City of Oregon City

625 Center Street
Oregon City, OR 97045
503-657-0891

Meeting Agenda

City Commission

Dan Holladay, Mayor
Carol Pauli, Commission President
Brian Shaw, Rocky Smith, Jr., Daphne Wuest

Tuesday, January 13, 2015 | **5:30 PM** | **Commission Chambers**

Work Session

1. Convene Work Session and Roll Call

2. Future Agenda Items

The Commission's adopted goals and available staff resources shall be considered when recommending future agenda items. The Commission may add an item to a future agenda with consensus of the Commission.

3. Discussion Items:

3a. 15-037 Library Project Update and Presentation

Sponsors: Library Director Maureen Cole
Attachments: Staff Report

Presentation to City Commission Work Session

Transportation Impact Analysis and Parking Study (Transporation Study)
Appendix to the Transportation Study

4. City Manager's Report

5. Adjournment

Citizen Comments: The following guidelines are given for citizens presenting information or raising issues relevant to the City but not listed on the agenda.
**Complete a Comment Card prior to the meeting and submit it to the City Recorder.*
**When the Mayor calls your name, proceed to the speaker table and state your name and city of residence into the microphone.*
**Each speaker is given 3 minutes to speak. To assist in tracking your speaking time, refer to the timer on the table.*
**As a general practice, the City Commission does not engage in discussion with those making comments.*
**Electronic presentations are permitted, but shall be delivered to the City Recorder 48 hours in advance of the meeting.*

Agenda Posted at City Hall, Pioneer Community Center, Library, City Web site.
Video Streaming & Broadcasts: The meeting is streamed live on Internet on the Oregon City's Web site at www.orcity.org and available on demand following the meeting. The meeting can be viewed live on

Willamette Falls Television on channels 23 and 28 for Oregon City area residents. The meetings are also rebroadcast on WFMC. Please contact WFMC at 503-650-0275 for a programming schedule.

City Hall is wheelchair accessible with entry ramps and handicapped parking located on the east side of the building. Hearing devices may be requested from the City Recorder prior to the meeting. Disabled individuals requiring other assistance must make their request known 48 hours preceding the meeting by contacting the City Recorder's Office at 503-657-0891.

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Staff Report

File Number: 15-037

Agenda Date: 1/13/2015

Status: Agenda Ready

To: City Commission

Agenda #: 3a.

From: Library Director Maureen Cole

File Type: Report

SUBJECT:
Library Project Update and Presentation

RECOMMENDED ACTION (Motion):
Discussion

BACKGROUND:
On May 20, 2014, the Bond Measure for the library project was approved by voters. On October 15, 2014, the City Commission of Oregon City selected the two story option as their choice for the addition to the Carnegie Library in Carnegie Library Park.

Last month, on December 10, the City Commission reviewed two options for a two story addition at their regular work session. There was consensus for a preference for the more traditional, 'Atrium' option during the current Schematic Design Phase. Both of these options were also presented to the Library Board the following evening. Opinions were less unanimous but ultimately the Board decided to support the City Commission's preference. Since that time, the Atrium concept has been developed, revised and refined. There has also been a lot of work on the interior of the building. SE /A, Architects for the project, will provide the latest evolution of this work in their presentation on January 13 to update and get feedback from the City Commission.

Since the last City Commission meeting:
-The Library Director met with the Library Board which supports the City Commission preference

-A 'thank you' to Library supporters was held in conjunction with the Open House for outgoing Mayor and Commissioners

-DKS completed the Transportation Study; it is attached

-The bond loan was completed and the project received $6,000,000.00; the interest rate was about 1% lower than previously projected

-The Library Director met with the McLoughlin Neighborhood Association for its official project meeting

The Library Project held its land use pre-app meeting with City departments on Tuesday, January 6, 2015. During this required meeting, all city land use codes and requirements are reviewed so that when the public review process starts all parties are aware of required elements of the project and appropriately prepared to respond.

Over the next couple of weeks, SE /A will align information and design elements to respond to code requirements and guidance received at the pre-app meeting in order to complete the Schematic Design Phase. Upon completion, the Project will request approval by the City Commission on January 21 to move from the Schematic Design Phase into the Design Development Phase and commence the public review process.

Public review includes two parts which run concurrently: review with the Historic Review Board and review with the Planning Department of the City. The review process documents will be submitted on January 23 in order to be considered for the February Historic Review Board meeting.

