Service ▪ U.S. Fish and Wildlife Service

Endangered Species	quality impacts and physical impediments in T&E species contributing waterways should be avoided.		▪ Oregon Department of Agriculture ▪ Oregon Department of Fish and Wildlife
HazMat	Further site investigations at identified sites in regulatory databases.	Interchange District	▪ Oregon Department of Environmental Quality

This memo identifies baseline resource information in the study area from a "visual windshield validation" perspective. ODOT will need to undertake detailed studies of specific areas to determine design limitations for specific proposed projects. Potential projects identified in the IAMP may require permits, regulatory requirements, or authorizations.

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USFWS. 2021b. National Wetland Inventory online interactive mapping application. http://www.fws.gov/wetlands/Data/Mapper.html.

USFWS 2021c. Information, Planning, and Conservation System (IPaC) Resource List. http://ecos.fws.gov/ipac/

TECHNICAL MEMORANDUM #5 ATTACHMENTS

Determine Potential Environmental Constraints (Task 4.4)

Table of Contents

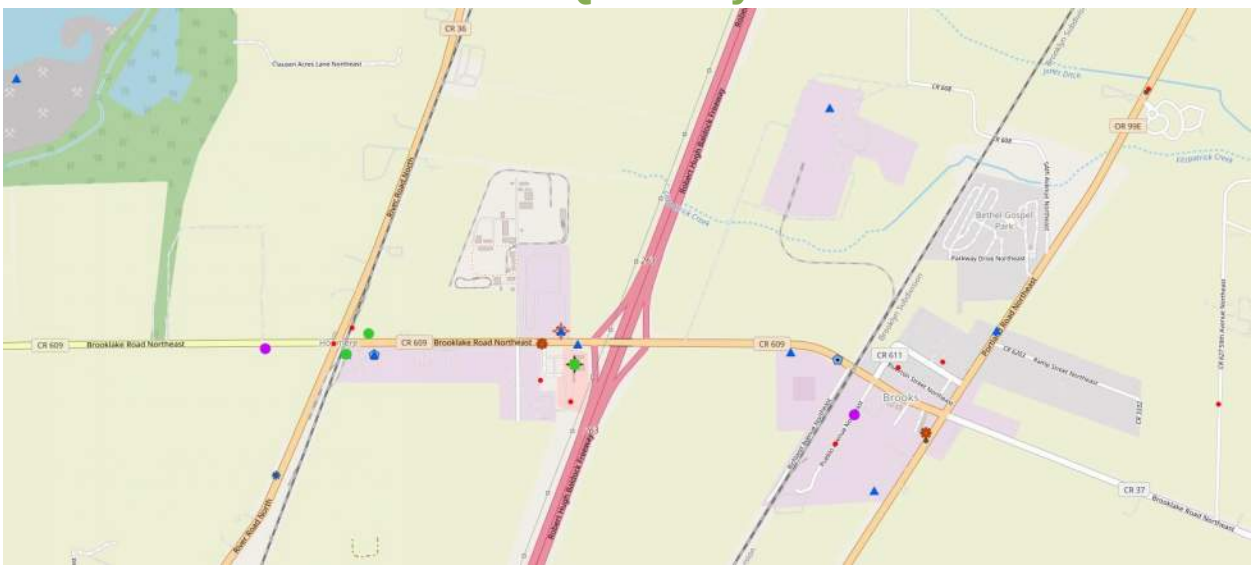
Attachment A: Study Area Tax Lot Summary

TAX LOT NUMBER	SITE ADDRESS	ACRES[1]	ZONE	BUILDING AREA (S.F.)	OVERLAY	COMPREHENSIVE PLAN DESIGNATION	VACANT OR DEVELOPED[2]	Notes
062W180000201		0	P	0		Public	Vacant	
062W17DB02600	4965 BROOKLAKE RD NE	0.16	AR	1334		Rural Residential	Developed	
062W17DB03200	9010 PUEBLO AVE NE	0.17	AR	0		Rural Residential	Vacant	
062W18BC00600	3625 BROOKLAKE RD NE	0.24	IUC	5500		Industrial	Developed	
062W17CA00702	4860 BROOKLAKE RD NE	0.26	IUC	5200		Industrial	Developed	
062W17DB02700	4945 BROOKLAKE RD NE	0.26	AR	984		Rural Residential	Developed	
062W18BC00300		0.26	EFU	0		Primary Agriculture	Vacant	
062W17CA00800	4790 BROOKLAKE RD NE	0.38	CC	4900		Commercial	Developed	
062W17DB03400	5000 BROOKLAKE RD NE	0.4	CC	3315		Commercial	Developed	
062W18D001601		0.43	IUC	4120		Industrial	Developed	
062W17CA00400	9045 PUEBLO AVE NE	0.47	AR	0		Rural Residential	Vacant	
062W17CA00500	4875 BROOKLAKE RD NE	0.47	AR	1620		Rural Residential	Developed	
062W17DB01800	5015 BROOKLAKE RD NE	0.47	CC	7000		Commercial	Developed	
062W17DB01400	9015 PORTLAND RD NE	0.51	CC	3720		Commercial	Developed	
062W17DB03600	5050 BROOKLAKE RD NE	0.51	CC	8400		Commercial	Developed	
062W17DB03602		0.52	CC	2306		Commercial	Developed	
062W17DB01700	5045 BROOKLAKE RD NE	0.54	CC	4176		Commercial	Developed	
062W18D000608	8983 TRUCKMAN WAY NE	0.54	ID	8000		Commercial	Developed	
062W18D000600		0.55	ID	312		Commercial	Vacant	
062W18C000101		0.56	IUC	3672		Industrial	Developed	
062W17DB02501	4991 BROOKLAKE RD NE	0.57	CC	7200		Commercial	Developed	
062W18D001600	8921 HUFF AVE NE	0.57	IUC	0		Industrial	Vacant	
062W17DB02500	4985 BROOKLAKE RD NE	0.62	CC	4800		Commercial	Developed	
062W17DB03300	4960 BROOKLAKE RD NE	0.67	P	15270		Public	Developed	
062W17CA00701	4870 BROOKLAKE RD NE	0.77	IUC	8820		Industrial	Developed	
062W18D000606	4150 BROOKLAKE RD NE	0.84	ID	3465		Commercial	Developed	
062W17DB03301	4960 BROOKLAKE RD NE	0.85	P	0		Public	Vacant	
062W18BC00400	3675 BROOKLAKE RD NE	0.86	CC	8280		Commercial	Developed	
062W18BC00500	3655 BROOKLAKE RD NE	0.88	IUC	13816		Industrial	Developed	
062W18D000609		0.92	ID	0		Commercial	Vacant	Truckman Way
062W17DB03500	5020 BROOKLAKE RD NE	0.95	CC	3600		Commercial	Developed	
062W18D000800	8920 HUFF AVE NE	1	IUC	11560		Industrial	Developed	
062W18D000900	8890 HUFF AVE NE	1	IUC	7500		Industrial	Developed	
062W18D001100	8810 HUFF AVE NE	1	IUC	9720		Industrial	Developed	
062W18D001300	8811 HUFF AVE NE	1	IUC	12900		Industrial	Developed	
062W18D001400	1826 HUFF AVE NE	1	IUC	100		Industrial	Vacant	
062W18D001500	8891 HUFF AVE NE	1	IUC	8376		Industrial	Developed	
062W18D000700	8970 HUFF AVE NE	1.11	IUC	5625		Industrial	Developed	
062W18D001700	8981 HUFF AVE NE	1.12	IUC	10100		Industrial	Developed	
062W18D000603	8982 TRUCKMAN WAY	1.15	ID	2972		Commercial	Developed	
062W17CA02600		1.25	EFU	0		Primary Agriculture	Vacant	
062W17DB03603		1.27	CC	0		Commercial	Vacant	
062W17CA00703		***1.35***	IUC	0		Industrial	Vacant	
062W17CA02700	8865 RICHLAND AVE NE	1.38	EFU	0		Primary Agriculture	Vacant	
062W18D000607		1.42	ID	0		Commercial	Vacant	
062W18C000100		1.44	IUC	0		Industrial	Vacant	
062W17CA00700		1.88	IUC; EFU	0		Industrial	Vacant	
062W18BC00701	3635 BROOKLAKE RD NE	1.98	EFU; IUC	0		Primary Agriculture; Industrial	Vacant	
062W18C000200	3900 BROOKLAKE RD NE	2	IUC	420		Industrial	Vacant	
062W18C000300	3820 BROOKLAKE RD NE	2	IUC	9747		Industrial	Developed	
062W18C000400	3770 BROOKLAKE RD NE	2	IUC	20000		Industrial	Developed	
062W18C000500	3760 BROOKLAKE RD NE	2	IUC	4660		Industrial	Developed	
062W18C000600	3740 BROOKLAKE RD NE	2	IUC	16400		Industrial	Developed	
062W18C000700	3720 BROOKLAKE RD NE	2	IUC	14767		Industrial	Developed	
062W18C001801		2.1	EFU	0		Primary Agriculture	Vacant	
062W18C001300		2.27	EFU	0		Primary Agriculture	Vacant	
062W17CA00900	4960 BROOKLAKE RD NE	3.43	P	51286		Public	Developed	
062W180001000	4205 BROOKLAKE RD NE	3.67	ID	0		Commercial	Vacant	
062W18D000602	4020 INTERSTATE PL NE	3.85	ID; IUC	16510		Industrial; Commercial	Developed	
062W18D000601		4.37	ID; EFU	0		Commercial	Vacant	
062W18BC00700		4.8	EFU	0		Primary Agriculture	Vacant	
062W18C001700		5.18	EFU	0		Primary Agriculture	Vacant	
062W18C000900	3680 BROOKLAKE RD NE	5.35	EFU	0		Primary Agriculture	Vacant	
062W18C001000	3630 BROOKLAKE RD NE	5.62	IUC	0		Industrial	Vacant	
062W18D000500	4220 BROOKLAKE RD NE	6.89	ID	10476		Commercial	Developed	
062W18001600		8.92	EFU	0		Primary Agriculture	Vacant	
062W170000500	4745 BROOKLAKE RD NE	10.08	IUC-LU	0	Limited Use	Industrial	Vacant	
062W17CA02800	4850 BROOKLAKE RD NE	15	EFU	0		Primary Agriculture	Vacant	
062W18C001800		17.93	EFU; IUC	0		Primary Agriculture; Industrial	Vacant	
062W180000900	4185 BROOKLAKE RD NE	21.89	ID	34603		Commercial	Developed	
062W180000800	3775 BROOKLAKE RD NE	25.67	EFU	300		Primary Agriculture	Vacant	
062W180000100	4205 BROOKLAKE RD NE	44.92	EFU; ID	0		Primary Agriculture; Commercial	Vacant	
062W180000200	3995 BROOKLAKE RD NE	61.64	P	90201		Public	Developed	
062W17C000500		114.6	EFU	0		Primary Agriculture	Vacant	
062W170000600	4755 BROOKLAKE RD NE	276.14	IUC-LU	0	Limited Use	Industrial	Vacant	

1. ***Bold, underlined and italicized*** are only partially in study area. Acreage listed represents entire lot acreage (includes acreage outside study area).
2. For the purpose of this memo, lots were designated vacant if they have less than 500 square feet of building area.

Source: Marion County

Attachment B: HazMat – DEQ Facility Profiler-Lite



**Locations on map are approximate

Environmental Cleanup Site Information (ECSI)

- Contaminated Site, Listed on CRL or Inventory
- Contaminated Site, No further action required
- Contaminated Site, Suspect site requiring further investigation
- Study Area, Listed on CRL or Inventory
- Study Area, Suspect site requiring further investigation

Hazardous Waste (HAZWASTE)

- Generator
- TSD

Leaking Underground Storage Tanks (LUST)

- Regulated LUST - Cleanup started
- Regulated LUST - Reported
- Regulated LUST - Cleanup completed
- Non-regulated LUST - Cleanup started
- Non-regulated LUST - Reported
- Non-regulated LUST - Cleanup completed

Solid Waste Information Facility Tracking (SWIFT)

- Compost
- Industrial
- Municipal
- SWLA
- Sludge
- Waste Tire

Underground Storage Tanks (UST)

6 TECHNICAL MEMORANDUM #6

Evaluation Framework

TECHNICAL MEMORANDUM #6

IAMP Evaluation Framework (Task 5.3)

Date: June 17, 2021

To: Oregon Department of Transportation, Region 2
Marion County

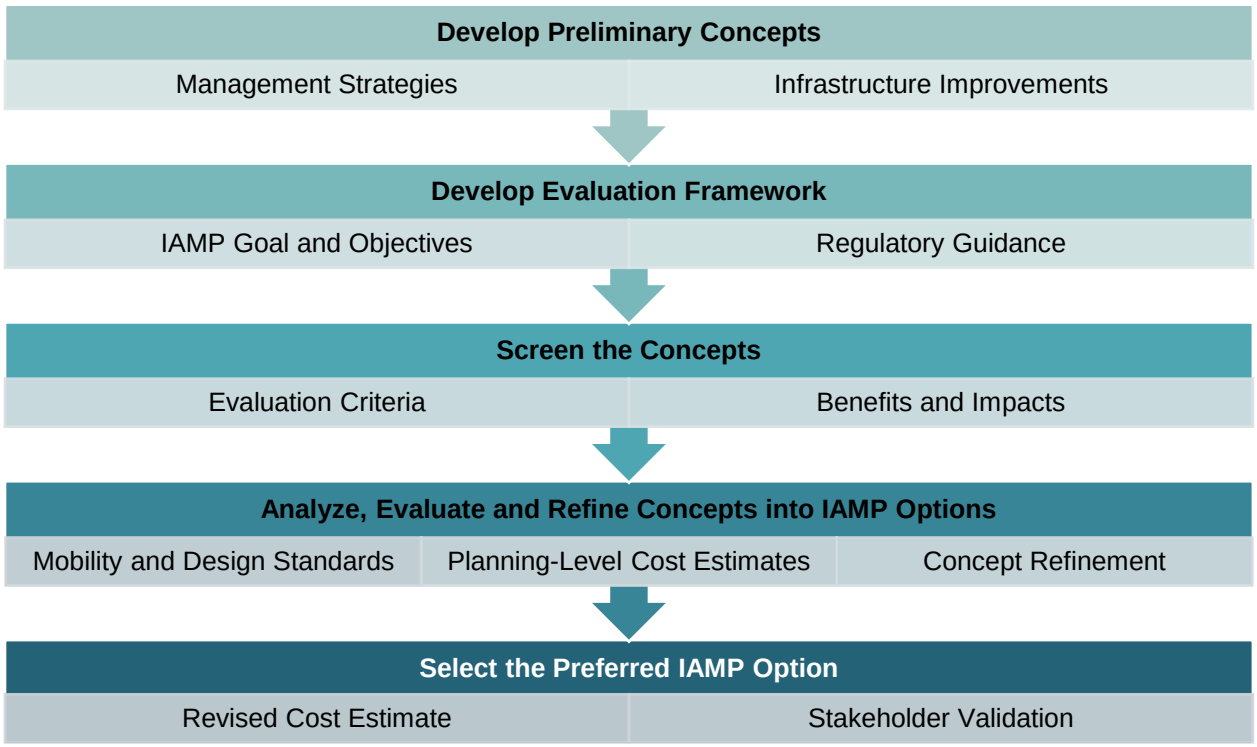
From: David Evans and Associates, Inc.

Subject: I-5: Brooks Interchange Area Management Plan (Exit 263)

Overview

The purpose of this memorandum is to outline the process of developing a series of concepts, evaluating and refining them into options, and ultimately selecting a Preferred Option for the I-5 Brooks Interchange. The process is illustrated in Figure 1. This memorandum will inform the concept development and analysis to be summarized in *Technical Memorandum #7.*

Figure 1. Brooks IAMP Concept Development and Selecting the Preferred IAMP Option



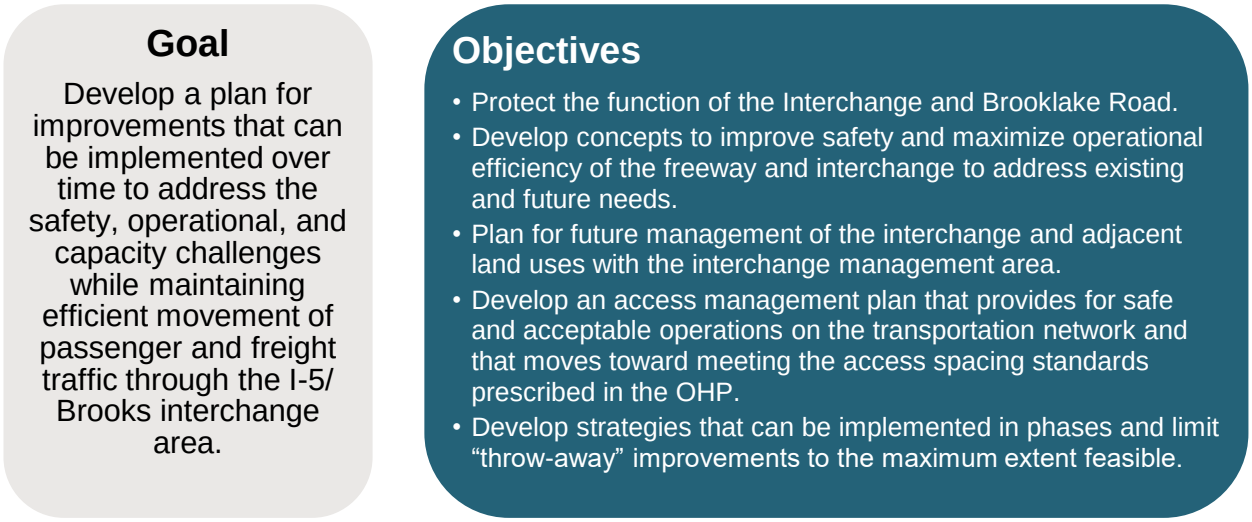
Step 1 Develop Preliminary Concepts

The Consultant will host a workshop with ODOT and Marion County staff to develop up to five potential interchange design concepts to address congestion and safety issues in the study area, utilizing at least one layout developed from previous studies of the interchange. Workshop participants will also help identify draft improvements necessary on Brooklake Road to address congestion, access, circulation and safety issues that affect interchange operations based on the needs described in *Technical Memoranda* #3 and #4, and considering the land use and environmental setting summarized in *Technical Memorandum #5*.

Step 2 Develop Evaluation Framework

Figure 2 summarizes the goal and objectives of the Brooks IAMP.

Figure 2. Brooks IAMP Goal and Objectives



Based on these objectives, the project team will define and apply a set of evaluation criteria to each of the study's interchange design concepts. The evaluation criteria are described in detail on the following page.

The project team will define and apply evaluation criteria to the potential concepts and strategies through a two-part process: an initial set of evaluation criteria to determine any "fatal flaws" and a detailed set of evaluation criteria to evaluate how each option advanced from the initial screening perform relative to the other concepts.

Initial Screening

The draft **initial evaluation criteria** are described below. This set of criteria is meant to screen out any concepts that are unlikely to be implemented due to any "fatal flaws". This will determine if an individual concept has one or more defects that prevent it from being successfully implemented. This screening identifies concepts that deviate from an acceptable footprint or level of operation and determines if that deviation is substantial enough to remove the concept from further consideration before more detailed analyses are completed. This review may result in the elimination of concepts, it also can result in refinement of the proposed concepts.

a) Clearly inconsistent with or unlikely to meet the project goal and objectives.
b) Requires the use of resources or properties which are highly unlikely to be available.
c) Incompatible with context of a rural interchange.

Detailed Screening

The draft **detailed evaluation criteria** are meant to aid in evaluating how well each concept meets the IAMP goal and evaluation criteria. When screening and evaluating potential interchange concepts, analysis includes cost, traffic performance (operations and safety), right-of-way requirements, land use and business impacts, and environmental considerations. These broad criteria are described below, and detailed evaluation criteria are defined in Table 1. These will be used to score each preliminary concept and a summary of the conditions will be provided in a matrix similar to what is shown in Table 2.

Construction Cost

The overall cost of an improvement is a significant factor in the feasibility of a design concept. Preliminary construction estimates for each design concept will be generated using conventional estimating techniques. Each concept's cost estimate will include a construction cost contingency to account for design uncertainties. The construction costs will likely not include costs associated with acquiring new rights-of-way (ROW). Construction cost also considers the potential ongoing and maintenance costs of the alternative.

Figure 3. Concept Evaluation Criteria

Traffic Performance

The traffic performance of each design concept will be evaluated at study intersections based on v/c ratio and LOS as outlined in the approved *Methodology Memorandum,* as well as potential benefits to safety.

The Oregon Highway Plan (OHP) and Highway Design Manual (HDM) mobility targets are applicable to the interchange. The OHP establishes a v/c ratio of 0.85 at freeway ramp terminals and an I-5 mainline mobility target of 0.70, ratios more than this result in unacceptable levels of congestion. The ODOT HDM design performance thresholds for new intersection ramp terminals is a v/c ratio of less than 0.60. Both mobility standards will be considered in the transportation performance analysis of the IAMP concepts.

The project team will analyze traffic performance for each concept. The improvement concepts will likely involve improving interchange performance by increasing the roadway vehicle capacity through additional lanes and intersection traffic control. In addition to the operational performance, the concepts will be evaluated on how they address existing SPIS locations and historical crash trends.

Right-of-Way Impacts

The concepts will be evaluated based on the amount and location of additional ROW that would be needed. The amount of additional ROW will be estimated in acres using GIS.

Land Use and Business Impacts
The project team will evaluate the concepts qualitatively to determine the relative impacts on land use and businesses. The interchange design concepts will be evaluated based on the estimated ROW impacts to developed parcels and developable land as designated in the Marion County's Rural Zoning Code (see Technical Memorandum #5).

Specific business and farm impacts will be evaluated for the May Trucking and Pilot Travel Center businesses in the in the northwest and southwest quadrants of the interchange, respectively. Other lands will be studied that may be impacted by new roadway connectors associated with the interchange design concepts.

Environmental Impacts
The study anticipates that each of the interchange design options will have some impacts on the built and/or natural environments. Technical Memorandum #5 provides a "visual windshield validation" of environmental conditions in the I-5/Brooks IAMP study area. Each of the interchange design concepts will be evaluated based on their relative impact to the documented built and natural environmental features in the study area.

Table 1. Detailed Evaluation Criteria

Screening Criteria	Objective	Evaluation Description
Construction Cost	Level of investment needed to implement	● - Low cost / within existing ROW ◕ - Moderate cost / within existing ROW ◑ - Moderate cost / some ROW needed ◔ - Significant cost / some ROW needed ○ - Significant cost / significant ROW needed
	Impact on maintenance and operations	● - Significantly reduces maintenance/operations costs ◕ - Minor reduction in maintenance/operations costs ◑ - Little to no impact on maintenance/operations costs ◔ - Minor increase in maintenance/operations costs ○ - Significantly increases maintenance/operations costs
Traffic Performance	Impacts to congestion and operations	● - Significantly reduces congestion / meets HDM v/c targets ◕- Reduction in congestion / meets OHP v/c targets ◑ - Little or no impact on congestion / exceeds OHP targets but better than No Build conditions ◔ - Minor increase in congestion / exceeds No Build v/c ○ - Significant increase in congestion/exceeds capacity (v/c >1.0) at ramp terminals
	Benefit to safety	● - Directly addresses crash pattern(s)/known deficiencies ◕ - Potential positive impact on crash pattern(s)/known deficiencies ◑ - No impact on safety ◔ - Potential negative impact on crash pattern(s)/known deficiencies ○ - Would directly worsen crash pattern(s)/known deficiencies

Screening Criteria	Objective	Evaluation Description
Right-of-Way Impacts	Limit impacts to ROW	● - ROW impacts are limited to one quadrant of interchange ◕ - ROW impacts are limited to east side of interchange ◑ - No change to current ROW impacts ◔ - ROW impacts to three quadrants of interchange ○ - ROW impacts to all quadrants of interchange
Land Use and Business Impacts	Limit business impacts	● - Improves access to existing businesses ◕ - No impact to existing businesses ◑ - Maintains access to existing businesses but relocates driveway ◔ - Restricts movements into and out of existing business / impacts site plan ○ - Removes access to existing business / impacts structures
	Limit impacts to developable and EFU lands	● - Positive impact to both developable and EFU lands ◕ - Positive impact to either developable or EFU lands ◑ - Does not impact developable or EFU lands ◔ - Negative impact to either developable or EFU lands ○ - Negative impact to both developable and EFU lands
Environmental Impacts	Acknowledge and plan for natural resources, wildlife and hazardous materials	● - Improves areas with known environmentally sensitive areas ◕ - Avoids negative impacts to environmentally sensitive areas ◑ - Does not impact environmentally sensitive areas ◔ - Improves condition for one resource at the expense to others ○ - Degrades environmentally sensitive areas
IAMP Goal*	Maintain efficient movement of freight traffic.	● - Improves freight movement through interchange. ◑ - No impact to freight movement ○ - Does not support or negatively impacts freight movement
	Improvements can be implemented over time	● - The improvement could be implemented in phases ◑ - The improvement cannot be implemented in phases ○ - The improvement replaces already planned / implemented improvements

* To capture components of the IAMP goal not included in other evaluation criteria

Table 2. Detailed Concept Evaluation Matrix

CONCEPT NAME AND DESCRIPTION	COST ESTIMATE	TRAFFIC PERFORMANCE	RIGHT-OF-WAY	LAND USE AND BUSINESS	ENVIRONMENTAL	IAMP GOAL	OTHER
Example: *Concept X*	*$XX Million (score ◗)* *Maintenance (score ◗)*	*Operations (score ◖):* ▪ *v/c SB Ramp Terminal* ▪ *v/c NB Ramp Terminal* *Safety (score ◗):* ▪ *Ramp queues enter safe stopping distance area* ▪ *Addresses Top 10% SPIS location*	*ROW needs by quadrant (score: ●):* *NW: X acres* *NE: X acres* *SW: None* *SE: X acres*	*Impacts to Business (score ◖):* ▪ *Access* ▪ *ROW* *Impacts to Land (score ○):* ▪ *Developable land* ▪ *EFU*	*Environmental impacts (score ●)*	▪ *Impacts to Freight (score ●)* ▪ *Phaseability (score ○)*	*Notable benefit/impact specific of Concept X*
Concept 1							
Concept 2							
Concept 3							
Concept 4							
Concept 5							
Concept 6							

Step 3 Screen the Concepts

The consultant team will describe and illustrate each interchange design concept. The project team will apply the **concept evaluation criteria** and summarize how well each concept performs against the criteria, and recommend which concepts are dropped, and which concepts are carried forward for further evaluation.

Step 4 Analyze, Evaluate and Refine Concepts into IAMP Options

Those concepts from Step 3 will be developed to higher levels of conceptual design to identify refinements to their impacts, costs and transportation performance.

Step 5 Selecting the Preferred IAMP Option

The project team will create a table to help demonstrate the relative benefits and impacts of the remaining options to determine the preferred IAMP option. Table 3 lists draft **options evaluation criteria** the consultant team developed and will refine to evaluate how each option performed relative to the other option(s). The criteria are based on the project problem statement, goal, and objectives described above. The project team will complete the table and document which option best meets the individual criteria and why. The table may also indicate where there is no significant difference between the options.

Findings from the table evaluation will help the project team select the Preferred IAMP Option.

Table 3. Refined IAMP Options Evaluation Criteria

Criterion	Better Performing Option	Why?
Transportation Design Impacts		
Construction cost		
ROW impacts		
Utility impacts		
Maintenance (long-term)		
Traffic operations		
Incident response time		
Multimodal Mobility and Safety		
Bicycle and pedestrian		
Freight mobility		
Safety for all users		
Accessibility		
Implementation		
Incremental phasing		
Construction staging		
Feasibility (Phase 1)		
Environmental Impacts		
Historic resource impacts		
Archaeological resource impacts		
Hazmat		
Noise impacts		
Environmental justice		
Land use		
Greenhouse gas		
Design Features		
Geotechnical		
Drainage design		
Roadway design		
Bridge design		
Wall design		
Traffic design		
Public familiarity with design		
Transportation Impacts		
Impacts to I-5		
Impacts to Brooklake Road		
Impacts to other local roads		
Risk & Public Acceptance		
Risk		
Public acceptance		

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7 TECHNICAL MEMORANDUM #7

Transportation System Concepts

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TECHNICAL MEMORANDUM #7

Transportation System Concepts (Task 5.3)

Date: June 28, 2022

To: Oregon Department of Transportation, Region 2
Marion County

From: David Evans and Associates, Inc.

Subject: I-5: Brooks Interchange Area Management Plan (Exit 263)

Overview

The purpose of this memorandum is to use the process identified in Technical Memorandum #6 to:

- Provide a list of concepts and strategies that will be screened
- Evaluate feasible concepts against the evaluation criteria
- Assess future operational performance of potential concepts

For each concept, planning-level cost estimates are identified. This memorandum primarily consists of bullet lists of concepts and strategies with brief descriptions of findings and recommended applications.

Concept Development

The alternatives analysis focused on two areas for consideration within the Brooks Interchange (I-5 Exit 263) study area:

- **Interchange Configurations** – These concepts identify potential improvements that address deficiencies at the interchange ramps and ramp terminal intersections.
- **Local System Improvements** – These concepts focus on the study intersections along Brooklake Road within the study area and access management to Brooklake Road within ¼-mile of the interchange ramps. The concepts build on the projects identified in the Salem-Keizer Area Transportation Study (SKATS) Regional Transportation System Plan (RTSP).

Interchange Configurations

The Consultant hosted a workshop with ODOT and Marion County to identify a set of potential interchange configurations to address the existing and anticipated deficiencies of the I-5 Brooks Interchange (Exit 263). The group discussed the following concepts for further assessment:

1. Tight Diamond Interchange (TDI)
2. Single Point Interchange (SPI)
3. Diverging Diamond Interchange (DDI)
4. Partial Cloverleaf (ParClo) – NW/NE
5. Partial Cloverleaf (ParClo) – NW/SE
6. Dogbone (tandem teardrop configuration at ramp termini)

The six preliminary interchange concepts are evaluated in this memorandum. The conceptual design assumes the future improvements will be built to 2012 ODOT Highway Design Manual (HDM) standards. All interchange concepts assume ramp termini grade modifications to improve freight mobility. The DDI concept follows the guidance in the Federal Highway Administration (FHWA) Diverging Diamond Interchange Informational Guide (2nd Edition). All interchange concepts also assume that the centerline of Brooklake Road remains on its current alignment and is widened to five lanes between Huff Avenue and the southbound ramp terminal. All interchange concepts also assume a new structure with a minimum of four lanes. For construction staging purposes, the preferred concept could consider shifting the alignment to construct the new interchange parallel to the existing structure, although this memorandum does not factor that option into the evaluation of concepts.

Local System Improvements

Access to the interchange is affected by traffic delays on the supporting arterial network: Brooklake Road, River Road and OR 99E (Portland Road). The intersections at the east and west gateways to the interchange already experience congestion, which is expected to worsen over the next 20 years.

The concepts developed for local system improvements address operational and safety deficiencies at individual study area intersections outside of the interchange ramps, which includes any necessary improvements needed beyond what was assumed in the 2043 No Build analysis (included in the SKATS RTSP and summarized in *Technical Memorandum #4*). Other improvements identify the changes needed to support the interchange configurations assuming design to current standards. In some cases, this may require access closures or modifications and new local network connections.

Evaluation Framework

To evaluate each interchange concept, screening criteria were developed to assess the benefits and impacts of each concept. These criteria are detailed in *Technical Memorandum #6* and summarized in the following sections.

Initial Screening

The initial screening results are summarized in Table 1. This set of criteria is meant to screen out any concepts that are unlikely to be implemented due to any "fatal flaws":

a) Clearly inconsistent with or unlikely to meet the project goal and objectives.
b) Requires the use of resources or properties which are highly unlikely to be available.
c) Incompatible with context of a rural interchange.

Table 1. Initial Screening ("Fatal Flaw")

CONCEPT NAME AND DESCRIPTION	CLEARLY INCONSISTENT WITH OR UNLIKELY TO MEET THE PROJECT GOAL AND OBJECTIVES	REQUIRES THE USE OF RESOURCES OR PROPERTIES WHICH ARE HIGHLY UNLIKELY TO BE AVAILABLE	INCOMPATIBLE WITH CONTEXT OF A RURAL INTERCHANGE
Interchange Configurations Concept 1: Tight Diamond Interchange	No	No	No
Concept 2: Single Point Interchange (SPI)	No	No	To be determined
Concept 3: Diverging Diamond Interchange (DDI)	No	To be determined	No
Concept 4: Partial Cloverleaf (ParClo) – NW/NE	No	No	No
Concept 5: Partial Cloverleaf (ParClo) – NW/SE	No	No	No
Concept 6: Dogbone	No	To be determined	To be determined

The results of the fatal flaw analysis do not definitively exclude any of the proposed interchange configurations. All six concepts are evaluated in this memorandum using the detailed screening criteria.

Detailed Screening

The **detailed evaluation criteria** are meant to aid in evaluating how well each concept meets the IAMP goal and evaluation criteria. These criteria are detailed in Table 2 and *Technical Memorandum #6: IAMP Evaluation Framework.* The results are summarized in the matrix in Table 3 and further explained in subsequent pages.

- Construction Cost
- Traffic Performance (Operations and Safety)
- Right of Way Impacts
- Land Use and Business Impacts
- Environmental Impacts
- IAMP Goal (Freight and Phasing Ability)

Table 2. Detailed Evaluation Criteria

SCREENING CRITERIA	OBJECTIVE	EVALUATION DESCRIPTION
Construction Cost	Level of investment needed to implement	● - Low cost / within existing ROW ◕ - Moderate cost / within existing ROW ◑ - Moderate cost / some ROW needed ◔ - Significant cost / some ROW needed ○ - Significant cost / significant ROW needed
	Impact on maintenance and operations	● - Significantly reduces maintenance/operations costs ◕ - Minor reduction in maintenance/operations costs ◑ - Little to no impact on maintenance/operations costs ◔ - Minor increase in maintenance/operations costs ○ - Significantly increases maintenance/operations costs
Traffic Performance	Impacts to congestion and operations	● - Significantly reduces congestion / meets HDM v/c targets ◕- Reduction in congestion / meets OHP v/c targets ◑ - Little or no impact on congestion / exceeds OHP targets but better than No Build conditions ◔ - Minor increase in congestion / exceeds No Build v/c ○ - Significant increase in congestion/exceeds capacity (v/c >1.0) at ramp terminals
	Benefit to safety	● - Directly addresses crash pattern(s)/known deficiencies ◕ - Potential positive impact on crash pattern(s)/known deficiencies ◑ - No impact on safety ◔ - Potential negative impact on crash pattern(s)/known deficiencies ○ - Would directly worsen crash pattern(s)/known deficiencies

SCREENING CRITERIA	OBJECTIVE	EVALUATION DESCRIPTION
Right-of-Way Impacts	Limit impacts to ROW	● - ROW impacts are limited to one quadrant of interchange ◕ - ROW impacts are limited to east side of interchange ◑ - No change to current ROW impacts ◔ - ROW impacts to three quadrants of interchange ○ - ROW impacts to all quadrants of interchange
Land Use and Business Impacts	Limit business impacts	● - Improves access to existing businesses ◕ - No impact to existing businesses ◑ - Maintains access to existing businesses but relocates driveway ◔ - Restricts movements into and out of existing business / impacts site plan ○ - Removes access to existing business / impacts structures
	Limit impacts to developable and EFU lands	● - Positive impact to both developable and EFU lands ◕ - Positive impact to either developable or EFU lands ◑ - Does not impact developable or EFU lands ◔ - Negative impact to either developable or EFU lands ○ - Negative impact to both developable and EFU lands
Environmental Impacts	Acknowledge and plan for natural resources, wildlife and hazardous materials	● - Improves areas with known environmentally sensitive areas ◕ - Avoids negative impacts to environmentally sensitive areas ◑ - Does not impact environmentally sensitive areas ◔ - Improves condition for one resource at the expense to others ○ - Degrades environmentally sensitive areas
IAMP Goal*	Maintain efficient movement of freight traffic.	● - Improves freight movement through interchange. ◑ - No impact to freight movement ○ - Does not support or negatively impacts freight movement
	Improvements can be implemented over time	● - The improvement could be implemented in phases ◑ - The improvement cannot be implemented in phases ○ - The improvement replaces already planned / implemented improvements

Table 3. Evaluation Matrix

CONCEPT NAME AND DESCRIPTION	COST ESTIMATE	TRAFFIC PERFORMANCE[1]	HDM TARGET	RIGHT-OF-WAY	LAND USE AND BUSINESS	ENVIRONMENTAL	IAMP GOAL	RECOMMENDATION
Concept 1: Tight Diamond Interchange	$56.9 Million (score ◕) Maintenance (score ◔)	Operations (score ◕): v/c SB Ramp Terminal = 0.80 v/c NB Ramp Terminal = 0.75 Although operations are expected to operate within the OHP mobility targets, this concept performs the worst of all the interchange concepts. Safety (score ◕): Potential positive impact on crash pattern(s)/known deficiencies – reduces queuing at exit ramps	SB Ramp Terminal = 0.75 NB Ramp Terminal = 0.75	ROW needs (score: ●): 3.3 acres	Impacts to Business (score ◕): • Least impacts to business access if phased • No anticipated structural or BPA impacts Impacts to Land (score ●): • Negligible impacts to EFU and developable lands	Environmental (score ◑) • Least likely to impact environmentally sensitive areas • Concept traffic operations result in most congestion of all concepts and potential GHG impacts	Impacts to Freight (score ●): • Improves freight movement through interchange • Tightest turning radii of interchange concepts Phasing Ability (score ●) • Options for phasing • Option for retrofit	Consider for further evaluation with possible design exception that considers HDM mobility target. Reasons for advancement following adoption of IAMP: relatively lower cost, sufficient performance, low impacts, positive benefit to freight mobility and ability to retrofit and phase solutions.
Concept 2: Single Point Interchange	$87.1 Million (score ○) Maintenance (score ◔)	Operations (score ◕): v/c I-5 Interchange = 0.74 Safety (score ◕): • Potential positive impact on crash pattern(s)/known deficiencies – reduces queuing at exit ramps • Reduced conflict points	I-5 Interchange = 0.75	ROW needs (score: ◕): 7.3 acres	Impacts to Business (score ◔): • No anticipated impacts to existing business structures • Mitigations would be required to avoid BPA tower impacts Impacts to Land (score ●): • Negligible impacts to EFU and developable lands	Environmental impacts (score ◑) • Potential for environmental impacts in the southeast quadrant due to an existing drainage ditch	Impacts to Freight (score ●): • Single signalized intersection at the interchange and additional exit ramp storage would improve freight movement through the interchange • Sweeping turns improve turning radii Phasing Ability (score ○) • Concept does not facilitate phasing or retrofit	Not recommended for further consideration due to: relatively high cost, environmental impacts and phasing/retrofit limitations.

Notes: 1. See *Technical Memorandum #6, Table 1* for score criteria legend;
2. EFU (exclusive farm use);
3. BPA (Bonneville Power Administration).

CONCEPT NAME AND DESCRIPTION	COST ESTIMATE	TRAFFIC PERFORMANCE[1]	HDM TARGET	RIGHT-OF-WAY	LAND USE AND BUSINESS	ENVIRONMENTAL	IAMP GOAL	RECOMMENDATION
Concept 3: Diverging Diamond Interchange	$60.5 Million (score ◑) Maintenance (score ◔)	Operations (score ◕): v/c SB Ramp Terminal = 0.69 v/c NB Ramp Terminal = 0.41 Safety (score ●): • Potential positive impact on crash pattern(s)/known deficiencies – reduces queuing at exit ramps • Reduced potential for wrong-way entry to ramps • Reduced distance of pedestrian crossings.	SB Ramp Terminal = 0.75 NB Ramp Terminal = 0.75	ROW needs (score: ◑): 8.0 acres	Impacts to Business (score ◔): • May impact existing business structures in southwest quadrant • Mitigations would be required if needed to avoid BPA tower impacts Impacts to Land (score ◖): • Minor loss of developable land inside Interchange District (NW quadrant) • Minor impacts to EFU and developable lands	Environmental impacts (score ◑) • Potential for environmental impacts in the southeast quadrant due to an existing drainage ditch	Impacts to Freight (score ●): • Removal of left-turn conflicts, clear channelization, and additional exit ramp storage would improve freight movement through the interchange • Sweeping turns improve turning radii Phasing Ability (score ◑) Concept may facilitate phasing or retrofit	Not recommended for further consideration due to high cost, impacts to business, land use and environment.
Concept 4: Partial Cloverleaf Interchange (NW/NE)	$75.8 Million (score ◔) Maintenance (score ○) Concept 4 maintenance costs are anticipated higher than Concept 5 due to greater difficulty managing traffic on northbound off-ramp.	Operations (score ●): v/c SB Ramp Terminal = 0.60 v/c NB Ramp Terminal = 0.51 Safety (score ◔): • Potential positive impact on crash pattern(s)/known deficiencies – reduces queuing at exit ramps • Loop exit ramp not preferred due to speed differential entering curve	SB Ramp Terminal = 0.75 NB Ramp Terminal = 0.75	ROW needs (score: ○): 15.1 acres	Impacts to Business (score ◕): • No anticipated structural or BPA impacts • More lane changes between Huff Ave and northbound ramp terminal Impacts to Land (score ◔): • Loss of developable land inside Interchange District (NW quadrant) and industrial (NE quadrant) • Minor impacts to EFU and developable lands	Environmental impacts (score ◔) • Potential for environmental impacts in the southeast quadrant due to an existing drainage ditch • If the northbound entrance ramp extended, freshwater emergent wetland and Fitzpatrick Creek may be impacted	Impacts to Freight (score ◑) • Removal of left-turn conflicts and additional exit ramp storage would improve freight movement through the interchange. • Lane changes between the northbound ramp terminal and Huff Avenue to access freight businesses south of Brooklake Rd • Potential for trucks tipping on the loop ramps (particularly exit loop) Phasing Ability (score ●) • Options for phasing • Option for retrofit	Not recommended for further consideration due to: relatively high cost, environmental impacts and phasing/retrofit limitations.

Notes: 1. See *Technical Memorandum #6, Table 1* for score criteria legend;
2. EFU (exclusive farm use);
3. BPA (Bonneville Power Administration).

CONCEPT NAME AND DESCRIPTION	COST ESTIMATE	TRAFFIC PERFORMANCE[1]	HDM TARGET	RIGHT-OF-WAY	LAND USE AND BUSINESS	ENVIRONMENTAL	IAMP GOAL	RECOMMENDATION
Concept 5: Partial Cloverleaf Interchange (NW/SE)	$75.4 Million (score ◔) Maintenance (score ◔)	Operations (score ●): v/c SB Ramp Terminal = 0.60 v/c NB Ramp Terminal = 0.55 Safety (score ◕): • Potential positive impact on crash pattern(s)/known deficiencies – reduces queuing at exit ramps	SB Ramp Terminal = 0.75 NB Ramp Terminal = 0.75	ROW needs (score: ◔): 14.7 acres	Impacts to Business (score ◕): • No anticipated structural or BPA impacts Impacts to Land (score ◑): • Loss of developable land inside Interchange District (NW quadrant) • Minor impacts to EFU and developable lands	Environmental impacts (score ◔) • Potential for environmental impacts in the southeast quadrant due to an existing drainage ditch • If the northbound entrance ramp extended, freshwater emergent wetland and Fitzpatrick Creek may be impacted	Impacts to Freight (score ◕) • Removal of left-turn conflicts and additional exit ramp storage would improve freight movement through the interchange. • Potential for trucks tipping on the loop ramps Phasing Ability (score ●) • Options for phasing • Option for retrofit	Not recommended for further consideration due to: relatively high cost, ROW needs, impact to land use and environmental impacts.
Concept 6: Dogbone	$59.1 Million (score ◑) Maintenance (score ◑)	Operations (score ◕): v/c SB Ramp Terminal = 0.70 v/c NB Ramp Terminal = 0.60 If Huff Ave signal backs up, could impact interchange movement Safety (score ◕): • Potential positive impact on crash pattern(s)/known deficiencies – reduces queuing at exit ramps. • Reduces collision points and eliminates potential for right-angle and head on collisions. • Can be difficult to navigate for unfamiliar users with oversized truck/freight/bike/ped	SB Ramp Terminal = 0.75 NB Ramp Terminal = 0.75	ROW needs (score: ●): 4.3 acres	Impacts to Business (score ◔): • May impact existing business structures in southwest quadrant • Mitigations would be required if needed to avoid BPA tower impacts Impacts to Land (score ◕): • Minor loss of developable land inside Interchange District (NW quadrant) • Minor impacts to EFU and developable lands	Environmental impacts (score ◔) • Potential for environmental impacts in the southeast quadrant due to an existing drainage ditch • If the northbound entrance ramp extended, freshwater emergent wetland and Fitzpatrick Creek may be impacted	Impacts to Freight (score ◑) • Removal of left-turn conflicts and additional exit ramp storage would improve freight movement through the interchange. • Freight and oversized vehicles can offtrack in roundabouts • Weaving between Huff Ave and the southbound ramp terminal could be a concern without gaps in Brooklake traffic Phasing Ability (score ●) • Option for retrofit	Consider for further evaluation Reasons for advancement following adoption of IAMP: relatively lower cost, sufficient performance, lower impacts, positive benefit to freight mobility and ability to retrofit solutions.

Notes: 1. See *Technical Memorandum #6, Table 1* for score criteria legend;
2. EFU (exclusive farm use);
3. BPA (Bonneville Power Administration).

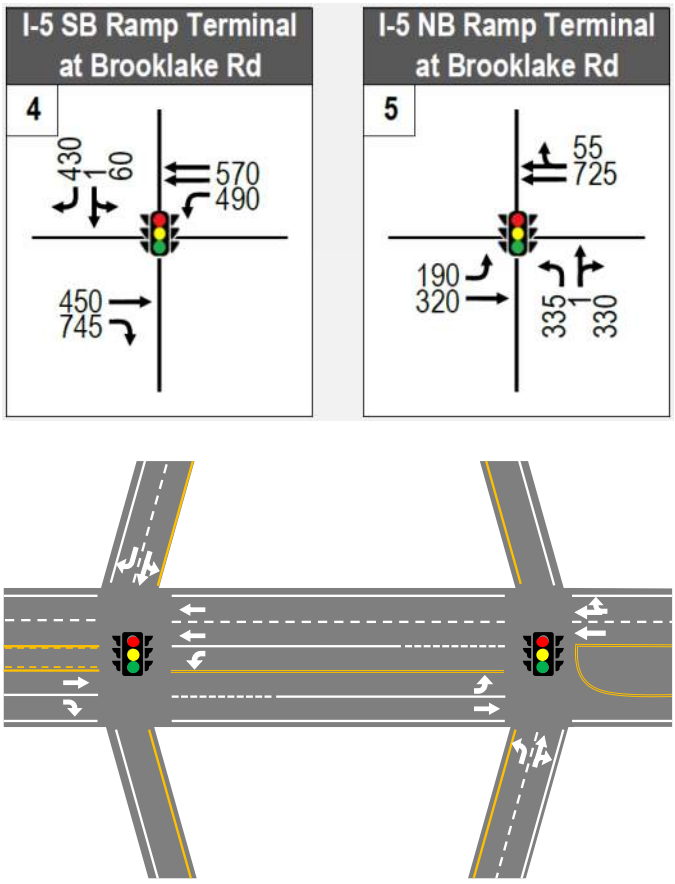
Interchange Configurations

Concept 1: Tight Diamond Interchange (TDI)

A Tight Diamond Interchange (TDI) is a compressed version of diamond interchange, the latter being the most common interchange configuration. There are four one-way diagonal ramps, one in each quadrant of the interchange. Each exit ramp provides for right, through and left-turn movements at the intersection with the crossroad. Because left turns are made at grade, across conflicting traffic on the crossroad, intersection sight distance is a primary consideration. The TDI is generally used in areas where right-of-way is a constraint as the two ramp terminals are closely spaced with coordinated signal timing.

This interchange concept would replace the current structure over I-5 to attain the needed vertical clearance from I-5 and structure width for necessary capacity. This would result in closure of adjacent accesses to accommodate the grade changes on Brooklake Road (the operational impacts are discussed in the Local System Improvements section). In this design concept, both exit ramps remain a single lane exit, but widen to two lanes of storage. Traffic flow at the ramp terminals would be controlled by coordinated traffic signals. The preliminary lane configurations are shown in Figure 1.

Figure 1. TDI 2043 PM Peak Hour Volumes and Lane Configurations



Construction Cost Estimate

$56.9 million (2021 dollars)

Traffic Operations and Safety

The traffic operations assume traffic signals for this concept; a formal Intersection Control Evaluation (ICE) analysis will be required if and when this concept is selected as the preferred option for the IAMP.

Table 4 summarizes estimated v/c ratios for the initial TDI concept. Both ramp terminals are expected to meet adopted Oregon Highway Plan (OHP) mobility targets by 2043 under the proposed configuration.

Table 4. TDI Traffic Operations (Year 2043)

INTERSECTION	CRITICAL MOVEMENT[1]	V/C	LOS	OHP MOBILITY TARGET[2]	HDM MOBILITY TARGET[3]
SB Ramp Terminal	Overall	0.80	F	v/c ≤ 0.85	v/c ≤ 0.75
NB Ramp Terminal	Overall	0.76	C	v/c ≤ 0.85	v/c ≤ 0.75

Acronyms: EB = eastbound; WB = westbound; NB = northbound; and SB = southbound. L = left; T = through; and R = right.
AWSC = all-way stop control; TWSC = two-way stop control; Signal = signal control.
Intersections exceeding the applicable mobility target are **bold and shaded.**

Notes:
1. At signalized intersections, the overall results are reported; at all-way stop-controlled intersections, the results are reported for the worst movements; and at unsignalized intersections the results are reported for the worst major and minor movements that must stop or yield the right of travel to other traffic flows.
2. 1999 Oregon Highway Plan (OHP), Table 6, Policy 1F applies to existing and no build conditions.
3. Table 10-2: 20 Year Design-Mobility Standards (Volume-to-Capacity Ratio), Highway Design Manual, 2012. Provided for comparison only; ODOT facility plans follow OHP and no construction funding is available at this time.

Observations

- This concept performs the worst of all the interchange concepts. Traffic operations are expected to operate within the OHP and HDM mobility targets for the northbound ramp terminal, but not the HDM mobility target for the southbound ramp terminal. A possible design exception may be required if and when this concept is advanced into NEPA evaluation and preliminary engineering following adoption of the IAMP.
- The westbound left-turn queuing across the interchange structure is expected to extend back to the northbound ramp terminal during the PM peak hour.
- The outer westbound through lane across the interchange structure is underutilized.
- A formal Intersection Control Evaluation (ICE) and full traffic signal warrant analysis of the proposed ramp termini will be required if and when this concept is advanced into NEPA evaluation and preliminary engineering following adoption of the IAMP.

Possible Modifications to Current Concept Configuration

- The southbound ramp terminal could consider a shared eastbound through/right-turn lane instead of an exclusive right-turn lane
- 4-lane Structure
    - Provide a single westbound through lane (instead of dual) across the structure.
    - Convert the southbound right-turn at the southbound ramp terminal to an add-lane to Brooklake Road.
    - Provide for additional westbound to southbound entrance ramp storage by extending a storage lane back through the northbound ramp terminal OR add dual left (requires widening of southbound entrance ramp to accommodate dual receiving lanes).

Safety

- The concept improves sight distance for ramps terminals with the new interchange bridge.
- Traffic signals at the ramp terminals could reduce angle crashes but may increase rear end collisions on Brooklake Road.
- Increased storage on exit ramp reduces risk of traffic backing into safe stopping distance or onto the freeway.
- The TDI is similar to the most common interchange configuration; therefore, it meets driver expectation.
- TDI and diamond interchanges could have possible wrong-way entry on the ramps from the crossroad.

Right of Way Impacts

Right of Way (ROW) impacts are generally related to the improvements necessary to adjust Brooklake Road and the ramp terminals to the correct grade. Although the interchange ramp terminals remain in approximately the existing horizontal location for this concept, Brooklake Road is widened to five lanes west of the interchange and approaches to the ramp terminals have ROW impacts for all quadrants, with the most ROW needed in the northwest quadrant. This concept is not expected to impact the Bonneville Power Administration (BPA) tower located between I-5 and the southbound exit ramp. Table 5 summarizes the ROW impacts for the TDI concept. This interchange concept has the lowest ROW needs.

Table 5. TDI Right of Way Impacts

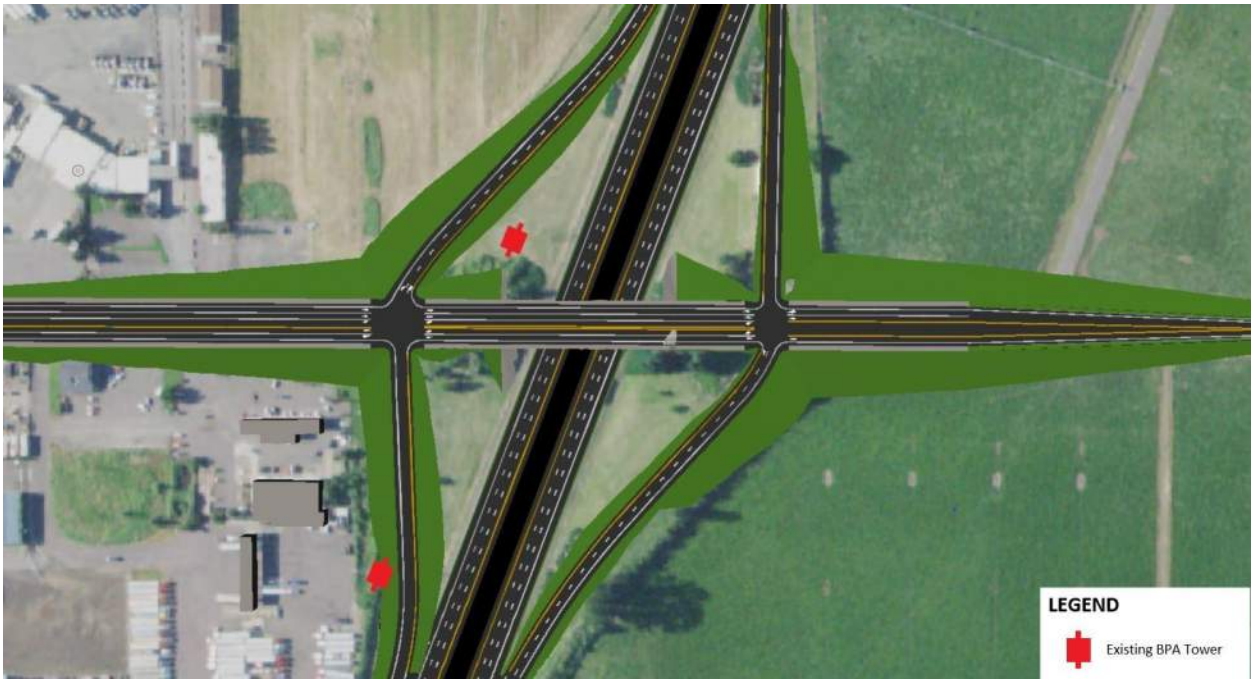
QUADRANT	ROW (ACRES)	MARION COUNTY LAND USE	
		ZONING	COMPREHENSIVE PLAN
NW	1.5	Interchange District	Commercial
NE	0.6	Unincorporated Community Industrial - Limited Use	Industrial
SW	0.6	Interchange District	Commercial
SE	0.6	Exclusive Farm Use	Primary Agriculture
Total	**3.3**		

Land Use and Business Impacts

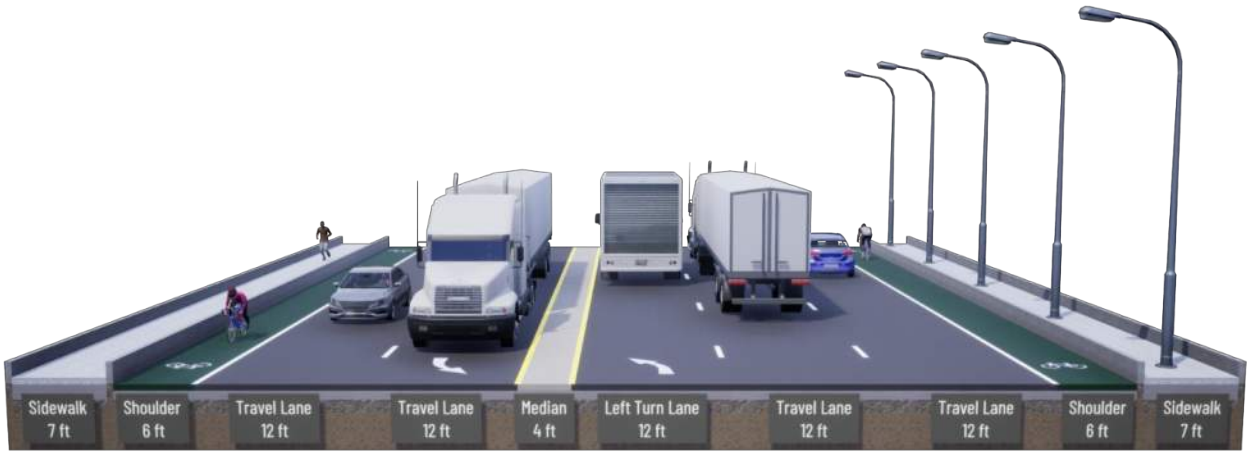
The grade requirements and the widening of Brooklake Road to five lanes between Huff Avenue and the southbound ramp terminal would require significant modification to the access points to businesses on either side of Brooklake Road, as seen in Figure 2. West of I-5, the access the businesses north and south of Brooklake Road would need to be closed and traffic routed to Huff Avenue. Impacts to existing structures and BPA transmission line towers are not anticipated. On the east side of I-5, access modifications would be required at 50th Avenue NE to accommodate the widening of Brooklake Road at the approach to the northbound ramp terminal.

Figure 2: TDI Conceptual Layout and Profile

Layout



Profile



Environmental Impacts

This concept is least likely to have environmental impacts. There are no documented wetlands within the anticipated ROW. If the northbound entrance ramp were to be extended, there is a freshwater emergent wetland and Fitzpatrick Creek that may be impacted.

IAMP Goal (Freight and Phasing)

Freight

- Signalized interchange, additional exit ramp storage, and correcting the approach grade would improve freight movement through the interchange.

Phasing

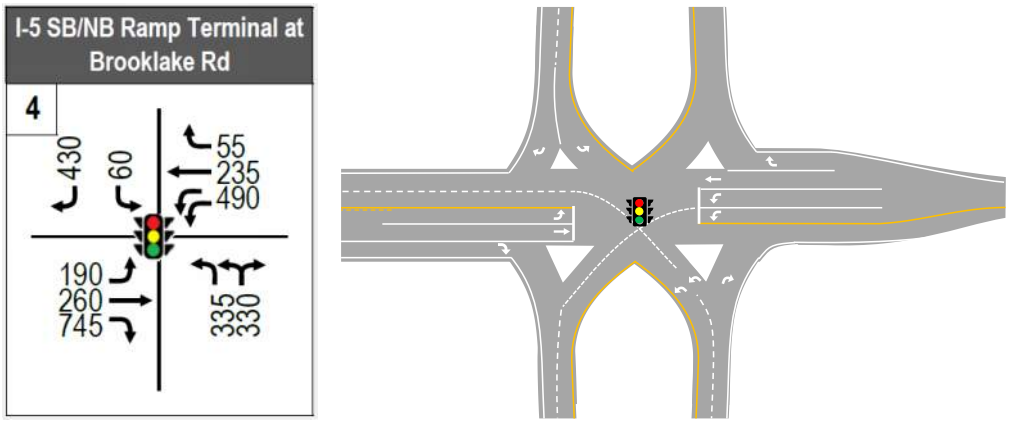
- An initial phase to this interchange could be signalizing the interchange ramp terminals.
- The 4-lane version of this concept has the potential to be designed as a retrofit of the existing structure.

Concept 2: Single Point Interchange (SPI)

The geometry of the entrance and exit ramps of an SPI is such that they appear to intersect at a single point. There is only one central intersection, as shown in Figure 3. The left and right turns from the exit ramp are channelized, prohibiting through movements onto the entrance ramp. Opposing left-turn paths do not cross and can be made at the same time. The long, gradual turns are a particular advantage for larger vehicles. While the SPUI can be beneficial where ROW is limited, the pavement area and the footprint of the structure is considerably wider. The larger intersection width requires greater structure length and depth, which increases costs for bridge construction, retaining walls and earthwork.

This interchange concept would replace the current structure over I-5 to attain the needed vertical clearance from I-5 and structure width for necessary capacity. This would result in closure of adjacent accesses to accommodate the grade changes on Brooklake Road. (The operational impacts are discussed in the Local System Improvements section). In this design concept, both exit ramps remain a single lane exit, but widen to two lanes of storage. Traffic flow at the ramp terminals would be controlled by a single traffic signal. The preliminary lane configurations are shown in Figure 3.

Figure 3. SPI 2043 PM Peak Hour Volumes and Lane Configurations



Construction Cost Estimate

$87.1 million (2021 dollars)

Traffic Operations and Safety

Operations

Table 6 summarizes estimated v/c ratios and for the initial SPI concept. This configuration is expected to operate well within adopted Oregon Highway Plan (OHP) mobility target and within the HDM mobility target by 2043 under the proposed configuration, which extends the five-lane cross-section of Brooklake Road across the structure to the east.

Table 6. SPI Traffic Operations (Year 2043)

Intersection	Critical Movement[1]	v/c	LOS	OHP Mobility Target[2]	HDM Mobility Target[3]
SB/NB Ramp Terminal	Overall	0.74	C	v/c ≤ 0.85	v/c ≤ 0.75

Acronyms: EB = eastbound; WB = westbound; NB = northbound; and SB = southbound. L = left; T = through; and R = right; AWSC = all-way stop control; TWSC = two-way stop control; Signal = signal control.
Intersections exceeding the applicable mobility target are **bold and shaded.**

Notes:

1. At signalized intersections, the overall results are reported; at all-way stop-controlled intersections, the results are reported for the worst movements; and at unsignalized intersections the results are reported for the worst major and minor movements that must stop or yield the right of travel to other traffic flows.
2. 1999 Oregon Highway Plan (OHP), Table 6, Policy 1F applies to existing and no build conditions.
3. Table 10-2: 20 Year Design-Mobility Standards (Volume-to-Capacity Ratio), Highway Design Manual, 2012. Provided for comparison only; ODOT facility plans follow OHP and no construction funding is available at this time.

Observations

- Traffic moves through interchange with limited congestion.

Possible Modifications to Proposed Concept Analysis

- The assumed design of the SPI considers the "preferred" design values in the HDM. The "minimum" design values could be considered, although they are unlikely to significantly reduce the structure size and resulting cost estimate.[1]
- A single westbound left-turn lane (instead of dual) causes the intersections to exceed the OHP and HDM mobility targets.
- A single northbound left-turn lane (instead of dual) causes the intersection to exceed the OHP and HDM mobility targets.

Safety

- Improved sight distance for ramps terminal with the new interchange bridge.
- Traffic signal at the ramp terminal could reduce angle crashes but may increase rear end collisions on Brooklake Road.
- Reduced conflict points by allowing opposing left turns to proceed simultaneously with fewer traffic signals, meaning vehicles only cross paths at one location.
- Increased storage on exit ramp reduces risk of traffic backing into safe stopping distance or onto the freeway.
- Improved turning radii for large vehicles.

Right of Way Impacts

Right of Way (ROW) impacts are generally related to the improvements necessary to adjust Brooklake Road and the ramp terminals to the correct grade. The interchange ramps extend out further to accommodate the curvature needed to approach the single intersection. It is generally preferred to align the ramps in a way that guides traffic in the direction it is supposed to go to avoid driver confusion. As mentioned previously, designing to the HDM "minimum" design values may reduce the ROW impacts due to the entrance and exit ramps, however the structure size would not be significantly reduced.

The widening of Brooklake Road to five lanes and approaches to the ramp terminals have ROW impacts for all quadrants. Most ROW impacts are to the northwest and southeast quadrants. Without design modifications or additional ROW needs, this concept would impact the BPA tower located between I-5 and the southbound exit ramp. Table 7 summarizes the ROW impacts for the SPI concept.

[1] *Highway Design Manual*, Appendix J. Figures J-12 (Preferred Design Values For Single Point Interchanges) and J-13 (Minimum Design Value For Single Point Intersection Design).

Table 7. SPI Right of Way Impacts

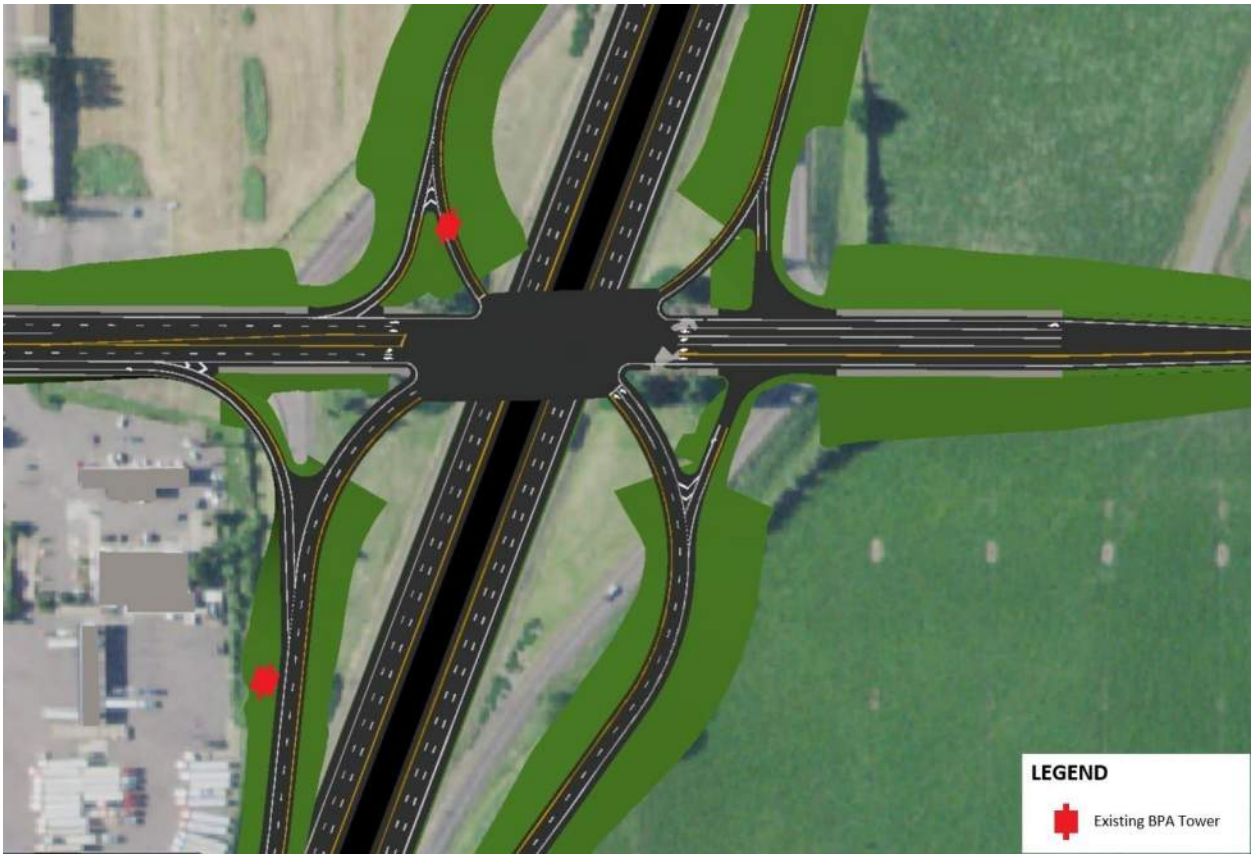
Quadrant	ROW (acres)	Marion County Land Use	
		Zoning	Comprehensive Plan
NW	2.8	Interchange District	Commercial
NE	1.3	Unincorporated Community Industrial - Limited Use	Industrial
SW	0.4	Interchange District	Commercial
SE	2.8	Exclusive Farm Use	Primary Agriculture
Total	**7.3**		

Land Use and Business Impacts

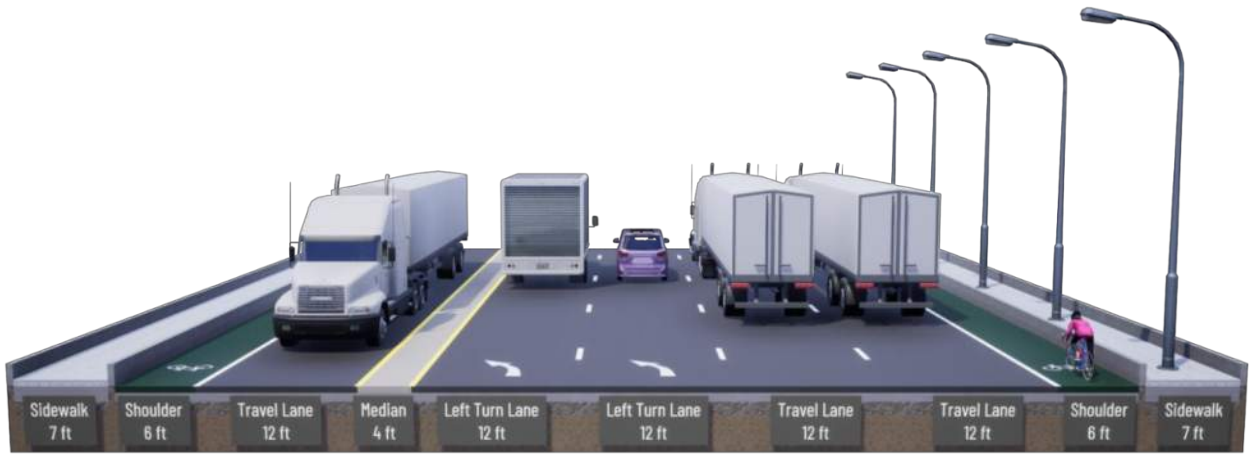
The grade requirements of this concept and the widening of Brooklake Road to five lanes between Huff Avenue and the southbound ramp terminal would require significant modification to the business accesses on either side of Brooklake Road, as seen in Figure 4. West of I-5, the access to the businesses north and south of Brooklake Road would need to be closed and traffic routed to Huff Avenue. With one exception, impacts to existing structures are not anticipated. The SPI concept will likely require the relocation of the BPA transmission line tower in the northwest quadrant. On the east side of I-5, access modifications would be required at 50th Avenue NE to accommodate the widening of Brooklake Road at the approach to the northbound ramp terminal.

Figure 4: SPI Conceptual Layout and Profile

Layout



Profile



Environmental Impacts

This concept has potential for environmental impacts in the southeast quadrant due to an existing drainage ditch. There are no documented wetlands within the anticipated ROW. If the northbound entrance ramp were to be extended, there is a freshwater emergent wetland and Fitzpatrick Creek that may be impacted.

IAMP Goal (Freight and Phasing)

Freight

- One single signalized intersection at the interchange and additional exit ramp storage would improve freight movement through the interchange.
- The sweeping turns for each of the ramps provides improved turning radii for large vehicles.

Phasing

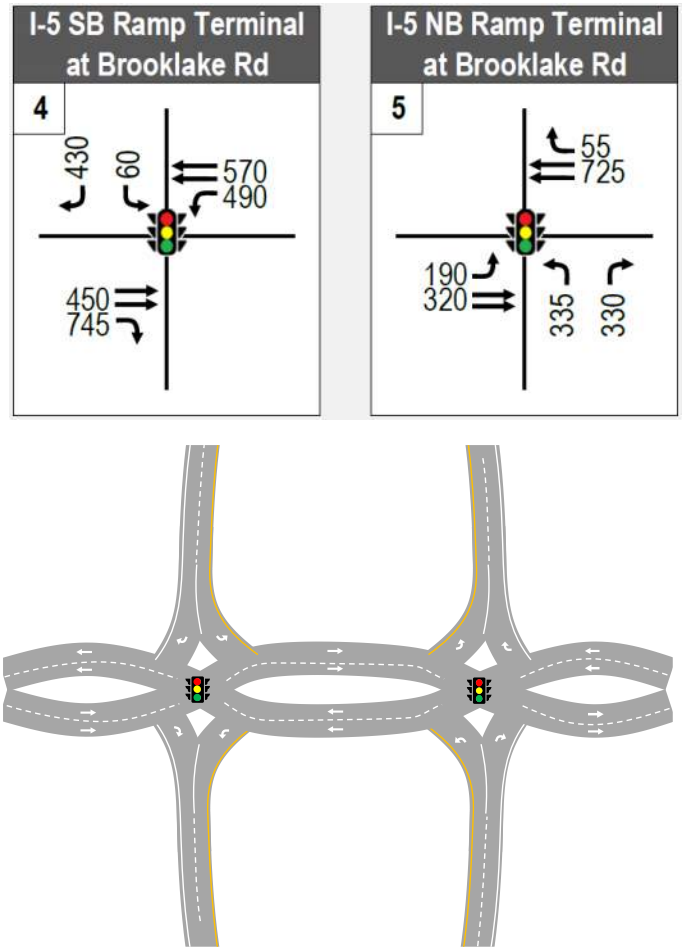
- This interchange concept does not lend itself to a phased alternative or retrofit of existing structure.

Concept 3: Diverging Diamond Interchange (DDI)

A diverging diamond interchange (DDI), also called a double crossover diamond interchange, allows traffic on the minor road to cross to the opposite side of the road while within the interchange. Dual traffic signals control the movement of traffic during this crossover maneuver. Upon reaching the second signal, vehicles return to driving on the right side of the road. This orientation allows all signals in the intersection to operate in a two-phase operation. It also improves safety as opposing left turns are eliminated.

This interchange concept would replace the current structure over I-5 to attain the needed vertical clearance from I-5. This would result in closure of adjacent accesses to accommodate the grade changes on Brooklake Road. (The operational impacts are discussed in the Local System Improvements section). In this design concept, both exit ramps remain a single lane exit, but widen to two lanes of storage. Similarly, the entrance ramps would be widened for two receiving lanes before merging to a single lane in advance of merging with the freeway. Traffic flow at the ramp terminals would be controlled by two-phase traffic signals. The preliminary lane configurations are shown in Figure 5.

Figure 5. DDI 2043 PM Peak Hour Volumes and Lane Configurations



Construction Cost Estimate

$60.5 million (2021 dollars)

Traffic Operations and Safety

Operations

Table 8 summarizes estimated v/c ratios and for the initial DDI concept. At both ramp terminals, this configuration is expected to operate well within adopted OHP and HDM mobility targets by 2043 under the proposed configuration. The crossovers can operate with only two traffic signal phases, which allows the interchange to handle a greater volume of traffic and operate with fewer delays.

Table 8. DDI Traffic Operations (Year 2043)

Intersection	Critical Movement[1]	v/c	LOS	OHP Mobility Target[2]	HDM Mobility Target[3]
SB Ramp Terminal	Overall	0.69	A	v/c ≤ 0.85	v/c ≤ 0.75
NB Ramp Terminal	Overall	0.41	B	v/c ≤ 0.85	v/c ≤ 0.75

Acronyms: EB = eastbound; WB = westbound; NB = northbound; and SB = southbound. L = left; T = through; and R = right.
AWSC = all-way stop control; TWSC = two-way stop control; Signal = signal control.
Intersections exceeding the applicable mobility target are **bold and shaded.**

Notes:
1. At signalized intersections, the overall results are reported; at all-way stop-controlled intersections, the results are reported for the worst movements; and at unsignalized intersections the results are reported for the worst major and minor movements that must stop or yield the right of travel to other traffic flows.
2. 1999 Oregon Highway Plan (OHP), Table 6, Policy 1F applies to existing and no build conditions.
3. Table 10-2: 20 Year Design-Mobility Standards (Volume-to-Capacity Ratio), Highway Design Manual, 2012. Provided for comparison only; ODOT facility plans follow OHP and no construction funding is available at this time.

Observations

- Ample capacity.
- Traffic moves through interchange with limited congestion.

Possible Modifications to Proposed Concept Analysis

- Preliminary analysis of a DDI with a single through lane in each direction indicated future operations meet both the OHP and HDM mobility targets by 2043.
- A single through lane in each direction would result in westbound queuing that could impact traffic on the northbound exit ramp.

Safety

- New bridge structure and vertical curve provide improved sight distance for ramp terminals with the new interchange.
- Traffic signals at the ramp terminals could reduce angle crashes but may increase rear end collisions on Brooklake Road.
- Increased storage on exit ramp reduces risk of traffic backing into safe stopping distance or onto the freeway.

- Fewer conflict points than standard interchange design.
- Reduced potential for wrong-way entry to ramps.
- Decreased distance of pedestrian crossings.

Right of Way Impacts

Right of Way (ROW) impacts are generally related to the improvements necessary to adjust Brooklake Road and the ramp terminals to the correct grade and alignment. Brooklake Road approaches to the interchange extend out further to accommodate the curvature needed to approach the ramp terminals. Most ROW impacts are to the northwest and northeast quadrants. Design modifications could reduce impact to the BPA tower located between I-5 and the southbound exit ramp. Table 9 summarizes the ROW impacts for the DDI concept.

Table 9. DDI Right of Way Impacts

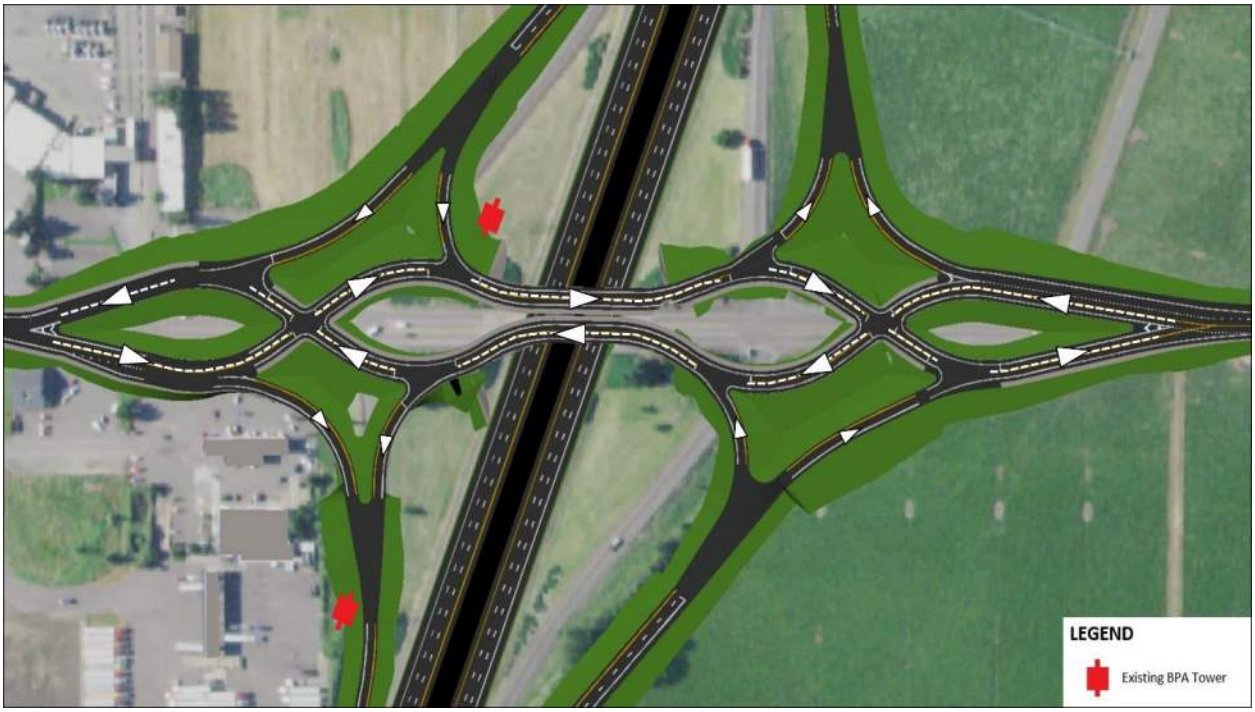
Quadrant	ROW (acres)	Marion County Land Use	
		Zoning	Comprehensive Plan
NW	4.0	Interchange District	Commercial
NE	1.9	Unincorporated Community Industrial - Limited Use	Industrial
SW	0.9	Interchange District	Commercial
SE	1.2	Exclusive Farm Use	Primary Agriculture
Total	**8.0**		

Land Use and Business Impacts

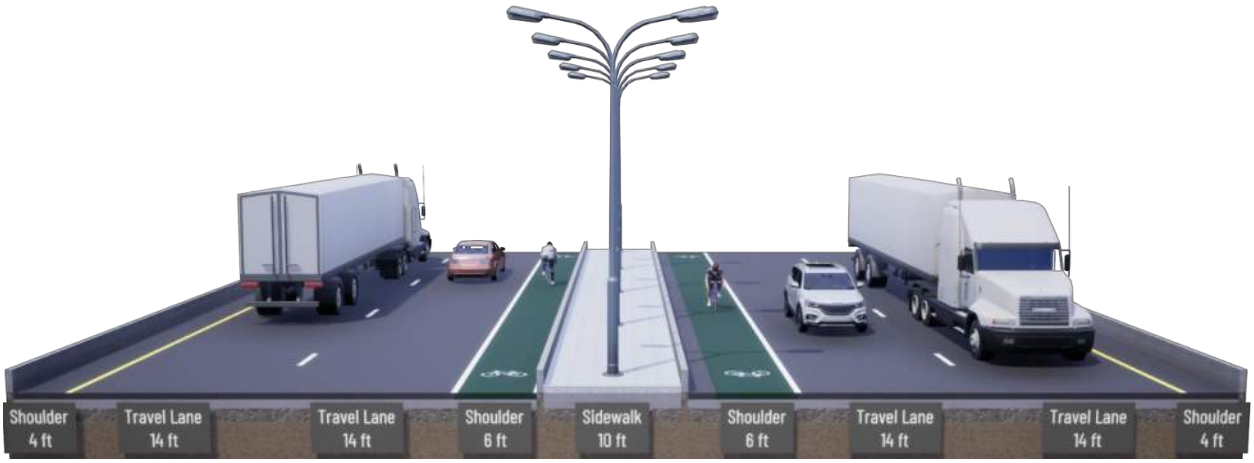
The grade requirements of this concept and the widening of Brooklake Road to five lanes between Huff Avenue and the southbound ramp terminal would require significant modification to the access points to businesses on either side of Brooklake Road, as seen in Figure 6. West of I-5, the access to the businesses north and south of Brooklake Road would need to be closed and traffic routed to Huff Avenue. The DDI concept may impact existing structures in the southwest quadrant unless design refinements are made, including a retaining wall. The DDI concept may require the relocation of the BPA transmission line tower in the northwest quadrant. On the east side of I-5, access modifications would be required at 50th Avenue NE to accommodate the widening of Brooklake Road at the approach to the northbound ramp terminal.

Figure 6. DDI Conceptual Layout and Profile

Layout



Profile



Environmental Impacts

This concept has potential for environmental impacts in the southeast quadrant due to an existing drainage ditch. There are no documented wetlands within the anticipated ROW. If the northbound entrance ramp were to be extended, there is a freshwater emergent wetland and Fitzpatrick Creek that may be impacted.

IAMP Goal (Freight and Phasing)

Freight

- Removal of left-turn conflicts, clear channelization, and additional exit ramp storage would improve freight movement through the interchange.
- The sweeping turns for the ramps provides improved turning radii for large vehicles.

Phasing

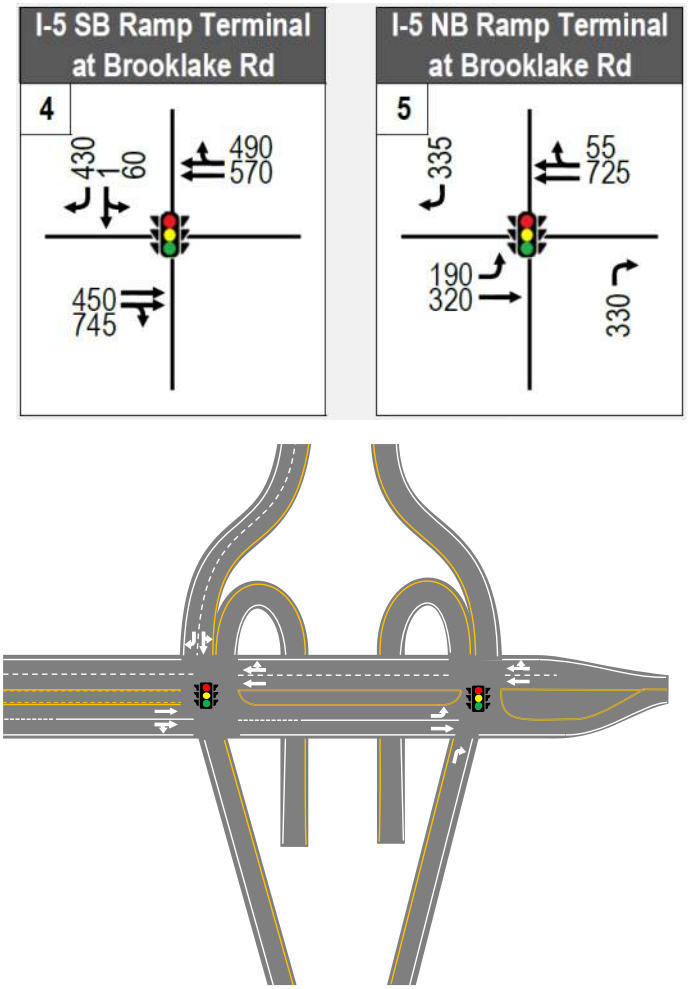
- Attempting to accommodate a single lane DDI on the existing structure and meet design standards is not feasible.
- This concept as a two-lane DDI would require a new structure; retrofitting is not feasible.

Concept 4: Partial Cloverleaf (ParClo) – NW/NE

Partial cloverleaf interchanges are a modified version of a full cloverleaf interchange. The orientation of the loop ramps and diamond ramps can be chosen based on the specific needs of the site: the layout does not need to be symmetrical. The diamond ramps are used to turn right, while the loop ramps replace left turns with right turn movements. Depending on the placement of the loops, a weaving area may be formed where a loop exit ramp immediately follows a loop entrance ramp, which is something that must be considered when designing a ParClo interchange. The loops also require more ROW than a diamond interchange.

This version of the ParClo concept provides a loop ramp in the northwest quadrant for the westbound to southbound entrance ramp and a loop ramp in the northeast quadrant for the northbound to westbound exit ramp movements. This interchange concept would replace the current structure over I-5 to attain the needed vertical clearance over I-5. This would result in closure of adjacent accesses to accommodate the grade changes on Brooklake Road. (The operational impacts are discussed in the Local System Improvements section). In this design concept, the southbound exit ramp remains a single lane exit, but widens to two lanes of storage. The northbound exit ramps would be single lanes. Traffic flow at the ramp terminals would be controlled by traffic signals, including the loop ramp traffic. The non-free flow ramps are preferred for multimodal considerations. The preliminary lane configurations are shown in Figure 7.

Figure 7. ParClo (NW/NE) 2043 PM Peak Hour Volumes and Lane Configurations



Construction Cost Estimate

$75.8 million (2021 dollars)

Traffic Operations and Safety:

Operations

Table 10 summarizes estimated v/c ratios for the initial ParClo (NW/NE) concept. At both ramp terminals, this configuration is expected to operate well within adopted OHP and HDM mobility targets by 2043 under the proposed configuration. The loop ramps reduce the number of left-turn phases, which allows the interchange to handle a greater volume of traffic and operate with fewer delays.

Table 10. ParClo (NW/NE) Traffic Operations (Year 2043)

Intersection	Critical Movement[1]	v/c	LOS	OHP Mobility Target[2]	HDM Mobility Target[3]
SB Ramp Terminal	Overall	0.60	C	v/c ≤ 0.85	v/c ≤ 0.75
NB Ramp Terminal	Overall	0.51	C	v/c ≤ 0.85	v/c ≤ 0.75

Acronyms: EB = eastbound; WB = westbound; NB = northbound; and SB = southbound. L = left; T = through; and R = right.
AWSC = all-way stop control; TWSC = two-way stop control; Signal = signal control.
Intersections exceeding the applicable mobility target are **bold and shaded.**

Notes:
1. At signalized intersections, the overall results are reported; at all-way stop-controlled intersections, the results are reported for the worst movements; and at unsignalized intersections the results are reported for the worst major and minor movements that must stop or yield the right of travel to other traffic flows.
2. 1999 Oregon Highway Plan (OHP), Table 6, Policy 1F applies to existing and no build conditions.
3. Table 10-2: 20 Year Design-Mobility Standards (Volume-to-Capacity Ratio), Highway Design Manual, 2012. Provided for comparison only; ODOT facility plans follow OHP and no construction funding is available at this time.

Observations

- Ample capacity.
- Traffic moves through interchange with limited congestion.
- Since the loop ramps are not free flow, weaving between the ramp terminals is less of a concern.
- Exit loop ramps are not preferred due to the changes in speeds from freeway to loop ramp curve.
- A formal Intersection Control Evaluation (ICE) of the proposed ramp termini will be required if and when this concept is advanced into NEPA evaluation and preliminary engineering following adoption of the IAMP.

Possible Modifications to Proposed Concept Analysis

- Preliminary analysis of a three-lane structure assumed a shared eastbound left-through lane across the interchange structure. The northbound ramp terminal would operate under split-phase timing. The operations are expected to meet OHP targets by 2043 but results in additional queuing.

Safety

- Improved sight distance for ramps terminal with the new interchange bridge.
- Traffic signals at the ramp terminals could reduce angle crashes but may increase rear end collisions on Brooklake Road.
- Increased storage on exit ramp reduces risk of traffic backing into safe stopping distance or onto the freeway.
- May create weaving concerns between the ramp terminals in the westbound direction.
- Reduced number of left-turn conflicts.
- Loop exit ramps are not preferred for safety of exiting freeway (speed differential entering a curve)
- Need to consider potential for wrong way traffic of exit ramp.

Right of Way Impacts

Right of Way (ROW) impacts are generally related to the improvements necessary to adjust Brooklake Road and the ramp terminals to the correct grade and alignment. For this ParClo option, there is additional ROW needed to accommodate the loop ramps in the northwest and northeast quadrants. This concept is not expected to impact the BPA tower located between I-5 and the southbound exit ramp, which would be inside the loop. Table 11 summarizes the ROW impacts for the ParClo (NW/NE) concept.