Over the coming weeks, the Architects' work is in the Design Development Phase. Design Development is one of two major design phases remaining, prior to construction. During the Design Development Phase more detailed plans, sections, elevations, typical construction details, and diagrammatic layouts of building systems are prepared to fix and describe the size and character of the project as to architectural, structural, mechanical and electrical systems, etc. Design Development documents also include outline specifications that identify major materials and systems and establish in general their quality levels.

Following Design Development will be the final design phase, Construction Documents. The Construction Documents created during this phase will further develop the approved Design Development Documents and will consist of drawings and specifications setting forth in great detail the quality levels of materials and systems and other requirements for construction of the project.

Moving from each phase to the next requires approval of the client; therefore approval from the City Commission to move from the Design Development Phase into the Construction Document Phase will be requested on March 18. After that, and with the successful conclusion of the public review and permitting process, a request to proceed to construction will be made to the City Commission on July 15.

Summary of dates:
Jan 21: Request approval to move from Schematic Design into Design Development; request approval to start public review process (2 parts: historic and land use)

Jan 23: Submit documents for review process with both Historic Review Board and City

Mar 18: Request approval from City Commission to move into Construction Document Phase

Jul 15: Request approval from City Commission to start construction

Other important milestones will take place during these next few months as well. Cost

estimates will be prepared at or near the conclusion of each phase. The Schematic Design cost estimate will be ready in mid-February, the Design Development estimate in early April, and a 50% Construction Documents estimate in late May. Establishment of the GMP (Guaranteed Maximum Price) will take place in June. The Library Board and the City Commission will be updated about this progress regularly.

Staff will return on January 21 to ask the City Commission to approve moving from Schematic Design into Design Development and approve moving into the public review process.

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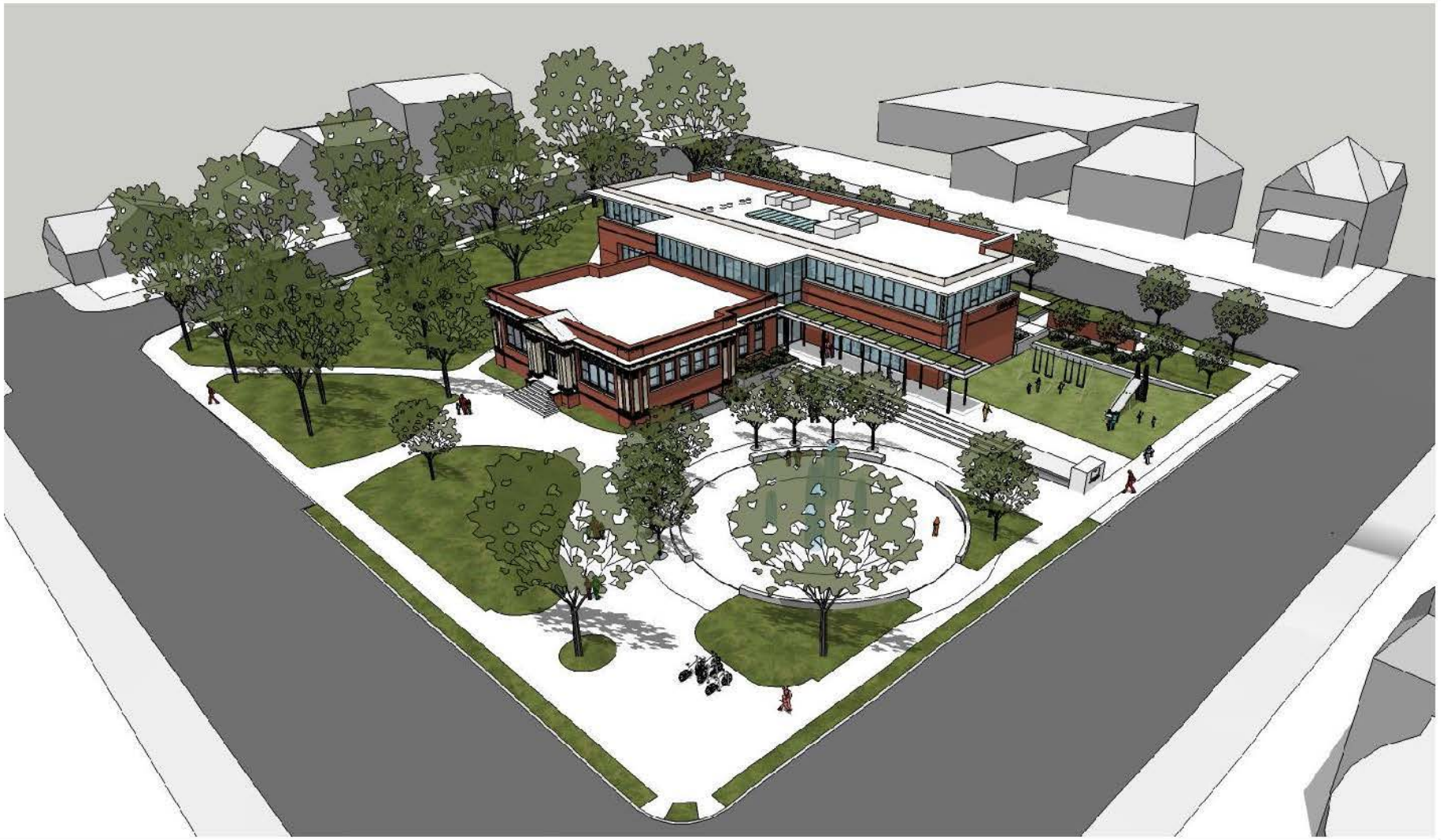
Oregon City Carnegie Library & Addition