Table 11. ParClo (NW/NE) Right of Way Impacts

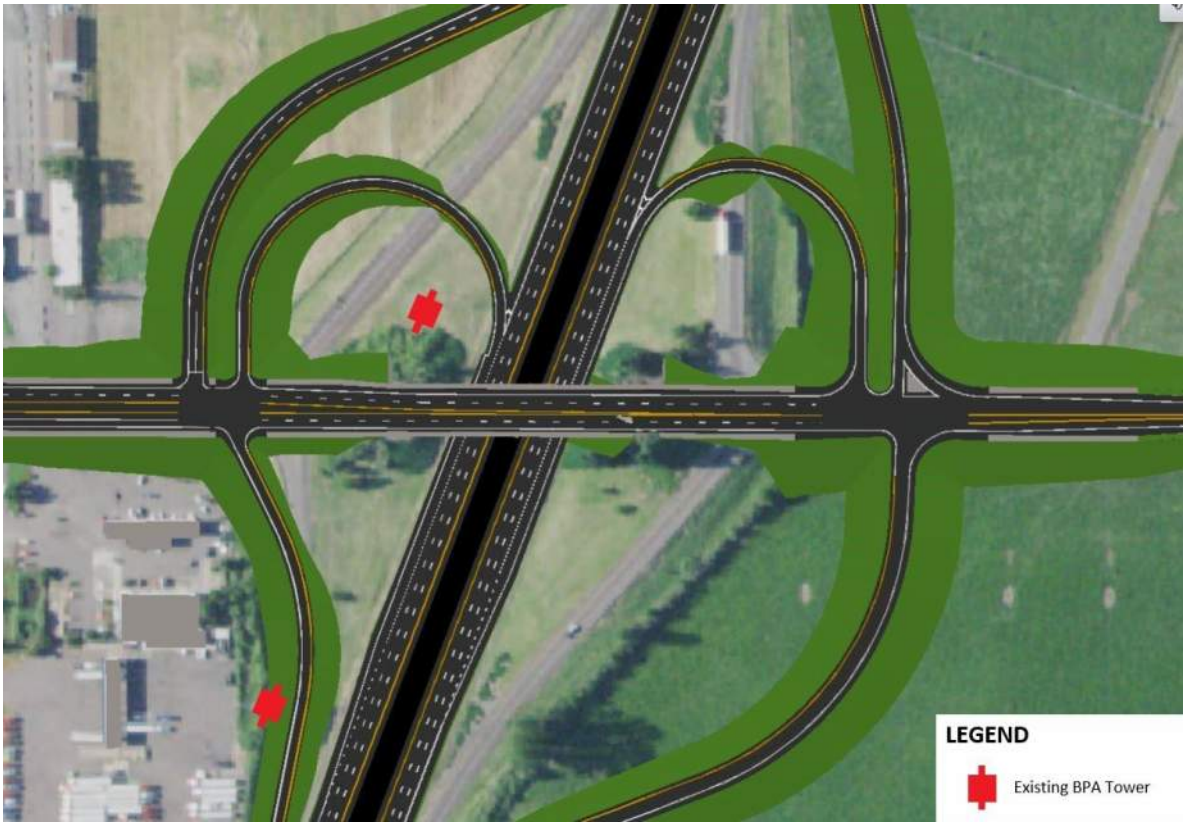
Quadrant	ROW (acres)	Marion County Land Use	
		Zoning	Comprehensive Plan
NW	5.7	Interchange District	Commercial
NE	4.6	Unincorporated Community Industrial - Limited Use	Industrial
SW	0.7	Interchange District	Commercial
SE	4.1	Exclusive Farm Use	Primary Agriculture
Total	**15.1**		

Land Use and Business Impacts

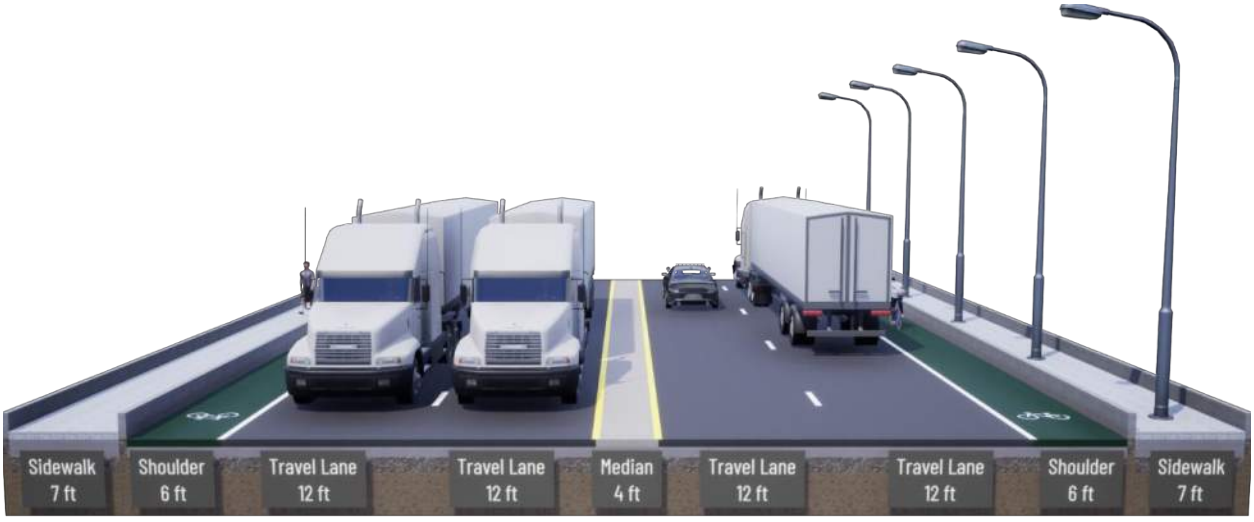
The grade requirements and the widening of Brooklake Road to five lanes between Huff Avenue and the southbound ramp terminal would require significant modification to the access points to businesses on either side of Brooklake Road between Huff Avenue and 50th Avenue. This option has the largest impact to developable lands and access modifications would be required at 50th Avenue NE to accommodate the northbound to westbound loop ramp. Figure 8 shows the conceptual layout and profile.

Figure 8. ParClo (NW/NE) Conceptual Layout and Profile

Layout



Profile



Environmental Impacts

This concept has potential for environmental impacts in the southeast quadrant due to an existing drainage ditch. There are no documented wetlands within the anticipate ROW. If the northbound entrance ramp were to be extended, there is a freshwater emergent wetland and Fitzpatrick Creek that may be impacted.

IAMP Goal (Freight and Phasing)

Freight

- Removal of left-turn conflicts and additional exit ramp storage would improve freight movement through the interchange.
- Compared to other concepts, the ParClo (NW/NE) configuration would likely require more lane changes between the northbound ramp terminal and the Huff Avenue intersection to access freight businesses south of Brooklake Road.
- Design would need to consider heavy freight use to avoid trucks tipping on the loop ramps.

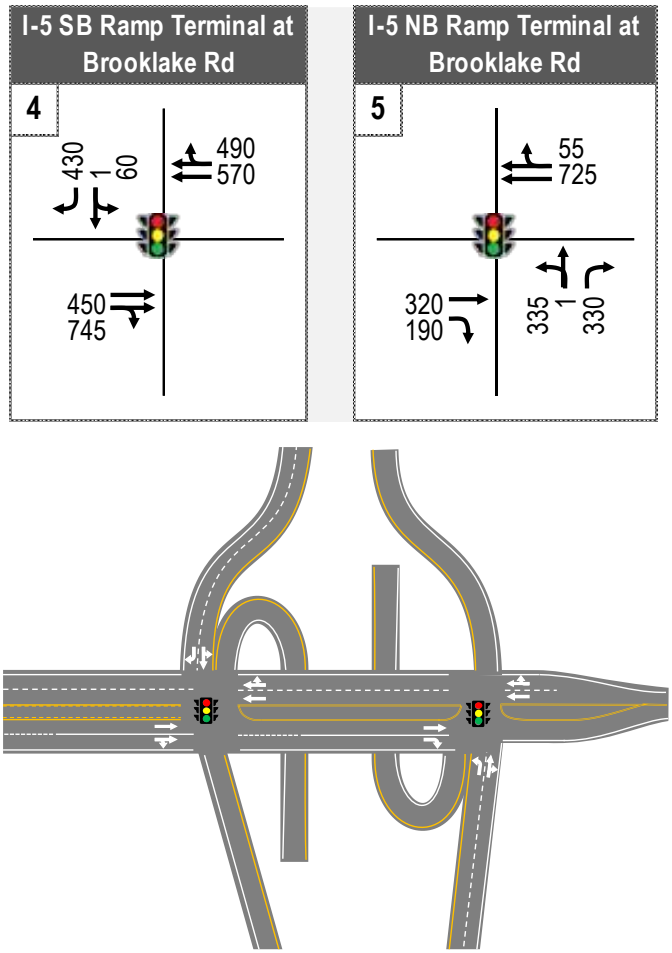
Phasing

- The loop ramps have the potential to be constructed in phases (northbound ramp terminal first).
- This concept has the potential to be constructed as a retrofit to the existing structure, however it would require design exceptions for clearance and sight distance.

Concept 5: Partial Cloverleaf (ParClo) – NW/SE

This version of the ParClo concept provides a loop ramp in the northwest quadrant for the westbound to southbound entrance ramp and a loop ramp in the southeast quadrant for the eastbound to northbound entrance ramp movements. This interchange concept would replace the current structure over I-5 to attain the needed vertical clearance from I-5. This would result in closure of adjacent accesses to accommodate the grade changes on Brooklake Road. (The operational impacts are discussed in the Local System Improvements section). In this design concept, both exit ramps remain a single lane exit, but widen to two lanes of storage. Traffic flow at the ramp terminals would be controlled by traffic signals, including the loop ramp traffic. The non-free flow ramps are preferred for multimodal considerations. The preliminary lane configurations are shown in Figure 9.

Figure 9. ParClo (NW/SE) 2043 PM Peak Hour Volumes and Lane Configurations



Construction Cost Estimate

$75.4 million (2021 dollars)

Traffic Operations and Safety

Operations

Table 12 summarizes estimated v/c ratios for the initial ParClo (NW/SE) concept. At both ramp terminals, this configuration is expected to operate well within adopted OHP and HDM mobility targets by 2043 under the proposed configuration. The loop ramps reduce the number of left-turn phases, which allows the interchange to handle a greater volume of traffic and operate with fewer delays.

Table 12. ParClo (NW/NE) Traffic Operations (Year 2043)

Intersection	Critical Movement[1]	v/c	LOS	OHP Mobility Target[2]	HDM Mobility Target[3]
SB Ramp Terminal	Overall	0.60	C	v/c ≤ 0.85	v/c ≤ 0.75
NB Ramp Terminal	Overall	0.55	B	v/c ≤ 0.85	v/c ≤ 0.75

Acronyms: EB = eastbound; WB = westbound; NB = northbound; and SB = southbound. L = left; T = through; and R = right.
AWSC = all-way stop control; TWSC = two-way stop control; Signal = signal control.
Intersections exceeding the applicable mobility target are **bold and shaded.**

Notes:
1. At signalized intersections, the overall results are reported; at all-way stop-controlled intersections, the results are reported for the worst movements; and at unsignalized intersections the results are reported for the worst major and minor movements that must stop or yield the right of travel to other traffic flows.
2. 1999 Oregon Highway Plan (OHP), Table 6, Policy 1F applies to existing and no build conditions.
3. Table 10-2: 20 Year Design-Mobility Standards (Volume-to-Capacity Ratio), Highway Design Manual, 2012. Provided for comparison only; ODOT facility plans follow OHP and no construction funding is available at this time.

Observations

- Ample capacity.
- Traffic moves through interchange with limited congestion.
- This interchange option may cause unbalanced lane usage along Brooklake Road, especially for eastbound direction. All the entrance ramp vehicles will need to keep to the right lane to get onto the freeway either northbound or southbound.
- A formal Intersection Control Evaluation (ICE) of the proposed ramp termini will be required if and when this concept is advanced into NEPA evaluation and preliminary engineering following adoption of the IAMP.

Possible Modifications to Proposed Concept Analysis

- Could resolve the potential eastbound unbalanced lane usage with an eastbound right-turn drop lane at the southbound ramp terminal.
- Preliminary analysis of a three-lane structure assumed a shared eastbound left-through lane approaching the northbound ramp terminal and split-phase timing. The operations are expected to meet OHP targets by 2043 but results in additional queuing. The queuing is most noticeable in the eastbound direction, although all movements are impacted.

Safety

- Improved sight distance for ramps terminal with the new interchange bridge.
- Traffic signals at the ramp terminals could reduce angle crashes but may increase rear end collisions on Brooklake Road.
- Increased storage on exit ramp reduces risk of traffic backing into safe stopping distance or onto the freeway.

- Reduced number of left-turn conflicts.
- Need to consider potential for wrong way traffic of exit ramp.

Right of Way Impacts

Right of Way (ROW) impacts are generally related to the improvements necessary to adjust Brooklake Road and the ramp terminals to the correct grade and alignment. For this ParClo option, there is additional ROW needed to accommodate the loop ramps in the northwest and southeast quadrants. The impacts to ROW are slightly less than the PacClo (NW/NE) concept. This ParClo (NW/SE) concept is not expected to impact the BPA tower located between I-5 and the southbound exit ramp. Table 13 summarizes the anticipated ROW impacts.

Table 13. ParClo (NW/SE) Right of Way Impacts

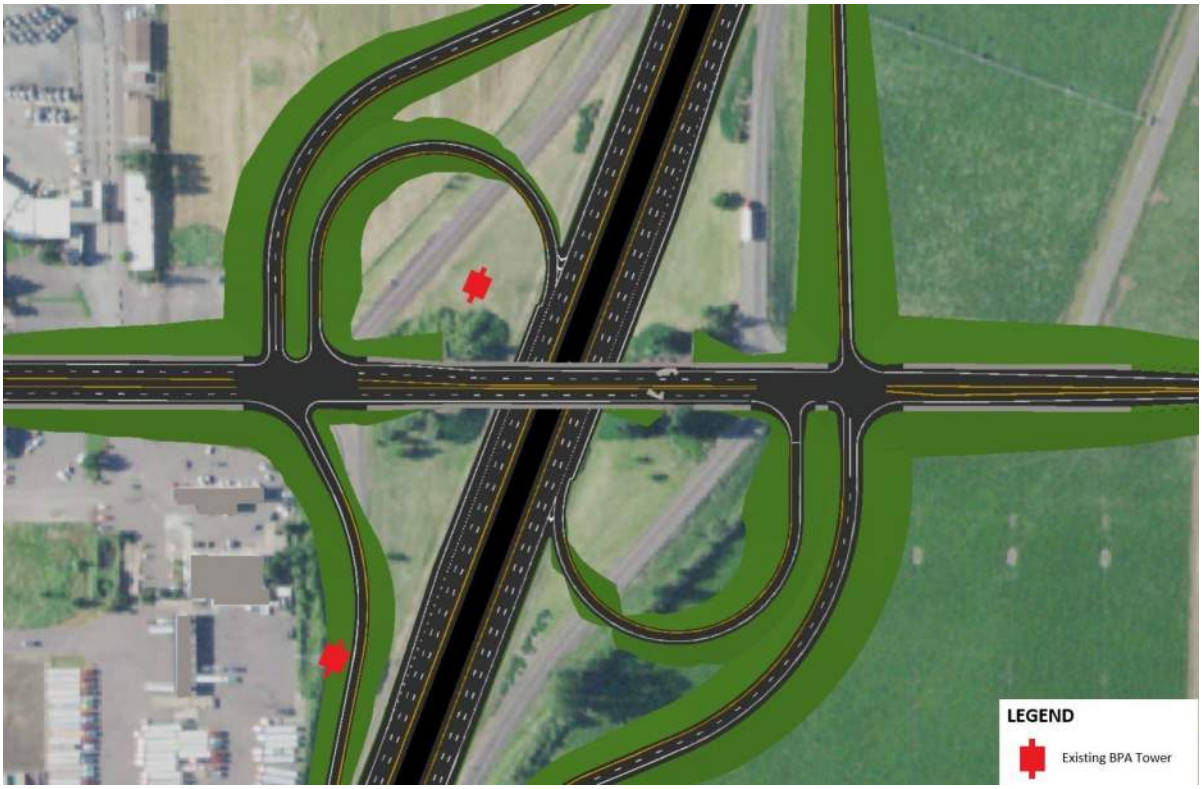
Quadrant	ROW (acres)	Marion County Land Use	
		Zoning	Comprehensive Plan
NW	5.7	Interchange District	Commercial
NE	2.6	Unincorporated Community Industrial - Limited Use	Industrial
SW	0.7	Interchange District	Commercial
SE	5.7	Exclusive Farm Use	Primary Agriculture
Total	**14.7**		

Land Use and Business Impacts

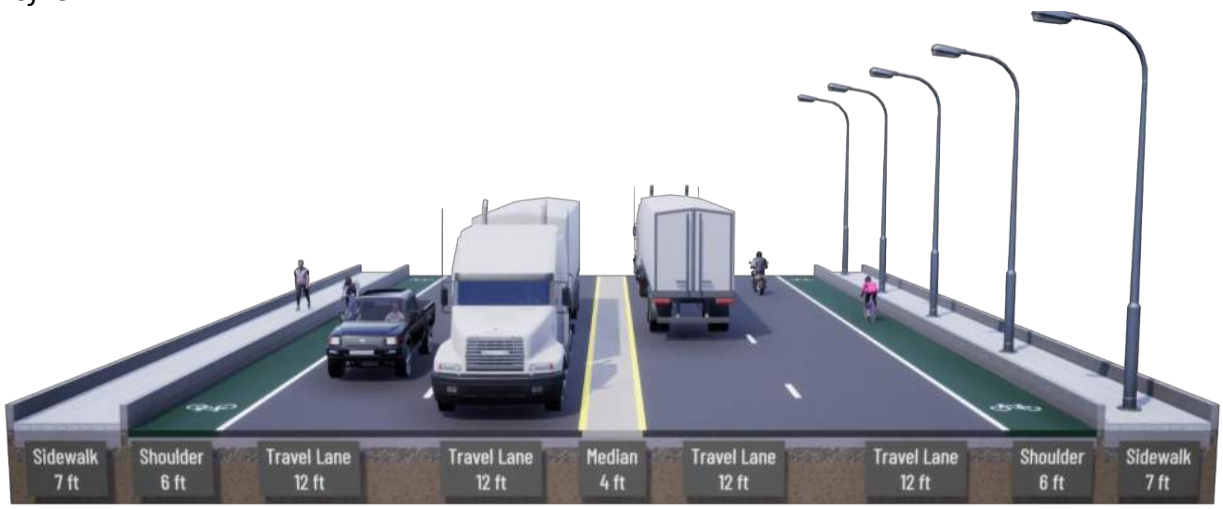
The grade requirements of this concept and the widening of Brooklake Road to five lanes between Huff Avenue and the southbound ramp terminal would require significant modification to the access points to businesses on either side of Brooklake Road, as seen in Figure 10. West of I-5, the access the businesses north and south of Brooklake Road would need to be closed and traffic routed to Huff Avenue. This ParClo concept is not expected to impact existing structures or BPA power transmission line towers. However, it has the second largest impact to developable lands. On the east side of I-5, access modifications would be required at 50th Avenue NE to accommodate the northbound to westbound loop ramp.

Figure 10. ParClo NW/SE Conceptual Layout and Profile

Layout



Profile



Environmental Impacts

This concept has potential for environmental impacts in the southeast quadrant due to an existing drainage ditch. There are no documented wetlands within the anticipate ROW. If the

northbound entrance ramp were to be extended, there is a freshwater emergent wetland and Fitzpatrick Creek that may be impacted.

IAMP Goal (Freight and Phasing)

Freight

- Removal of left-turn conflicts and additional exit ramp storage would improve freight movement through the interchange.
- Design would need to consider heavy freight use to avoid trucks tipping on the loop ramps.

Phasing

- The loop ramps have the potential to be constructed in phases (northbound ramp terminal first).
- This concept has the potential to be constructed as a retrofit to the existing structure, however it would require design exceptions for clearance and sight distance.

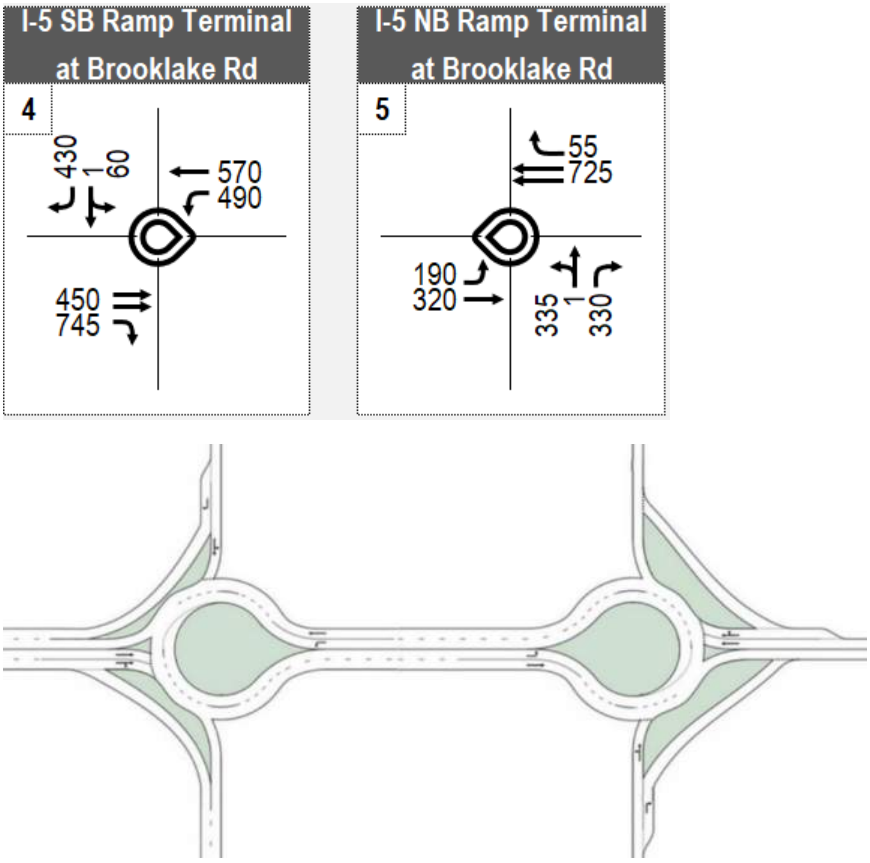
Concept 6: Dogbone

The dogbone is like a diamond interchange, except instead of stop- or signal-controlled ramp terminals, the ramp terminals are controlled by teardrops pointing towards each other. The teardrop shape as opposed to a full roundabout helps to reduce conflicts and queues. The teardrop also allow for smoother traffic flow, with the yield control preventing complete stops while still calming traffic when maneuvering the curve.

For the purposes of the IAMP evaluation of options, it is assumed that bypass lanes are included in the Dogbone concept to remove all right-turn traffic from the teardrop operations. If selected for advancement beyond the adopted IAMP, further assessment and analysis will be completed to determine the need for each bypass lane.

This interchange concept would replace the current structure over I-5 to attain the needed vertical clearance from I-5 and structure width for necessary capacity. This would result in closure of adjacent accesses to accommodate the grade changes on Brooklake Road. (The operational impacts are discussed in the Local System Improvements section). In this design concept, traffic flow at the ramp terminals would be controlled by teardrop. The movements from the freeway in both directions would be through a right-turn slip lane (bypass lane), as well as the movement onto southbound I-5. The preliminary lane configurations are shown in Figure 11.

Figure 11. Dogbone 2043 PM Peak Hour Volumes and Lane Configurations



Construction Cost Estimate

$59.1 million (2021 dollars)

Traffic Operations and Safety

Operations

Table 14 summarizes estimated v/c ratios and for the initial Dogbone concept. Both ramp terminals are expected to meet adopted OHP and HDM mobility targets by 2043 under the proposed configuration.

Table 14. Dogbone Traffic Operations (Year 2043)

Intersection	Critical Movement[1]	v/c	LOS	OHP Mobility Target[2]	HDM Mobility Target[3]
SB Ramp Terminal	Overall	0.70	A	v/c ≤ 0.85	v/c ≤ 0.75
NB Ramp Terminal	Overall	0.60	B	v/c ≤ 0.85	v/c ≤ 0.75

Acronyms: EB = eastbound; WB = westbound; NB = northbound; and SB = southbound. L = left; T = through; and R = right.
AWSC = all-way stop control; TWSC = two-way stop control; Signal = signal control.
Intersections exceeding the applicable mobility target are **bold and shaded.**

Notes:
1. At signalized intersections, the overall results are reported; at all-way stop-controlled intersections, the results are reported for the worst movements; and at unsignalized intersections the results are reported for the worst major and minor movements that must stop or yield the right of travel to other traffic flows.
2. 1999 Oregon Highway Plan (OHP), Table 6, Policy 1F applies to existing and no build conditions.
3. Table 10-2: 20 Year Design-Mobility Standards (Volume-to-Capacity Ratio), Highway Design Manual, 2012. Provided for comparison only; ODOT facility plans follow OHP and no construction funding is available at this time.

Observations

- Need to acknowledge the high truck volume through the interchange and trucks may take two lanes unless wider lanes are provided.
- Entrance ramps must be widened if accommodating both a right-turn slip lane and left-turns in the eastbound and westbound direction on Brooklake Road.
- Free-flowing teardrop could limit queuing between the ramp terminals.
- If queuing becomes a concern at Huff Avenue in the westbound direction, it could impact the operations of the interchange since roundabouts are free flowing, they do not have a mechanism to force gaps in the mainline traffic to clear a queue.

Possible Modifications to Proposed Concept Analysis

- Could provide a westbound right slip lane to I-5 at the northbound ramp terminal and potentially reduce to a single through lane.

Safety

- Improved sight distance for ramps terminals with the new interchange.
- Reduces number of conflict points, reduces crash severities, and eliminates potential for right-angle and head on collisions.
- Continuous flow minimizes backups onto the freeway or into safe stopping distance area.
- Can be difficult to navigate for unfamiliar oversized truck/freight drivers, although this should be able to be addressed in design.
- Reduces speed of vehicles traveling through intersection.

Right of Way Impacts

Right of Way (ROW) impacts are generally related to the improvements necessary to adjust Brooklake Road and the ramp terminals to the correct grade and provide for the right-turn slip lanes (or bypass lanes). Although the interchange ramp terminals remain in the existing location for this concept, teardrop require a larger footprint, so this concept requires slightly more ROW than the TDI concept. This concept has the potential to impact the BPA transmission line tower located between I-5 and the southbound exit ramp. Table 15 summarizes the ROW impacts for the Dogbone concept.

Table 15. Dogbone Right of Way Impacts

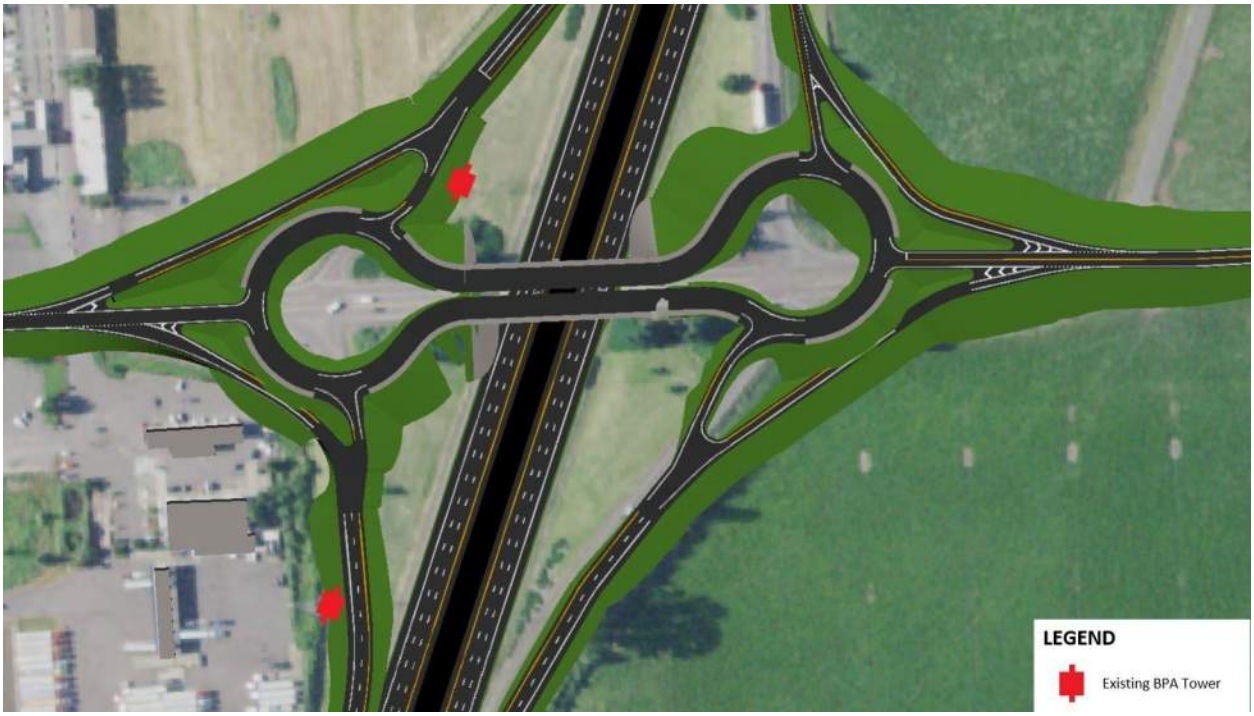
Quadrant	ROW (acres)	Marion County Land Use	
		Zoning	Comprehensive Plan
NW	1.7	Interchange District	Commercial
NE	1.3	Unincorporated Community Industrial - Limited Use	Industrial
SW	0.8	Interchange District	Commercial
SE	0.5	Exclusive Farm Use	Primary Agriculture
Total	**4.3**		

Land Use and Business Impacts

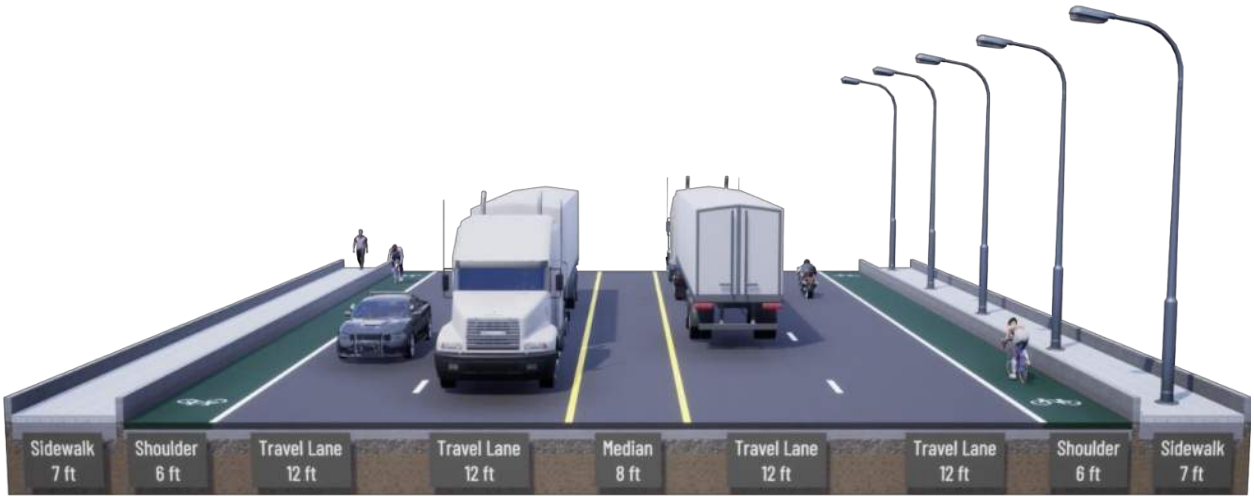
The grade requirements and the widening of Brooklake Road to five lanes between Huff Avenue and the southbound ramp terminal would require significant modification to the access points to businesses on either side of Brooklake Road, as seen in Figure 12. West of I-5, the access the businesses north and south of Brooklake Road would need to be closed and traffic routed to Huff Avenue. Impacts to existing structures are not anticipated, although existing parking lots would be impacted in both the northwest and southwest quadrants. The Dogbone concept will likely require the relocation of the BPA transmission line tower in the northwest quadrant. On the east side of I-5, access modifications would be required at 50th Avenue NE to accommodate the widening of Brooklake Road at the approach to the northbound ramp terminal.

Figure 12. Dogbone Conceptual Layout and Profile

Layout



Profile



Environmental Impacts

This concept has potential for environmental impacts in the southeast quadrant due to an existing drainage ditch. There are no documented wetlands within the anticipate ROW. If the northbound entrance ramp were to be extended, there is a freshwater emergent wetland and Fitzpatrick Creek that may be impacted.

IAMP Goal (Freight and Phasing)

Freight

- Removal of left-turn conflicts and additional exit ramp storage would improve freight movement through the interchange.
- Unfamiliar freight and oversized vehicles users can have trouble navigating teardrop (offtracking), although this should be able to be addressed in design.
- Weaving between Huff Avenue and the southbound ramp terminal could be a concern without traffic signals providing adequate gaps in traffic for lane maneuvers.

Phasing

- This interchange concept has potential to retrofit the existing structure if operations allow a three-lane structure.

Interchange Concepts to be Advanced

The outcome of the evaluation phase indicates two (2) interchange concepts that most comprehensively meet the IAMP objectives:

- Tight Diamond Interchange – Preferred Option 1
- Dogbone Interchange – Alternative Option 1A

These two concepts will be incorporated in the IAMP. Following IAMP adoption, and when funding is secured, these two interchange concepts will be evaluated further as part of the NEPA and preliminary design process.

I-5 Ramp Intersection Queuing Analysis

Table 16 summarizes the queuing analysis of key intersections for each of the for the two interchange design concepts recommended for further study and preliminary design assessment. The queuing analysis is conducted assuming year 2043 PM Peak Hour traffic volumes and proposed lane configurations as noted under each interchange design concept. The analysis indicates that the longest vehicle queues do not exceed the storage lane capacity for all exit ramp approaches, addressing the primary safety concern of traffic backing into the safe stopping distance from the mainline. Further refinements to the design are expected for inclusion in the IAMP.

Table 16. I-5 Ramp Termini Intersection Queuing Analysis

		TDI		Dogbone	
Intersection	Movement	95th Percentile Queue	Storage Length	95th Percentile Queue	Storage Length
SB Ramp Terminal	SB L/T	100	1,000	<25	1,000
	SB R	200	1,000	50	1,000
	EB T	350	1,067	150	1,067
	EB R	525	1,067	<25	1,067
	WB L	750	675	<25	675
	WB T	675	675	<25	675
NB Ramp Terminal	NB L	575	1,000	100	1,00
	NB T/R	150	1,000	100	1,000
	EB L	325	675	<25	675
	EB T	75	675	<25	675
	WB T	475	>1,000	125	>1,000
	WB T/R	275	150	125	150

Local System Improvements

As shown in Figure 13 (page 43), local roadway system improvements are identified that address operational and safety deficiencies at individual intersections within the study area, as well as necessary access modifications to support a new interchange. Table 17 lists the necessary intersection traffic control and local access improvements needed beyond what was assumed in the 2043 No Build analysis (included in the SKATS RTSP and summarized in *Technical Memorandum #4*).

Table 17. Local System Improvements

Location	Improvement	Problem Addressed	Timing
River Rd at Brooklake Rd	Assumes new traffic signal but no additional approach lanes.	Intersection expected to meet County mobility target by 2043 with LOS C and v/c 0.82	Signalize as soon as possible[3]; intersection is currently over capacity. Add dual SBL when intersection fails with signal.
May Trucking/ PILOT access and Truckman Way	Close accesses, create local connection to Huff Ave and divert traffic to Huff Ave.	Accesses between Huff Ave and SB Ramp Terminal must be closed with grade improvements to Brooklake Rd	With new interchange.
Huff Ave at Brooklake Rd	Add capacity to signalized intersection[3]: Add dedicated eastbound through/right-turn lane.	With new interchange, intersection and access closures, Huff Ave is expected to narrowly meet County mobility targets by 2043 at LOS E and v/c 0.85	Development-driven or paired with new interchange, whichever comes first.
50th Ave at Brooklake Rd	Modify (right-out only) or move access to east.	Accesses within a ¼-mile of the new interchange ramp terminals need to move toward achieving ODOT access management standards.	With new interchange.
OR 99E (Portland Rd) at Brooklake Rd	Consider implementing alternate mobility target.	Intersection is expected to narrowly exceed ODOT OHP mobility targets[2] by 2043, operating at LOS D and v/c = 0.91.	Medium-term; intersection over capacity in 2043. Not tied to interchange improvements.

Notes:

1. LOS D, v/c ≤ 0.85. The Marion County Rural Transportation System Plan (TSP) designates the traffic operations standard on County facilities and defers to ODOT standards for intersections with state highways within the County.
2. v/c ≤ 0.90. 1999 Oregon Highway Plan (OHP), Table 6, Policy 1F.
3. Intersection assumed signalized by 2043 per Project List for the SKATS 2019 – 2043 RTSP.

Interim Improvements

There are current operational and safety concerns that could benefit from interim capacity and safety improvements in the study area prior to major interchange re-construction. Those improvements are listed below and also illustrated in Figure 13.

- Widening to provide storage and turn channelization for two lanes on the southbound and northbound exit ramps.
- Grading improvements at ramp terminals to flatten approach grades on the exit ramps for freight turning movements.
- Signalize the northbound and southbound ramp terminals if needed as mitigation for intersection sight distance issues or to accommodate increased pedestrian use. This requires an Intersection Control Evaluation by ODOT.
- Add pedestrian pushbutton signals and ADA-compliant landing areas with any traffic signals, as well as sidewalk connections from the traffic signals to the sidewalk on the south side of the existing bridge.
- The exit ramp improvements can be incorporated into the preferred option.

Table 18. Interim Improvement Traffic Operations

Intersection	Critical Movement[1]	2030		2043		OHP Mobility Target[2]	HDM Mobility Target[3]
		v/c	LOS	v/c	LOS		
SB Ramp Terminal	Overall	0.81	D	**0.88**	D	v/c ≤ 0.85	v/c ≤ 0.75
NB Ramp Terminal	Overall	**0.85**	F	**0.99**	F	v/c ≤ 0.85	v/c ≤ 0.75

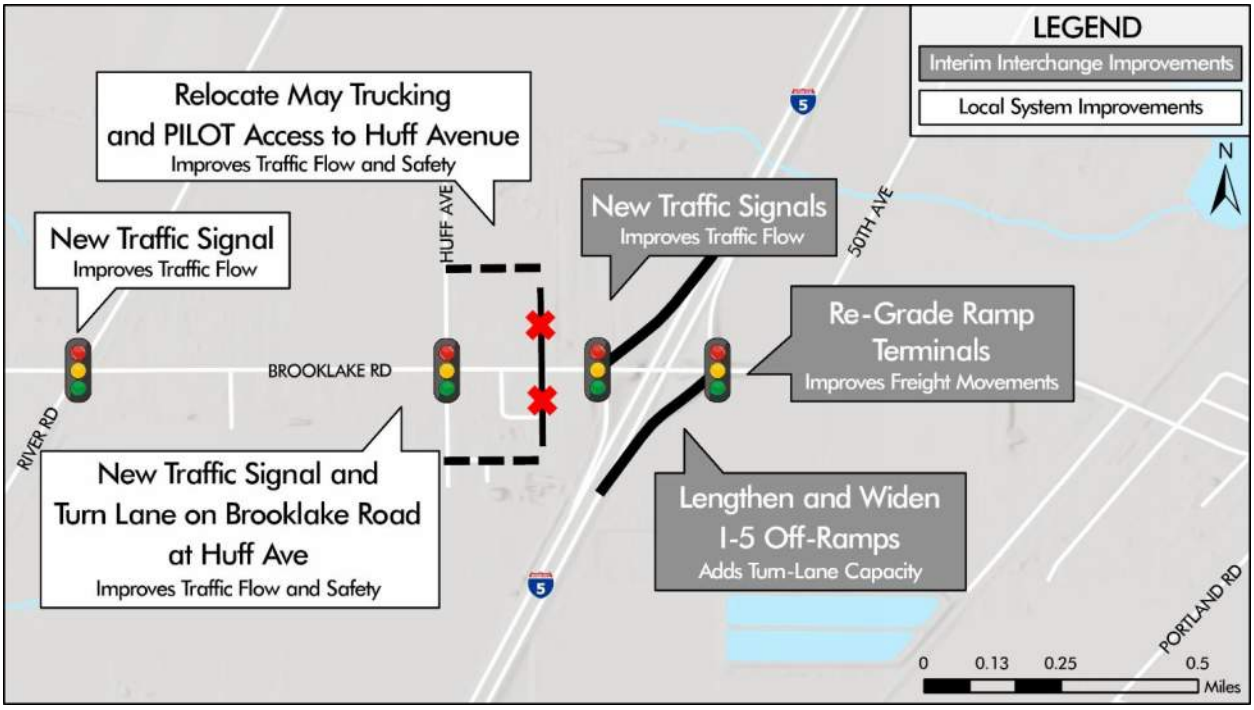
Acronyms: EB = eastbound; WB = westbound; NB = northbound; and SB = southbound. L = left; T = through; and R = right.
AWSC = all-way stop control; TWSC = two-way stop control; Signal = signal control.
Intersections exceeding the applicable mobility target are **bold and shaded.**

Notes:
1. At signalized intersections, the overall results are reported; at all-way stop-controlled intersections, the results are reported for the worst movements; and at unsignalized intersections the results are reported for the worst major and minor movements that must stop or yield the right of travel to other traffic flows.
2. 1999 Oregon Highway Plan (OHP), Table 6, Policy 1F applies to existing and no build conditions.
3. Table 10-2: 20 Year Design-Mobility Standards (Volume-to-Capacity Ratio), Highway Design Manual, 2012. Provided for comparison only; ODOT facility plans follow OHP and no construction funding is available at this time.

The interim-year analysis was conducted using interpolated volumes for year 2030. The southbound ramp intersection is expected to operate at an intersection critical v/c ratio of 0.81, and the northbound ramp intersection is expected to operate at an intersection critical v/c ratio of 0.85. Therefore, the year the ramp intersections are expected to exceed the OHP mobility target of a v/c ratio of 0.85 is approximately 2030. Recognizing that funding for the recommended option of the IAMP may not be achieved within the planning horizon, alternative

mobility targets (AMTs) are proposed for the interchange ramp terminals. *Technical Memorandum #8* will analyze and verify the need for AMTs.

Figure 13. Local System and Interim Interchange Improvement Summary



Conclusions

Based on the concept evaluations above, the following interchange concepts were advanced as preferred options:

- Tight Diamond Interchange – Preferred Option 1
- Dogbone Interchange – Alternative Option 1A

The options above will be refined to higher levels of engineering design to refine impacts, costs, and transportation performance for presentation to the public and stakeholders, and for inclusion in the final IAMP.

Based on currently projected funding availability, the necessary funding for construction by 2043 of the Preferred Options might not be available. Therefore, it is expected that each of the ramp intersections will exceed the OHP mobility target without the interchange improvements.

The Interim Interchange Improvements will improve operations at the interchange over the existing condition but will not meet the existing OHP mobility target of a volume to capacity ratio (v/c) of 0.85 at the ramp terminals by the end of the planning horizon (2043). However,

the interchange ramp terminals will operate significantly better than the OHP mobility target with either the Preferred or Supplemental Options. The project team recommends establishing an AMT at both ramp terminals for the peak hour of operation. This AMT would remain in place until the Preferred or Supplemental Option is completed.

TECHNICAL MEMORANDUM #7

Transportation System Concepts (Task 5.3)

Contents

Attachment A: Scoring Criteria

a) Clearly inconsistent with or unlikely to meet the project goal and objectives.
b) Requires the use of resources or properties which are highly unlikely to be available.
c) Incompatible with context of a rural interchange.

Detailed Screening

The draft **detailed evaluation criteria** are meant to aid in evaluating how well each concept meets the IAMP goal and evaluation criteria. When screening and evaluating potential interchange concepts, analysis includes cost, traffic performance (operations and safety), right-of-way requirements, land use and business impacts, and environmental considerations. These broad criteria are described below, and detailed evaluation criteria are defined in Table 1. These will be used to score each preliminary concept and a summary of the conditions will be provided in a matrix similar to what is shown in Table 2.

Construction Cost

The overall cost of an improvement is a significant factor in the feasibility of a design concept. Preliminary construction estimates for each design concept will be generated using conventional estimating techniques. Each concept's cost estimate will include a construction cost contingency to account for design uncertainties. The construction costs will likely not include costs associated with acquiring new rights-of-way (ROW). Construction cost also considers the potential ongoing and maintenance costs of the alternative.

Figure 3. Concept Evaluation Criteria

Traffic Performance

The traffic performance of each design concept will be evaluated at study intersections based on v/c ratio and LOS as outlined in the approved *Methodology Memorandum,* as well as potential benefits to safety.

The Oregon Highway Plan (OHP) and Highway Design Manual (HDM) mobility targets are applicable to the interchange. The OHP establishes a v/c ratio of 0.85 at freeway ramp terminals and an I-5 mainline mobility target of 0.70, ratios more than this result in unacceptable levels of congestion. The ODOT HDM design performance thresholds for new intersection ramp terminals is a v/c ratio of less than 0.60. Both mobility standards will be considered in the transportation performance analysis of the IAMP concepts.

The project team will analyze traffic performance for each concept. The improvement concepts will likely involve improving interchange performance by increasing the roadway vehicle capacity through additional lanes and intersection traffic control. In addition to the operational performance, the concepts will be evaluated on how they address existing SPIS locations and historical crash trends.

Right-of-Way Impacts

The concepts will be evaluated based on the amount and location of additional ROW that would be needed. The amount of additional ROW will be estimated in acres using GIS.

Land Use and Business Impacts
The project team will evaluate the concepts qualitatively to determine the relative impacts on land use and businesses. The interchange design concepts will be evaluated based on the estimated ROW impacts to developed parcels and developable land as designated in the Marion County's Rural Zoning Code (see Technical Memorandum #5).

Specific business and farm impacts will be evaluated for the May Trucking and Pilot Travel Center businesses in the in the northwest and southwest quadrants of the interchange, respectively. Other lands will be studied that may be impacted by new roadway connectors associated with the interchange design concepts.

Environmental Impacts
The study anticipates that each of the interchange design options will have some impacts on the built and/or natural environments. Technical Memorandum #5 provides a "visual windshield validation" of environmental conditions in the I-5/Brooks IAMP study area. Each of the interchange design concepts will be evaluated based on their relative impact to the documented built and natural environmental features in the study area.

Table 1. Detailed Evaluation Criteria

Screening Criteria	Objective	Evaluation Description
Construction Cost	Level of investment needed to implement	● - Low cost / within existing ROW ◖ - Moderate cost / within existing ROW ○ - Moderate cost / some ROW needed ◗ - Significant cost / some ROW needed ● - Significant cost / significant ROW needed
	Impact on maintenance and operations	● - Significantly reduces maintenance/operations costs ◖ - Minor reduction in maintenance/operations costs ○ - Little to no impact on maintenance/operations costs ◗ - Minor increase in maintenance/operations costs ● - Significantly increases maintenance/operations costs
Traffic Performance	Impacts to congestion and operations	● - Significantly reduces congestion / meets HDM v/c targets ◖ - Reduction in congestion / meets OHP v/c targets ○ - Little or no impact on congestion / exceeds OHP targets but better than No Build conditions ◗ - Minor increase in congestion / exceeds No Build v/c ● - Significant increase in congestion/exceeds capacity (v/c >1.0) at ramp terminals
	Benefit to safety	● - Directly addresses crash pattern(s)/known deficiencies ◖ - Potential positive impact on crash pattern(s)/known deficiencies ○ - No impact on safety ◗ - Potential negative impact on crash pattern(s)/known deficiencies ● - Would directly worsen crash pattern(s)/known deficiencies

Screening Criteria	Objective	Evaluation Description
Right-of-Way Impacts	Limit impacts to ROW	● - ROW impacts are limited to one quadrant of interchange ◖ - ROW impacts are limited to east side of interchange ○ - No change to current ROW impacts ◗ - ROW impacts to three quadrants of interchange ● - ROW impacts to all quadrants of interchange
Land Use and Business Impacts	Limit business impacts	● - Improves access to existing businesses ◖ - No impact to existing businesses ○ - Maintains access to existing businesses but relocates driveway ◗ - Restricts movements into and out of existing business / impacts site plan ● - Removes access to existing business / impacts structures
	Limit impacts to developable and EFU lands	● - Positive impact to both developable and EFU lands ◖ - Positive impact to either developable or EFU lands ○ - Does not impact developable or EFU lands ◗ - Negative impact to either developable or EFU lands ● - Negative impact to both developable and EFU lands
Environmental Impacts	Acknowledge and plan for natural resources, wildlife and hazardous materials	● - Improves areas with known environmentally sensitive areas ◖ - Avoids negative impacts to environmentally sensitive areas ○ - Does not impact environmentally sensitive areas ◗ - Improves condition for one resource at the expense to others ● - Degrades environmentally sensitive areas
IAMP Goal*	Maintain efficient movement of freight traffic.	● - Improves freight movement through interchange. ○ - No impact to freight movement ● - Does not support or negatively impacts freight movement
	Improvements can be implemented over time	● - The improvement could be implemented in phases ○ - The improvement cannot be implemented in phases ● - The improvement replaces already planned / implemented improvements

* To capture components of the IAMP goal not included in other evaluation criteria

Attachment B: Workshop Notes

DAVID EVANS AND ASSOCIATES INC.

I-5: Brooks Interchange Area Management Plan
Concept Workshop Meeting Summary

Location:	Zoom Call
Date:	May 3, 2021
Time:	2:30 pm – 4:00 pm
Project Information:	ODOT Contract Number: B36376, WOC #2 ODOT EA: 21PF220-631-P30 DEA Project Number: ODOT00000983

Agenda

- Introductions
- Project Background / Key Issues
- Group Discussion:
  - Constraints
  - Merits of typical interchange layouts
  - Determine 3-5 interchange layouts for further analysis
- Options for interim improvements

Attendees

- Dan Fricke (PMT), ODOT
- Angela Rogge (PMT), DEA
- Janelle Shanahan (PMT), Marion Co.
- Dave Warrick, ODOT Interchange Design
- Eliseo Lemus, ODOT Region 2 Roadway
- Satvinder Sandhu, FHWA Local Programs Manager
- Ted Stewart, DEA Roadway
- Josh Anderson, DEA Traffic

Meeting Notes

Project Overview

- Angela Rogge kicked of the meeting with a round of introductions.
- Mentioned that the interchange has been studied before:
  - May Trucking Study (2018)
  - In the 1990's when PILOT was coming in
  - 2006 Brooks Interchange Study by ODOT
- Dan Fricke added:
  - In addition to ODOT and the County's involvement, this study is important to City of Keizer. Keizer sees the Brooks Interchange as the "backdoor" to their community.
  - There is currently no funding identified for final design/construction.

- Janelle Shanahan added:
    - Marion County has major concerns about traffic congestion
    - She had a discussion with Brian May (environmental) and the County is planning to expand solid waste services within/near the study area
        - SE quadrant
        - Next to existing facility

Existing Deficiencies:

- Geometric approach slopes are above standard grade (Brooklake Rd)
- There is a ditch along the northbound exit ramp
- Existing bridge is not widenable
- The NW Quadrant used to have a gas station. ODOT owns landscape strip.
- Access issues on the west side of the interchange
- Interchange history:
    - Built in the 70's
    - Vertical alignment creates sightline issues (camelback)
- Queues can back up to freeway, especially on northbound exit ramp
- Both ramp terminals have operational concerns
- NB Ramp terminal has high crash history

Review of Concepts:

- **See attached spreadsheet**

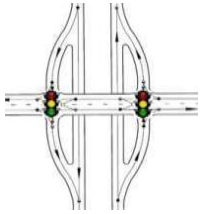
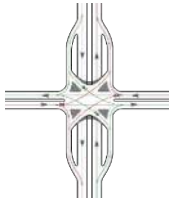
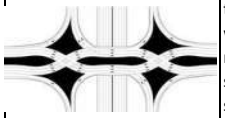
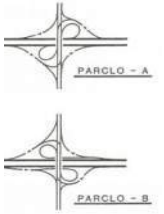
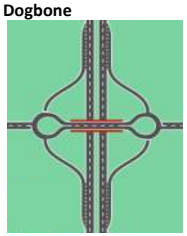
Interim Improvements Brainstorm:

- Single lane DDI *might* fit within existing structure.
- Extend exit ramps
- 2-lane exit ramps
- Get to grade over structure
- Follow-up from Satvinder via email:
    - Any considerations for the interim improvements should be developed after we have some preferred alternatives developed, so that there is minimal throw away when the final design is prepared/implemented.
    - Listening to the congestion faced at some of the recently constructed interchanges in Medford area, travel forecasts should be properly vetted for the design year, including considerations of local plans.

ACTION ITEMS FOR FOLLOW-UP:

- **Conduct a preliminary fatal flaw analysis of the 5 layouts to see if any drop off before more detailed review is done.**

Attachments: Preliminary Concepts Spreadsheet and Workshop Packet

Interchange Type	Application	Brooks Interchange		Design Considerations/Questions	Conceptual layout for detailed analysis?
		Benefits	Impacts/Cons		
Tight Diamond 	For use in areas of limited ROW (access spacing between ramps ~200-400 ft) Signalized	-Signalized intersections need appropriate coordinated timing to keep the space between in order to clear -Compact ROW -May not require full rebuild of ramps.	-Limited space for turn lanes in existing structure width -Widen structure (could need dual lefts) -Widen ramps -Structure on the crest curve -Would require replacement of structure -potentially 5-lane structure	Need to two lane exit ramps	Would still likely require a rebuild of the structure due WB capacity needs at SB ramp terminal. 5-lane
Single Point Interchange 	Consolidates all the left-turn movements to/from ramps into a single intersection.	Fewer intersection/conflict points	-Large structure -Structure depth may require raising the new structure which extends impacts to intersections east and west. -Grade seems like it may limit the feasibility of this interchange. -Usually found in more urban areas	-Adjacent off-freeway intersections are impacting interchange in Medford; Huff would need a closer look during analysis. -Market St SPI seems to be working well Intersection sight distance calculates for ramps	
Diverging Diamond 	Accommodates left-turning movements while eliminating the need for a left-turn signal phase at signalized ramp terminal intersections.	2-lanes in each direction on structure		2nd Edition of DDI guide (site specific)	Interim phase DDI? Dual NBL, single SBL.
Partial Cloverleaf 	Heavier left turn movements accommodated via loops	-Reduced delay -More storage space for NB exit ramp	-Exit loop ramps need long deceleration, flat grades. -Entrance loops is what May trucking study looked at. -Weaving may be an issue depending on layout.	Where to put the loops? Avoid structures	Consider: May Trucking Layout & assymetrical (north side)
Dogbone 	Roundabouts are incomplete circle to reduce conflicts and reduce queuing	Free flow	-Operations / public resistance -ROW -Freight mobility		Check against fatal flaw

Items to consider:
- **Cost**
- **Traffic Operations**
- **Freight Movement**
- **Right-of-way**
- **Business/land use impacts**
- **Lane configurations**
- **Technology/Design features**

Notes
SB clearance just 16'11"
NB clearance 17'10"
Consider future growth of I-5 --> we just need to make a consistent assumption
Multimodal connectivity

Brooks IAMP Workshop Packet

Workshop Goals

Primary: Determine 3-5 interchange layouts for further detailed analysis

Secondary: Discuss local street network, multimodal and safety improvements

Study Area

Brooks Interchange, Brooklake Rd: River Rd to Portland Rd (OR 99E) and connecting road, adjacent land

Summary of Conditions

Geometry

Interchange	• Deceleration lane length is too short on both exit ramps. • Acceleration length of SB entrance ramp is substandard.
Access Spacing	• Adjacent public road accesses (west side) are too close to ramp terminals. • Twelve access points within a ¼-mile (1,320 feet) of ramp terminals. • There is an informal gravel park & ride on the east side of the interchange that has
Sight Distance	• The sight distance is limited at both the northbound and southbound ramp terminals. • The sight distance of crossroad is substandard for the operating speed.

Traffic (2043)

Operations	• Interchange ramps expected to exceed mobility targets and be over capacity • SB diverge and mainline south of Brooks expected to exceed 85% capacity in PM • Signal at Huff is dependant on development north of Brooklake Rd • Future analysis assumes River Rd is signalized, but will be over capacity if not
Queuing	• Queuing expected to extend onto I-5 mainline at both ramp terminals • Brooklake Rd at Portland Rd (OR 99E) queuing concerns (NB/SB)

Safety

Crash History 2014-2018	• Ramp terminals exceed the statewide 90th percentile crash rate. • Northbound ramp terminal is a top 10% SPIS location. • Turning and Rear End make up 81% of crashes (33% and 48%, respectively)

Multimodal

Bike/Ped	• Sidewalk on south side of overpass • Bikes expected to use narrow shoulder - varries between 2 and 6 feet
Transit	No regular ptransit available through the interchange ramp terminals or Brooklake Rd

Land Use

Major Draws	• Freight generators east and west, but majority on west side
Comp Plan	• Farm, commerical, industrial and public (Antique Powerland)
Zoning	• Interchange District Overlay west of I-5

Environmental

Natural Resources	• Area of Minimal Flood Hazard • Emergent wetlands northeast and south east of I-5 • Potential cottonwood-forested wetland east of I-5
Wildlife	• No critical habitat has been designated within the study area
HazMat	• Various sites in multiple databases (Pilot, May, Marion Co. Recycling and Covanta) • Further site investigations at identified sites would be needed before construction

Previous Studies

• Short-term evaluation of existing roadway traffic operations and the impact of proposed May Trucking expansions out to 2025 recommended signalizing River Rd intersection, ramp terminals and
• Long-term evaluation of a partial cloverleaf interchange (originally proposed in the 1997 IAMP) and projected traffic out to 2040.

May Trucking Study (2019)

- Construction of a loop ramp from westbound Brooklake Road to southbound I-5
- Construction of a loop ramp from eastbound Brooklake Road to northbound I-5
- Construction of a free right turn lane from eastbound Brooklake Road to southbound I-5 ramp
- Construction of a free right turn lane from westbound Brooklake Road to northbound I-5 ramp
- Construction of an additional lane on both northbound and southbound I-5 off-ramps to allow for two full approach lanes
- Installation of traffic signals on Brooklake Road at the intersections with the I-5 southbound and northbound ramps

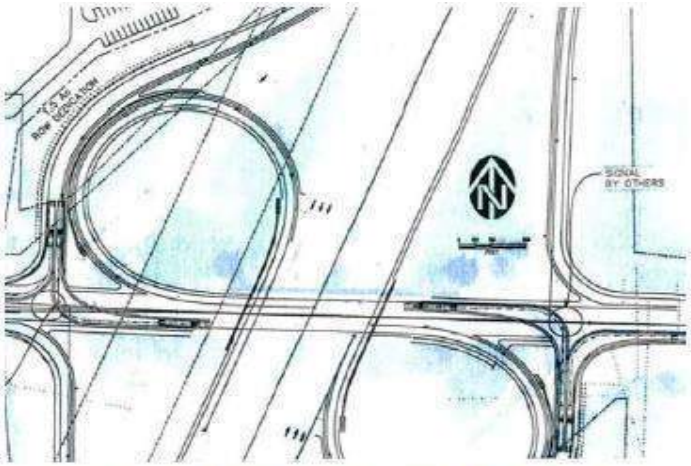
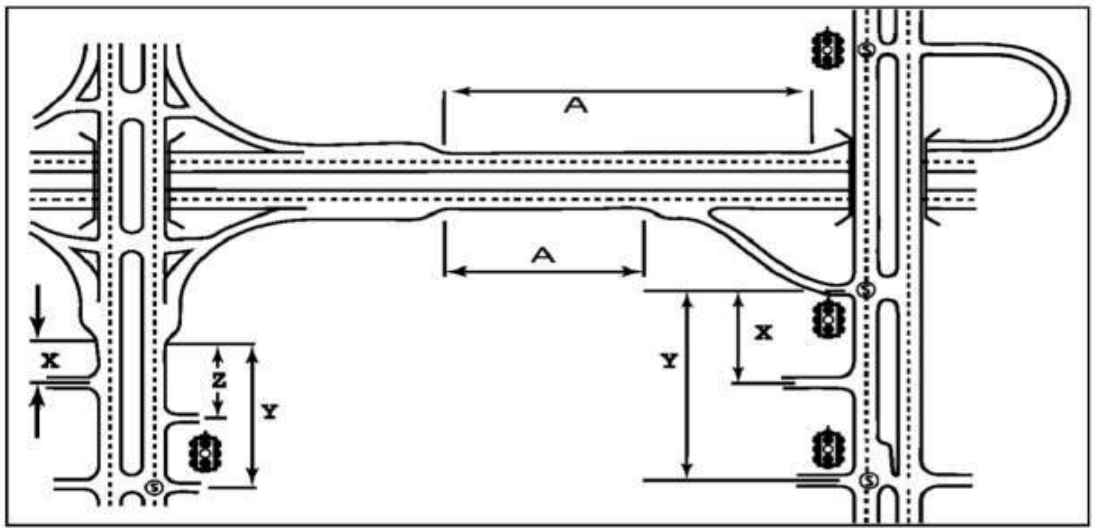


Figure 1: Brooklake/I-5 Interchange Layout

OHP Minimum Spacing Standards for Freeway Interchanges with Multi-Lane Crossroads

Category of Mainline	Type of Area	Spacing Dimensions			
		A	X	Y	Z
FREEWAY	Fully Developed Urban	1 mi. (1.6 km)	750 ft. (230 m)	1320 ft. (400 m)	990 ft. (300 m)
	Urban	1 mi. (1.6 km)	1320 ft. (400 m)	1320 ft. (400 m)	1320 ft. (400 m)
	Rural	2 mi. (3.2 km)	1320 ft. (400 m)	1320 ft. (400 m)	1320 ft. (400 m)



Brooks IAMP Workshop Packet

Existing Roadway Geometry

Roadway Segment	Lane Widths (ft) SB/WB	Lane Widths (ft) NB/EB	Shoulder Widths (ft) SB/WB	Shoulder Widths (ft) NB/EB	Pavement Width (ft)[1]	Pavement Condition
I-5 Southbound Mainline (3 travel lanes)	12	12	10	10	56	Very Good
I-5 Northbound Mainline (3 travel lanes)	12	12	10	10	56	Very Good
I-5 Southbound Exit Ramp[2]	16	N/A	3	6	25	Very Good
I-5 Southbound Entrance Ramp	16	N/A	3	8	27	Very Good
I-5 Northbound Exit Ramp[2]	N/A	16	6	4	26	Very Good
I-5 Northbound Entrance Ramp	N/A	16	5	4	25	Very Good
Brooklake Rd (Marion County) *West of Interchange*						
River Rd – Huff Ave	12	12	2	2	28	Very Good
Huff Ave – ODOT ROW	12	12	3-6	3-6	30-48[3]	Very Good
Brooklake Rd (ODOT) – West to East						
MP 263.39 – MP 263.41	12	16	6	12	58[3]	Good
MP 263.41 – MP 263.52	12	16	6	6	46[3]	Good
MP 263.52 – MP 263.56	12	16	6	6	40	Good
MP 263.56 – MP 263.61	16	16	6	6	56[3]	Good
MP 263.61 – MP 263.63	16	16	3	8	43	Good
Brooklake Rd (Marion County) *East of interchange*						
ODOT ROW (east) – SPRR Xing	12	12	5	5	34	Good
SPRR Xing – Portland Rd (OR 99E)	12	12	5	5	34	Good
River Rd						
Buena Crest School – Brooklake Rd	12	12	6	4	34	Good
Brooklake Rd – Waconda Rd	11	11	5	5	22	Very Good
Huff Avenue						
South to dead end – Brooklake Rd	N/A	N/A	N/A	N/A	34	Good
Brooklake Rd – North to gate	N/A	N/A	N/A	N/A	22	Good
Truckman Way	N/A	N/A	N/A	N/A	34	Good
50th Ave	12	12	N/A	N/A	24	Good
Portland Rd (OR 99E)						
MP 41.21 – MP 41.24 (north leg)	12	12	N/A	N/A	51[4]	Fair
MP 41.24 – MP 41.34 (south leg)	17	17	N/A	N/A	47-48[4]	Fair

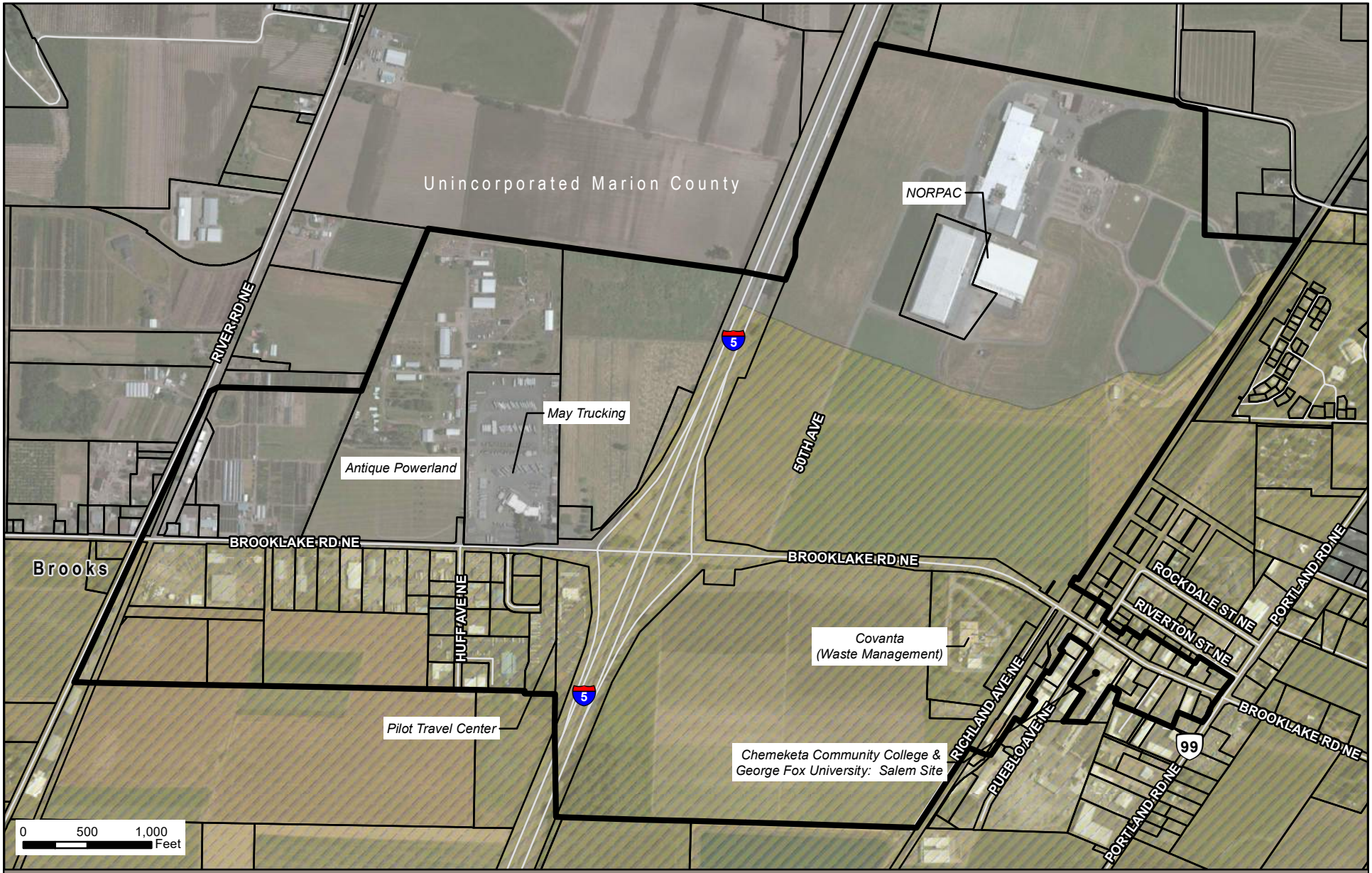
Sources: ODOT TransGIS, ODOT Highway Inventory Detail Report and *Marion County Rural Transportation System Plan, Appendix B (2012)*

Acronyms: SB = Southbound; NB = Northbound; WB = Westbound; EB = Eastbound; MP = Mile Point

1. Pavement width is listed for ODOT facilities while right-of-way (ROW) width is listed for Marion County facilities.
2. Presence of right-turn flares.
3. Median present
4. Turn lane(s) present

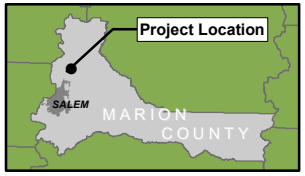
Figures from Technical Memoranda (Attached)

Study Area
Comprehensive Plan Designations
Marion County Zoning
FEMA Floodplains and Goal 5 Resources
Soils, Wetlands and Streams
2020 Turning Movement Volumes
2043 Turning Movement Volumes



Brooks Interchange Area Management Plan

N

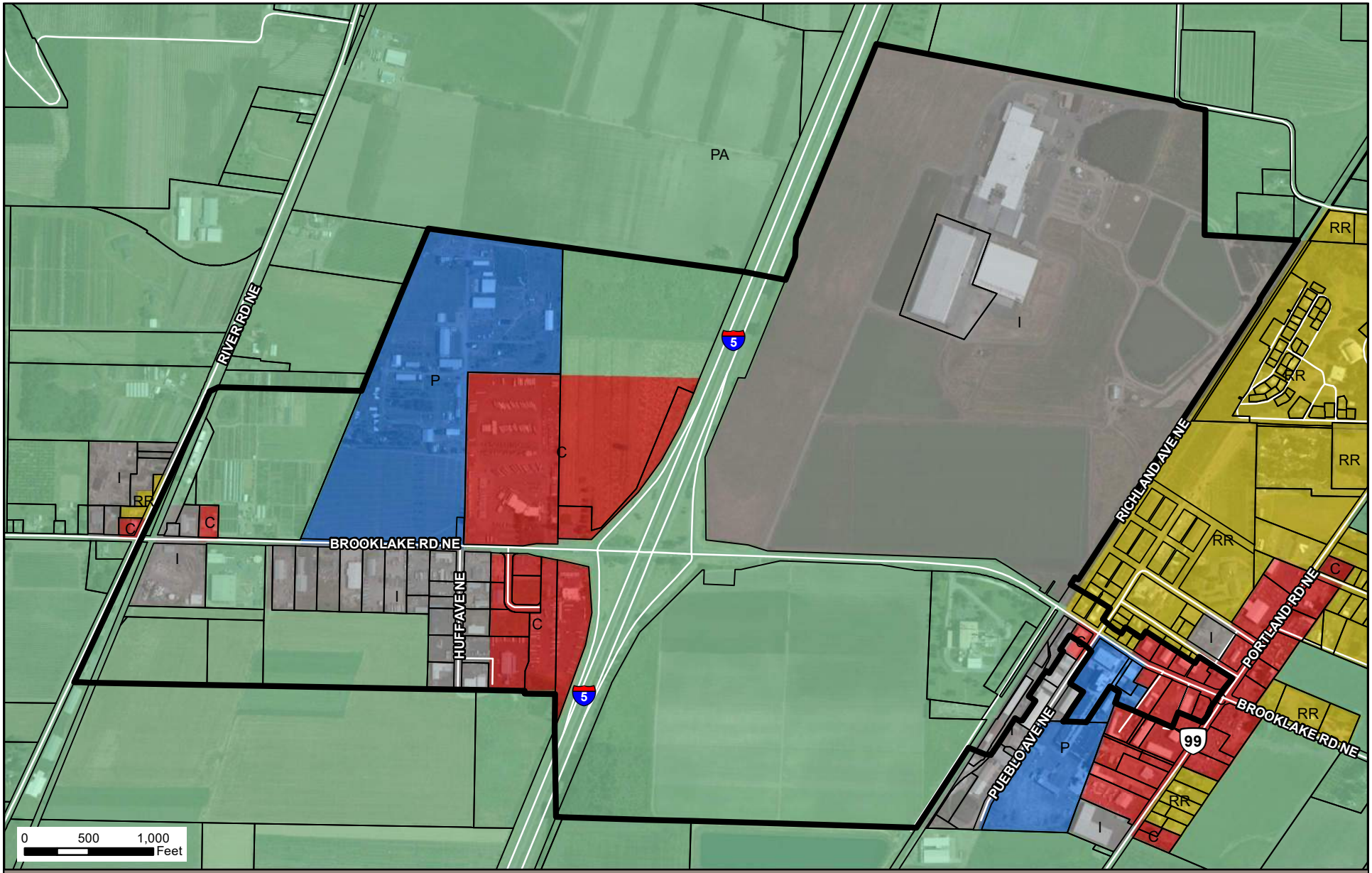


Study Area
SKATS Boundary
Tax Parcel

Figure 1
Study Area

Data Sources: Marion County, 2020

P:\O\ODOT00000983\0600\INFO\GS\Maps\TM5_EnviroLandUse\Fig 1 TM5-Study Area.mxd



Brooks Interchange Area Management Plan

N

Study Area
Tax Parcel
Road

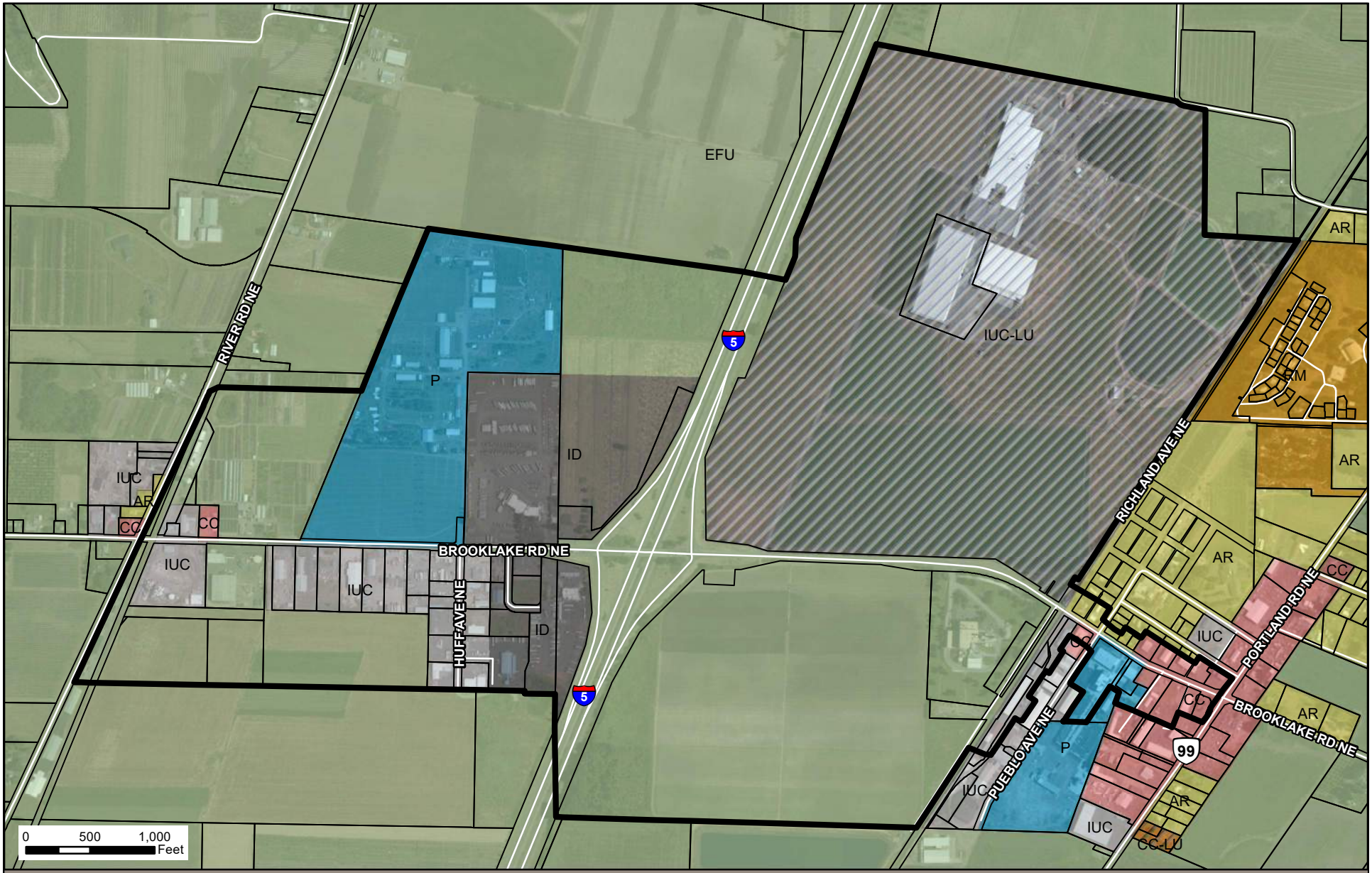
Comprehensive Land Use Plan Designation

Commercial (C)
Industrial (I)
Primary Agriculture (PA)
Public (P)
Rural Residential (RR)

Figure 2
Marion County Comprehensive Plan Designations

Data Sources: Marion County, 2020

P:\O\ODOT00000983\0600\INFO\GS\Maps\TM5_EnviroLandUse\Fig 2 Land Use.mxd



Brooks Interchange Area Management Plan

N

Data Sources: Marion County, 2020

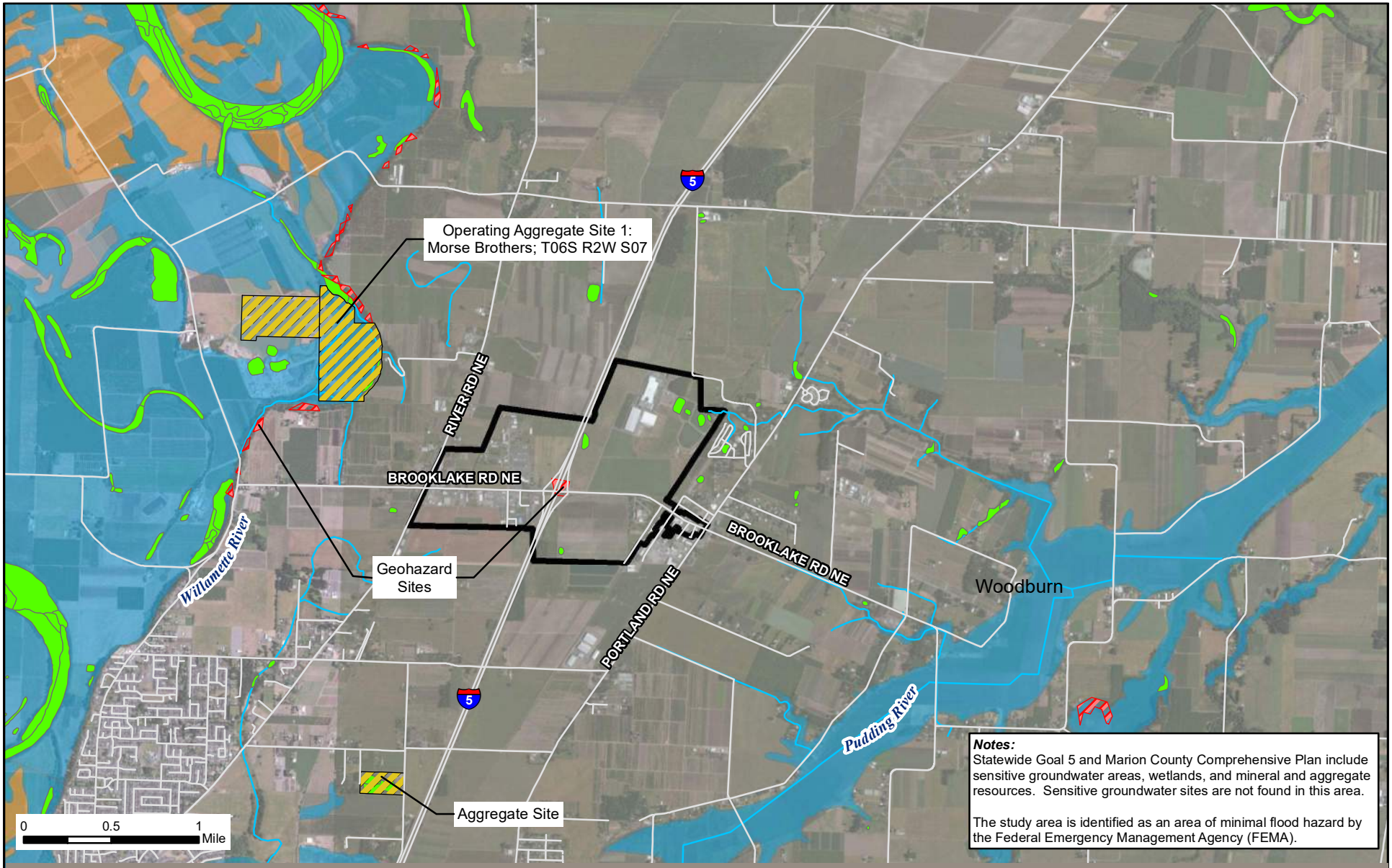
Study Area
Tax Parcel
Road

Marion County Zoning

- Acreage Residential (AR)
- Community Commercial (CC)
- Community Commercial - Limited Use (CC-LU)
- Exclusive Farm Use (EFU)
- Interchange District (ID)
- Multiple Family Residential (RM)
- Public (P)
- Unincorporated Community Industrial (IUC)
- Unincorporated Community Industrial - Limited Use (IUC-LU)

Figure 3
Marion County Zoning

P:\O\ODOT00000983\0600\INFO\GS\Maps\TM5_EnviroLandUse\Fig 3 Marion County Zoning.mxd



Brooks Interchange Area Management Plan

N

Study Area
Stream/River
Road

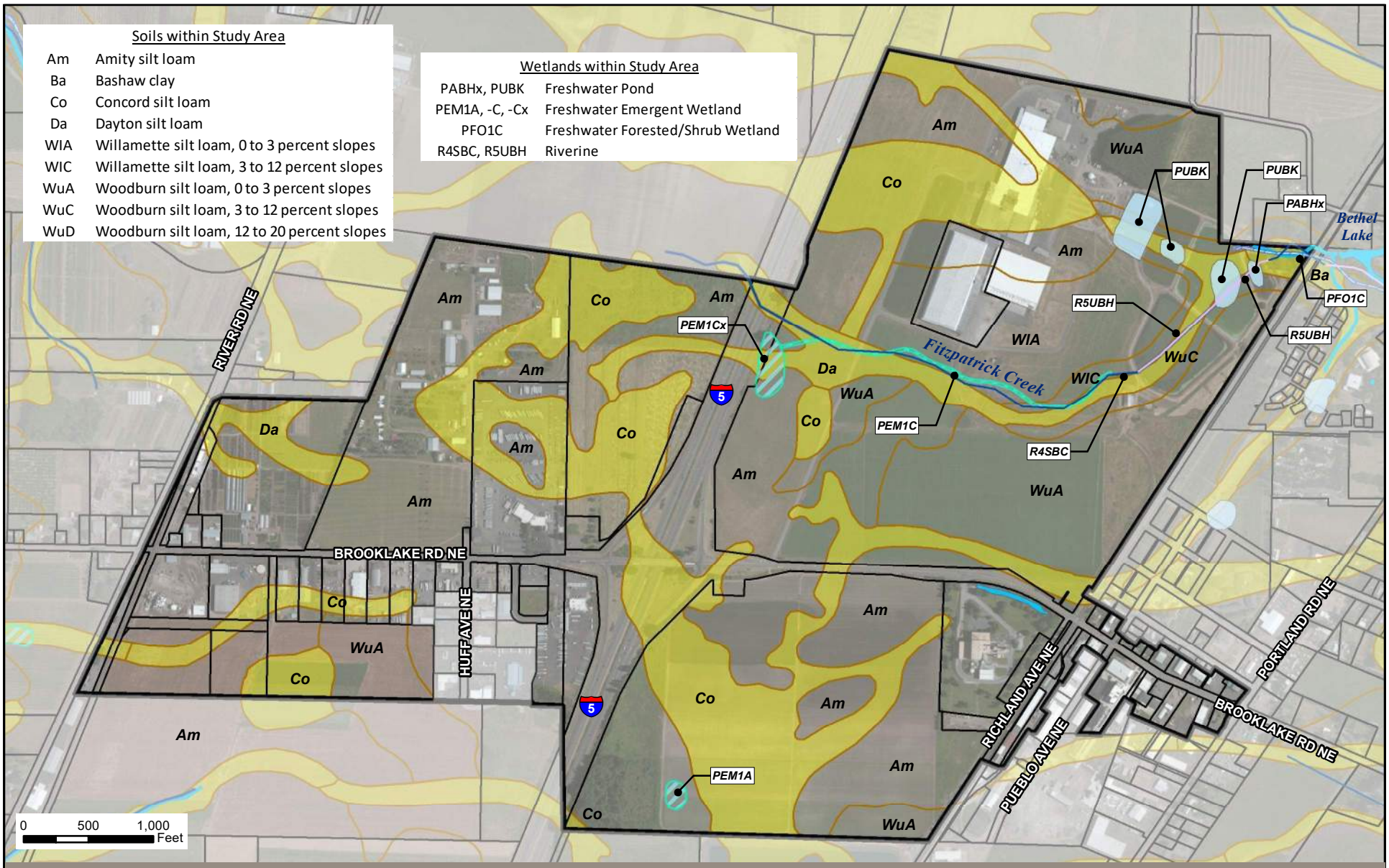
Marion County
Aggregate Site
Geohazard Site
Local Wetlands Inventory (LWI) Wetland

Flood Hazard Zones
1% Annual Chance Flood Hazard (100-year flood)
0.2% Annual Chance Flood Hazard (500-year flood)

Figure 4
FEMA Floodplains and Goal 5 Resources

Data Sources:
41047CO225G FEMA floodmap; Marion County, USGS, USFWS

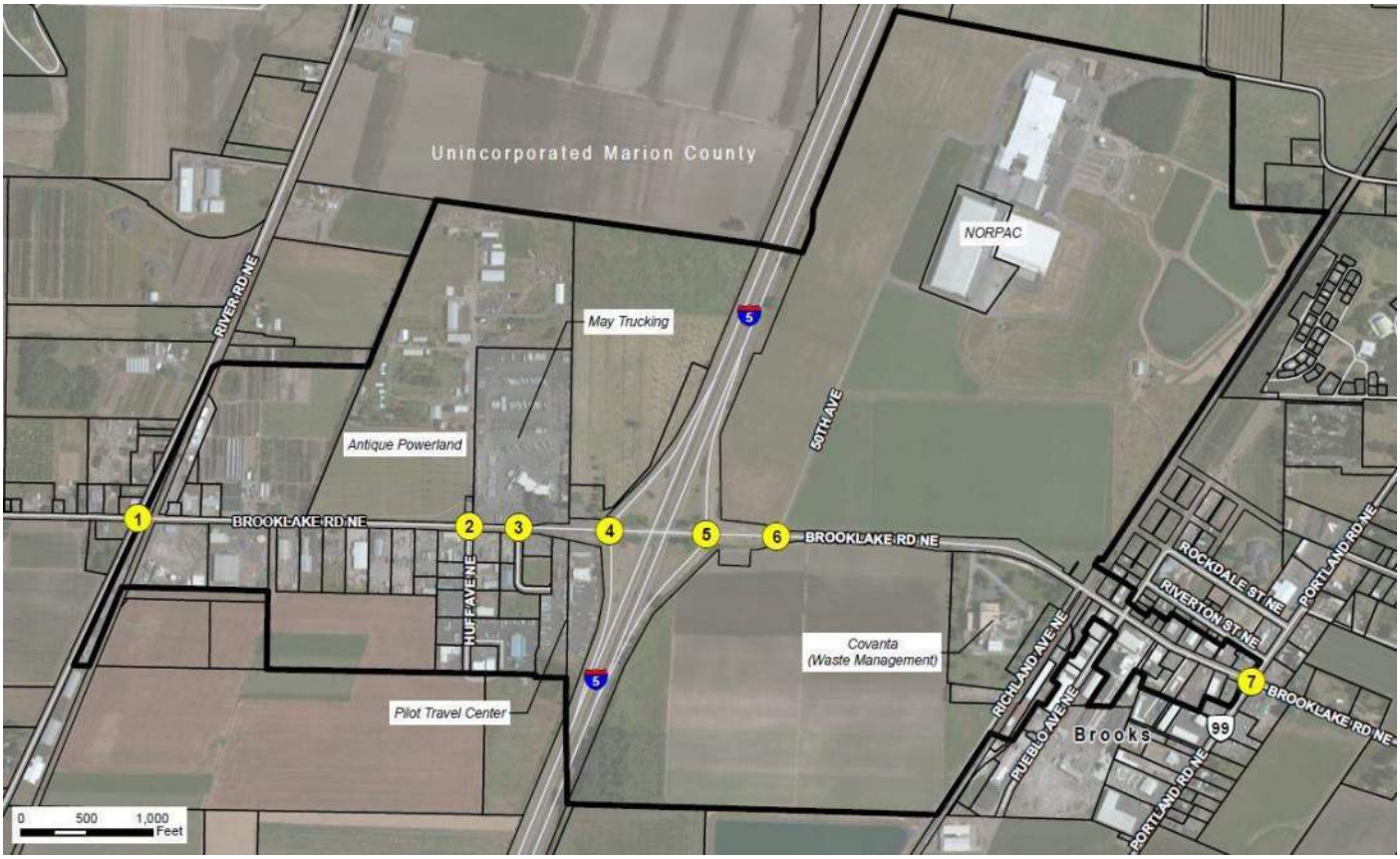
P:\O\ODOT00000983\0600\INFO\GS\Maps\TM5_EnviroLandUse\Fig 4 FEMA and Goal 5.mxd



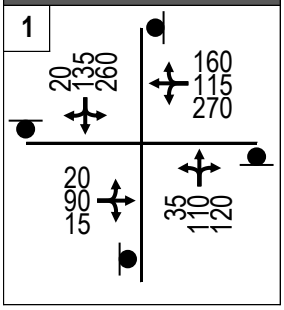
Brooks Interchange Area Management Plan

Figure 5
Soils, Wetlands, and Streams

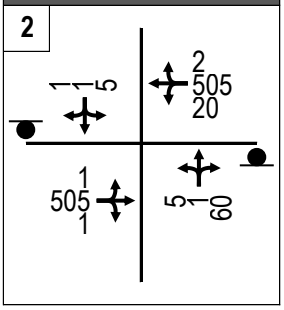
Data Sources: Marion County, NRCS, USGS, USFWS