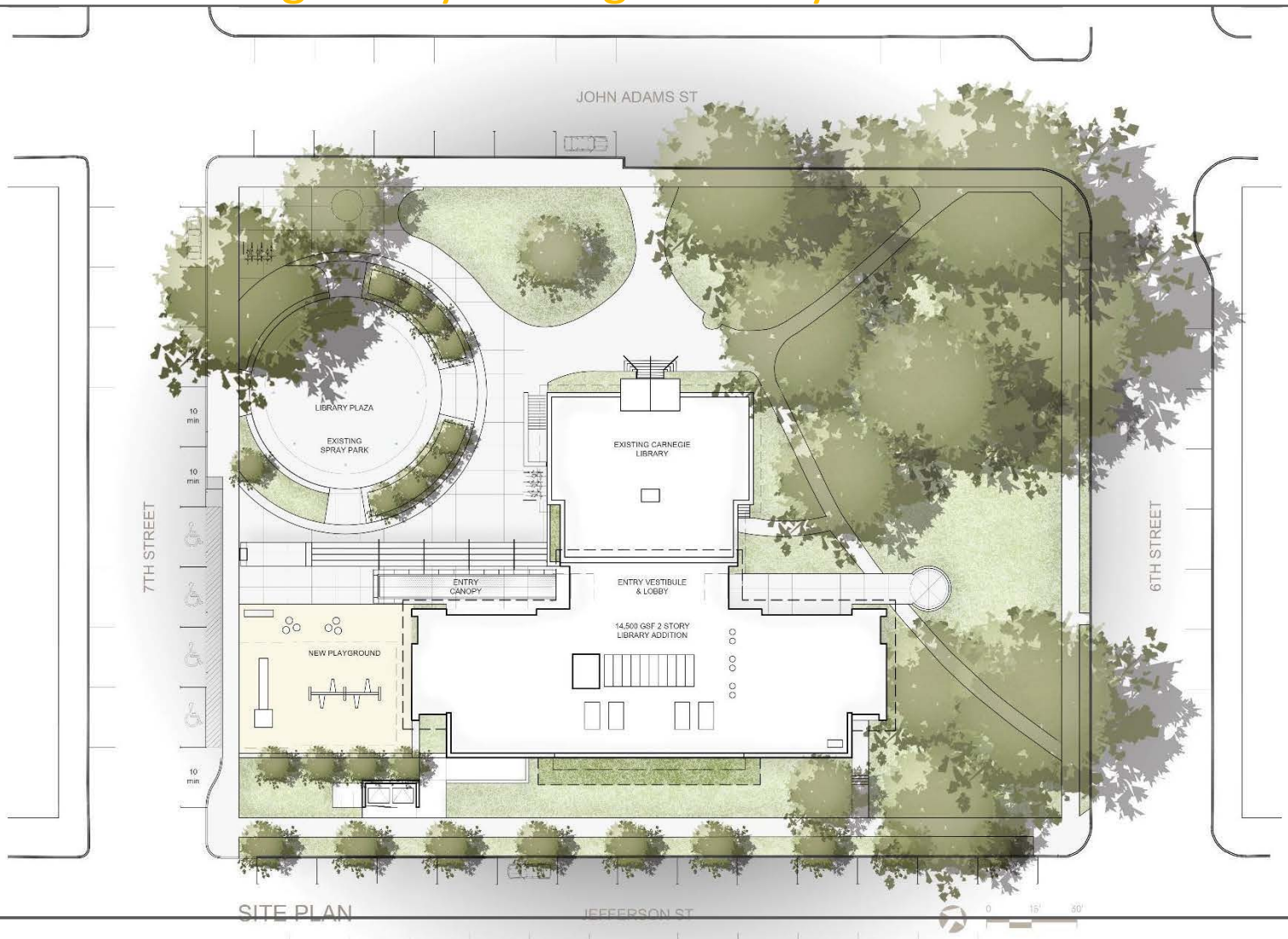


Schematic Design Presentation

January 08, 2015

SCOTT|EDWARDS ARCHITECTURE LLP

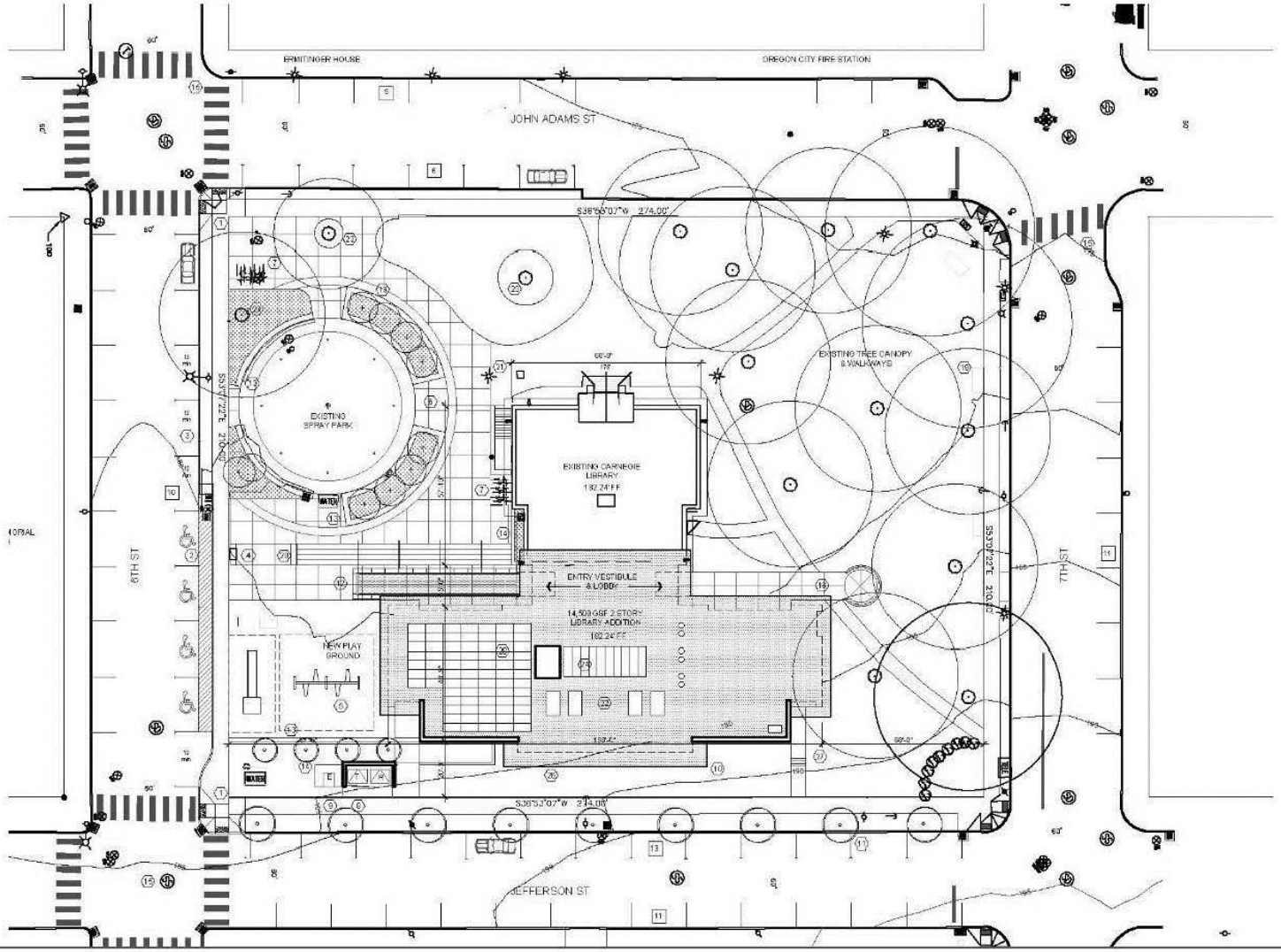
Oregon City Carnegie Library & Addition



Site Plan

S|E A
SCOTT|EDWARDS ARCHITECTURE LLP

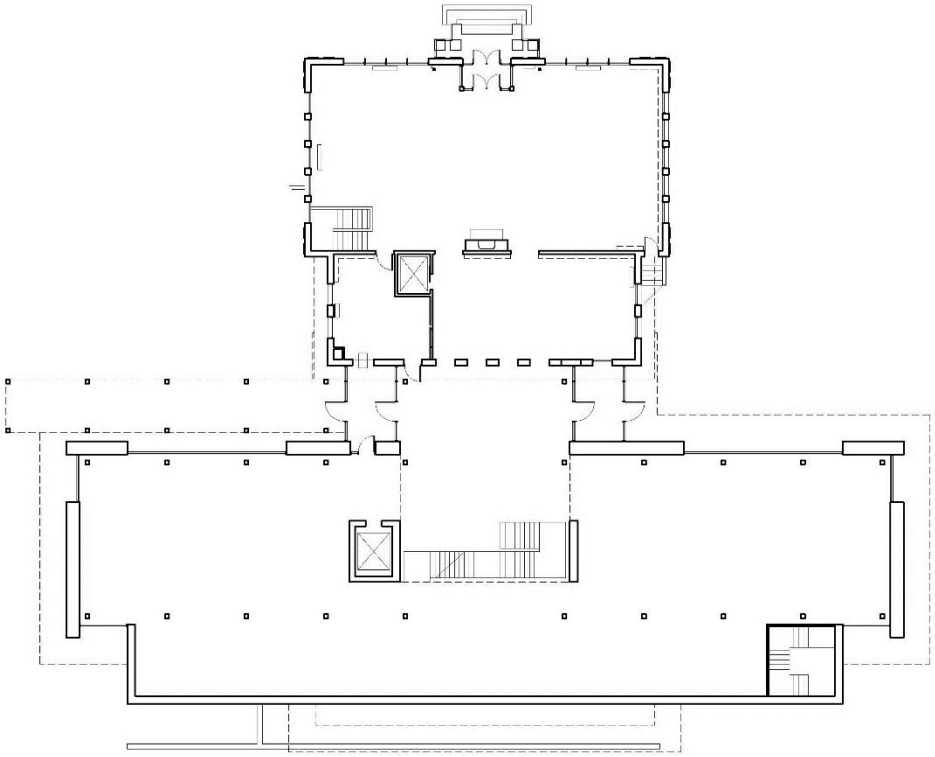