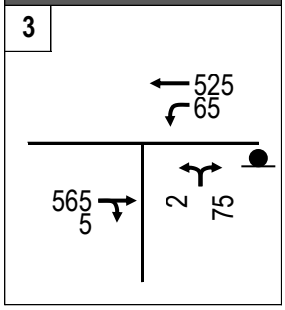
River Rd at Brooklake Rd



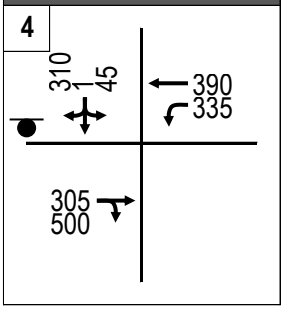
Huff Ave at Brooklake Rd



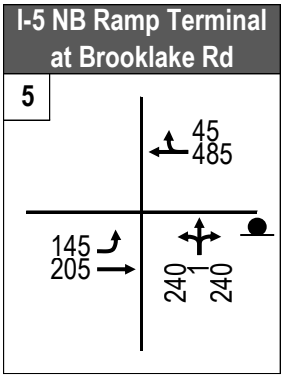
Truckman Way at Brooklake Rd



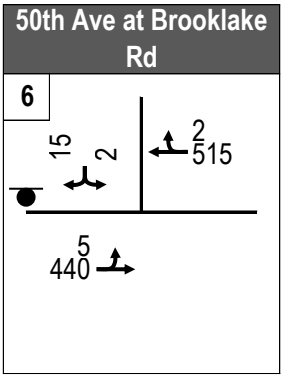
I-5 SB Ramp Terminal at Brooklake Rd



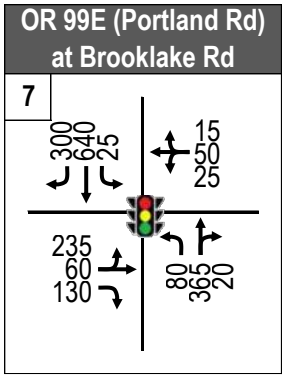
I-5 NB Ramp Terminal at Brooklake Rd



50th Ave at Brooklake Rd



OR 99E (Portland Rd) at Brooklake Rd



Brooks Interchange Area Management Plan

Legend

(##) Study Area Intersection

Turning Movement Volume

Lane Configuration

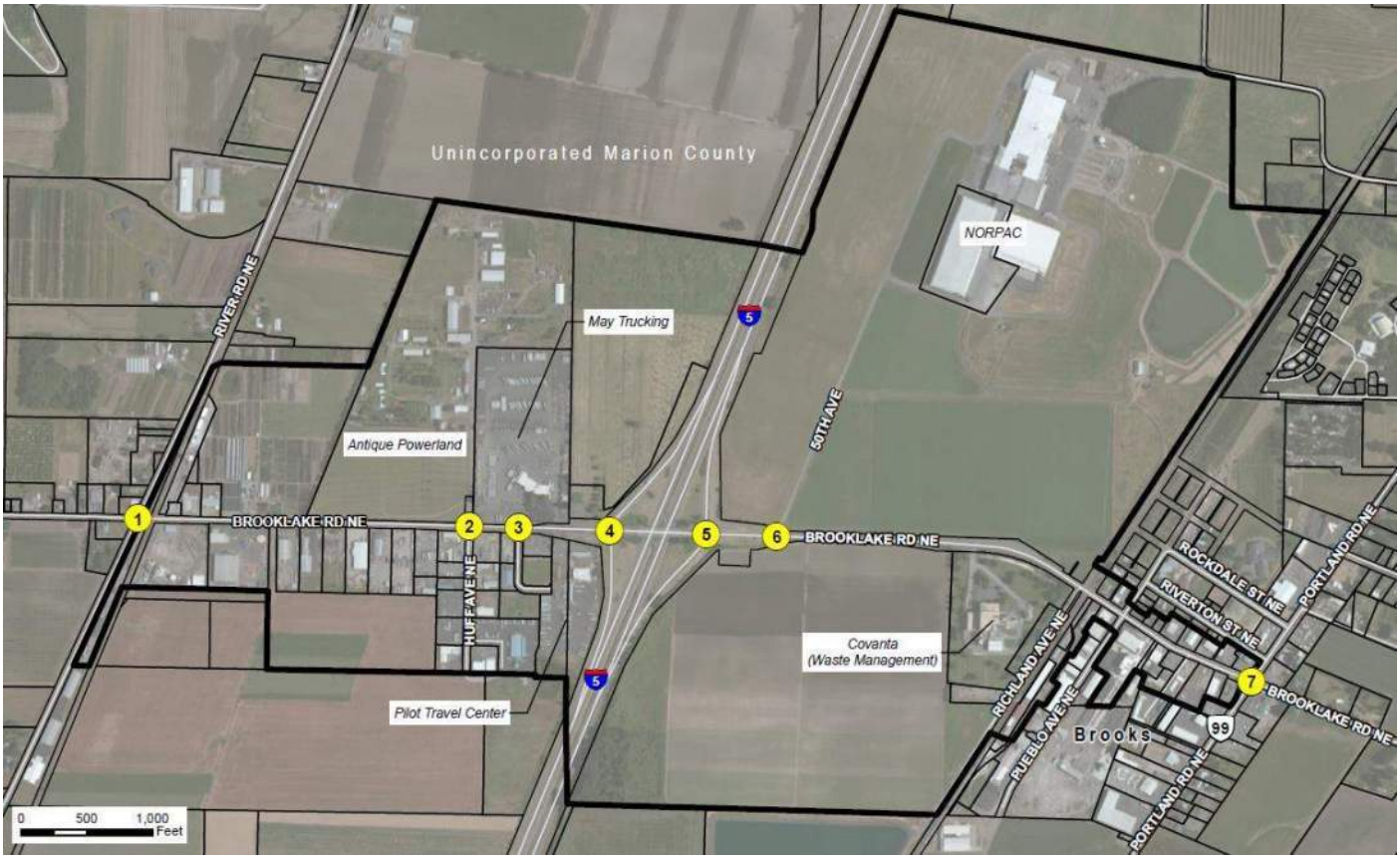
STOP Controlled Approach

Signalized Intersection

* *Adjusted for COVID-19 impacts*

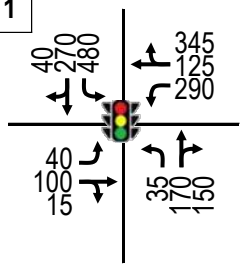
Figure 2

Existing (2020) PM Peak Hour Turning Movement Volumes



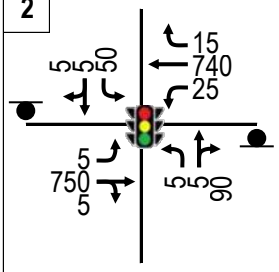
River Rd at Brooklake Rd

1



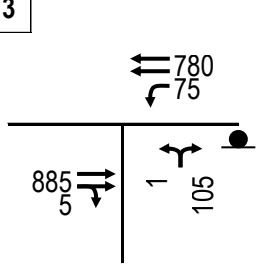
Huff Ave at Brooklake Rd

2



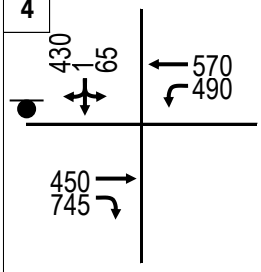
Truckman Way at Brooklake Rd

3



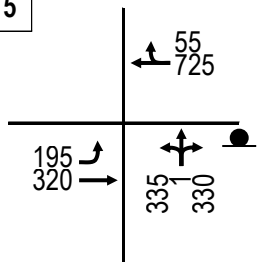
I-5 SB Ramp Terminal at Brooklake Rd

4



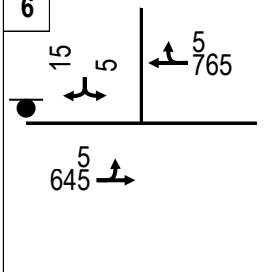
I-5 NB Ramp Terminal at Brooklake Rd

5



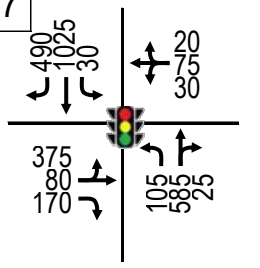
50th Ave at Brooklake Rd

6



OR 99E (Portland Rd) at Brooklake Rd

7



Brooks Interchange Area Management Plan

Legend

(##) Study Area Intersection

Turning Movement Volume

Lane Configuration

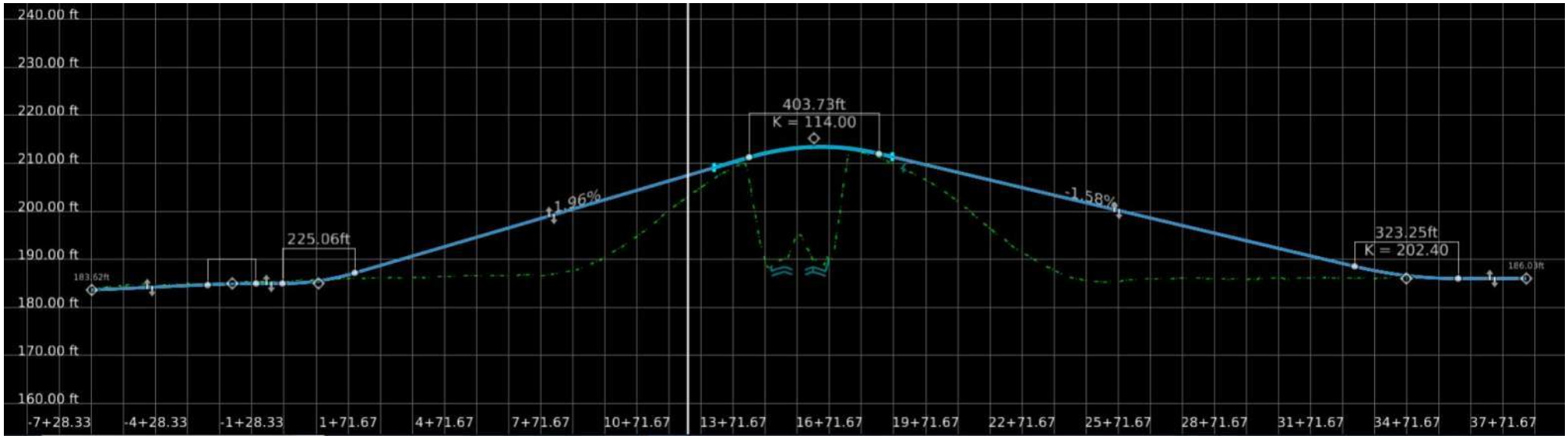
STOP Controlled Approach

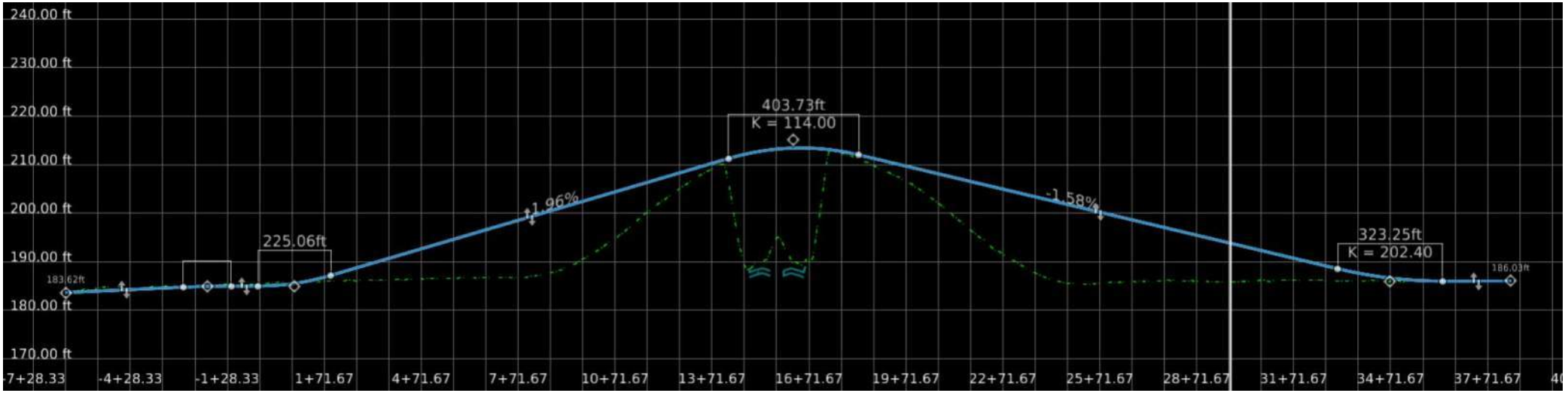
Signalized Intersection

Figure 1

Future Baseline *(2043)*
PM Peak Hour
Turning Movement Volumes

Attachment C: Concepts Plan/Profile


240.00 ft
230.00 ft
220.00 ft
210.00 ft
200.00 ft
190.00 ft
180.00 ft
170.00 ft
160.00 ft
403.73ft
K = 114.00
225.06ft
1.96%
-1.58%
323.25ft
K = 202.40
183.62ft
186.03ft
-7+28.33
-4+28.33
-1+28.33
1+71.67
4+71.67
7+71.67
10+71.67
13+71.67
16+71.67
19+71.67
22+71.67
25+71.67
28+71.67
31+71.67
34+71.67
37+71.67


240.00 ft
230.00 ft
220.00 ft
210.00 ft
200.00 ft
190.00 ft
180.00 ft
170.00 ft
403.73ft
K = 114.00
225.06ft
1.96%
-1.58%
323.25ft
K = 202.40
183.62ft
186.03ft
-7+28.33
-4+28.33
-1+28.33
1+71.67
4+71.67
7+71.67
10+71.67
13+71.67
16+71.67
19+71.67
22+71.67
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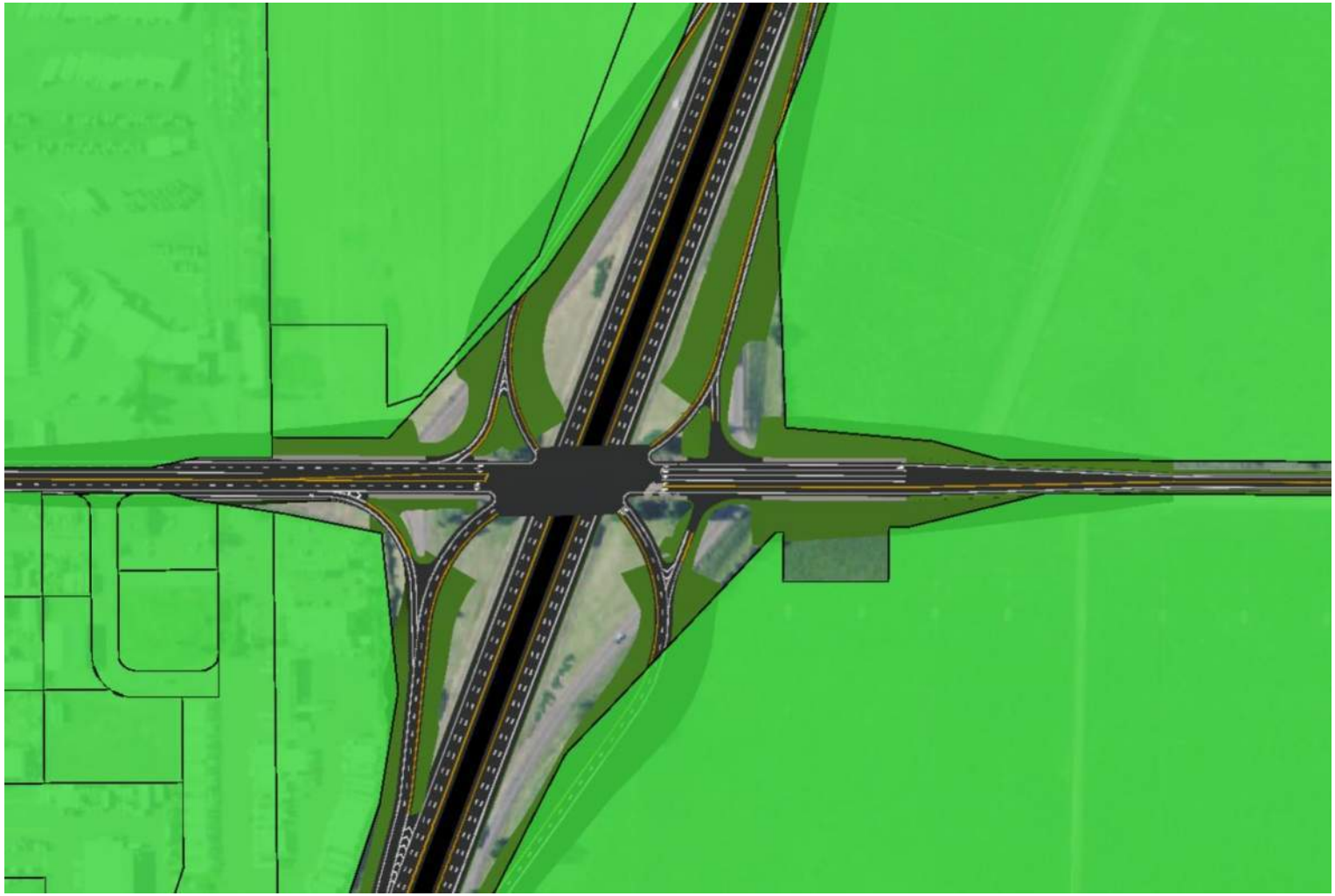
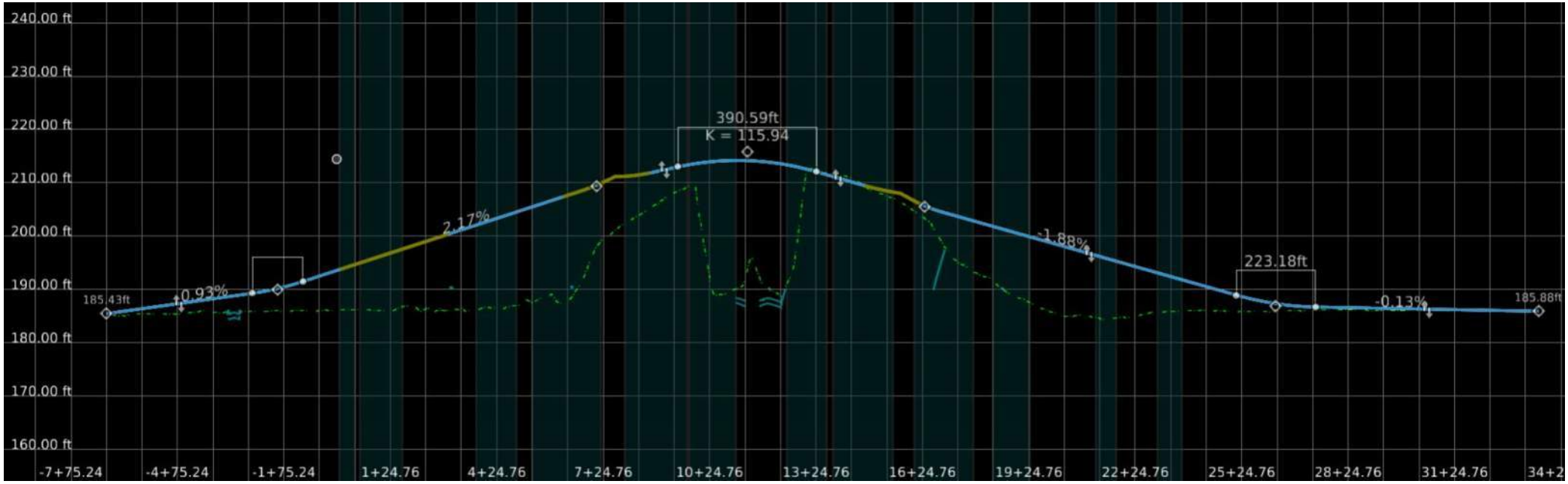
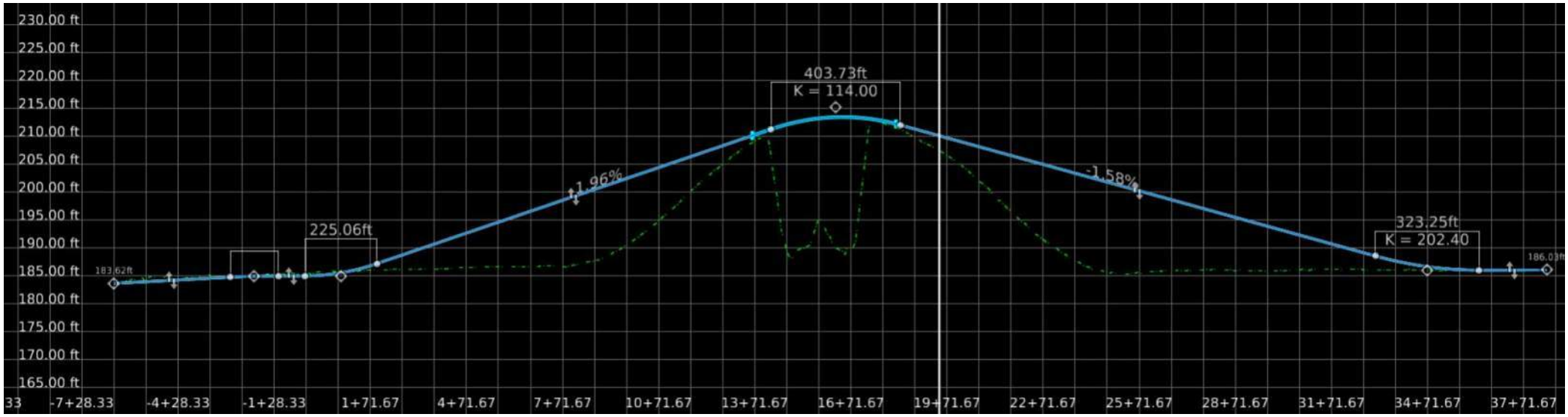
28+71.67
31+71.67
34+71.67
37+71.67




240.00 ft
230.00 ft
220.00 ft
210.00 ft
200.00 ft
190.00 ft
180.00 ft
170.00 ft
160.00 ft
390.59ft
K = 115.94
2.17%
-1.88%
223.18ft
185.43ft
0.93%
-0.13%
185.88ft
-7+75.24
-4+75.24
-1+75.24
1+24.76
4+24.76
7+24.76
10+24.76
13+24.76
16+24.76
19+24.76
22+24.76
25+24.76
28+24.76
31+24.76
34+2


230.00 ft
225.00 ft
220.00 ft
215.00 ft
210.00 ft
205.00 ft
200.00 ft
195.00 ft
190.00 ft
185.00 ft
180.00 ft
175.00 ft
170.00 ft
165.00 ft
403.73ft
K = 114.00
225.06ft
323.25ft
K = 202.40
1.96%
-1.58%
183.62ft
186.03ft
33
-7+28.33
-4+28.33
-1+28.33
1+71.67
4+71.67
7+71.67
10+71.67
13+71.67
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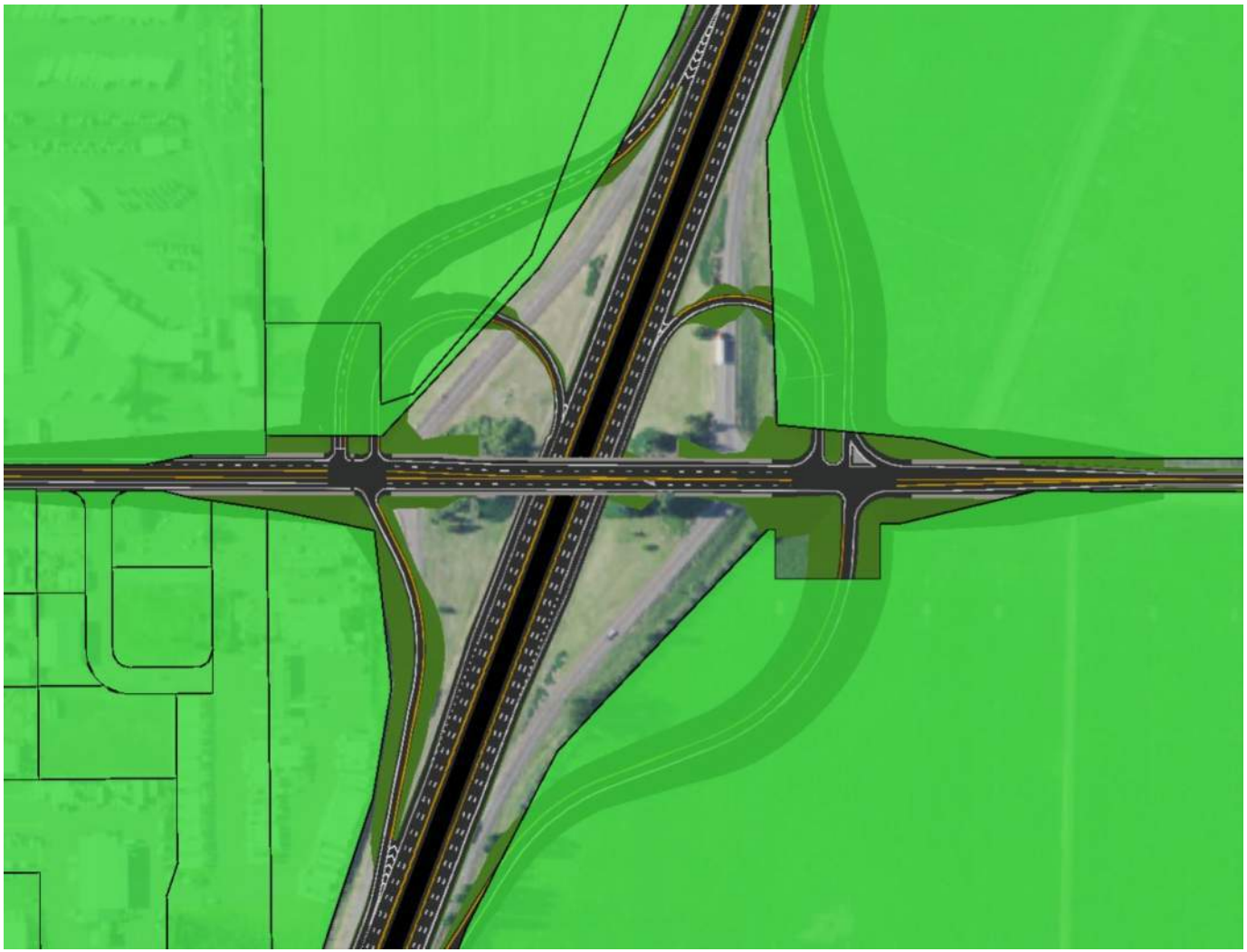
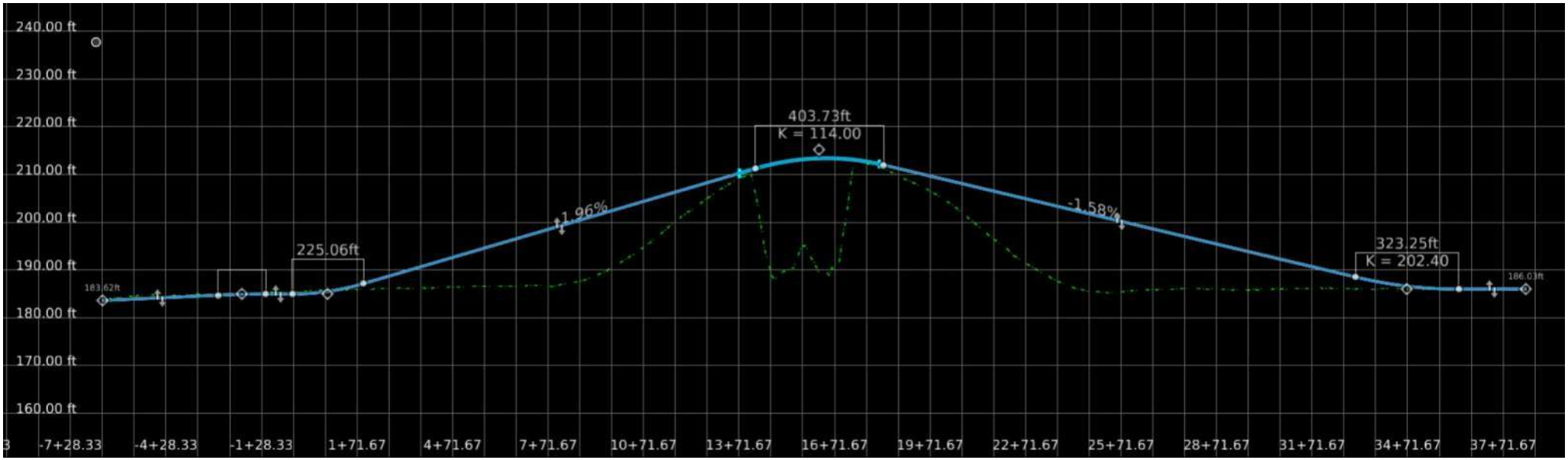
34+71.67
37+71.67




240.00 ft
230.00 ft
220.00 ft
210.00 ft
200.00 ft
190.00 ft
180.00 ft
170.00 ft
160.00 ft
403.73ft
K = 114.00
225.06ft
323.25ft
K = 202.40
1.96%
-1.58%
183.62ft
186.03ft
-7+28.33
-4+28.33
-1+28.33
1+71.67
4+71.67
7+71.67
10+71.67
13+71.67
16+71.67
19+71.67
22+71.67
25+71.67
28+71.67
31+71.67
34+71.67
37+71.67

Attachment D: Synchro Worksheets / HCM 6 Signalized Intersection Calculations, Signal Warrants

Signalized Intersection Operations - "Hand" Calculations

Xc = Sum of critical flow ratios * C/(C-L)
C Cycle Length
L Lost time per phase 4s
Total Lost time 16 s

Scenario — *Same for all interchange scenarios* | *Same for all interchange scenarios* | *Same for all interchange scenarios*

TDI

River		Huff		SB Ramp				NB Ramp				Portland Rd			
					Adj. Flow	Sat. Flow			Adj. Flow	Sat. Flow			Adj. Flow	Sat. Flow	
10		20		40				50 EBL	205	1355	0.151292	70 EBT	80	234	0.34188
				WBL pt	0.17		0.17	WBT	763	3069	0.248615	NBL	105	1485	0.070707
				WBL pm	0.41		0.41	NBL	353	1368	0.258041				
				SBR	147	1344	0.109375					SBT	1025	1695	0.60472
							0.689375				0.657948				1.017307
				c	90			c	90			c	100		
				L	12			L	12			L	12		
HCM 6	HCM 2000	HCM 6	HCM 2000	0.80 F HCM 6	0.80 D HCM 2000			0.76 C HCM 6	0.78 C HCM 2000			1.16 E HCM 6	1.22 F HCM 2000		

SPI

River		Huff		SB Ramp/NB Ramp				SB Ramp/NB Ramp				Portland Rd			
					Adj. Flow	Sat. Flow							Adj. Flow	Sat. Flow	
10		20		40 EBR	*HCM 6th Edition methodology does not support more than 4 approaches*			*NB and SB ramp terminal are at a single point*				70 EBT	80	234	0.34188
												NBL	105	1485	0.070707
							0					SBT	1025	1695	0.60472
															1.017307
				c	90							c	100		
				L	12							L	12		
HCM 6	HCM 2000	HCM 6	HCM 2000	- - HCM 6	0.74 C HCM 2000			n/a n/a HCM 6	n/a n/a HCM 2000			1.16 E HCM 6	1.22 F HCM 2000		

DDI

River		Huff		SB Ramp				NB Ramp				Portland Rd			
					Adj. Flow	Sat. Flow			Adj. Flow	Sat. Flow			Adj. Flow	Sat. Flow	
10		20		40 EBR	*HCM 6th Edition methodology does not support clustered intersections.*			55 EBT WBL	*HCM 6th Edition methodology does not support clustered intersections.*			70 EBT	80	234	0.34188
												NBL	105	1485	0.070707
							0				0	SBT	1025	1695	0.60472
															1.017307
				c	90			c	90			c	100		
				L	12			L	12			L	12		
HCM 6	HCM 2000	HCM 6	HCM 2000	- - HCM 6	0.69 A HCM 2000			- - HCM 6	0.41 B HCM 2000			1.16 E HCM 6	1.22 F HCM 2000		

ParClo NW/NE

River		Huff		SB Ramp				NB Ramp				Portland Rd			
					Adj. Flow	Sat. Flow			Adj. Flow	Sat. Flow			Adj. Flow	Sat. Flow	
10		20		40 EBT	1027	3118	0.329378	50 EBL	200	1355	0.147601	70 EBT	80	234	0.34188
				SBR	282	1344	0.209821	WBT	816	3069	0.265885	NBL	105	1485	0.070707
								SBR	23	1231	0.018684				
							0.539199				0.43217	SBT	1025	1695	0.60472
															1.017307
				c	80			c	80			c	100		
				L	8			L	12			L	12		
HCM 6	HCM 2000	HCM 6	HCM 2000	0.60 C HCM 6	0.67 B HCM 2000			0.51 C HCM 6	0.51 C HCM 2000			1.16 E HCM 6	1.22 F HCM 2000		

ParClo NW/SE

River		Huff		SB Ramp				NB Ramp				Portland Rd			
					Adj. Flow	Sat. Flow			Adj. Flow	Sat. Flow			Adj. Flow	Sat. Flow	
10		20		40 EBT	1024	3118	0.328416	50 WBT	816	3336	0.244604	70 EBT	80	234	0.34188
				SBR	293	1344	0.218006	NBL	353	1368	0.258041	NBL	105	1485	0.070707
							0.546422				0.502645	SBT	1025	1695	0.60472
															1.017307
				c	90			c	90			c	100		
				L	8			L	8			L	12		
HCM 6	HCM 2000	HCM 6	HCM 2000	0.60 C HCM 6	0.66 C HCM 2000			0.55 B HCM 6	0.58 B HCM 2000			1.16 E HCM 6	1.22 F HCM 2000		

Dogbone

River		Huff		SB Ramp				NB Ramp				Portland Rd			
					Adj. Flow	Sat. Flow			Adj. Flow	Sat. Flow			Adj. Flow	Sat. Flow	
10		20		40 WB	A	0.52	*SIDRA results for roundabout*	50 NB	A	0.56	*SIDRA results for roundabout*	70 EBT	80	234	0.34188
				SB	A	0.31		WB	C	0.60		NBL	105	1485	0.070707
				EB	A	0.70		EB	A	0.45					
							0				0	SBT	1025	1695	0.60472
															1.017307
				c				c				c	100		
				L				L				L	12		
HCM 6	HCM 2000	HCM 6	HCM 2000	- - HCM 6	0.7 A SIDRA			- - HCM 6	0.60 B SIDRA			1.16 E HCM 6	1.22 F HCM 2000		

NO BUILD

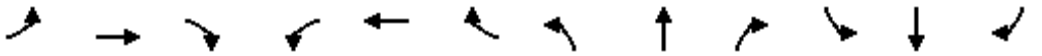
River				Huff				SB Ramp			NB Ramp			Portland Rd			
	Adj. Flow	Sat. Flow			Adj. Flow	Sat. Flow			Adj. Flow	Sat. Flow		Adj. Flow	Sat. Flow		Adj. Flow	Sat. Flow	
10 WBL-prot			0.11	20 EBTR	833	1654	0.503628	40			50			70 EBT	474	1243	0.381335
WBL-perm			0.15	WBL	28	900	0.031111							NBL	109	1485	0.073401
SBL-prot			0.3	SBL	56	1667	0.033593										
SBL-perm			0.26											SBT	1068	1695	0.630088
			0.82				0.568332										1.084825
c	90			c	90									c	100		
L	16			L	16									L	12		
1.00 D HCM 6	1.02 D HCM 2000			0.69 B HCM 6	0.74 B HCM 2000									1.23 F HCM 6	1.22 F HCM 2000		

Siganlize only (Ramps)

River				Huff				SB Ramp			NB Ramp			Portland Rd			
	Adj. Flow	Sat. Flow			Adj. Flow	Sat. Flow			Adj. Flow	Sat. Flow		Adj. Flow	Sat. Flow		Adj. Flow	Sat. Flow	
10 WBL-prot			0.11	20 EBTR	833	1654	0.503628	40 EBR	405	1447	0.279889	50			70 EBT	474	1243	0.381335
WBL-perm			0.15	WBL	28	900	0.031111	WBL	490	1739	0.281771	WBT	725	1662	0.436221	NBL	109	1485	0.073401
SBL-prot			0.3	SBL	56	1667	0.033593	SBR	95	1459	0.065113	NBL	335	1485	0.225589				
SBL-perm			0.26													SBT	1068	1695	0.630088
			0.82				0.568332				0.626774				0.661811				1.084825
c	90			c	90			c	68.5			c	68.8			c	100		
L	16			L	16			L	12			L	8			L	12		
1.00 D HCM 6	1.02 D HCM 2000			0.69 B HCM 6	0.74 B HCM 2000			0.76 D HCM 6	0.77 C HCM 2000			0.75 D HCM 6	0.90 C HCM 2000			1.23 F HCM 6	1.22 F HCM 2000		

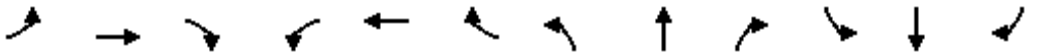
Local System Capacity

River				Huff				SB Ramp			NB Ramp			Portland Rd			
	Adj. Flow	Sat. Flow			Adj. Flow	Sat. Flow			Adj. Flow	Sat. Flow		Adj. Flow	Sat. Flow		Adj. Flow	Sat. Flow	
10 WBL-prot	305	1279	0.12	20 EBT			0.24							70 EBL	391	1615	0.242105
WBL-perm	179	830	0.14	WBT			0.31							WBLTR	130	1503	0.086494
NBTR	337	1563	0.215611	NBT			0.03							NBL	109	1485	0.073401
SBL	505	2855	0.176883	SBL			0.1							NBTR	635	1683	0.377302
			0.652494				0.68										0.779302
c	77.7			c	79.9									c	109.7		
L	16			L	16									L	16		
0.82 C HCM 6	0.84 C HCM 2000			0.85 E HCM 6	0.84 C HCM 2000									0.91 D HCM 6	0.87 D HCM 2000		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	450	745	490	570	0	0	0	0	65	1	430
Future Volume (vph)	0	450	745	490	570	0	0	0	0	65	1	430
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Lane Util. Factor		1.00	1.00	1.00	0.95						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1535	1316	1583	2818						1589	1328
Flt Permitted		1.00	1.00	0.37	1.00						0.95	1.00
Satd. Flow (perm)		1535	1316	612	2818						1589	1328
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	474	784	516	600	0	0	0	0	68	1	453
RTOR Reduction (vph)	0	0	321	0	0	0	0	0	0	0	0	306
Lane Group Flow (vph)	0	474	463	516	600	0	0	0	0	0	69	147
Heavy Vehicles (%)	0%	14%	13%	5%	18%	0%	0%	0%	0%	5%	0%	12%
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		8		7	4						2	
Permitted Phases			8	4						2		2
Actuated Green, G (s)		44.5	44.5	68.5	68.5						13.5	13.5
Effective Green, g (s)		44.5	44.5	68.5	68.5						13.5	13.5
Actuated g/C Ratio		0.49	0.49	0.76	0.76						0.15	0.15
Clearance Time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Vehicle Extension (s)		2.5	2.5	2.5	2.5						2.5	2.5
Lane Grp Cap (vph)		758	650	681	2144						238	199
v/s Ratio Prot		0.31		c0.17	0.21							
v/s Ratio Perm			0.35	c0.41							0.04	c0.11
v/c Ratio		0.63	0.71	0.76	0.28						0.29	0.74
Uniform Delay, d1		16.6	17.8	13.7	3.3						34.0	36.6
Progression Factor		1.00	1.00	1.01	0.43						1.00	1.00
Incremental Delay, d2		3.9	6.5	3.1	0.2						0.5	12.7
Delay (s)		20.5	24.3	17.0	1.6						34.5	49.2
Level of Service		C	C	B	A						C	D
Approach Delay (s)		22.9			8.7			0.0			47.3	
Approach LOS		C			A			A			D	

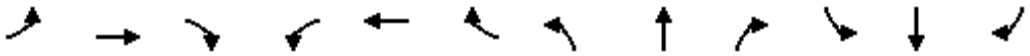
Intersection Summary			
HCM 2000 Control Delay	21.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	93.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	450	745	490	570	0	0	0	0	65	1	430
Future Volume (veh/h)	0	450	745	490	570	0	0	0	0	65	1	430
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1559	1573	1682	1504	0				1682	1750	1586
Adj Flow Rate, veh/h	0	474	784	516	600	0				68	1	453
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	14	13	5	18	0				5	0	12
Cap, veh/h	0	676	577	506	2001	0				347	5	284
Arrive On Green	0.00	0.43	0.43	0.44	1.00	0.00				0.21	0.21	0.21
Sat Flow, veh/h	0	1559	1333	1602	2933	0				1644	24	1344
Grp Volume(v), veh/h	0	474	784	516	600	0				69	0	453
Grp Sat Flow(s),veh/h/ln	0	1559	1333	1602	1429	0				1668	0	1344
Q Serve(g_s), s	0.0	22.3	39.0	20.0	0.0	0.0				3.1	0.0	19.0
Cycle Q Clear(g_c), s	0.0	22.3	39.0	20.0	0.0	0.0				3.1	0.0	19.0
Prop In Lane	0.00		1.00	1.00		0.00				0.99		1.00
Lane Grp Cap(c), veh/h	0	676	577	506	2001	0				352	0	284
V/C Ratio(X)	0.00	0.70	1.36	1.02	0.30	0.00				0.20	0.00	1.60
Avail Cap(c_a), veh/h	0	676	577	506	2001	0				352	0	284
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.09	0.09	0.56	0.56	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	20.8	25.5	21.0	0.0	0.0				29.2	0.0	35.5
Incr Delay (d2), s/veh	0.0	0.6	162.0	34.8	0.2	0.0				0.2	0.0	284.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.3	36.8	10.6	0.1	0.0				1.2	0.0	28.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	21.3	187.5	55.8	0.2	0.0				29.4	0.0	319.9
LnGrp LOS	A	C	F	F	A	A				C	A	F
Approach Vol, veh/h		1258			1116						522	
Approach Delay, s/veh		124.9			25.9						281.5	
Approach LOS		F			C						F	

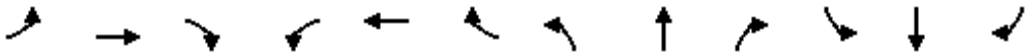
Timer - Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		23.0		67.0			24.0	43.0				
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0				
Max Green Setting (Gmax), s		19.0		63.0			20.0	39.0				
Max Q Clear Time (g_c+I1), s		21.0		2.0			22.0	41.0				
Green Ext Time (p_c), s		0.0		7.6			0.0	0.0				

Intersection Summary												
HCM 6th Ctrl Delay			115.0									
HCM 6th LOS			F									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	195	320	0	0	725	55	335	1	330	0	0	0
Future Volume (vph)	195	320	0	0	725	55	335	1	330	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0				
Lane Util. Factor	1.00	1.00			0.95		1.00	1.00				
Frt	1.00	1.00			0.99		1.00	0.85				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1341	1667			3106		1352	1391				
Flt Permitted	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	1341	1667			3106		1352	1391				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	205	337	0	0	763	58	353	1	347	0	0	0
RTOR Reduction (vph)	0	0	0	0	6	0	0	244	0	0	0	0
Lane Group Flow (vph)	205	337	0	0	815	0	353	104	0	0	0	0
Heavy Vehicles (%)	24%	5%	0%	0%	6%	5%	23%	0%	7%	0%	0%	0%
Turn Type	Prot	NA			NA		Perm	NA				
Protected Phases	3	8			4			6				
Permitted Phases							6					
Actuated Green, G (s)	18.0	55.2			33.2		26.8	26.8				
Effective Green, g (s)	18.0	55.2			33.2		26.8	26.8				
Actuated g/C Ratio	0.20	0.61			0.37		0.30	0.30				
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0				
Vehicle Extension (s)	2.5	2.5			2.5		2.5	2.5				
Lane Grp Cap (vph)	268	1022			1145		402	414				
v/s Ratio Prot	c0.15	0.20			c0.26			0.07				
v/s Ratio Perm							c0.26					
v/c Ratio	0.76	0.33			0.71		0.88	0.25				
Uniform Delay, d1	34.0	8.4			24.3		30.0	24.0				
Progression Factor	0.76	0.18			1.00		1.00	1.00				
Incremental Delay, d2	9.8	0.7			3.8		18.9	0.2				
Delay (s)	35.8	2.3			28.1		48.9	24.2				
Level of Service	D	A			C		D	C				
Approach Delay (s)		15.0			28.1			36.7			0.0	
Approach LOS		B			C			D			A	

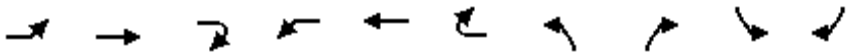
Intersection Summary			
HCM 2000 Control Delay	27.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	93.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	195	320	0	0	725	55	335	1	330	0	0	0
Future Volume (veh/h)	195	320	0	0	725	55	335	1	330	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1422	1682	0	0	1668	1682	1436	1750	1654			
Adj Flow Rate, veh/h	205	337	0	0	763	58	353	1	347			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	24	5	0	0	6	5	23	0	7			
Cap, veh/h	326	1040	0	0	995	76	400	1	433			
Arrive On Green	0.48	1.00	0.00	0.00	0.33	0.33	0.29	0.29	0.29			
Sat Flow, veh/h	1355	1682	0	0	3069	227	1368	4	1479			
Grp Volume(v), veh/h	205	337	0	0	405	416	353	0	348			
Grp Sat Flow(s),veh/h/ln	1355	1682	0	0	1585	1627	1368	0	1484			
Q Serve(g_s), s	10.1	0.0	0.0	0.0	20.6	20.6	22.2	0.0	19.5			
Cycle Q Clear(g_c), s	10.1	0.0	0.0	0.0	20.6	20.6	22.2	0.0	19.5			
Prop In Lane	1.00		0.00	0.00		0.14	1.00		1.00			
Lane Grp Cap(c), veh/h	326	1040	0	0	528	542	400	0	434			
V/C Ratio(X)	0.63	0.32	0.00	0.00	0.77	0.77	0.88	0.00	0.80			
Avail Cap(c_a), veh/h	326	1040	0	0	528	542	456	0	495			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.74	0.74	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	20.3	0.0	0.0	0.0	26.9	26.9	30.4	0.0	29.4			
Incr Delay (d2), s/veh	2.6	0.6	0.0	0.0	10.2	10.0	16.1	0.0	7.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	2.6	0.2	0.0	0.0	8.6	8.8	8.5	0.0	7.3			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.9	0.6	0.0	0.0	37.1	36.8	46.4	0.0	37.2			
LnGrp LOS	C	A	A	A	D	D	D	A	D			
Approach Vol, veh/h		542			821			701				
Approach Delay, s/veh		9.0			37.0			41.8				
Approach LOS		A			D			D				

Timer - Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			25.7	34.0		30.3		59.7				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			18.0	30.0		30.0		52.0				
Max Q Clear Time (g_c+I1), s			12.1	22.6		24.2		2.0				
Green Ext Time (p_c), s			0.3	3.9		2.2		3.6				

Intersection Summary												
HCM 6th Ctrl Delay			31.3									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR2	WBL	WBT	WBR2	NBL	NBR2	SBL	SBR2
Lane Configurations										
Traffic Volume (vph)	195	255	745	490	235	55	335	330	65	430
Future Volume (vph)	195	255	745	490	235	55	335	330	65	430
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	0.97	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1341	1667	1316	3072	1483	1417	2622	1390	1583	1328
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1341	1667	1316	3072	1483	1417	2622	1390	1583	1328
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	205	268	784	516	247	58	353	347	68	453
RTOR Reduction (vph)	0	0	384	0	0	37	0	163	0	215
Lane Group Flow (vph)	205	268	400	516	247	21	353	184	68	238
Heavy Vehicles (%)	24%	5%	13%	5%	18%	5%	23%	7%	5%	12%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	Perm	Prot	Perm
Protected Phases	3	8		7	4		6		2	
Permitted Phases			8			4		6 7		2 3
Actuated Green, G (s)	15.9	23.1	23.1	16.2	23.4	23.4	14.8	35.0	14.8	34.7
Effective Green, g (s)	15.9	23.1	23.1	16.2	23.4	23.4	14.8	35.0	14.8	34.7
Actuated g/C Ratio	0.24	0.35	0.35	0.25	0.35	0.35	0.22	0.53	0.22	0.52
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.5		2.5	
Lane Grp Cap (vph)	322	582	459	752	524	501	587	736	354	697
v/s Ratio Prot	0.15	0.16		c0.17	0.17		c0.13		0.04	
v/s Ratio Perm			c0.30			0.01		0.13		0.18
v/c Ratio	0.64	0.46	0.87	0.69	0.47	0.04	0.60	0.25	0.19	0.34
Uniform Delay, d1	22.5	16.7	20.1	22.6	16.6	14.0	23.0	8.4	20.8	9.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.6	0.4	16.3	2.4	0.5	0.0	1.5	0.1	0.2	0.2
Delay (s)	26.1	17.1	36.5	25.0	17.0	14.0	24.5	8.6	21.0	9.3
Level of Service	C	B	D	C	B	B	C	A	C	A
Approach Delay (s)		30.6			21.8					
Approach LOS		C			C					

Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	66.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

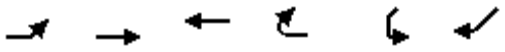
HCM 6th Edition methodology does not support more than 4 approaches.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR
Lane Configurations		↑↑	↱		↑↑			↱		
Traffic Volume (vph)	0	450	745	0	570	0	0	430	0	0
Future Volume (vph)	0	450	745	0	570	0	0	430	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0		4.0			4.0		
Lane Util. Factor		0.95	1.00		0.95			1.00		
Frt		1.00	0.85		1.00			0.86		
Flt Protected		1.00	1.00		1.00			1.00		
Satd. Flow (prot)		2917	1316		2818			1352		
Flt Permitted		1.00	1.00		1.00			1.00		
Satd. Flow (perm)		2917	1316		2818			1352		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	474	784	0	600	0	0	453	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	249	0	0
Lane Group Flow (vph)	0	474	784	0	600	0	0	204	0	0
Heavy Vehicles (%)	0%	14%	13%	0%	18%	0%	0%	12%	2%	2%
Turn Type		NA	Prot		NA			Prot		
Protected Phases		7	7		7!			1!		
Permitted Phases										
Actuated Green, G (s)		60.0	60.0		60.0			27.0		
Effective Green, g (s)		60.0	60.0		60.0			27.0		
Actuated g/C Ratio		1.00	1.00		1.00			0.45		
Clearance Time (s)		4.0	4.0		4.0			4.0		
Lane Grp Cap (vph)		2917	1316		2818			608		
v/s Ratio Prot		0.16	c0.60		0.21			0.15		
v/s Ratio Perm										
v/c Ratio		0.16	0.60		0.21			0.34		
Uniform Delay, d1		0.0	0.0		0.0			10.7		
Progression Factor		1.00	1.00		1.00			1.00		
Incremental Delay, d2		0.1	2.0		0.2			1.5		
Delay (s)		0.1	2.0		0.2			12.2		
Level of Service		A	A		A			B		
Approach Delay (s)		1.3			0.2		12.2		0.0	
Approach LOS		A			A		B		A	

Intersection Summary			
HCM 2000 Control Delay	3.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

HCM 6th Edition methodology does not support clustered intersections.

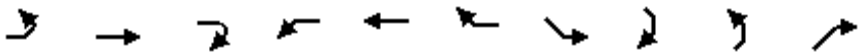


Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Traffic Volume (vph)	450	0	570	0	0	0
Future Volume (vph)	450	0	570	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0		4.0			
Lane Util. Factor	0.97		0.95			
Frt	1.00		1.00			
Flt Protected	0.95		1.00			
Satd. Flow (prot)	2829		2818			
Flt Permitted	0.95		1.00			
Satd. Flow (perm)	2829		2818			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	474	0	600	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	474	0	600	0	0	0
Heavy Vehicles (%)	14%	0%	18%	2%	2%	2%
Turn Type	Prot		NA			
Protected Phases	1		2			
Permitted Phases						
Actuated Green, G (s)	27.0		25.0			
Effective Green, g (s)	27.0		25.0			
Actuated g/C Ratio	0.45		0.42			
Clearance Time (s)	4.0		4.0			
Lane Grp Cap (vph)	1273		1174			
v/s Ratio Prot	c0.17		c0.21			
v/s Ratio Perm						
v/c Ratio	0.37		0.51			
Uniform Delay, d1	10.9		13.0			
Progression Factor	1.00		0.57			
Incremental Delay, d2	0.8		1.5			
Delay (s)	11.7		9.0			
Level of Service	B		A			
Approach Delay (s)		11.7	9.0		0.0	
Approach LOS		B	A		A	

Intersection Summary			
HCM 2000 Control Delay	10.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM 6th Edition methodology does not support clustered intersections.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SER	NEL	NER
Lane Configurations		↑↑			↑↑	↱				↱
Traffic Volume (vph)	0	320	0	0	725	55	0	0	0	330
Future Volume (vph)	0	320	0	0	725	55	0	0	0	330
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0	4.0				4.0
Lane Util. Factor		0.95			0.95	1.00				1.00
Frt		1.00			1.00	0.85				0.86
Flt Protected		1.00			1.00	1.00				1.00
Satd. Flow (prot)		3167			3137	1417				1415
Flt Permitted		1.00			1.00	1.00				1.00
Satd. Flow (perm)		3167			3137	1417				1415
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	337	0	0	763	58	0	0	0	347
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	162
Lane Group Flow (vph)	0	337	0	0	763	58	0	0	0	185
Heavy Vehicles (%)	0%	5%	0%	0%	6%	5%	2%	2%	0%	7%
Turn Type		NA			NA	Prot				Prot
Protected Phases		7!			7	7				4!
Permitted Phases										
Actuated Green, G (s)		60.0			60.0	60.0				32.0
Effective Green, g (s)		60.0			60.0	60.0				32.0
Actuated g/C Ratio		1.00			1.00	1.00				0.53
Clearance Time (s)		4.0			4.0	4.0				4.0
Lane Grp Cap (vph)		3167			3137	1417				754
v/s Ratio Prot		0.11			c0.24	0.04				0.13
v/s Ratio Perm										
v/c Ratio		0.11			0.24	0.04				0.25
Uniform Delay, d1		0.0			0.0	0.0				7.5
Progression Factor		1.00			1.00	1.00				1.00
Incremental Delay, d2		0.1			0.2	0.1				0.8
Delay (s)		0.1			0.2	0.1				8.3
Level of Service		A			A	A				A
Approach Delay (s)		0.1			0.2		0.0		8.3	
Approach LOS		A			A		A		A	

Intersection Summary			
HCM 2000 Control Delay	2.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	38.7%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

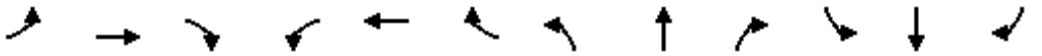
HCM 6th Edition methodology does not support clustered intersections.

Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Traffic Volume (vph)	320	0	725	0	0	0
Future Volume (vph)	320	0	725	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0		4.0			
Lane Util. Factor	0.95		0.97			
Frt	1.00		1.00			
Flt Protected	1.00		0.95			
Satd. Flow (prot)	3167		3043			
Flt Permitted	1.00		0.95			
Satd. Flow (perm)	3167		3043			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	337	0	763	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	337	0	763	0	0	0
Heavy Vehicles (%)	5%	0%	6%	0%	2%	2%
Turn Type	NA		Prot			
Protected Phases	3		4			
Permitted Phases						
Actuated Green, G (s)	20.0		32.0			
Effective Green, g (s)	20.0		32.0			
Actuated g/C Ratio	0.33		0.53			
Clearance Time (s)	4.0		4.0			
Lane Grp Cap (vph)	1055		1622			
v/s Ratio Prot	c0.11		c0.25			
v/s Ratio Perm						
v/c Ratio	0.32		0.47			
Uniform Delay, d1	14.9		8.7			
Progression Factor	0.67		1.00			
Incremental Delay, d2	0.8		1.0			
Delay (s)	10.8		9.7			
Level of Service	B		A			
Approach Delay (s)	10.8			9.7	0.0	
Approach LOS	B			A	A	

Intersection Summary			
HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	38.7%	ICU Level of Service	A
Analysis Period (min)	15		

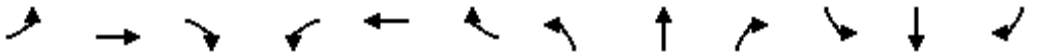
c Critical Lane Group

HCM 6th Edition methodology does not support clustered intersections.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	450	745	0	570	490	0	0	0	65	1	430
Future Volume (vph)	0	450	745	0	570	490	0	0	0	65	1	430
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0						4.0	4.0
Lane Util. Factor		0.95			0.95						1.00	1.00
Frt		0.91			0.93						1.00	0.85
Flt Protected		1.00			1.00						0.95	1.00
Satd. Flow (prot)		2659			2763						1589	1328
Flt Permitted		1.00			1.00						0.95	1.00
Satd. Flow (perm)		2659			2763						1589	1328
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	474	784	0	600	516	0	0	0	68	1	453
RTOR Reduction (vph)	0	231	0	0	120	0	0	0	0	0	0	171
Lane Group Flow (vph)	0	1027	0	0	996	0	0	0	0	0	69	282
Heavy Vehicles (%)	0%	14%	13%	0%	18%	5%	2%	2%	2%	5%	0%	12%
Turn Type		NA			NA					Prot	NA	Prot
Protected Phases		8			4					5	2	2
Permitted Phases												
Actuated Green, G (s)		54.7			54.7						17.3	17.3
Effective Green, g (s)		54.7			54.7						17.3	17.3
Actuated g/C Ratio		0.68			0.68						0.22	0.22
Clearance Time (s)		4.0			4.0						4.0	4.0
Vehicle Extension (s)		2.5			2.5						2.5	2.5
Lane Grp Cap (vph)		1818			1889						343	287
v/s Ratio Prot		c0.39			0.36						0.04	c0.21
v/s Ratio Perm												
v/c Ratio		0.56			0.53						0.20	0.98
Uniform Delay, d1		6.5			6.3						25.7	31.2
Progression Factor		1.00			0.27						1.00	1.00
Incremental Delay, d2		1.3			0.9						0.2	48.2
Delay (s)		7.8			2.6						25.9	79.4
Level of Service		A			A						C	E
Approach Delay (s)		7.8			2.6			0.0			72.3	
Approach LOS		A			A			A			E	

Intersection Summary			
HCM 2000 Control Delay	17.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



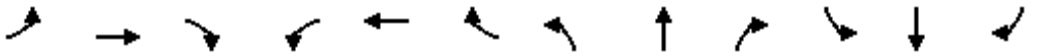
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	450	745	0	570	490	0	0	0	65	1	430
Future Volume (veh/h)	0	450	745	0	570	490	0	0	0	65	1	430
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1559	1573	0	1504	1682				1682	1750	1586
Adj Flow Rate, veh/h	0	474	0	0	600	516				68	1	453
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	14	13	0	18	5				5	0	12
Cap, veh/h	0	1581		0	778	667				602	9	493
Arrive On Green	0.00	0.53	0.00	0.00	0.71	0.71				0.37	0.37	0.37
Sat Flow, veh/h	0	3118	0	0	1533	1250				1644	24	1344
Grp Volume(v), veh/h	0	474	0	0	588	528				69	0	453
Grp Sat Flow(s),veh/h/ln	0	1481	0	0	1429	1279				1668	0	1344
Q Serve(g_s), s	0.0	7.1	0.0	0.0	21.1	21.3				2.2	0.0	25.8
Cycle Q Clear(g_c), s	0.0	7.1	0.0	0.0	21.1	21.3				2.2	0.0	25.8
Prop In Lane	0.00		0.00	0.00		0.98				0.99		1.00
Lane Grp Cap(c), veh/h	0	1581		0	763	683				611	0	493
V/C Ratio(X)	0.00	0.30		0.00	0.77	0.77				0.11	0.00	0.92
Avail Cap(c_a), veh/h	0	1581		0	763	683				688	0	554
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.33	1.33				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.09	0.00	0.00	0.85	0.85				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	10.4	0.0	0.0	8.5	8.5				16.8	0.0	24.2
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	6.4	7.2				0.1	0.0	19.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.9	0.0	0.0	4.7	4.4				0.8	0.0	9.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	10.4	0.0	0.0	14.8	15.7				16.8	0.0	43.2
LnGrp LOS	A	B		A	B	B				B	A	D
Approach Vol, veh/h		474	A		1116						522	
Approach Delay, s/veh		10.4			15.2						39.7	
Approach LOS		B			B						D	

Timer - Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		33.3		46.7				46.7				
Change Period (Y+Rc), s		4.0		4.0				4.0				
Max Green Setting (Gmax), s		33.0		39.0				39.0				
Max Q Clear Time (g_c+I1), s		27.8		23.3				9.1				
Green Ext Time (p_c), s		1.5		9.5				5.1				

Intersection Summary		
HCM 6th Ctrl Delay		20.2
HCM 6th LOS		C

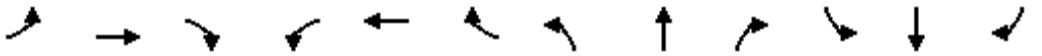
Notes

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	195	320	0	0	725	55	0	0	330	0	0	335
Future Volume (vph)	195	320	0	0	725	55	0	0	330	0	0	335
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0			4.0				4.0			4.0
Lane Util. Factor	1.00	1.00			0.95				1.00			1.00
Frt	1.00	1.00			0.99				0.86			0.86
Flt Protected	0.95	1.00			1.00				1.00			1.00
Satd. Flow (prot)	1341	1667			3106				1415			1231
Flt Permitted	0.95	1.00			1.00				1.00			1.00
Satd. Flow (perm)	1341	1667			3106				1415			1231
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	205	337	0	0	763	58	0	0	347	0	0	353
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	324	0	0	330
Lane Group Flow (vph)	205	337	0	0	816	0	0	0	23	0	0	23
Heavy Vehicles (%)	24%	5%	0%	0%	6%	5%	0%	0%	7%	0%	0%	23%
Turn Type	Prot	NA			NA				Prot			Prot
Protected Phases	3	8			4				1			5
Permitted Phases												
Actuated Green, G (s)	16.8	66.8			46.0				5.2			5.2
Effective Green, g (s)	16.8	66.8			46.0				5.2			5.2
Actuated g/C Ratio	0.21	0.83			0.58				0.07			0.07
Clearance Time (s)	4.0	4.0			4.0				4.0			4.0
Vehicle Extension (s)	2.5	2.5			2.5				2.5			2.5
Lane Grp Cap (vph)	281	1391			1785				91			80
v/s Ratio Prot	c0.15	0.20			c0.26				0.02			c0.02
v/s Ratio Perm												
v/c Ratio	0.73	0.24			0.46				0.25			0.29
Uniform Delay, d1	29.5	1.4			9.8				35.5			35.6
Progression Factor	0.95	1.09			1.00				1.00			1.00
Incremental Delay, d2	7.2	0.3			0.8				1.0			1.4
Delay (s)	35.4	1.8			10.6				36.6			37.1
Level of Service	D	A			B				D			D
Approach Delay (s)		14.5			10.6			36.6			37.1	
Approach LOS		B			B			D			D	

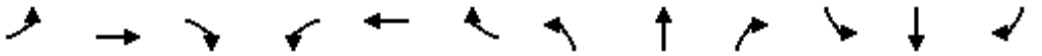
Intersection Summary			
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	195	320	0	0	725	55	0	0	330	0	0	335
Future Volume (veh/h)	195	320	0	0	725	55	0	0	330	0	0	335
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1422	1682	0	0	1668	1682	0	0	1654	0	0	1436
Adj Flow Rate, veh/h	205	337	0	0	763	58	0	0	347	0	0	353
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	24	5	0	0	6	5	0	0	7	0	0	23
Cap, veh/h	234	1598	0	0	2171	165	0	0	0	0	0	0
Arrive On Green	0.35	1.00	0.00	0.00	0.73	0.73	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	1355	1682	0	0	3069	227		0			0	
Grp Volume(v), veh/h	205	337	0	0	405	416		0.0			0.0	
Grp Sat Flow(s),veh/h/ln	1355	1682	0	0	1585	1627						
Q Serve(g_s), s	11.4	0.0	0.0	0.0	7.5	7.5						
Cycle Q Clear(g_c), s	11.4	0.0	0.0	0.0	7.5	7.5						
Prop In Lane	1.00		0.00	0.00		0.14						
Lane Grp Cap(c), veh/h	234	1598	0	0	1153	1184						
V/C Ratio(X)	0.88	0.21	0.00	0.00	0.35	0.35						
Avail Cap(c_a), veh/h	373	1598	0	0	1153	1184						
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00						
Upstream Filter(I)	0.75	0.75	0.00	0.00	1.00	1.00						
Uniform Delay (d), s/veh	25.4	0.0	0.0	0.0	4.0	4.0						
Incr Delay (d2), s/veh	8.7	0.2	0.0	0.0	0.8	0.8						
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0						
%ile BackOfQ(50%),veh/ln	3.3	0.1	0.0	0.0	1.6	1.7						
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.1	0.2	0.0	0.0	4.8	4.8						
LnGrp LOS	C	A	A	A	A	A						
Approach Vol, veh/h		542			821							
Approach Delay, s/veh		13.0			4.8							
Approach LOS		B			A							

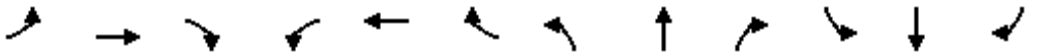
Timer - Assigned Phs		3	4					8				
Phs Duration (G+Y+Rc), s		17.8	62.2					80.0				
Change Period (Y+Rc), s		4.0	4.0					4.0				
Max Green Setting (Gmax), s		22.0	28.0					54.0				
Max Q Clear Time (g_c+I1), s		13.4	9.5					2.0				
Green Ext Time (p_c), s		0.4	7.3					3.6				

Intersection Summary	
HCM 6th Ctrl Delay	8.1
HCM 6th LOS	A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	450	745	0	570	490	0	0	0	65	1	430
Future Volume (vph)	0	450	745	0	570	490	0	0	0	65	1	430
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0						4.0	4.0
Lane Util. Factor		0.95			0.95						1.00	1.00
Frt		0.91			0.93						1.00	0.85
Flt Protected		1.00			1.00						0.95	1.00
Satd. Flow (prot)		2659			2763						1589	1328
Flt Permitted		1.00			1.00						0.95	1.00
Satd. Flow (perm)		2659			2763						1589	1328
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	474	784	0	600	516	0	0	0	68	1	453
RTOR Reduction (vph)	0	234	0	0	121	0	0	0	0	0	0	160
Lane Group Flow (vph)	0	1024	0	0	995	0	0	0	0	0	69	293
Heavy Vehicles (%)	0%	14%	13%	0%	18%	5%	0%	0%	0%	5%	0%	12%
Turn Type		NA			NA					Perm	NA	Perm
Protected Phases		8			4						2	
Permitted Phases										2		2
Actuated Green, G (s)		57.7			57.7						24.3	24.3
Effective Green, g (s)		57.7			57.7						24.3	24.3
Actuated g/C Ratio		0.64			0.64						0.27	0.27
Clearance Time (s)		4.0			4.0						4.0	4.0
Vehicle Extension (s)		2.5			2.5						2.5	2.5
Lane Grp Cap (vph)		1704			1771						429	358
v/s Ratio Prot		c0.39			0.36							
v/s Ratio Perm											0.04	c0.22
v/c Ratio		0.60			0.56						0.16	0.82
Uniform Delay, d1		9.4			9.1						25.1	30.8
Progression Factor		1.00			0.71						1.00	1.00
Incremental Delay, d2		1.6			1.2						0.1	13.3
Delay (s)		11.0			7.6						25.2	44.0
Level of Service		B			A						C	D
Approach Delay (s)		11.0			7.6			0.0			41.5	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



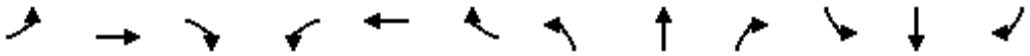
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	450	745	0	570	490	0	0	0	65	1	430
Future Volume (veh/h)	0	450	745	0	570	490	0	0	0	65	1	430
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1559	1573	0	1504	1682				1682	1750	1586
Adj Flow Rate, veh/h	0	474	0	0	600	516				68	1	453
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	14	13	0	18	5				5	0	12
Cap, veh/h	0	1615		0	795	682				601	9	492
Arrive On Green	0.00	0.55	0.00	0.00	1.00	1.00				0.37	0.37	0.37
Sat Flow, veh/h	0	3118	0	0	1533	1250				1644	24	1344
Grp Volume(v), veh/h	0	474	0	0	588	528				69	0	453
Grp Sat Flow(s),veh/h/ln	0	1481	0	0	1429	1279				1668	0	1344
Q Serve(g_s), s	0.0	7.8	0.0	0.0	0.0	0.0				2.5	0.0	29.0
Cycle Q Clear(g_c), s	0.0	7.8	0.0	0.0	0.0	0.0				2.5	0.0	29.0
Prop In Lane	0.00		0.00	0.00		0.98				0.99		1.00
Lane Grp Cap(c), veh/h	0	1615		0	779	698				610	0	492
V/C Ratio(X)	0.00	0.29		0.00	0.75	0.76				0.11	0.00	0.92
Avail Cap(c_a), veh/h	0	1615		0	779	698				704	0	568
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.09	0.00	0.00	0.81	0.81				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	11.1	0.0	0.0	0.0	0.0				18.9	0.0	27.3
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	5.5	6.2				0.1	0.0	18.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.2	0.0	0.0	1.2	1.2				0.9	0.0	10.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	11.1	0.0	0.0	5.5	6.2				18.9	0.0	45.9
LnGrp LOS	A	B		A	A	A				B	A	D
Approach Vol, veh/h		474	A		1116						522	
Approach Delay, s/veh		11.1			5.8						42.3	
Approach LOS		B			A						D	

Timer - Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		36.9		53.1				53.1				
Change Period (Y+Rc), s		4.0		4.0				4.0				
Max Green Setting (Gmax), s		38.0		44.0				44.0				
Max Q Clear Time (g_c+I1), s		31.0		2.0				9.8				
Green Ext Time (p_c), s		1.9		16.3				5.3				

Intersection Summary		
HCM 6th Ctrl Delay		16.0
HCM 6th LOS		B

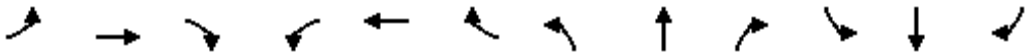
Notes

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	320	195	0	725	55	335	1	330	0	0	0
Future Volume (vph)	0	320	195	0	725	55	335	1	330	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0		4.0		4.0	4.0				
Lane Util. Factor		1.00	1.00		0.95		1.00	1.00				
Frt		1.00	0.85		0.99		1.00	0.85				
Flt Protected		1.00	1.00		1.00		0.95	1.00				
Satd. Flow (prot)		1667	1200		3106		1352	1391				
Flt Permitted		1.00	1.00		1.00		0.95	1.00				
Satd. Flow (perm)		1667	1200		3106		1352	1391				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	337	205	0	763	58	353	1	347	0	0	0
RTOR Reduction (vph)	0	0	86	0	5	0	0	232	0	0	0	0
Lane Group Flow (vph)	0	337	119	0	816	0	353	116	0	0	0	0
Heavy Vehicles (%)	0%	5%	24%	0%	6%	5%	23%	0%	7%	0%	0%	0%
Turn Type		NA	Perm		NA		Split	NA				
Protected Phases		8			4		6	6				
Permitted Phases			8									
Actuated Green, G (s)		52.2	52.2		52.2		29.8	29.8				
Effective Green, g (s)		52.2	52.2		52.2		29.8	29.8				
Actuated g/C Ratio		0.58	0.58		0.58		0.33	0.33				
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0				
Vehicle Extension (s)		2.5	2.5		2.5		2.5	2.5				
Lane Grp Cap (vph)		966	696		1801		447	460				
v/s Ratio Prot		0.20			c0.26		c0.26	0.08				
v/s Ratio Perm			0.10									
v/c Ratio		0.35	0.17		0.45		0.79	0.25				
Uniform Delay, d1		10.0	8.8		10.8		27.3	22.0				
Progression Factor		0.95	1.24		1.00		1.00	1.00				
Incremental Delay, d2		0.8	0.4		0.8		8.7	0.2				
Delay (s)		10.3	11.4		11.6		36.0	22.2				
Level of Service		B	B		B		D	C				
Approach Delay (s)		10.7			11.6			29.1			0.0	
Approach LOS		B			B			C			A	

Intersection Summary			
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.6%	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 (veh/h)	0	320	195	0	725	55	335	1	330	0	0	0
Future Volume (veh/h)	0	320	195	0	725	55	335	1	330	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1682	1422	0	1668	1682	1436	1750	1654			
Adj Flow Rate, veh/h	0	337	205	0	763	0	353	1	347			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	5	24	0	6	5	23	0	7			
Cap, veh/h	0	1010	724	0	1904		424	1	459			
Arrive On Green	0.00	1.00	1.00	0.00	0.60	0.00	0.31	0.31	0.31			
Sat Flow, veh/h	0	1682	1205	0	3336	0	1368	4	1479			
Grp Volume(v), veh/h	0	337	205	0	763	0	353	0	348			
Grp Sat Flow(s),veh/h/ln	0	1682	1205	0	1585	0	1368	0	1484			
Q Serve(g_s), s	0.0	0.0	0.0	0.0	11.4	0.0	21.6	0.0	19.0			
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	11.4	0.0	21.6	0.0	19.0			
Prop In Lane	0.00		1.00	0.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	1010	724	0	1904		424	0	460			
V/C Ratio(X)	0.00	0.33	0.28	0.00	0.40		0.83	0.00	0.76			
Avail Cap(c_a), veh/h	0	1010	724	0	1904		653	0	709			
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	0.71	0.71	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	9.4	0.0	28.9	0.0	28.0			
Incr Delay (d2), s/veh	0.0	0.6	0.7	0.0	0.6	0.0	4.5	0.0	1.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	0.2	0.1	0.0	3.4	0.0	7.0	0.0	6.5			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.6	0.7	0.0	10.1	0.0	33.4	0.0	29.9			
LnGrp LOS	A	A	A	A	B		C	A	C			
Approach Vol, veh/h		542			763	A		701				
Approach Delay, s/veh		0.7			10.1			31.6				
Approach LOS		A			B			C				

Timer - Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				58.1		31.9		58.1				
Change Period (Y+Rc), s				4.0		4.0		4.0				
Max Green Setting (Gmax), s				39.0		43.0		39.0				
Max Q Clear Time (g_c+I1), s				13.4		23.6		2.0				
Green Ext Time (p_c), s				8.3		4.3		5.2				

Intersection Summary												
HCM 6th Ctrl Delay			15.1									
HCM 6th LOS			B									

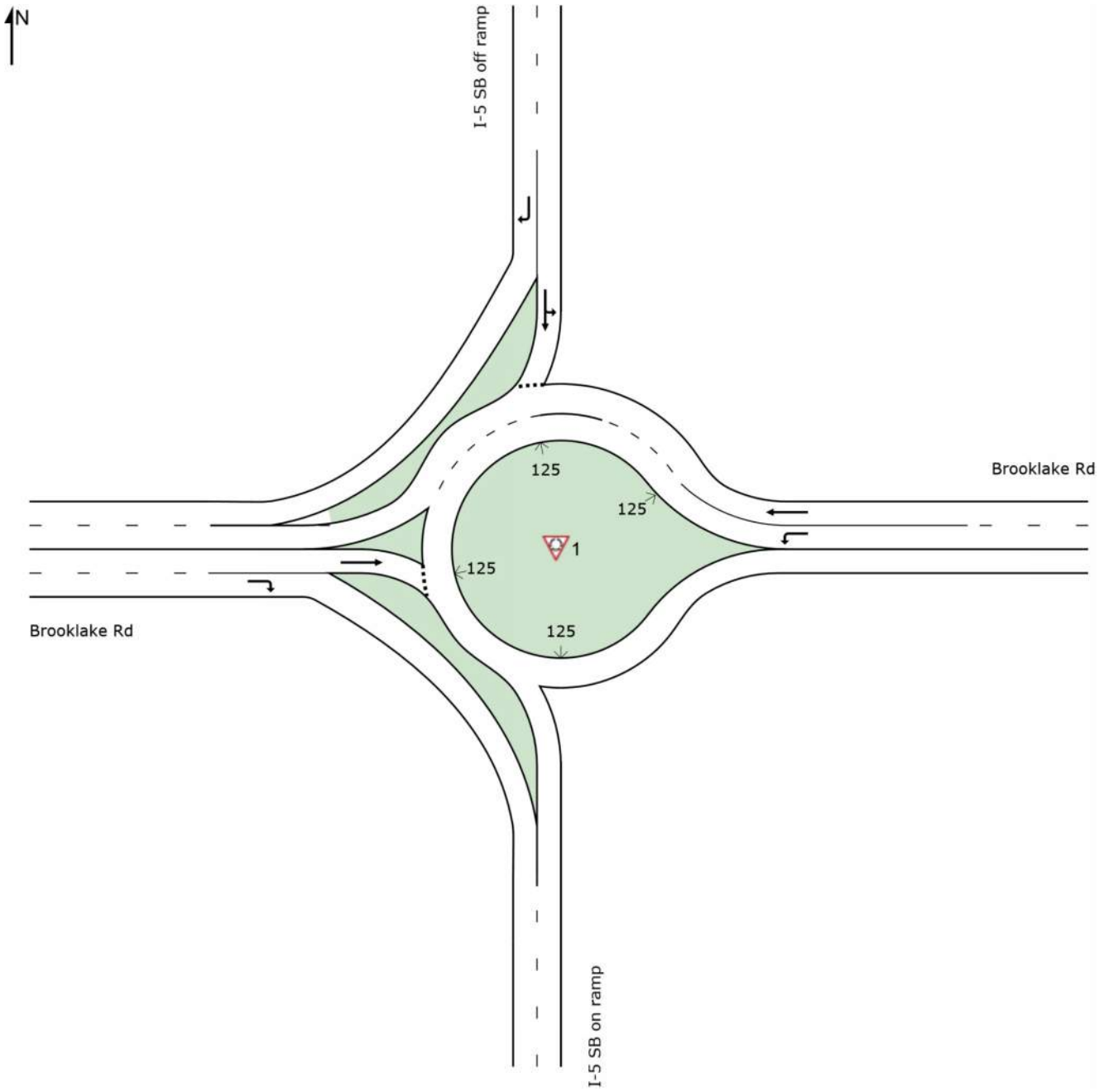
Notes

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

SITE LAYOUT

Site: 1 [No4 I-5 SB Terminal at Brooklake Rd]

Site Category: (None)
Roundabout



LANE SUMMARY

Site: 1 [No4 I-5 SB Terminal at Brooklake Rd]

Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
East: Brooklake Rd													
Lane 1	533	5.0	1352	0.394	100	6.3	LOS A	0.0	0.0	Full	1600	0.0	0.0
Lane 2[d]	620	18.0	1203	0.515	100	8.7	LOS A	0.0	0.0	Full	1600	0.0	0.0
Approach	1152	12.0		0.515		7.6	LOS A	0.0	0.0				
North: I-5 SB off ramp													
Lane 1[d]	66	4.9	452	0.147	100	10.1	LOS B	0.5	12.1	Full	1600	0.0	0.0
Lane 2	467	12.0	1495	0.313	100	0.0	LOS A	0.0	0.0	Full	1600	0.0	0.0
Approach	534	11.1		0.313		1.3	LOS A	0.5	12.1				
West: Brooklake Rd													
Lane 1[d]	489	14.0	703	0.696	100	19.5	LOS C	6.4	178.5	Full	1600	0.0	0.0
Lane 2	810	13.0	1482	0.546	100	0.1	LOS A	0.0	0.0	Full	1600	0.0	0.0
Approach	1299	13.4		0.696		7.4	LOS A	6.4	178.5				
Intersection	2985	12.4		0.696		6.4	LOS A	6.4	178.5				

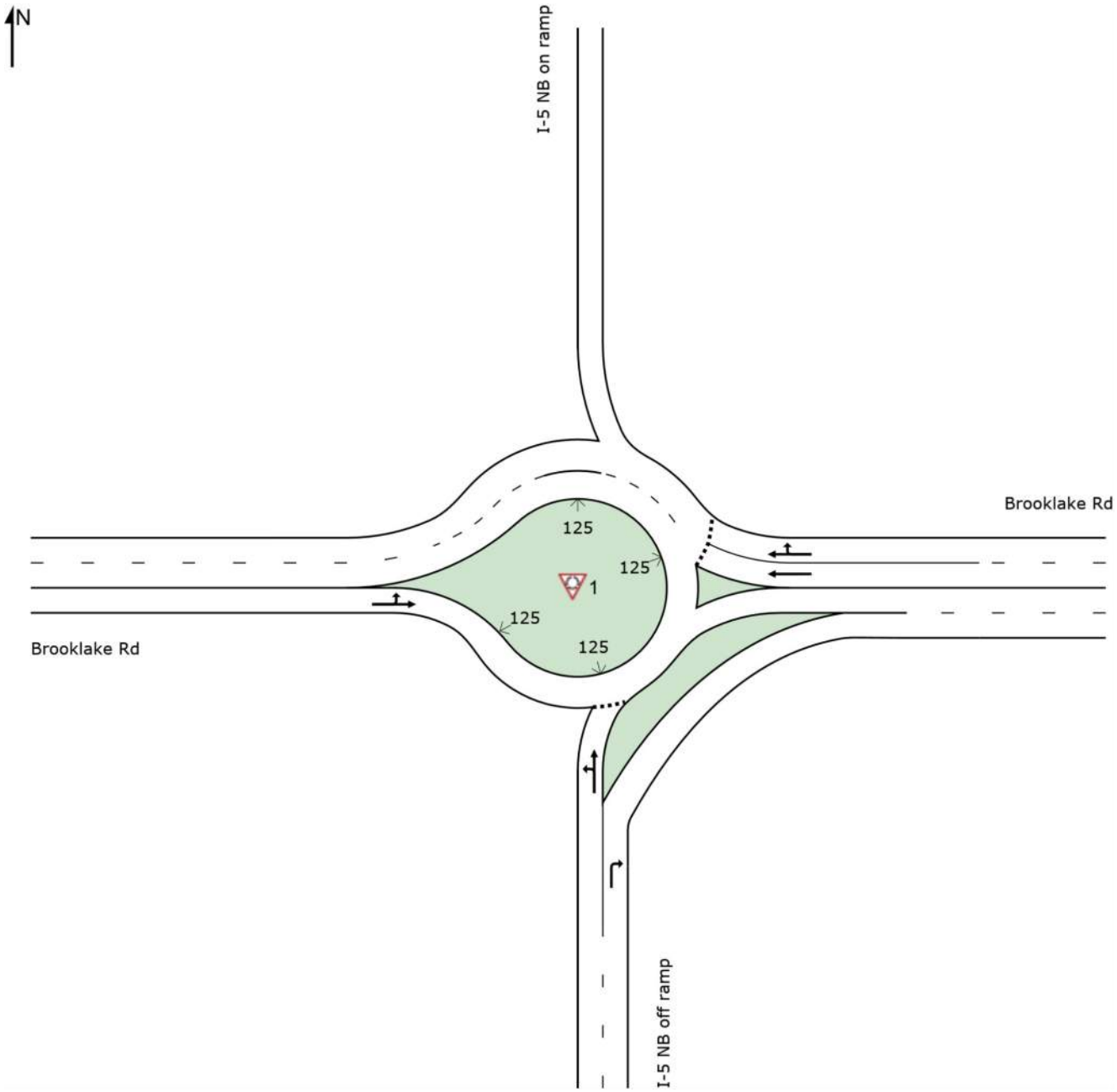
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective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

d Dominant lane on roundabout approach

SITE LAYOUT

Site: 1 [No5 I-5 NB Terminal at Brooklake Rd]

Site Category: (None)
Roundabout



LANE SUMMARY

Site: 1 [No5 I-5 NB Terminal at Brooklake Rd]

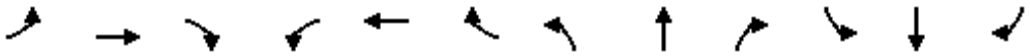
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: I-5 NB off ramp													
Lane 1[d]	365	22.9	656	0.557	100	14.9	LOS B	3.4	100.4	Full	1600	0.0	0.0
Lane 2	359	7.0	1565	0.229	100	0.0	LOS A	0.0	0.0	Full	1600	0.0	0.0
Approach	724	15.0		0.557		7.5	LOS A	3.4	100.4				
East: Brooklake Rd													
Lane 1	424	6.0	705	0.601	100	15.5	LOS C	4.4	116.4	Full	1600	0.0	0.0
Lane 2[d]	424	5.9	706	0.601	100	15.5	LOS C	4.5	116.5	Full	1600	0.0	0.0
Approach	848	5.9		0.601		15.5	LOS C	4.5	116.5				
West: Brooklake Rd													
Lane 1[d]	554	12.1	1231	0.450	100	7.5	LOS A	0.0	0.0	Full	1600	0.0	0.0
Approach	554	12.1		0.450		7.5	LOS A	0.0	0.0				
Intersection	2126	10.6		0.601		10.7	LOS B	4.5	116.5				

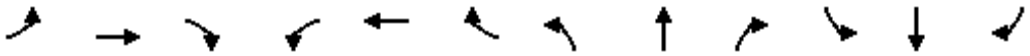
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective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

d Dominant lane on roundabout approach



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	100	15	290	125	345	35	170	150	480	270	40
Future Volume (vph)	40	100	15	290	125	345	35	170	150	480	270	40
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.97	1.00	
Frt	1.00	0.98		1.00	0.89		1.00	0.93		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)	1662	1618		1614	1487		1614	1550		2805	1672	
Flt Permitted	0.34	1.00		0.47	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	598	1618		804	1487		1614	1550		2805	1672	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	42	105	16	305	132	363	37	179	158	505	284	42
RTOR Reduction (vph)	0	7	0	0	113	0	0	35	0	0	6	0
Lane Group Flow (vph)	42	114	0	305	382	0	37	302	0	505	320	0
Heavy Vehicles (%)	0%	6%	6%	3%	4%	5%	3%	4%	6%	15%	3%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA		Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)	13.7	11.7		29.0	23.0		3.0	19.3		17.4	33.7	
Effective Green, g (s)	13.7	11.7		29.0	23.0		3.0	19.3		17.4	33.7	
Actuated g/C Ratio	0.18	0.15		0.37	0.30		0.04	0.25		0.22	0.43	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	132	243		438	440		62	385		628	725	
v/s Ratio Prot	0.01	0.07		c0.12	c0.26		0.02	c0.19		c0.18	0.19	
v/s Ratio Perm	0.05			0.14								
v/c Ratio	0.32	0.47		0.70	0.87		0.60	0.78		0.80	0.44	
Uniform Delay, d1	27.2	30.2		19.0	25.9		36.8	27.3		28.5	15.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	1.0		4.4	16.3		12.2	9.7		7.2	0.3	
Delay (s)	28.3	31.2		23.4	42.2		49.0	36.9		35.7	15.7	
Level of Service	C	C		C	D		D	D		D	B	
Approach Delay (s)		30.4			35.1			38.1			27.9	
Approach LOS		C			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	32.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	77.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



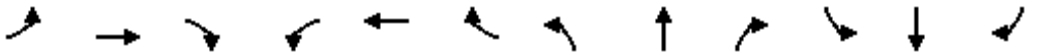
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	100	15	290	125	345	35	170	150	480	270	40
Future Volume (veh/h)	40	100	15	290	125	345	35	170	150	480	270	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1668	1668	1709	1695	1682	1709	1695	1668	1545	1709	1750
Adj Flow Rate, veh/h	42	105	0	305	132	0	37	179	158	505	284	42
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	6	6	3	4	5	3	4	6	15	3	0
Cap, veh/h	272	161		453	426		48	221	195	615	658	97
Arrive On Green	0.03	0.10	0.00	0.19	0.25	0.00	0.03	0.27	0.27	0.22	0.45	0.45
Sat Flow, veh/h	1667	1668	0	1628	1695	0	1628	830	733	2855	1455	215
Grp Volume(v), veh/h	42	105	0	305	132	0	37	0	337	505	0	326
Grp Sat Flow(s),veh/h/ln	1667	1668	0	1628	1695	0	1628	0	1563	1428	0	1670
Q Serve(g_s), s	1.5	4.1	0.0	10.8	4.3	0.0	1.5	0.0	13.8	11.5	0.0	9.1
Cycle Q Clear(g_c), s	1.5	4.1	0.0	10.8	4.3	0.0	1.5	0.0	13.8	11.5	0.0	9.1
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.47	1.00		0.13
Lane Grp Cap(c), veh/h	272	161		453	426		48	0	416	615	0	755
V/C Ratio(X)	0.15	0.65		0.67	0.31		0.77	0.00	0.81	0.82	0.00	0.43
Avail Cap(c_a), veh/h	316	464		457	696		143	0	504	837	0	881
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.6	29.7	0.0	20.2	20.7	0.0	32.9	0.0	23.4	25.5	0.0	12.7
Incr Delay (d2), s/veh	0.2	3.3	0.0	3.5	0.3	0.0	17.2	0.0	7.5	4.3	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	1.6	0.0	4.0	1.6	0.0	0.8	0.0	5.1	3.7	0.0	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.8	33.1	0.0	23.7	21.0	0.0	50.0	0.0	30.9	29.8	0.0	13.0
LnGrp LOS	C	C		C	C		D	A	C	C	A	B
Approach Vol, veh/h		147	A		437	A		374			831	
Approach Delay, s/veh		31.3			22.9			32.8			23.2	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.0	34.9	6.2	21.2	18.7	22.2	16.8	10.6
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	6.0	36.0	4.0	28.0	20.0	22.0	13.0	19.0
Max Q Clear Time (g_c+I1), s	3.5	11.1	3.5	6.3	13.5	15.8	12.8	6.1
Green Ext Time (p_c), s	0.0	6.1	0.0	0.9	1.2	2.4	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	25.8
HCM 6th LOS	C

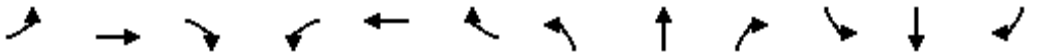
Notes

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	450	745	490	570	0	0	0	0	60	1	430
Future Volume (vph)	0	450	745	490	570	0	0	0	0	60	1	430
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1667	1429	1719	1610						1726	1442
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		1667	1429	1719	1610						1726	1442
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	450	745	490	570	0	0	0	0	60	1	430
RTOR Reduction (vph)	0	0	340	0	0	0	0	0	0	0	0	335
Lane Group Flow (vph)	0	450	405	490	570	0	0	0	0	0	61	95
Heavy Vehicles (%)	0%	14%	13%	5%	18%	0%	0%	0%	0%	5%	0%	12%
Turn Type		NA	Perm	Prot	NA					Perm	NA	Perm
Protected Phases		8		7	4						2	
Permitted Phases			8							2		2
Actuated Green, G (s)		23.5	23.5	24.7	52.2						8.3	8.3
Effective Green, g (s)		23.5	23.5	24.7	52.2						8.3	8.3
Actuated g/C Ratio		0.34	0.34	0.36	0.76						0.12	0.12
Clearance Time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Vehicle Extension (s)		2.5	2.5	2.5	2.5						2.5	2.5
Lane Grp Cap (vph)		571	490	619	1226						209	174
v/s Ratio Prot		0.27		c0.29	0.35							
v/s Ratio Perm			c0.28								0.04	c0.07
v/c Ratio		0.79	0.83	0.79	0.46						0.29	0.55
Uniform Delay, d1		20.3	20.6	19.6	3.0						27.4	28.3
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		6.9	10.7	6.6	0.2						0.6	2.8
Delay (s)		27.1	31.3	26.2	3.2						28.0	31.1
Level of Service		C	C	C	A						C	C
Approach Delay (s)		29.7			13.9			0.0			30.7	
Approach LOS		C			B			A			C	

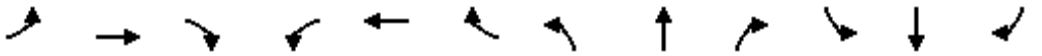
Intersection Summary			
HCM 2000 Control Delay	23.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	68.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	450	745	490	570	0	0	0	0	60	1	430
Future Volume (veh/h)	0	450	745	490	570	0	0	0	0	60	1	430
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1693	1707	1826	1633	0				1826	1900	1722
Adj Flow Rate, veh/h	0	450	745	490	570	0				60	1	430
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Percent Heavy Veh, %	0	14	13	5	18	0				5	0	12
Cap, veh/h	0	580	496	528	1130	0				386	6	317
Arrive On Green	0.00	0.34	0.34	0.30	0.69	0.00				0.22	0.22	0.22
Sat Flow, veh/h	0	1693	1447	1739	1633	0				1781	30	1459
Grp Volume(v), veh/h	0	450	745	490	570	0				61	0	430
Grp Sat Flow(s),veh/h/ln	0	1693	1447	1739	1633	0				1811	0	1459
Q Serve(g_s), s	0.0	20.9	30.0	23.9	14.5	0.0				2.4	0.0	19.0
Cycle Q Clear(g_c), s	0.0	20.9	30.0	23.9	14.5	0.0				2.4	0.0	19.0
Prop In Lane	0.00		1.00	1.00		0.00				0.98		1.00
Lane Grp Cap(c), veh/h	0	580	496	528	1130	0				393	0	317
V/C Ratio(X)	0.00	0.78	1.50	0.93	0.50	0.00				0.16	0.00	1.36
Avail Cap(c_a), veh/h	0	580	496	576	1175	0				393	0	317
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	25.8	28.8	29.6	6.4	0.0				27.8	0.0	34.3
Incr Delay (d2), s/veh	0.0	6.3	236.8	20.4	0.3	0.0				0.1	0.0	180.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.6	42.0	12.1	3.5	0.0				1.0	0.0	22.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	32.1	265.5	49.9	6.7	0.0				27.9	0.0	214.7
LnGrp LOS	A	C	F	D	A	A				C	A	F
Approach Vol, veh/h		1195			1060						491	
Approach Delay, s/veh		177.6			26.7						191.5	
Approach LOS		F			C						F	

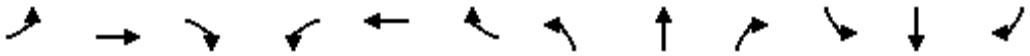
Timer - Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		23.0		64.6			30.6	34.0				
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0				
Max Green Setting (Gmax), s		19.0		63.0			29.0	30.0				
Max Q Clear Time (g_c+I1), s		21.0		16.5			25.9	32.0				
Green Ext Time (p_c), s		0.0		7.1			0.6	0.0				

Intersection Summary												
HCM 6th Ctrl Delay			121.8									
HCM 6th LOS			F									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	190	320	0	0	725	55	335	1	330	0	0	0
Future Volume (vph)	190	320	0	0	725	55	335	1	330	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0				
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00				
Frt	1.00	1.00			0.99		1.00	0.85				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1456	1810			1777		1467	1510				
Flt Permitted	0.22	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	337	1810			1777		1467	1510				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	190	320	0	0	725	55	335	1	330	0	0	0
RTOR Reduction (vph)	0	0	0	0	4	0	0	237	0	0	0	0
Lane Group Flow (vph)	190	320	0	0	776	0	335	94	0	0	0	0
Heavy Vehicles (%)	24%	5%	0%	0%	6%	5%	23%	0%	7%	0%	0%	0%
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		8			4			6				
Permitted Phases	8						6					
Actuated Green, G (s)	41.5	41.5			41.5		19.3	19.3				
Effective Green, g (s)	41.5	41.5			41.5		19.3	19.3				
Actuated g/C Ratio	0.60	0.60			0.60		0.28	0.28				
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0				
Vehicle Extension (s)	2.5	2.5			2.5		2.5	2.5				
Lane Grp Cap (vph)	203	1091			1071		411	423				
v/s Ratio Prot		0.18			0.44			0.06				
v/s Ratio Perm	c0.56						c0.23					
v/c Ratio	0.94	0.29			0.72		0.82	0.22				
Uniform Delay, d1	12.4	6.6			9.6		23.1	19.0				
Progression Factor	1.00	1.00			1.00		1.00	1.00				
Incremental Delay, d2	45.0	0.1			2.3		11.5	0.2				
Delay (s)	57.4	6.7			11.9		34.6	19.2				
Level of Service	E	A			B		C	B				
Approach Delay (s)		25.6			11.9			26.9			0.0	
Approach LOS		C			B			C			A	

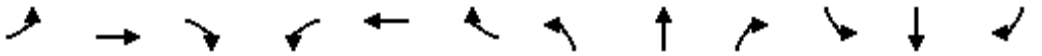
Intersection Summary			
HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	68.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	190	320	0	0	725	55	335	1	330	0	0	0
Future Volume (veh/h)	190	320	0	0	725	55	335	1	330	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1544	1826	0	0	1811	1826	1559	1900	1796			
Adj Flow Rate, veh/h	190	320	0	0	725	55	335	1	330			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	24	5	0	0	6	5	23	0	7			
Cap, veh/h	298	1177	0	0	1071	81	385	1	416			
Arrive On Green	0.64	0.64	0.00	0.00	0.64	0.64	0.26	0.26	0.26			
Sat Flow, veh/h	572	1826	0	0	1662	126	1485	5	1606			
Grp Volume(v), veh/h	190	320	0	0	0	780	335	0	331			
Grp Sat Flow(s),veh/h/ln	572	1826	0	0	0	1788	1485	0	1611			
Q Serve(g_s), s	26.1	6.3	0.0	0.0	0.0	22.9	17.9	0.0	15.9			
Cycle Q Clear(g_c), s	48.9	6.3	0.0	0.0	0.0	22.9	17.9	0.0	15.9			
Prop In Lane	1.00		0.00	0.00		0.07	1.00		1.00			
Lane Grp Cap(c), veh/h	298	1177	0	0	0	1153	385	0	418			
V/C Ratio(X)	0.64	0.27	0.00	0.00	0.00	0.68	0.87	0.00	0.79			
Avail Cap(c_a), veh/h	328	1274	0	0	0	1248	429	0	465			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	24.7	6.4	0.0	0.0	0.0	9.3	29.4	0.0	28.7			
Incr Delay (d2), s/veh	3.1	0.1	0.0	0.0	0.0	1.2	15.6	0.0	7.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	3.4	1.8	0.0	0.0	0.0	6.8	7.5	0.0	6.5			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.8	6.5	0.0	0.0	0.0	10.5	45.1	0.0	36.5			
LnGrp LOS	C	A	A	A	A	B	D	A	D			
Approach Vol, veh/h		510			780			666				
Approach Delay, s/veh		14.4			10.5			40.8				
Approach LOS		B			B			D				

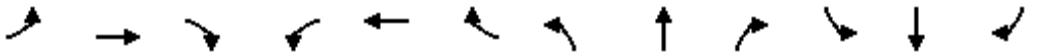
Timer - Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				57.6		25.6		57.6				
Change Period (Y+Rc), s				4.0		4.0		4.0				
Max Green Setting (Gmax), s				58.0		24.0		58.0				
Max Q Clear Time (g_c+I1), s				24.9		19.9		50.9				
Green Ext Time (p_c), s				10.4		1.6		2.6				

Intersection Summary												
HCM 6th Ctrl Delay			21.9									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	375	80	170	30	75	20	105	585	25	30	1025	490
Future Volume (vph)	375	80	170	30	75	20	105	585	25	30	1025	490
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	3.5	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1599	1699	1403		1589		1458	1675		1599	3197	1417
Flt Permitted	0.95	1.00	1.00		0.91		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1599	1699	1403		1463		1458	1675		1599	3197	1417
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	391	83	177	31	78	21	109	609	26	31	1068	510
RTOR Reduction (vph)	0	0	77	0	6	0	0	1	0	0	0	318
Lane Group Flow (vph)	391	83	100	0	124	0	109	634	0	31	1068	192
Heavy Vehicles (%)	4%	3%	6%	4%	7%	8%	14%	4%	0%	4%	4%	5%
Turn Type	Prot	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases			4	8								6
Actuated Green, G (s)	28.1	46.8	46.8		14.7		9.0	46.6		2.4	40.0	40.0
Effective Green, g (s)	28.6	47.3	47.3		15.2		9.0	48.0		2.4	41.4	41.4
Actuated g/C Ratio	0.26	0.43	0.43		0.14		0.08	0.44		0.02	0.38	0.38
Clearance Time (s)	4.0	4.5	4.5		4.5		4.0	5.4		4.0	5.4	5.4
Vehicle Extension (s)	2.5	2.5	2.5		2.5		2.5	4.0		2.5	4.0	4.0
Lane Grp Cap (vph)	416	732	604		202		119	732		34	1206	534
v/s Ratio Prot	c0.24	0.05					c0.07	c0.38		0.02	0.33	
v/s Ratio Perm			0.07		c0.08							0.14
v/c Ratio	0.94	0.11	0.16		0.61		0.92	0.87		0.91	0.89	0.36
Uniform Delay, d1	39.7	18.7	19.1		44.5		50.0	27.9		53.5	31.9	24.6
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	29.0	0.1	0.1		4.7		56.6	10.8		117.9	8.3	0.6
Delay (s)	68.7	18.7	19.2		49.1		106.5	38.8		171.5	40.2	25.2
Level of Service	E	B	B		D		F	D		F	D	C
Approach Delay (s)		48.9			49.1			48.7			38.0	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	43.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	109.7	Sum of lost time (s)	15.5
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
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 (veh/h)	375	80	170	30	75	20	105	585	25	30	1025	490
Future Volume (veh/h)	375	80	170	30	75	20	105	585	25	30	1025	490
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1695	1709	1668	1695	1654	1641	1559	1695	1750	1695	1695	1682
Adj Flow Rate, veh/h	391	83	0	31	78	21	109	609	26	31	1068	510
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	3	6	4	7	8	14	4	0	4	4	5
Cap, veh/h	424	696		71	111	27	129	733	31	37	1256	556
Arrive On Green	0.26	0.41	0.00	0.11	0.11	0.11	0.09	0.45	0.44	0.02	0.39	0.39
Sat Flow, veh/h	1615	1709	1414	256	1004	243	1485	1614	69	1615	3221	1425
Grp Volume(v), veh/h	391	83	0	130	0	0	109	0	635	31	1068	510
Grp Sat Flow(s),veh/h/ln	1615	1709	1414	1503	0	0	1485	0	1683	1615	1611	1425
Q Serve(g_s), s	24.4	3.1	0.0	5.8	0.0	0.0	7.5	0.0	34.2	2.0	31.3	35.2
Cycle Q Clear(g_c), s	24.4	3.1	0.0	8.7	0.0	0.0	7.5	0.0	34.2	2.0	31.3	35.2
Prop In Lane	1.00		1.00	0.24		0.16	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	424	696		202	0	0	129	0	764	37	1256	556
V/C Ratio(X)	0.92	0.12		0.64	0.00	0.00	0.84	0.00	0.83	0.85	0.85	0.92
Avail Cap(c_a), veh/h	445	966		415	0	0	129	0	764	47	1260	558
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.1	19.1	0.0	44.8	0.0	0.0	46.6	0.0	24.8	50.4	28.8	30.0
Incr Delay (d2), s/veh	23.9	0.1	0.0	2.5	0.0	0.0	36.7	0.0	8.0	61.9	5.9	20.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.2	1.2	0.0	3.2	0.0	0.0	4.0	0.0	14.3	1.4	12.4	13.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.0	19.2	0.0	47.3	0.0	0.0	83.2	0.0	32.8	112.3	34.7	50.5
LnGrp LOS	E	B		D	A	A	F	A	C	F	C	D
Approach Vol, veh/h		474	A		130			744			1609	
Approach Delay, s/veh		53.7			47.3			40.2			41.2	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.3	51.0		46.2	13.0	44.4	30.7	15.5				
Change Period (Y+Rc), s	4.0	* 5.4		4.5	4.0	* 5.4	4.0	4.5				
Max Green Setting (Gmax), s	3.0	* 45		58.0	9.0	* 39	28.0	26.0				
Max Q Clear Time (g_c+I1), s	4.0	36.2		5.1	9.5	37.2	26.4	10.7				
Green Ext Time (p_c), s	0.0	5.0		0.8	0.0	1.8	0.3	0.3				

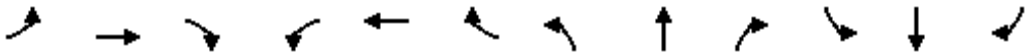
Intersection Summary			
HCM 6th Ctrl Delay		43.2	
HCM 6th LOS		D	

Notes

User approved pedestrian interval to be less than phase max green.

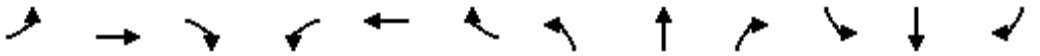
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	100	15	290	125	345	35	170	150	480	270	40
Future Volume (vph)	40	100	15	290	125	345	35	170	150	480	270	40
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.97	1.00	
Frt	1.00	0.98		1.00	0.89		1.00	0.93		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)	1662	1618		1614	1487		1614	1550		2805	1672	
Flt Permitted	0.34	1.00		0.47	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	598	1618		804	1487		1614	1550		2805	1672	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	42	105	16	305	132	363	37	179	158	505	284	42
RTOR Reduction (vph)	0	7	0	0	113	0	0	35	0	0	6	0
Lane Group Flow (vph)	42	114	0	305	382	0	37	302	0	505	320	0
Heavy Vehicles (%)	0%	6%	6%	3%	4%	5%	3%	4%	6%	15%	3%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA		Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)	13.7	11.7		29.0	23.0		3.0	19.3		17.4	33.7	
Effective Green, g (s)	13.7	11.7		29.0	23.0		3.0	19.3		17.4	33.7	
Actuated g/C Ratio	0.18	0.15		0.37	0.30		0.04	0.25		0.22	0.43	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	132	243		438	440		62	385		628	725	
v/s Ratio Prot	0.01	0.07		c0.12	c0.26		0.02	c0.19		c0.18	0.19	
v/s Ratio Perm	0.05			0.14								
v/c Ratio	0.32	0.47		0.70	0.87		0.60	0.78		0.80	0.44	
Uniform Delay, d1	27.2	30.2		19.0	25.9		36.8	27.3		28.5	15.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	1.0		4.4	16.3		12.2	9.7		7.2	0.3	
Delay (s)	28.3	31.2		23.4	42.2		49.0	36.9		35.7	15.7	
Level of Service	C	C		C	D		D	D		D	B	
Approach Delay (s)		30.4			35.1			38.1			27.9	
Approach LOS		C			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	32.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	77.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



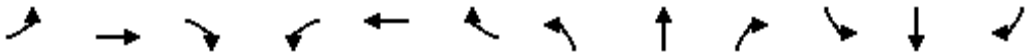
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	100	15	290	125	345	35	170	150	480	270	40
Future Volume (veh/h)	40	100	15	290	125	345	35	170	150	480	270	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1668	1668	1709	1695	1682	1709	1695	1668	1545	1709	1750
Adj Flow Rate, veh/h	42	105	0	305	132	0	37	179	158	505	284	42
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	6	6	3	4	5	3	4	6	15	3	0
Cap, veh/h	272	161		453	426		48	221	195	615	658	97
Arrive On Green	0.03	0.10	0.00	0.19	0.25	0.00	0.03	0.27	0.27	0.22	0.45	0.45
Sat Flow, veh/h	1667	1668	0	1628	1695	0	1628	830	733	2855	1455	215
Grp Volume(v), veh/h	42	105	0	305	132	0	37	0	337	505	0	326
Grp Sat Flow(s),veh/h/ln	1667	1668	0	1628	1695	0	1628	0	1563	1428	0	1670
Q Serve(g_s), s	1.5	4.1	0.0	10.8	4.3	0.0	1.5	0.0	13.8	11.5	0.0	9.1
Cycle Q Clear(g_c), s	1.5	4.1	0.0	10.8	4.3	0.0	1.5	0.0	13.8	11.5	0.0	9.1
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.47	1.00		0.13
Lane Grp Cap(c), veh/h	272	161		453	426		48	0	416	615	0	755
V/C Ratio(X)	0.15	0.65		0.67	0.31		0.77	0.00	0.81	0.82	0.00	0.43
Avail Cap(c_a), veh/h	316	464		457	696		143	0	504	837	0	881
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.6	29.7	0.0	20.2	20.7	0.0	32.9	0.0	23.4	25.5	0.0	12.7
Incr Delay (d2), s/veh	0.2	3.3	0.0	3.5	0.3	0.0	17.2	0.0	7.5	4.3	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	1.6	0.0	4.0	1.6	0.0	0.8	0.0	5.1	3.7	0.0	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.8	33.1	0.0	23.7	21.0	0.0	50.0	0.0	30.9	29.8	0.0	13.0
LnGrp LOS	C	C		C	C		D	A	C	C	A	B
Approach Vol, veh/h		147	A		437	A		374			831	
Approach Delay, s/veh		31.3			22.9			32.8			23.2	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.0	34.9	6.2	21.2	18.7	22.2	16.8	10.6
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	6.0	36.0	4.0	28.0	20.0	22.0	13.0	19.0
Max Q Clear Time (g_c+I1), s	3.5	11.1	3.5	6.3	13.5	15.8	12.8	6.1
Green Ext Time (p_c), s	0.0	6.1	0.0	0.9	1.2	2.4	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	25.8
HCM 6th LOS	C

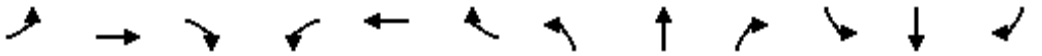
Notes

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	700	50	270	690	40	35	5	395	100	5	25
Future Volume (vph)	10	700	50	270	690	40	35	5	395	100	5	25
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.85		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	3117		1046	1651	1488	1421	1288		1662	1534	
Flt Permitted	0.37	1.00		0.14	1.00	1.00	0.73	1.00		0.31	1.00	
Satd. Flow (perm)	656	3117		153	1651	1488	1099	1288		547	1534	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	11	778	56	300	767	44	39	6	439	111	6	28
RTOR Reduction (vph)	0	5	0	0	0	17	0	379	0	0	24	0
Lane Group Flow (vph)	11	829	0	300	767	27	39	66	0	111	10	0
Heavy Vehicles (%)	0%	6%	0%	59%	6%	0%	17%	0%	16%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4		4	6			2		
Actuated Green, G (s)	26.4	25.7		52.9	48.2	48.2	13.1	10.9		16.9	12.8	
Effective Green, g (s)	26.4	25.7		52.9	48.2	48.2	13.1	10.9		16.9	12.8	
Actuated g/C Ratio	0.33	0.32		0.66	0.60	0.60	0.16	0.14		0.21	0.16	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	225	1002		360	995	897	189	175		172	245	
v/s Ratio Prot	0.00	0.27		c0.24	0.46		0.01	0.05		c0.03	0.01	
v/s Ratio Perm	0.02			c0.31		0.02	0.03			c0.10		
v/c Ratio	0.05	0.83		0.83	0.77	0.03	0.21	0.38		0.65	0.04	
Uniform Delay, d1	18.0	25.0		18.2	11.8	6.4	28.7	31.4		27.8	28.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	5.6		14.9	3.6	0.0	0.4	1.0		7.1	0.1	
Delay (s)	18.1	30.6		33.1	15.4	6.4	29.1	32.4		34.9	28.4	
Level of Service	B	C		C	B	A	C	C		C	C	
Approach Delay (s)		30.5			19.8			32.1			33.4	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	79.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	88.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



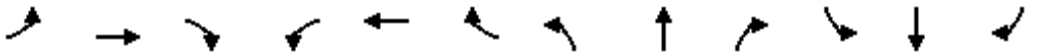
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	700	50	270	690	40	35	5	395	100	5	25
Future Volume (veh/h)	10	700	50	270	690	40	35	5	395	100	5	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1668	1750	945	1668	1750	1518	1750	1532	1750	1750	1750
Adj Flow Rate, veh/h	11	778	56	300	767	44	39	6	439	111	6	28
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	6	0	59	6	0	17	0	16	0	0	0
Cap, veh/h	179	869	63	319	878	780	382	5	339	161	67	313
Arrive On Green	0.01	0.29	0.29	0.25	0.53	0.53	0.03	0.23	0.23	0.05	0.25	0.25
Sat Flow, veh/h	1667	2998	216	900	1668	1483	1446	20	1466	1667	269	1255
Grp Volume(v), veh/h	11	411	423	300	767	44	39	0	445	111	0	34
Grp Sat Flow(s),veh/h/ln	1667	1585	1629	900	1668	1483	1446	0	1486	1667	0	1524
Q Serve(g_s), s	0.4	21.5	21.5	19.0	34.8	1.3	1.8	0.0	20.0	4.0	0.0	1.5
Cycle Q Clear(g_c), s	0.4	21.5	21.5	19.0	34.8	1.3	1.8	0.0	20.0	4.0	0.0	1.5
Prop In Lane	1.00		0.13	1.00		1.00	1.00		0.99	1.00		0.82
Lane Grp Cap(c), veh/h	179	460	472	319	878	780	382	0	344	161	0	380
V/C Ratio(X)	0.06	0.89	0.90	0.94	0.87	0.06	0.10	0.00	1.29	0.69	0.00	0.09
Avail Cap(c_a), veh/h	238	477	490	347	888	790	409	0	344	161	0	380
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.5	29.4	29.4	16.7	17.9	10.0	24.3	0.0	33.2	27.9	0.0	24.9
Incr Delay (d2), s/veh	0.1	18.4	18.1	31.4	9.4	0.0	0.1	0.0	152.1	11.2	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	9.8	10.1	5.9	13.4	0.4	0.6	0.0	21.6	2.2	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.6	47.8	47.5	48.1	27.3	10.0	24.4	0.0	185.3	39.1	0.0	25.0
LnGrp LOS	C	D	D	D	C	B	C	A	F	D	A	C
Approach Vol, veh/h		845			1111			484			145	
Approach Delay, s/veh		47.3			32.3			172.3			35.8	
Approach LOS		D			C			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.4	25.6	4.9	49.5	8.0	24.0	25.3	29.1
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	4.0	20.0	4.0	46.0	4.0	20.0	24.0	26.0
Max Q Clear Time (g_c+I1), s	3.8	3.5	2.4	36.8	6.0	22.0	21.0	23.5
Green Ext Time (p_c), s	0.0	0.1	0.0	5.0	0.0	0.0	0.3	1.5

Intersection Summary	
HCM 6th Ctrl Delay	63.6
HCM 6th LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	375	80	170	30	75	20	105	585	25	30	1025	490
Future Volume (vph)	375	80	170	30	75	20	105	585	25	30	1025	490
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	3.5	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1599	1699	1403		1589		1458	1675		1599	3197	1417
Flt Permitted	0.95	1.00	1.00		0.91		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1599	1699	1403		1463		1458	1675		1599	3197	1417
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	391	83	177	31	78	21	109	609	26	31	1068	510
RTOR Reduction (vph)	0	0	77	0	6	0	0	1	0	0	0	318
Lane Group Flow (vph)	391	83	100	0	124	0	109	634	0	31	1068	192
Heavy Vehicles (%)	4%	3%	6%	4%	7%	8%	14%	4%	0%	4%	4%	5%
Turn Type	Prot	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases			4	8								6
Actuated Green, G (s)	28.1	46.8	46.8		14.7		9.0	46.6		2.4	40.0	40.0
Effective Green, g (s)	28.6	47.3	47.3		15.2		9.0	48.0		2.4	41.4	41.4
Actuated g/C Ratio	0.26	0.43	0.43		0.14		0.08	0.44		0.02	0.38	0.38
Clearance Time (s)	4.0	4.5	4.5		4.5		4.0	5.4		4.0	5.4	5.4
Vehicle Extension (s)	2.5	2.5	2.5		2.5		2.5	4.0		2.5	4.0	4.0
Lane Grp Cap (vph)	416	732	604		202		119	732		34	1206	534
v/s Ratio Prot	c0.24	0.05					c0.07	c0.38		0.02	0.33	
v/s Ratio Perm			0.07		c0.08							0.14
v/c Ratio	0.94	0.11	0.16		0.61		0.92	0.87		0.91	0.89	0.36
Uniform Delay, d1	39.7	18.7	19.1		44.5		50.0	27.9		53.5	31.9	24.6
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	29.0	0.1	0.1		4.7		56.6	10.8		117.9	8.3	0.6
Delay (s)	68.7	18.7	19.2		49.1		106.5	38.8		171.5	40.2	25.2
Level of Service	E	B	B		D		F	D		F	D	C
Approach Delay (s)		48.9			49.1			48.7			38.0	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	43.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	109.7	Sum of lost time (s)	15.5
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
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 (veh/h)	375	80	170	30	75	20	105	585	25	30	1025	490
Future Volume (veh/h)	375	80	170	30	75	20	105	585	25	30	1025	490
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1695	1709	1668	1695	1654	1641	1559	1695	1750	1695	1695	1682
Adj Flow Rate, veh/h	391	83	0	31	78	21	109	609	26	31	1068	510
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	3	6	4	7	8	14	4	0	4	4	5
Cap, veh/h	424	696		71	111	27	129	733	31	37	1256	556
Arrive On Green	0.26	0.41	0.00	0.11	0.11	0.11	0.09	0.45	0.44	0.02	0.39	0.39
Sat Flow, veh/h	1615	1709	1414	256	1004	243	1485	1614	69	1615	3221	1425
Grp Volume(v), veh/h	391	83	0	130	0	0	109	0	635	31	1068	510
Grp Sat Flow(s),veh/h/ln	1615	1709	1414	1503	0	0	1485	0	1683	1615	1611	1425
Q Serve(g_s), s	24.4	3.1	0.0	5.8	0.0	0.0	7.5	0.0	34.2	2.0	31.3	35.2
Cycle Q Clear(g_c), s	24.4	3.1	0.0	8.7	0.0	0.0	7.5	0.0	34.2	2.0	31.3	35.2
Prop In Lane	1.00		1.00	0.24		0.16	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	424	696		202	0	0	129	0	764	37	1256	556
V/C Ratio(X)	0.92	0.12		0.64	0.00	0.00	0.84	0.00	0.83	0.85	0.85	0.92
Avail Cap(c_a), veh/h	445	966		415	0	0	129	0	764	47	1260	558
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.1	19.1	0.0	44.8	0.0	0.0	46.6	0.0	24.8	50.4	28.8	30.0
Incr Delay (d2), s/veh	23.9	0.1	0.0	2.5	0.0	0.0	36.7	0.0	8.0	61.9	5.9	20.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.2	1.2	0.0	3.2	0.0	0.0	4.0	0.0	14.3	1.4	12.4	13.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.0	19.2	0.0	47.3	0.0	0.0	83.2	0.0	32.8	112.3	34.7	50.5
LnGrp LOS	E	B		D	A	A	F	A	C	F	C	D
Approach Vol, veh/h		474	A		130			744			1609	
Approach Delay, s/veh		53.7			47.3			40.2			41.2	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.3	51.0		46.2	13.0	44.4	30.7	15.5				
Change Period (Y+Rc), s	4.0	* 5.4		4.5	4.0	* 5.4	4.0	4.5				
Max Green Setting (Gmax), s	3.0	* 45		58.0	9.0	* 39	28.0	26.0				
Max Q Clear Time (g_c+I1), s	4.0	36.2		5.1	9.5	37.2	26.4	10.7				
Green Ext Time (p_c), s	0.0	5.0		0.8	0.0	1.8	0.3	0.3				

Intersection Summary												
HCM 6th Ctrl Delay			43.2									
HCM 6th LOS			D									

Notes

User approved pedestrian interval to be less than phase max green.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Oregon Department of Transportation

Transportation Development Branch

Transportation Planning Analysis Unit

Preliminary Traffic Signal Warrant Analysis[1]

Major Street:	River Rd	**Minor Street:**	Brooklake Rd
Project:	Brooks IAMP	**City/County:**	Marion County
Year:	2020	**Alternative:**	Existing

Preliminary Signal Warrant Volumes

Number of Approach lanes		ADT on major street approaching from both directions		ADT on minor street, highest approaching volume	
Major Street	Minor Street	Percent of standard warrants 100	70	Percent of standard warrants 100	70
Case A: Minimum Vehicular Traffic					
1	1	8850	6200	2650	1850
2 or more	1	10600	7400	2650	1850
2 or more	2 or more	10600	7400	3550	2500
1	2 or more	8850	6200	3550	2500
Case B: Interruption of Continuous Traffic					
1	1	13300	9300	1350	950
2 or more	1	15900	11100	1350	950
2 or more	2 or more	15900	11100	1750	1250
1	2 or more	13300	9300	1750	1250
	100 percent of standard warrants				
X	70 percent of standard warrants[2]				

Preliminary Signal Warrant Calculation

	Street	Number of Lanes	Warrant Volumes	Approach Volumes	Warrant Met
Case A	Major	1	6200	8293	Y
	Minor	1	1850	4695	
Case B	Major	1	9300	8293	N
	Minor	1	950	4695	

Analyst and Date: Reviewer and Date:

[1] Meeting preliminary signal warrants does **not** guarantee that a signal will be installed. When preliminary signal warrants are met, project analysts need to coordinate with Region Traffic to initiate the traffic signal engineering investigation as outlined in the Traffic Manual. Before a signal can be installed, the engineering investigation must be conducted or reviewed by the Region Traffic Manager who will forward signal recommendations to headquarters. Traffic signal warrants must be met and the State Traffic Engineer's approval obtained before a traffic signal can be installed on a state highway.

[2] Used due to 85th percentile speed in excess of 40 mph or isolated community with population of less than 10,000.

Oregon Department of Transportation

Transportation Development Branch

Transportation Planning Analysis Unit

Preliminary Traffic Signal Warrant Analysis[1]

Major Street:	Brooklake Rd	**Minor Street:**	Huff Ave
Project:	Brooks IAMP	**City/County:**	Marion County
Year:	2020	**Alternative:**	Existing

Preliminary Signal Warrant Volumes

Number of Approach lanes		ADT on major street approaching from both directions		ADT on minor street, highest approaching volume	
Major Street	Minor Street	Percent of standard warrants 100	70	Percent of standard warrants 100	70
Case A: Minimum Vehicular Traffic					
1	1	8850	6200	2650	1850
2 or more	1	10600	7400	2650	1850
2 or more	2 or more	10600	7400	3550	2500
1	2 or more	8850	6200	3550	2500
Case B: Interruption of Continuous Traffic					
1	1	13300	9300	1350	950
2 or more	1	15900	11100	1350	950
2 or more	2 or more	15900	11100	1750	1250
1	2 or more	13300	9300	1750	1250
X	100 percent of standard warrants				
	70 percent of standard warrants[2]				

Preliminary Signal Warrant Calculation

	Street	Number of Lanes	Warrant Volumes	Approach Volumes	Warrant Met
Case A	Major	1	8850	12610	N
	Minor	1	2650	73	
Case B	Major	1	13300	12610	N
	Minor	1	1350	73	

Analyst and Date: Reviewer and Date:

[1] Meeting preliminary signal warrants does **not** guarantee that a signal will be installed. When preliminary signal warrants are met, project analysts need to coordinate with Region Traffic to initiate the traffic signal engineering investigation as outlined in the Traffic Manual. Before a signal can be installed, the engineering investigation must be conducted or reviewed by the Region Traffic Manager who will forward signal recommendations to headquarters. Traffic signal warrants must be met and the State Traffic Engineer's approval obtained before a traffic signal can be installed on a state highway.

[2] Used due to 85th percentile speed in excess of 40 mph or isolated community with population of less than 10,000.

Oregon Department of Transportation

Transportation Development Branch

Transportation Planning Analysis Unit

Preliminary Traffic Signal Warrant Analysis[1]

Major Street:	I-5 SB Ramp Terminal - Field (	**Minor Street:**	Brooklake Rd
Project:	Brooks IAMP	**City/County:**	Marion County
Year:	2020	**Alternative:**	Existing

Preliminary Signal Warrant Volumes

Number of Approach lanes		ADT on major street approaching from both directions		ADT on minor street, highest approaching volume	
Major Street	Minor Street	Percent of standard warrants 100	70	Percent of standard warrants 100	70
Case A: Minimum Vehicular Traffic					
1	1	8850	6200	2650	1850
2 or more	1	10600	7400	2650	1850
2 or more	2 or more	10600	7400	3550	2500
1	2 or more	8850	6200	3550	2500
Case B: Interruption of Continuous Traffic					
1	1	13300	9300	1350	950
2 or more	1	15900	11100	1350	950
2 or more	2 or more	15900	11100	1750	1250
1	2 or more	13300	9300	1750	1250
X	100 percent of standard warrants				
	70 percent of standard warrants[2]				

Preliminary Signal Warrant Calculation

	Street	Number of Lanes	Warrant Volumes	Approach Volumes	Warrant Met
Case A	Major	1	8850	18659	N
	Minor	1	2650	561	
Case B	Major	1	13300	18659	N
	Minor	1	1350	561	

Analyst and Date: Reviewer and Date:

[1] Meeting preliminary signal warrants does **not** guarantee that a signal will be installed. When preliminary signal warrants are met, project analysts need to coordinate with Region Traffic to initiate the traffic signal engineering investigation as outlined in the Traffic Manual. Before a signal can be installed, the engineering investigation must be conducted or reviewed by the Region Traffic Manager who will forward signal recommendations to headquarters. Traffic signal warrants must be met and the State Traffic Engineer's approval obtained before a traffic signal can be installed on a state highway.

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Oregon Department of Transportation

Transportation Development Branch

Transportation Planning Analysis Unit

Preliminary Traffic Signal Warrant Analysis[1]

Major Street:	I-5 SB Ramp Terminal	**Minor Street:**	Brooklake Rd
Project:	Brooks IAMP	**City/County:**	Marion County
Year:	2020	**Alternative:**	Existing

Preliminary Signal Warrant Volumes

Number of Approach lanes		ADT on major street approaching from both directions		ADT on minor street, highest approaching volume	
Major Street	Minor Street	Percent of standard warrants 100	70	Percent of standard warrants 100	70
Case A: Minimum Vehicular Traffic					
1	1	8850	6200	2650	1850
2 or more	1	10600	7400	2650	1850
2 or more	2 or more	10600	7400	3550	2500
1	2 or more	8850	6200	3550	2500
Case B: Interruption of Continuous Traffic					
1	1	13300	9300	1350	950
2 or more	1	15900	11100	1350	950
2 or more	2 or more	15900	11100	1750	1250
1	2 or more	13300	9300	1750	1250
X	100 percent of standard warrants				
	70 percent of standard warrants[2]				

Preliminary Signal Warrant Calculation

	Street	Number of Lanes	Warrant Volumes	Approach Volumes	Warrant Met
Case A	Major	1	8850	18659	N
	Minor	1	2650	561	
Case B	Major	1	13300	18659	N
	Minor	1	1350	561	

Analyst and Date: Reviewer and Date:

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Oregon Department of Transportation

Transportation Development Branch

Transportation Planning Analysis Unit

Preliminary Traffic Signal Warrant Analysis[1]

Major Street:	Brooklake Rd	**Minor Street:**	I-5 NB Ramp Terminal - Field
Project:	Brooks IAMP	**City/County:**	Marion County
Year:	2020	**Alternative:**	Existing

Preliminary Signal Warrant Volumes

Number of Approach lanes		ADT on major street approaching from both directions		ADT on minor street, highest approaching volume	
Major Street	Minor Street	Percent of standard warrants 100	70	Percent of standard warrants 100	70
Case A: Minimum Vehicular Traffic					
1	1	8850	6200	2650	1850
2 or more	1	10600	7400	2650	1850
2 or more	2 or more	10600	7400	3550	2500
1	2 or more	8850	6200	3550	2500
Case B: Interruption of Continuous Traffic					
1	1	13300	9300	1350	950
2 or more	1	15900	11100	1350	950
2 or more	2 or more	15900	11100	1750	1250
1	2 or more	13300	9300	1750	1250
X	100 percent of standard warrants				
	70 percent of standard warrants[2]				

Preliminary Signal Warrant Calculation

	Street	Number of Lanes	Warrant Volumes	Approach Volumes	Warrant Met
Case A	Major	1	8850	10732	Y
	Minor	1	2650	2939	
Case B	Major	1	13300	10732	N
	Minor	1	1350	2939	

Analyst and Date: Reviewer and Date:

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Oregon Department of Transportation

Transportation Development Branch

Transportation Planning Analysis Unit

Preliminary Traffic Signal Warrant Analysis[1]

Major Street:	Brooklake Rd	**Minor Street:**	I-5 NB Ramp Terminal
Project:	Brooks IAMP	**City/County:**	Marion County
Year:	2020	**Alternative:**	Existing

Preliminary Signal Warrant Volumes

Number of Approach lanes		ADT on major street approaching from both directions		ADT on minor street, highest approaching volume	
Major Street	Minor Street	Percent of standard warrants 100	70	Percent of standard warrants 100	70
Case A: Minimum Vehicular Traffic					
1	1	8850	6200	2650	1850
2 or more	1	10600	7400	2650	1850
2 or more	2 or more	10600	7400	3550	2500
1	2 or more	8850	6200	3550	2500
Case B: Interruption of Continuous Traffic					
1	1	13300	9300	1350	950
2 or more	1	15900	11100	1350	950
2 or more	2 or more	15900	11100	1750	1250
1	2 or more	13300	9300	1750	1250
X	100 percent of standard warrants				
	70 percent of standard warrants[2]				

Preliminary Signal Warrant Calculation

	Street	Number of Lanes	Warrant Volumes	Approach Volumes	Warrant Met
Case A	Major	1	8850	10732	Y
	Minor	1	2650	3171	
Case B	Major	1	13300	10732	N
	Minor	1	1350	3171	

Analyst and Date: Reviewer and Date:

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Oregon Department of Transportation

Transportation Development Branch

Transportation Planning Analysis Unit

Preliminary Traffic Signal Warrant Analysis[1]

Major Street:	River Rd	**Minor Street:**	Brooklake Rd
Project:	Brooks IAMP	**City/County:**	Marion County
Year:	2043	**Alternative:**	No-Build

Preliminary Signal Warrant Volumes

Number of Approach lanes		ADT on major street approaching from both directions		ADT on minor street, highest approaching volume	
Major Street	Minor Street	Percent of standard warrants 100	70	Percent of standard warrants 100	70
Case A: Minimum Vehicular Traffic					
1	1	8850	6200	2650	1850
2 or more	1	10600	7400	2650	1850
2 or more	2 or more	10600	7400	3550	2500
1	2 or more	8850	6200	3550	2500
Case B: Interruption of Continuous Traffic					
1	1	13300	9300	1350	950
2 or more	1	15900	11100	1350	950
2 or more	2 or more	15900	11100	1750	1250
1	2 or more	13300	9300	1750	1250
	100 percent of standard warrants				
X	70 percent of standard warrants[2]				

Preliminary Signal Warrant Calculation

	Street	Number of Lanes	Warrant Volumes	Approach Volumes	Warrant Met
Case A	Major	1	6200	13963	Y
	Minor	1	1850	5061	
Case B	Major	1	9300	13963	Y
	Minor	1	950	5061	

Analyst and Date: Reviewer and Date:

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Oregon Department of Transportation

Transportation Development Branch

Transportation Planning Analysis Unit

Preliminary Traffic Signal Warrant Analysis[1]

Major Street:	Brooklake Rd	**Minor Street:**	Huff Ave
Project:	Brooks IAMP	**City/County:**	Marion County
Year:	2043	**Alternative:**	No-Build

Preliminary Signal Warrant Volumes

Number of Approach lanes		ADT on major street approaching from both directions		ADT on minor street, highest approaching volume	
Major Street	Minor Street	Percent of standard warrants 100	70	Percent of standard warrants 100	70
Case A: Minimum Vehicular Traffic					
1	1	8850	6200	2650	1850
2 or more	1	10600	7400	2650	1850
2 or more	2 or more	10600	7400	3550	2500
1	2 or more	8850	6200	3550	2500
Case B: Interruption of Continuous Traffic					
1	1	13300	9300	1350	950
2 or more	1	15900	11100	1350	950
2 or more	2 or more	15900	11100	1750	1250
1	2 or more	13300	9300	1750	1250
X	100 percent of standard warrants				
	70 percent of standard warrants[2]				

Preliminary Signal Warrant Calculation

	Street	Number of Lanes	Warrant Volumes	Approach Volumes	Warrant Met
Case A	Major	1	8850	18780	N
	Minor	1	2650	122	
Case B	Major	1	13300	18780	N
	Minor	1	1350	122	

Analyst and Date: Reviewer and Date:

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Oregon Department of Transportation

Transportation Development Branch

Transportation Planning Analysis Unit

Preliminary Traffic Signal Warrant Analysis[1]

Major Street:	Brooklake Rd	**Minor Street:**	I-5 SB Ramp Terminal - Field C
Project:	Brooks IAMP	**City/County:**	Marion County
Year:	2043	**Alternative:**	No-Build

Preliminary Signal Warrant Volumes

Number of Approach lanes		ADT on major street approaching from both directions		ADT on minor street, highest approaching volume	
Major Street	Minor Street	Percent of standard warrants 100	70	Percent of standard warrants 100	70
Case A: Minimum Vehicular Traffic					
1	1	8850	6200	2650	1850
2 or more	1	10600	7400	2650	1850
2 or more	2 or more	10600	7400	3550	2500
1	2 or more	8850	6200	3550	2500
Case B: Interruption of Continuous Traffic					
1	1	13300	9300	1350	950
2 or more	1	15900	11100	1350	950
2 or more	2 or more	15900	11100	1750	1250
1	2 or more	13300	9300	1750	1250
X	100 percent of standard warrants				
	70 percent of standard warrants[2]				

Preliminary Signal Warrant Calculation

	Street	Number of Lanes	Warrant Volumes	Approach Volumes	Warrant Met
Case A	Major	1	8850	27500	N
	Minor	1	2650	784	
Case B	Major	1	13300	27500	N
	Minor	1	1350	784	

Analyst and Date: Reviewer and Date:

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Oregon Department of Transportation

Transportation Development Branch

Transportation Planning Analysis Unit

Preliminary Traffic Signal Warrant Analysis[1]

Major Street:	Brooklake Rd	**Minor Street:**	I-5 SB Ramp Terminal
Project:	Brooks IAMP	**City/County:**	Marion County
Year:	2043	**Alternative:**	No-Build

Preliminary Signal Warrant Volumes

Number of Approach lanes		ADT on major street approaching from both directions		ADT on minor street, highest approaching volume	
Major Street	Minor Street	Percent of standard warrants 100	70	Percent of standard warrants 100	70
Case A: Minimum Vehicular Traffic					
1	1	8850	6200	2650	1850
2 or more	1	10600	7400	2650	1850
2 or more	2 or more	10600	7400	3550	2500
1	2 or more	8850	6200	3550	2500
Case B: Interruption of Continuous Traffic					
1	1	13300	9300	1350	950
2 or more	1	15900	11100	1350	950
2 or more	2 or more	15900	11100	1750	1250
1	2 or more	13300	9300	1750	1250
X	100 percent of standard warrants				
	70 percent of standard warrants[2]				

Preliminary Signal Warrant Calculation

	Street	Number of Lanes	Warrant Volumes	Approach Volumes	Warrant Met
Case A	Major	1	8850	27500	Y
	Minor	1	2650	4775	
Case B	Major	1	13300	27500	Y
	Minor	1	1350	4775	

Analyst and Date: Reviewer and Date:

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Oregon Department of Transportation

Transportation Development Branch

Transportation Planning Analysis Unit

Preliminary Traffic Signal Warrant Analysis[1]

Major Street:	Brooklake Rd	**Minor Street:**	I-5 NB Ramp Terminal - Field
Project:	Brooks IAMP	**City/County:**	Marion County
Year:	2043	**Alternative:**	No-Build

Preliminary Signal Warrant Volumes

Number of Approach lanes		ADT on major street approaching from both directions		ADT on minor street, highest approaching volume	
Major Street	Minor Street	Percent of standard warrants 100	70	Percent of standard warrants 100	70
Case A: Minimum Vehicular Traffic					
1	1	8850	6200	2650	1850
2 or more	1	10600	7400	2650	1850
2 or more	2 or more	10600	7400	3550	2500
1	2 or more	8850	6200	3550	2500
Case B: Interruption of Continuous Traffic					
1	1	13300	9300	1350	950
2 or more	1	15900	11100	1350	950
2 or more	2 or more	15900	11100	1750	1250
1	2 or more	13300	9300	1750	1250
X	100 percent of standard warrants				
	70 percent of standard warrants[2]				

Preliminary Signal Warrant Calculation

	Street	Number of Lanes	Warrant Volumes	Approach Volumes	Warrant Met
Case A	Major	1	8850	15732	Y
	Minor	1	2650	4098	
Case B	Major	1	13300	15732	Y
	Minor	1	1350	4098	

Analyst and Date: Reviewer and Date:

[1] Meeting preliminary signal warrants does **not** guarantee that a signal will be installed. When preliminary signal warrants are met, project analysts need to coordinate with Region Traffic to initiate the traffic signal engineering investigation as outlined in the Traffic Manual. Before a signal can be installed, the engineering investigation must be conducted or reviewed by the Region Traffic Manager who will forward signal recommendations to headquarters. Traffic signal warrants must be met and the State Traffic Engineer's approval obtained before a traffic signal can be installed on a state highway.

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Oregon Department of Transportation

Transportation Development Branch

Transportation Planning Analysis Unit

Preliminary Traffic Signal Warrant Analysis[1]

Major Street:	Brooklake Rd	**Minor Street:**	I-5 NB Ramp Terminal
Project:	Brooks IAMP	**City/County:**	Marion County
Year:	2043	**Alternative:**	No-Build

Preliminary Signal Warrant Volumes

Number of Approach lanes		ADT on major street approaching from both directions		ADT on minor street, highest approaching volume	
Major Street	Minor Street	Percent of standard warrants 100	70	Percent of standard warrants 100	70
Case A: Minimum Vehicular Traffic					
1	1	8850	6200	2650	1850
2 or more	1	10600	7400	2650	1850
2 or more	2 or more	10600	7400	3550	2500
1	2 or more	8850	6200	3550	2500
Case B: Interruption of Continuous Traffic					
1	1	13300	9300	1350	950
2 or more	1	15900	11100	1350	950
2 or more	2 or more	15900	11100	1750	1250
1	2 or more	13300	9300	1750	1250
X	100 percent of standard warrants				
	70 percent of standard warrants[2]				

Preliminary Signal Warrant Calculation

	Street	Number of Lanes	Warrant Volumes	Approach Volumes	Warrant Met
Case A	Major	1	8850	15732	Y
	Minor	1	2650	6671	
Case B	Major	1	13300	15732	Y
	Minor	1	1350	6671	

Analyst and Date: Reviewer and Date:

[1] Meeting preliminary signal warrants does **not** guarantee that a signal will be installed. When preliminary signal warrants are met, project analysts need to coordinate with Region Traffic to initiate the traffic signal engineering investigation as outlined in the Traffic Manual. Before a signal can be installed, the engineering investigation must be conducted or reviewed by the Region Traffic Manager who will forward signal recommendations to headquarters. Traffic signal warrants must be met and the State Traffic Engineer's approval obtained before a traffic signal can be installed on a state highway.

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8 TECHNICAL MEMORANDUM #8

Alternative Mobility Target Documentation

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TECHNICAL MEMORANDUM #8

Alternative Mobility Target Documentation (Task 6.3)

Date: November 22, 2022

To: Oregon Department of Transportation, Region 2
Marion County

From: David Evans and Associates, Inc.

Subject: I-5/Brooklake Road Interchange Area Management Plan (Exit 263)

Overview

This technical memorandum (TM) #8 was prepared to document the existing conditions and future forecast operating conditions of the two I-5 ramp terminal intersections at Brooklake Road, determine whether and when the intersections are expected to exceed adopted mobility targets, analyze and verify the need for alternative mobility targets (AMTs), and develop the AMTs if needed.

TM #8 is the eighth in a series of ten technical memoranda for the I-5/Brooklake Road Interchange Management Plan (IAMP). The purpose of the IAMP is to assess the existing and future traffic and safety conditions within the interchange area and identify and recommend potential future solutions.

Background

Roadway Classifications

I-5, including the ramps, is an Oregon Department of Transportation (ODOT) facility, and both the Federal Highway Administration and ODOT designate it as a truck/freight route. Brooklake Road is a Marion County facility, except within the interchange area from about 125 feet west of the southbound ramps to about 325 feet east of the northbound ramps, which is under ODOT jurisdiction. TM #3 previously summarized the jurisdiction, functional classification, other special designations, number of lanes, and posted speeds for the interchange.

Current Mobility Targets

The mobility targets in the Oregon Highway Plan (OHP) and the ODOT Highway Design Manual (HDM) apply to the interchange. The OHP establishes a volume-to-capacity (v/c) ratio of 0.85 at freeway ramp terminals and an I-5 mainline mobility target of 0.85. The ODOT HDM design performance threshold for new intersection ramp terminals is a v/c ratio of less than 0.75.

The analysis presented in this TM #8 initially uses a ramp terminal v/c ratio target of 0.85 as the mobility target.

Existing and Future Interchange Ramp Operations

TM #3 previously analyzed and summarized the PM peak hour traffic operating conditions of the two ramp terminal intersections for existing year (2020), and TM 4 did the same for the future year (2043). Analyses were conducted using Synchro/SimTraffic software and based on methodology in the Highway Capacity Manual, Sixth Edition, along with procedures in the ODOT Analysis Procedures Manual (APM).

Both ramp terminal intersections were analyzed under the existing stop-controlled conditions. The future year analysis assumed that the planned widening of Brooklake Road to five lanes from Huff Avenue to the southbound ramps was in place.

Based on the analysis, under existing year (2020) conditions, the southbound ramp terminal intersection meets the OHP mobility target, while the northbound ramp intersection exceeds the OHP mobility target. In the future year (2043), both ramp terminal intersections are expected to exceed the OHP mobility target. Table 1 summarizes the existing and future operating conditions for the two ramp terminal intersections.

Table 1. Existing Year (2020) and Future Year (2043) PM Peak Hour Intersection Operations

Intersection	Control Type	Critical Movement	Existing Year (2020)	Future Year (2043)	OHP Mobility Target[1]	HDM Mobility Target[2]
I-5 SB Ramps at Brooklake Rd	TWSC	WB L	0.45	**0.86**	0.85	0.75
		SB R	0.53	**>2.00**		
I-5 NB Ramps at Brooklake Rd	TWSC	EB L	0.17	0.25	0.85	0.75
		NB L	**>1.00**	**>2.00**		

Acronyms: EB = eastbound, NB = northbound, SB = southbound, WB = westbound; L = left; R = right; TWSC = Two-Way Stop Control.
Movements exceeding the applicable mobility target are **bold and shaded.**
Notes:
1. 1999 Oregon Highway Plan (OHP), Table 6, Policy 1F applies to existing and no build conditions.
2. Table 10-2: 20 Year Design-Mobility Standards (Volume-to-Capacity Ratio), Highway Design Manual, 2012. Provided for comparison only; ODOT facility plans follow OHP and no construction funding is available at this time.

Proposed System Improvement Concepts

TM #7 summarizes the analysis and evaluation of six different preliminary interchange design concepts for future year 2043 operating conditions. The six concepts are:

1. Tight Diamond Interchange
2. Single Point Interchange
3. Diverging Diamond Interchange
4. Partial Cloverleaf – Northwest/Northeast
5. Partial Cloverleaf – Northwest/Southeast
6. Dogbone

The six concepts were evaluated for several performance criteria, one of which was traffic operations. Based on the analysis, all six concepts are expected to meet the OHP mobility target of a v/c ratio of 0.85 at the two ramp terminal intersections in the PM peak hour under future year operating conditions.

Local Street System Improvements

As shown in Figure 1, local roadway system improvements are identified that address operational and safety deficiencies at individual intersections within the study area, as well as necessary access modifications to support a new interchange. Table 2 lists the necessary intersection traffic control and local access improvements needed beyond what was assumed in the 2043 No Build analysis (included in the SKATS RTSP and summarized in Technical Memorandum #4).

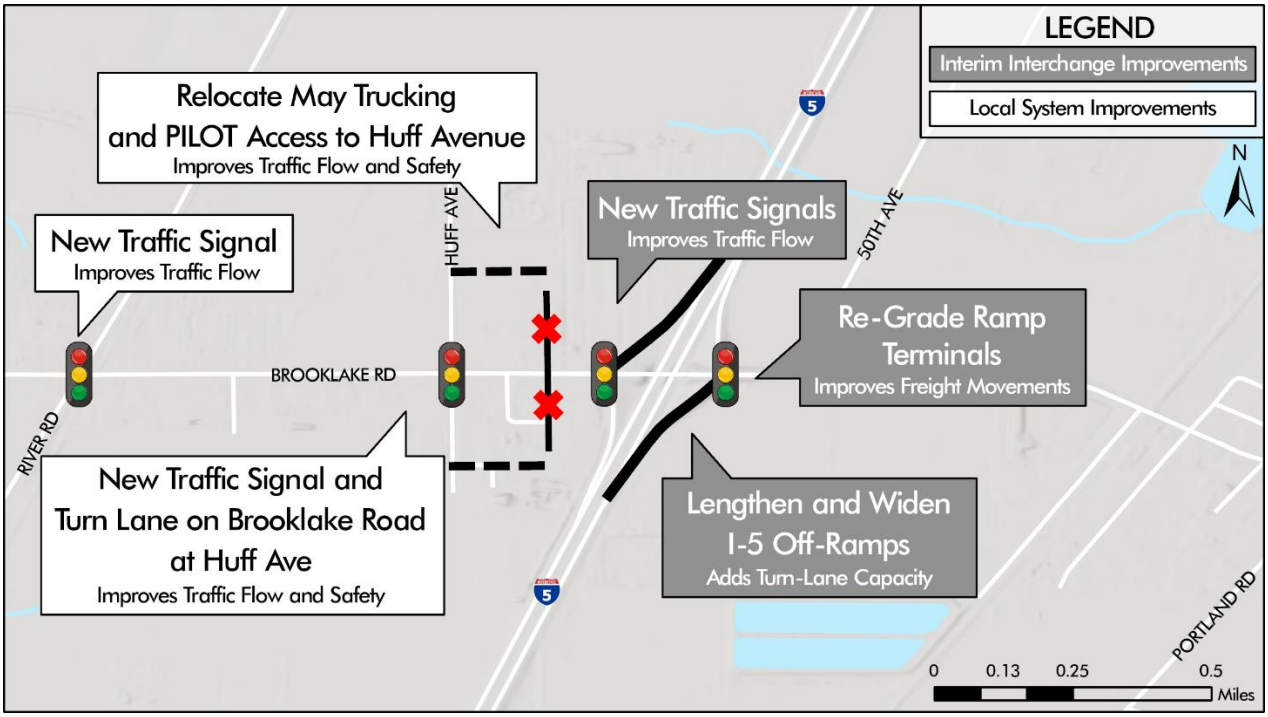


Figure 1. Local System and Interim I-5 Interchange Improvement Needs

Table 2. Local System Improvements

Location	Improvement	Problem Addressed	Timing
River Rd at Brooklake Rd	Assumes new traffic signal but no additional approach lanes.	Intersection expected to meet County mobility target by 2043 with LOS C and v/c 0.82	Signalize as soon as possible[3]; intersection is currently over capacity. Add dual SBL when intersection fails with signal.
May Trucking/ PILOT access and Truckman Way	Close accesses, create local connection to Huff Ave and divert traffic to Huff Ave.	Accesses between Huff Ave and SB Ramp Terminal must be closed with grade improvements to Brooklake Rd	With new interchange or with widening of Brooklake Rd to five lanes.
Huff Ave at Brooklake Rd	▪ Add capacity to signalized intersection[3]: ▪ Add dedicated eastbound through/right-turn lane.	With new interchange, intersection and access closures, Huff Ave is expected to narrowly meet County mobility targets by 2043 at LOS E and v/c 0.85	Development-driven or paired with new interchange, whichever comes first.

Location	Improvement	Problem Addressed	Timing
50th Ave at Brooklake Rd	Modify (right-out only) or move access to east.	Accesses within a ¼-mile of the new interchange ramp terminals need to move toward achieving ODOT access management standards.	With new interchange.
OR 99E (Portland Rd) at Brooklake Rd	Consider implementing alternate mobility target.	Intersection is expected to narrowly exceed ODOT mobility targets[2] by 2043, operating at LOS D and v/c = 0.91.	Medium-term; intersection over capacity in 2043. Not tied to interchange improvements.

Notes:
1. LOS D, v/c ≤ 0.85. The Marion County Rural Transportation System Plan (TSP) designates the traffic operations standard on County facilities and defers to ODOT standards for intersections with state highways within the County.
2. v/c ≤ 0.90. 1999 Oregon Highway Plan (OHP), Table 6, Policy 1F.
3. Intersection assumed signalized by 2043 per Project List for the SKATS 2019 – 2043 RTSP.

Interim Year Analysis

An interim-year analysis was conducted to determine the year at which the ramp intersections are expected to exceed the adopted OHP mobility target for traffic operations.

Volume Development and Interim Improvements

To develop the interim year traffic volumes, the analysis interpolated the traffic volume data from the existing year (2020) volumes in TM #3 and the future year (2043) volumes in TM #4. Attachment A summarizes the interpolated volumes for the interim years between 2020 and 2043. The interim-year analysis assumed that the two I-5 ramp terminal intersections were signalized and that each off-ramp was two lanes.

Expected Years that Intersections Would Exceed the Mobility Target

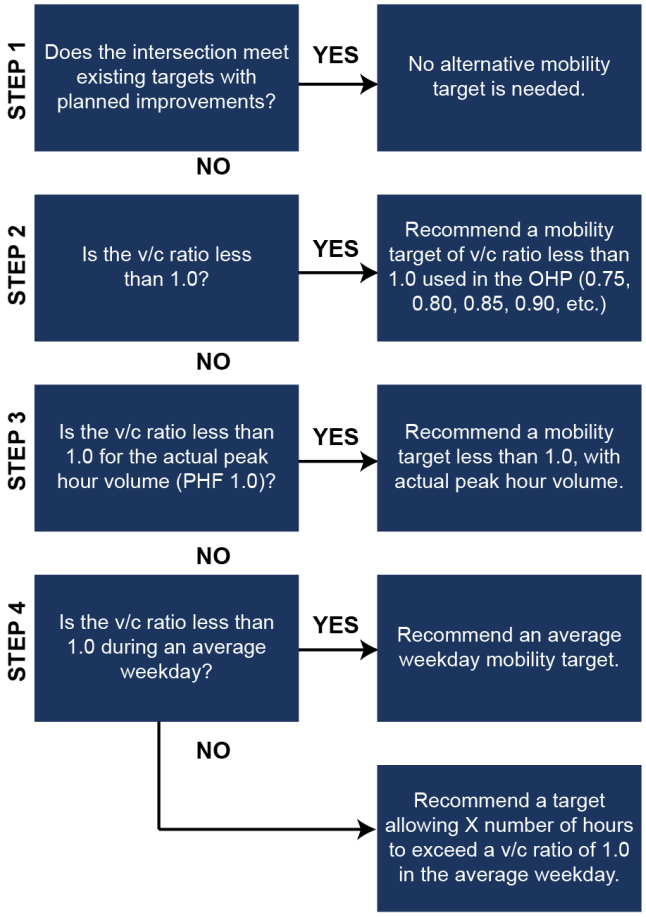
The interim-year analysis was conducted using the ODOT APM procedures. Using the interpolated volumes for year 2030, the southbound ramp intersection is expected to operate at an intersection critical v/c ratio of 0.81, and the northbound ramp intersection is expected to operate at an intersection critical v/c ratio of 0.85. Therefore, the year the northbound ramp intersection is expected to exceed the OHP mobility target of a v/c ratio of 0.85 is approximately 2029 or 2030. The southbound ramp intersection is expected to exceed the OHP mobility target by approximately 2032 or 2033. The Attachments B and C summarize the Synchro analysis sheets and intersection critical v/c calculations for the interim-years (2030 and 2032) and forecast year 2043, respectively.

Alternative Mobility Targets

Based on currently projected funding availability, the necessary funding for construction by 2043 of the interchange concepts identified and evaluated in TM #7 might not be available. Therefore, it is expected that each of the ramp intersections will exceed the OHP mobility target without the interchange improvements. Recognizing these funding limitations, the following AMTs are proposed for adoption by the State and Marion County at the interchange ramp terminals in order to reflect the operating conditions for the planning year (2043) horizon.

Alternative Mobility Target Methodology

The development of AMTs follows the methodology established by ODOT in the Operational Notice PB-02 (effective May 2, 2013). The intent of Operational Notice PB-02 was to provide guidance for implementing OHP Policy 1F, Action 1F.3 for situations where it might be appropriate to consider AMTs for measuring mobility. The graphic below is taken from the *Oregon Highway Plan Mobility Policy White Paper* (August 2020), which summarizes the AMT procedure outlined in Operational Notice PB-02.



Determination of Alternative Mobility Targets

The following steps outline the process for determining the AMTs for the two I-5 ramp terminal intersections at Brooklake Road. The process follows the methodology recommended in the ODOT Operational Notice PB-02 described previously. Table 2 summarizes the results of the AMT determination process, and Appendix C provides the related Synchro analysis sheets and intersection critical v/c calculations.

Step 1: Future year 2043 PM peak hour volumes used in the analysis represent the 30th highest hour (30 HV) conditions. The interim planned improvements included in the analysis are traffic signal controls at the two I-5 ramp intersections at Brooklake Road and the widening of Brooklake Road to five lanes between Huff Avenue and the I-5 southbound ramp terminal intersection.

Based on these conditions and following ODOT APM methodology for critical intersection v/c ratio calculations, the southbound ramp terminal intersection is expected to operate at a v/c ratio of 0.88,

and the northbound ramp terminal intersection is expected to operate at a v/c ratio of 0.99. The analysis was conducted for the peak 15 minutes using a Peak Hour Factor[1] (PHF) of 0.95 for the southbound ramp intersection and a PHF of 0.93 for the northbound ramp intersection.

Step 2: Based on the results in Step 1, both ramp terminal intersections are projected to have critical intersection v/c ratios that exceed the currently adopted OHP mobility target of 0.85, but that are less than 1.0. As such, it is recommended that AMTs be established for the two ramp terminal intersections.

Step 3 and Step 4: Not applicable with a v/c ratio from Step 2 that is less than 1.0.

Table 2. Determination of Alternative Mobility Target

Intersection	Control	OHP Mobility Target	Critical Movement	Step 1: With Interim Improvements	Step 2: Is v/c < 1.0?	Step 3: PHF 1.0	Step 4: Average Weekday	Recommended AMT
I-5 SB Ramps at Brooklake Rd	Traffic Signal	0.85	Overall Intersection v/c ratio	0.88	Yes (0.88)	N/A	N/A	**0.90**
I-5 NB Ramps at Brooklake Rd	Traffic Signal	0.85	Overall Intersection v/c ratio	0.99	Yes (0.99)	N/A	N/A	**0.99**

Note: N/A = not applicable, NB = northbound, SB = southbound.

Recommended Alternative Mobility Targets

The two I-5 ramp terminal intersections at the Brooklake Road interchange are forecasted to exceed the OHP mobility target of 0.85 in future year 2043 without the full interchange improvements as proposed in the interchange concepts in TM #7. With the interim improvements of signalization at the two ramp terminal intersections and the planned widening of Brooklake Road between Huff Avenue and the southbound ramps, the two ramp intersections are expected to operate at a v/c ratio of less than 1.0 in 2043 under peak 15-minute conditions and 30th highest hour volumes.

The recommended AMT is 0.90 at the southbound ramp terminal and 0.99 at the northbound ramp terminal, which is consistent with v/c ratio values used in the OHP.

In addition, it is expected that the northbound and southbound ramp terminals with interim improvements will exceed the currently adopted OHP mobility target of 0.85 by approximately 2030 and 2033, respectively.

Attachments:

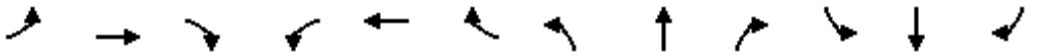
A. Interim Year Volume Development
B. 2030 and 2032 Synchro Outputs
C. 2043 Synchro Outputs
D. HCM6 Calculations

[1] The Peak Hour Factor (PHF) is used to convert the hourly traffic volume into the flow rate that represents the busiest 15 minutes of the peak one hour.

Attachment A. Interim Year Volume Development

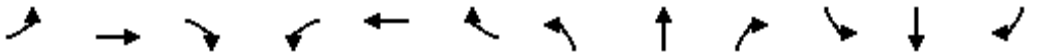
Intersection	Direction	Movement	From TM#3	0.043478	0.086957	0.130435	0.173913	0.217391	0.26087	0.304348	0.347826	0.391304	0.434783	0.478261	0.521739	0.565217	0.608696	0.652174	0.695652	0.73913	0.782609	0.826087	0.869565	0.913043	0.956522	From TM#4 Blanaced From TM#4 Blanaced
			2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
4: I-5 SB at Brooklake		EBL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	EB	EBT	305	311	318	324	330	337	343	349	355	362	368	374	381	387	393	400	406	412	418	425	431	437	444	450
0		EBR	500	511	521	532	543	553	564	575	585	596	607	617	628	638	649	660	670	681	692	702	713	724	734	745
0		WBL	335	342	348	355	362	369	375	382	389	396	402	409	416	423	429	436	443	450	456	463	470	477	483	490
	WB	WBT	390	398	406	413	421	429	437	445	453	460	468	476	484	492	500	507	515	523	531	539	547	554	562	570
		WBR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PM Peak Hour: 3:39 PM-4:39 PM		NBL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PM Peak Hour Used: 12:00 AM-1:00 AM	NB	NBT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Volume Difference: 2409.08695652174		NBR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		SBL	45	46	46	47	48	48	49	50	50	51	52	52	53	53	54	55	55	56	57	57	58	59	59	60
PHF:	SB	SBT	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
#DIV/0!		SBR	310	315	320	326	331	336	341	347	352	357	362	367	373	378	383	388	393	399	404	409	414	420	425	430
1960	***15 min SUM***																									
0	**TEV**		**1885**	**1922**	**1960**	**1997**	**2035**	**2072**	**2110**	**2147**	**2184**	**2222**	**2259**	**2297**	**2334**	**2372**	**2409**	**2447**	**2484**	**2521**	**2559**	**2596**	**2634**	**2671**	**2709**	**2746**
5: I-5 NB at Brooklake		EBL	145	147	149	152	154	156	158	160	162	165	167	169	171	173	175	178	180	182	184	186	188	191	193	195
	EB	EBT	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320
0		EBR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0		WBL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	WB	WBT	485	495	506	516	527	537	548	558	568	579	589	600	610	621	631	642	652	662	673	683	694	704	715	725
		WBR	45	45	46	46	47	47	48	48	48	49	49	50	50	51	51	52	52	52	53	53	54	54	55	55
PM Peak Hour: 3:07 AM-4:07 AM		NBL	240	244	248	252	257	261	265	269	273	277	281	285	290	294	298	302	306	310	314	318	323	327	331	335
PM Peak Hour Used: 12:00 AM-1:00 AM	NB	NBT	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Volume Difference: 1726.21739130435		NBR	240	244	248	252	256	260	263	267	271	275	279	283	287	291	295	299	303	307	310	314	318	322	326	330
		SBL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PHF:	SB	SBT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
#DIV/0!		SBR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1413	***15 min SUM***																									
0	**TEV**		**1361**	**1387**	**1413**	**1439**	**1465**	**1491**	**1518**	**1544**	**1570**	**1596**	**1622**	**1648**	**1674**	**1700**	**1726**	**1752**	**1778**	**1804**	**1831**	**1857**	**1883**	**1909**	**1935**	**1961**

Attachment B. 2030 and 2032 Synchro Outputs



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	370	607	402	468	0	0	0	0	52	1	362
Future Volume (vph)	0	370	607	402	468	0	0	0	0	52	1	362
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1535	1316	1583	1483						1590	1328
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		1535	1316	1583	1483						1590	1328
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	389	639	423	493	0	0	0	0	55	1	381
RTOR Reduction (vph)	0	0	131	0	0	0	0	0	0	0	0	305
Lane Group Flow (vph)	0	389	508	423	493	0	0	0	0	0	56	76
Heavy Vehicles (%)	0%	14%	13%	5%	18%	0%	0%	0%	0%	5%	0%	12%
Turn Type		NA	Perm	Prot	NA					Perm	NA	Perm
Protected Phases		8		7	4						2	
Permitted Phases			8							2		2
Actuated Green, G (s)		35.0	35.0	25.0	64.0						18.0	18.0
Effective Green, g (s)		35.0	35.0	25.0	64.0						18.0	18.0
Actuated g/C Ratio		0.39	0.39	0.28	0.71						0.20	0.20
Clearance Time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Vehicle Extension (s)		2.5	2.5	2.5	2.5						2.5	2.5
Lane Grp Cap (vph)		596	511	439	1054						318	265
v/s Ratio Prot		0.25		c0.27	0.33							
v/s Ratio Perm			c0.39								0.04	c0.06
v/c Ratio		0.65	0.99	0.96	0.47						0.18	0.29
Uniform Delay, d1		22.5	27.4	32.1	5.6						29.9	30.6
Progression Factor		1.00	1.00	1.16	1.18						1.00	1.00
Incremental Delay, d2		5.5	38.2	21.4	0.7						1.2	2.7
Delay (s)		28.0	65.6	58.5	7.4						31.1	33.3
Level of Service		C	E	E	A						C	C
Approach Delay (s)		51.4			31.0			0.0			33.0	
Approach LOS		D			C			A			C	

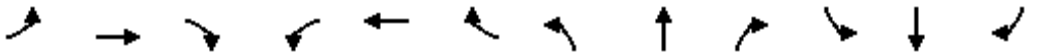
Intersection Summary			
HCM 2000 Control Delay	40.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	370	607	402	468	0	0	0	0	52	1	362
Future Volume (veh/h)	0	370	607	402	468	0	0	0	0	52	1	362
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1559	1573	1682	1504	0				1682	1750	1586
Adj Flow Rate, veh/h	0	389	511	423	493	0				55	1	83
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	14	13	5	18	0				5	0	12
Cap, veh/h	0	611	522	440	1070	0				328	6	269
Arrive On Green	0.00	0.39	0.39	0.55	1.00	0.00				0.20	0.20	0.20
Sat Flow, veh/h	0	1559	1333	1602	1504	0				1638	30	1344
Grp Volume(v), veh/h	0	389	511	423	493	0				56	0	83
Grp Sat Flow(s),veh/h/ln	0	1559	1333	1602	1504	0				1668	0	1344
Q Serve(g_s), s	0.0	18.2	34.0	22.7	0.0	0.0				2.5	0.0	4.7
Cycle Q Clear(g_c), s	0.0	18.2	34.0	22.7	0.0	0.0				2.5	0.0	4.7
Prop In Lane	0.00		1.00	1.00		0.00				0.98		1.00
Lane Grp Cap(c), veh/h	0	611	522	440	1070	0				334	0	269
V/C Ratio(X)	0.00	0.64	0.98	0.96	0.46	0.00				0.17	0.00	0.31
Avail Cap(c_a), veh/h	0	611	522	445	1070	0				334	0	269
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.39	0.39	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	22.2	27.0	19.8	0.0	0.0				29.8	0.0	30.7
Incr Delay (d2), s/veh	0.0	5.0	34.5	17.8	0.6	0.0				1.1	0.0	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	6.9	14.7	6.7	0.2	0.0				1.1	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	27.2	61.5	37.6	0.6	0.0				30.9	0.0	33.7
LnGrp LOS	A	C	E	D	A	A				C	A	C
Approach Vol, veh/h		900			916						139	
Approach Delay, s/veh		46.7			17.7						32.5	
Approach LOS		D			B						C	

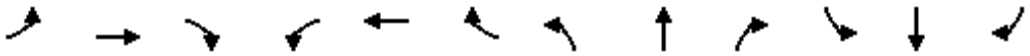
Timer - Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		22.0		68.0			28.7	39.3				
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0				
Max Green Setting (Gmax), s		18.0		64.0			25.0	35.0				
Max Q Clear Time (g_c+I1), s		6.7		0.0			24.7	36.0				
Green Ext Time (p_c), s		0.2		0.0			0.1	0.0				

Intersection Summary												
HCM 6th Ctrl Delay			32.1									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	167	255	0	0	589	49	281	1	279	0	0	0
Future Volume (vph)	167	255	0	0	589	49	281	1	279	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0				
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)	1341	1667			1651	1417	1352	1391				
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)	1341	1667			1651	1417	1352	1391				
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	180	274	0	0	633	53	302	1	300	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	30	0	220	0	0	0	0
Lane Group Flow (vph)	180	274	0	0	633	23	302	81	0	0	0	0
Heavy Vehicles (%)	24%	5%	0%	0%	6%	5%	23%	0%	7%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Perm	NA				
Protected Phases	3	8			4			6				
Permitted Phases						4	6					
Actuated Green, G (s)	14.2	58.0			39.8	39.8	24.0	24.0				
Effective Green, g (s)	14.2	58.0			39.8	39.8	24.0	24.0				
Actuated g/C Ratio	0.16	0.64			0.44	0.44	0.27	0.27				
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.5	2.5			2.5	2.5	2.5	2.5				
Lane Grp Cap (vph)	211	1074			730	626	360	370				
v/s Ratio Prot	c0.13	0.16			c0.38			0.06				
v/s Ratio Perm						0.02	c0.22					
v/c Ratio	0.85	0.26			0.87	0.04	0.84	0.22				
Uniform Delay, d1	36.9	6.8			22.7	14.2	31.2	25.7				
Progression Factor	1.23	0.88			1.00	1.00	1.00	1.00				
Incremental Delay, d2	22.7	0.5			13.2	0.1	20.3	1.4				
Delay (s)	68.2	6.5			35.9	14.3	51.5	27.1				
Level of Service	E	A			D	B	D	C				
Approach Delay (s)		31.0			34.2			39.3			0.0	
Approach LOS		C			C			D			A	

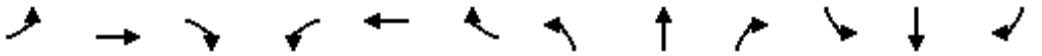
Intersection Summary			
HCM 2000 Control Delay	35.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	167	255	0	0	589	49	281	1	279	0	0	0
Future Volume (veh/h)	167	255	0	0	589	49	281	1	279	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1422	1682	0	0	1668	1682	1436	1750	1654			
Adj Flow Rate, veh/h	180	274	0	0	633	11	302	1	81			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	24	5	0	0	6	5	23	0	7			
Cap, veh/h	201	1084	0	0	753	643	365	5	391			
Arrive On Green	0.30	1.00	0.00	0.00	0.45	0.45	0.27	0.27	0.27			
Sat Flow, veh/h	1355	1682	0	0	1668	1425	1368	18	1468			
Grp Volume(v), veh/h	180	274	0	0	633	11	302	0	82			
Grp Sat Flow(s),veh/h/ln	1355	1682	0	0	1668	1425	1368	0	1486			
Q Serve(g_s), s	11.4	0.0	0.0	0.0	30.2	0.4	18.7	0.0	3.9			
Cycle Q Clear(g_c), s	11.4	0.0	0.0	0.0	30.2	0.4	18.7	0.0	3.9			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		0.99			
Lane Grp Cap(c), veh/h	201	1084	0	0	753	643	365	0	396			
V/C Ratio(X)	0.89	0.25	0.00	0.00	0.84	0.02	0.83	0.00	0.21			
Avail Cap(c_a), veh/h	226	1084	0	0	753	643	365	0	396			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.71	0.71	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	30.9	0.0	0.0	0.0	21.8	13.7	31.1	0.0	25.6			
Incr Delay (d2), s/veh	23.6	0.4	0.0	0.0	11.0	0.0	19.1	0.0	1.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.3	0.1	0.0	0.0	12.6	0.1	7.7	0.0	1.4			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.5	0.4	0.0	0.0	32.8	13.7	50.1	0.0	26.8			
LnGrp LOS	D	A	A	A	C	B	D	A	C			
Approach Vol, veh/h		454			644			384				
Approach Delay, s/veh		21.8			32.5			45.1				
Approach LOS		C			C			D				

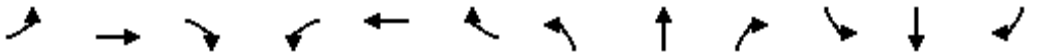
Timer - Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			17.4	44.6		28.0		62.0				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			15.0	39.0		24.0		58.0				
Max Q Clear Time (g_c+I1), s			13.4	2.4		20.7		0.0				
Green Ext Time (p_c), s			0.1	0.1		0.3		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			32.5									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	383	628	416	484	0	0	0	0	53	1	373
Future Volume (vph)	0	383	628	416	484	0	0	0	0	53	1	373
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1535	1316	1583	1483						1590	1328
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		1535	1316	1583	1483						1590	1328
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	403	661	438	509	0	0	0	0	56	1	393
RTOR Reduction (vph)	0	0	131	0	0	0	0	0	0	0	0	314
Lane Group Flow (vph)	0	403	530	438	509	0	0	0	0	0	57	79
Heavy Vehicles (%)	0%	14%	13%	5%	18%	0%	0%	0%	0%	5%	0%	12%
Turn Type		NA	Perm	Prot	NA					Perm	NA	Perm
Protected Phases		8		7	4						2	
Permitted Phases			8							2		2
Actuated Green, G (s)		36.0	36.0	24.0	64.0						18.0	18.0
Effective Green, g (s)		36.0	36.0	24.0	64.0						18.0	18.0
Actuated g/C Ratio		0.40	0.40	0.27	0.71						0.20	0.20
Clearance Time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Vehicle Extension (s)		2.5	2.5	2.5	2.5						2.5	2.5
Lane Grp Cap (vph)		614	526	422	1054						318	265
v/s Ratio Prot		0.26		c0.28	0.34							
v/s Ratio Perm			c0.40								0.04	c0.06
v/c Ratio		0.66	1.01	1.04	0.48						0.18	0.30
Uniform Delay, d1		22.0	27.0	33.0	5.7						29.9	30.6
Progression Factor		1.00	1.00	0.85	0.34						1.00	1.00
Incremental Delay, d2		5.4	40.9	39.7	0.7						1.2	2.8
Delay (s)		27.4	67.9	67.8	2.7						31.1	33.5
Level of Service		C	E	E	A						C	C
Approach Delay (s)		52.6			32.8			0.0			33.2	
Approach LOS		D			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	41.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

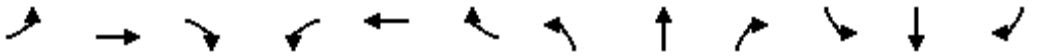


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	383	628	416	484	0	0	0	0	53	1	373
Future Volume (veh/h)	0	383	628	416	484	0	0	0	0	53	1	373
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1559	1573	1682	1504	0				1682	1750	1586
Adj Flow Rate, veh/h	0	403	533	438	509	0				56	1	95
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	14	13	5	18	0				5	0	12
Cap, veh/h	0	624	533	427	1070	0				328	6	269
Arrive On Green	0.00	0.40	0.40	0.09	0.23	0.00				0.20	0.20	0.20
Sat Flow, veh/h	0	1559	1333	1602	1504	0				1639	29	1344
Grp Volume(v), veh/h	0	403	533	438	509	0				57	0	95
Grp Sat Flow(s),veh/h/ln	0	1559	1333	1602	1504	0				1668	0	1344
Q Serve(g_s), s	0.0	18.8	36.0	24.0	26.2	0.0				2.5	0.0	5.5
Cycle Q Clear(g_c), s	0.0	18.8	36.0	24.0	26.2	0.0				2.5	0.0	5.5
Prop In Lane	0.00		1.00	1.00		0.00				0.98		1.00
Lane Grp Cap(c), veh/h	0	624	533	427	1070	0				334	0	269
V/C Ratio(X)	0.00	0.65	1.00	1.03	0.48	0.00				0.17	0.00	0.35
Avail Cap(c_a), veh/h	0	624	533	427	1070	0				334	0	269
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.36	0.36	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	21.8	27.0	41.0	20.0	0.0				29.8	0.0	31.0
Incr Delay (d2), s/veh	0.0	5.1	38.9	32.8	0.5	0.0				1.1	0.0	3.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.1	15.9	14.0	10.4	0.0				1.1	0.0	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	27.0	65.9	73.9	20.5	0.0				30.9	0.0	34.6
LnGrp LOS	A	C	E	F	C	A				C	A	C
Approach Vol, veh/h		936			947						152	
Approach Delay, s/veh		49.2			45.2						33.2	
Approach LOS		D			D						C	

Timer - Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		22.0		68.0			28.0	40.0				
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0				
Max Green Setting (Gmax), s		18.0		64.0			24.0	36.0				
Max Q Clear Time (g_c+I1), s		7.5		0.0			26.0	38.0				
Green Ext Time (p_c), s		0.2		0.0			0.0	0.0				

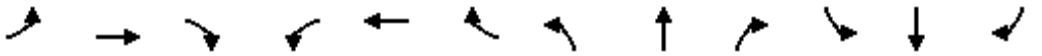
Intersection Summary												
HCM 6th Ctrl Delay			46.1									
HCM 6th LOS			D									

Attachment C. 2043 Synchro Outputs



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	450	745	490	570	0	0	0	0	60	1	430
Future Volume (vph)	0	450	745	490	570	0	0	0	0	60	1	430
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1535	1316	1583	1483						1590	1328
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		1535	1316	1583	1483						1590	1328
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	474	784	516	600	0	0	0	0	63	1	453
RTOR Reduction (vph)	0	0	308	0	0	0	0	0	0	0	0	308
Lane Group Flow (vph)	0	474	476	516	600	0	0	0	0	0	64	145
Heavy Vehicles (%)	0%	14%	13%	5%	18%	0%	0%	0%	0%	5%	0%	12%
Turn Type		NA	Perm	Prot	NA					Perm	NA	Perm
Protected Phases		8		7	4						2	
Permitted Phases			8							2		2
Actuated Green, G (s)		40.2	40.2	36.8	81.0						21.0	21.0
Effective Green, g (s)		40.2	40.2	36.8	81.0						21.0	21.0
Actuated g/C Ratio		0.37	0.37	0.33	0.74						0.19	0.19
Clearance Time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Vehicle Extension (s)		2.5	2.5	2.5	2.5						2.5	2.5
Lane Grp Cap (vph)		560	480	529	1092						303	253
v/s Ratio Prot		0.31		c0.33	0.40							
v/s Ratio Perm			c0.36								0.04	c0.11
v/c Ratio		0.85	0.99	0.98	0.55						0.21	0.57
Uniform Delay, d1		32.1	34.7	36.2	6.4						37.5	40.4
Progression Factor		1.00	1.00	1.36	1.13						1.00	1.00
Incremental Delay, d2		14.6	39.2	13.7	0.5						1.6	9.1
Delay (s)		46.7	73.9	62.9	7.7						39.1	49.5
Level of Service		D	E	E	A						D	D
Approach Delay (s)		63.7			33.2			0.0			48.2	
Approach LOS		E			C			A			D	

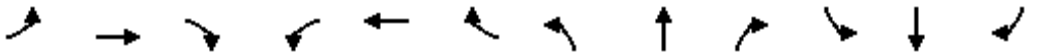
Intersection Summary			
HCM 2000 Control Delay	49.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	93.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	450	745	490	570	0	0	0	0	60	1	430
Future Volume (veh/h)	0	450	745	490	570	0	0	0	0	60	1	430
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1559	1573	1682	1504	0				1682	1750	1586
Adj Flow Rate, veh/h	0	474	567	516	600	0				63	1	142
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	14	13	5	18	0				5	0	12
Cap, veh/h	0	578	494	528	1108	0				313	5	257
Arrive On Green	0.00	0.37	0.37	0.66	1.00	0.00				0.19	0.19	0.19
Sat Flow, veh/h	0	1559	1333	1602	1504	0				1642	26	1344
Grp Volume(v), veh/h	0	474	567	516	600	0				64	0	142
Grp Sat Flow(s),veh/h/ln	0	1559	1333	1602	1504	0				1668	0	1344
Q Serve(g_s), s	0.0	30.3	40.8	34.0	0.0	0.0				3.6	0.0	10.5
Cycle Q Clear(g_c), s	0.0	30.3	40.8	34.0	0.0	0.0				3.6	0.0	10.5
Prop In Lane	0.00		1.00	1.00		0.00				0.98		1.00
Lane Grp Cap(c), veh/h	0	578	494	528	1108	0				318	0	257
V/C Ratio(X)	0.00	0.82	1.15	0.98	0.54	0.00				0.20	0.00	0.55
Avail Cap(c_a), veh/h	0	578	494	539	1108	0				318	0	257
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.11	0.11	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	31.3	34.6	18.4	0.0	0.0				37.4	0.0	40.3
Incr Delay (d2), s/veh	0.0	12.4	88.1	8.4	0.2	0.0				1.4	0.0	8.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	12.6	24.4	6.5	0.1	0.0				1.5	0.0	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	43.7	122.7	26.7	0.2	0.0				38.9	0.0	48.6
LnGrp LOS	A	D	F	C	A	A				D	A	D
Approach Vol, veh/h		1041			1116						206	
Approach Delay, s/veh		86.7			12.5						45.6	
Approach LOS		F			B						D	

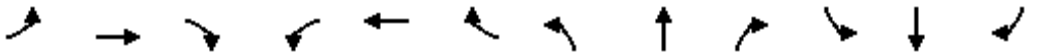
Timer - Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		25.0		85.0			40.2	44.8				
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0				
Max Green Setting (Gmax), s		21.0		81.0			37.0	40.0				
Max Q Clear Time (g_c+I1), s		12.5		0.0			36.0	42.8				
Green Ext Time (p_c), s		0.4		0.0			0.3	0.0				

Intersection Summary												
HCM 6th Ctrl Delay			48.1									
HCM 6th LOS			D									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	190	320	0	0	725	55	335	1	330	0	0	0
Future Volume (vph)	190	320	0	0	725	55	335	1	330	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0				
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)	1341	1667			1651	1417	1352	1391				
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)	1341	1667			1651	1417	1352	1391				
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	204	344	0	0	780	59	360	1	355	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	26	0	258	0	0	0	0
Lane Group Flow (vph)	204	344	0	0	780	33	360	98	0	0	0	0
Heavy Vehicles (%)	24%	5%	0%	0%	6%	5%	23%	0%	7%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Perm	NA				
Protected Phases	3	8			4			6				
Permitted Phases						4	6					
Actuated Green, G (s)	16.0	72.0			52.0	52.0	30.0	30.0				
Effective Green, g (s)	16.0	72.0			52.0	52.0	30.0	30.0				
Actuated g/C Ratio	0.15	0.65			0.47	0.47	0.27	0.27				
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.5	2.5			2.5	2.5	2.5	2.5				
Lane Grp Cap (vph)	195	1091			780	669	368	379				
v/s Ratio Prot	c0.15	0.21			c0.47			0.07				
v/s Ratio Perm						0.02	c0.27					
v/c Ratio	1.05	0.32			1.00	0.05	0.98	0.26				
Uniform Delay, d1	47.0	8.3			29.0	15.7	39.7	31.3				
Progression Factor	1.15	1.08			1.00	1.00	1.00	1.00				
Incremental Delay, d2	63.9	0.5			32.2	0.1	41.8	1.6				
Delay (s)	117.8	9.4			61.2	15.8	81.4	32.9				
Level of Service	F	A			E	B	F	C				
Approach Delay (s)		49.8			58.0			57.3			0.0	
Approach LOS		D			E			E			A	

Intersection Summary			
HCM 2000 Control Delay	55.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	93.2%	ICU Level of Service	F
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 (veh/h)	190	320	0	0	725	55	335	1	330	0	0	0
Future Volume (veh/h)	190	320	0	0	725	55	335	1	330	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1422	1682	0	0	1668	1682	1436	1750	1654			
Adj Flow Rate, veh/h	204	344	0	0	780	32	360	1	92			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	24	5	0	0	6	5	23	0	7			
Cap, veh/h	197	1101	0	0	789	674	373	4	401			
Arrive On Green	0.29	1.00	0.00	0.00	0.47	0.47	0.27	0.27	0.27			
Sat Flow, veh/h	1355	1682	0	0	1668	1425	1368	16	1470			
Grp Volume(v), veh/h	204	344	0	0	780	32	360	0	93			
Grp Sat Flow(s),veh/h/ln	1355	1682	0	0	1668	1425	1368	0	1485			
Q Serve(g_s), s	16.0	0.0	0.0	0.0	50.9	1.3	28.6	0.0	5.3			
Cycle Q Clear(g_c), s	16.0	0.0	0.0	0.0	50.9	1.3	28.6	0.0	5.3			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		0.99			
Lane Grp Cap(c), veh/h	197	1101	0	0	789	674	373	0	405			
V/C Ratio(X)	1.04	0.31	0.00	0.00	0.99	0.05	0.97	0.00	0.23			
Avail Cap(c_a), veh/h	197	1101	0	0	789	674	373	0	405			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.42	0.42	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	39.0	0.0	0.0	0.0	28.7	15.6	39.5	0.0	31.0			
Incr Delay (d2), s/veh	51.0	0.3	0.0	0.0	29.5	0.1	38.6	0.0	1.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	7.0	0.1	0.0	0.0	24.8	0.4	13.1	0.0	2.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	90.0	0.3	0.0	0.0	58.2	15.8	78.1	0.0	32.4			
LnGrp LOS	F	A	A	A	E	B	E	A	C			
Approach Vol, veh/h		548			812			453				
Approach Delay, s/veh		33.7			56.6			68.7				
Approach LOS		C			E			E				
Timer - Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			20.0	56.0		34.0		76.0				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			16.0	52.0		30.0		72.0				
Max Q Clear Time (g_c+I1), s			18.0	3.3		30.6		0.0				
Green Ext Time (p_c), s			0.0	0.2		0.0		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			52.7									
HCM 6th LOS			D									

Attachment D. HCM6 Calculations

Signalized Intersection Operations - "Hand" Calculations

Xc = Sum of critical flow ratios * C/(C-L)

C Cycle Length

L Lost time per phase 4s

Total Lost time 16 s

2030

SB Ramp				NB Ramp			
	Adj. Flow	Sat. Flow			Adj. Flow	Sat. Flow	
40 **EBR**	508	1333	0.381095	50 **EBL**	180	1355	0.132841
WBL	423	1602	0.264045	**WBT**	633	1668	0.379496
SBR	76	1344	0.056548	**NBL**	302	1368	0.22076
			0.701688				0.733098
c	90			c	90		
L	12			L	12		
0.81 C HCM 6	0.82 D HCM 2000			0.85 C HCM 6	0.86 D HCM 2000		

2043

SB Ramp				NB Ramp			
	Adj. Flow	Sat. Flow			Adj. Flow	Sat. Flow	
40 **EBR**	476	1333	0.357089	50 **EBL**	204	1355	0.150554
WBL	516	1602	0.322097	**WBT**	780	1668	0.467626
SBR	145	1344	0.107887	**NBL**	360	1368	0.263158
			0.787074				0.881337
c	110			c	110		
L	12			L	12		
0.88 D HCM 6	0.89 D HCM 2000			0.99 D HCM 6	1.00 E HCM 2000		

Signalized Intersection Operations - "Hand" Calculations

Xc = Sum of critical flow ratios * C/(C-L)

C Cycle Length

L Lost time per phase 4s

Total Lost time 16 s

2032

SB Ramp					NB Ramp			
		Adj. Flow	Sat. Flow			Adj. Flow	Sat. Flow	
40	EBR	530	1333	0.397599				
	WBL	438	1602	0.273408				
	SBR	79	1344	0.05878				
				0.729787				
	c	90						
	L	12						
	0.84 D HCM 6	0.85 D HCM 2000						

2043

SB Ramp					NB Ramp			
		Adj. Flow	Sat. Flow			Adj. Flow	Sat. Flow	

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9 DRAFT ACCESS MANAGEMENT KEY PRINCIPLES

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I-5: BROOKS INTERCHANGE AREA MANAGEMENT PLAN (EXIT 263)

Draft Access Management Key Principles for Review

December 1, 2021

Dear Property Owner/Business Owner,

The Oregon Department of Transportation (ODOT) is developing an Interchange Area Management Plan (IAMP) for the I-5 Exit 263 (Brooks) Interchange. The study area extends west and east of the interchange to include Brooklake Road and connecting roads and driveways between River Road and Portland Road (OR 99E). The IAMP will identify a concept for a new interchange and installing new local access roads to consolidate approaches in the critical operation area of the interchange. The IAMP will also identify interim improvements to address safety and congestion at the ramp terminals. The Brooks IAMP is a long-term (20+ years) transportation plan that applies Oregon Highway Plan (OHP) policies to the interchange. The State's access management rule (OAR 734-051-7010) defines the ODOT's role in managing access to state highways to maintain functional use and safety and to preserve the public's investment.

ODOT must involve affected property owners and businesses, local governments, stakeholders and the public when developing a facility plan such as the IAMP. When a facility plan identifies the need to modify, relocate, or close existing private approaches ODOT must develop key principles as part of the IAMP planning process. The key principles will support the overall IAMP goals and objectives but will be more specifically focused on the needs of highway access to the abutting properties. ODOT also must include an opportunity for affected property owners that abut the highway to review the key principles.

The purpose of this letter is to notify you that the draft key principles for the I-5: Brooks Interchange Area Management Plan (Exit 263) are ready for your review.

Draft Key Principles

The Brooks IAMP goals and objectives (Attachment A) were used to guide development of the draft key principles. These principles will be used to evaluate how abutting properties may retain or obtain access to Brooklake Road and I-5 during and after implementation of the IAMP and construction of the proposed improvements. For purposes of these draft key principles, the operational area of IAMP is defined as the segment of Brooklake Road from approximately 1/4-mile west of the southbound ramp terminal to 1/4-mile east of the northbound ramp terminal.

Draft Key Principles

1. Protect the public investment and long-term safety/operations of the interchange and Brooklake Road by reducing or eliminating turn conflicts within the operational area of the interchange.
2. Follow access management guidance in the Marion County Rural TSP Brooks Interchange Area Sub-Area Plan.[1]

[1] https://www.co.marion.or.us/PW/Engineering/rtsp/Documents/chapter12sub_areaplans.pdf

3. Plan for future management of the interchange and adjacent existing and planned land uses.
4. Assist phased construction of interchange improvements with minimal reconstruction.
5. Move toward meeting the ODOT access spacing standards.[2]
6. Ensure that the location and design of approaches are safe, they reflect the unique needs of each property, and they will serve current and anticipated future traffic.
7. Ensure that new local access roads are designed to an appropriate standard to address operations and safety.

Review Process

As a potentially affected property owner you may request a review up to the time of plan adoption or finalization, however the time to review and/or comment on the draft key principles is limited so that the department can finalize the key principles and apply them throughout the plan development. The finalization of the draft key principles will be no less than 20 days from this notice. After finalization of the key principles, reviews shall be focused on the application of the key principles, termed the methodology. Please review the draft key principles above.

- If the draft key principles are acceptable to you, then no further action is needed.
- If after your review you have questions or wish to provide comments on the draft key principles, please contact Dan Fricke, ODOT Project Manager. See below for contact information.

Potentially affected property owner reviews may be formal or informal, the formal review process is described in Attachment B. If you wish to request a formal review, please submit your request in writing, including your mailing address, no later than December 22, 2021 to Dan Fricke, ODOT Project Manager. See below for mailing address. Affected property owners will continue to have opportunities to review design decisions impacting private road approaches and will continue to have a right to request a formal review up to the time of the facility plan adoption.

Thank you for taking the time to review the I-5: Brooks Interchange Area Management Plan (Exit 263) draft key principles. You can stay up to date and engaged by visiting our Project website: https://www.oregon.gov/odot/projects/pages/project-details.aspx?project=BrooksIAMP

Sincerely,

Daniel L. Fricke
Senior Transportation Planner
Oregon Department of Transportation, Region 2
455 Airport Road SE, Building B
Salem, OR 97301-5395

Phone: 503-507-0391
E-mail: daniel.l.fricke@odot.oregon.gov

[2] https://www.oregon.gov/ODOT/Engineering/Doc_TechnicalGuidance/AM13-02b.pdf

Attachment A

I-5: Brooks Interchange Area Management Plan (Exit 263) Goal and Objectives

Goal

The primary goal of the Brooks IAMP is to develop a plan for improvements that can be implemented over time to address the safety, operational, and capacity challenges while maintaining efficient movement of passenger and freight traffic through the I-5/ Brooks interchange area. The objectives are summarized below:

Objectives

- Protect the function of the Interchange and Brooklake Road.
- Develop concepts to improve safety and maximize operational efficiency of the freeway and interchange to address existing and future needs.
- Plan for future management of the interchange and adjacent land uses with the interchange management area.
- Develop an access management plan that provides for safe and acceptable operations on the transportation network and that moves toward meeting the access spacing standards prescribed in the OHP.
- Develop strategies that can be implemented in phases and limit “throw-away” improvements to the maximum extent feasible.

Attachment B

Formal Review Process Details

Eligibility to Request Formalized Review

Oregon Administrative Rule (OAR) 734-051-7010 (2)(b) states that real property owners abutting the highway have an opportunity to review key principles and methodology for highway facility plans. Please note that only real property owners (i.e., owners of land and buildings) may request a more formalized review of the draft key principles.

Formal Review Process

If you are a real property owner, you may request a formal review of the draft key principles through either a Collaborative Discussion or Dispute Review Board. These processes are described below.

If you wish to request a formal review, please submit your request in writing, including your mailing address, no later than December 7, 2021, to:

Dan Fricke, ODOT Project Manager
Oregon Department of Transportation Region 2
455 Airport Road, Building B
Salem, OR 97301-5395

Phone: 503-507-0391
E-mail: daniel.l.fricke@odot.oregon.gov

Collaborative Discussion

If a property owner requests a Collaborative Discussion, it will take place within 45 calendar days from the date of written request, unless both parties agree to a time extension in writing. If ODOT receives more than one request for a Collaborative Discussion, ODOT may consider them individually, combine them into a single discussion, or group them into several topic-specific discussions.

The ODOT Region Manager may include any ODOT staff they find appropriate or necessary in the Collaborative Discussion. The Region Manager will also invite appropriate local government representatives, and may include other highway users, economic development representatives, or other parties which the Region Manager believes will contribute to finding appropriate solutions.

The Region Manager will consider the information presented as part of the Collaborative Discussion and make a final decision. Within 21 calendar days following the Collaborative Decision, the Region Manager will notify the property owner in writing of the final decision to:

- Modify the key principles and methodology; or
- Finalize the key principles and methodology without modifications.

Dispute Review Board

If a property owner requests a Dispute Review Board, it will take place within 45 calendar days from the date of written request, unless both parties agree to a time extension in writing. Only one Dispute Review Board process may be conducted for each facility plan.

The Dispute Review Board will include the ODOT Director, or designee who is familiar with the project and location; a representative of the local jurisdiction; an independent professional engineer with

education or experience in traffic engineering; and a representative from the economic or business sector. Members of the Dispute Review Board will be selected by the ODOT Region Manager.

The Dispute Review Board will provide its recommendation to the ODOT Director within 14 calendar days following the conclusion of its deliberations. The Director will consider the recommendations of the Dispute Review Board and make a final decision within 21 calendar days. The decision of the Director may not be appealed. The Director will notify in writing all parties participating in the review of the final decision to either:

- Modify the key principles and methodology; or
- Finalize the key principles and methodology without modifications.

Note – A property owner who requests review of the key principles and methodology through a Collaborative Discussion may also request review by a Dispute Review Board, after completion of the Collaborative Discussion. The request for review by a Dispute Review Board must be made no later than 21 calendar days after the final decision is issued by the Region Manager following the Collaborative Discussion. If a property owner requests review by a Dispute Review Board (without first conducting a Collaborative Discussion), the final decision of the ODOT Director following the Dispute Review Board is the final decision. The property owner may not request a Collaborative Discussion after Dispute Review Board review.

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10 MARION COUNTY COMPATIBILITY LETTER

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