Oregon City Carnegie Library & Addition



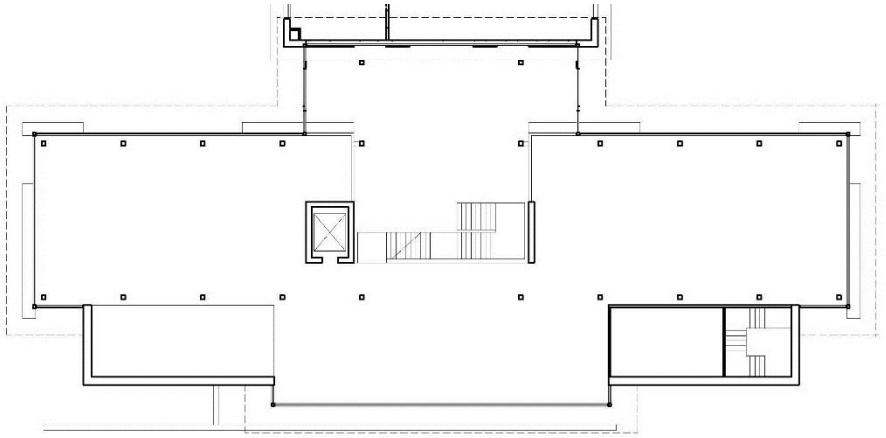
Site Roof Plan

SEA
SCOTT | EDWARDS ARCHITECTURE LLP

Oregon City Carnegie Library & Addition



Ground Floor Plan



Second Floor Plan

Schematic Floor Plans

SEA
SCOTT|EDWARDS ARCHITECTURE LLP

Oregon City Carnegie Library & Addition

View from 7th Street

SEA
SCOTT|EDWARDS ARCHITECTURE LLP

Oregon City Carnegie Library & Addition

View from John Adams & 6th

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Oregon City Carnegie Library & Addition

Option 1 –view from 6th Street

SEA
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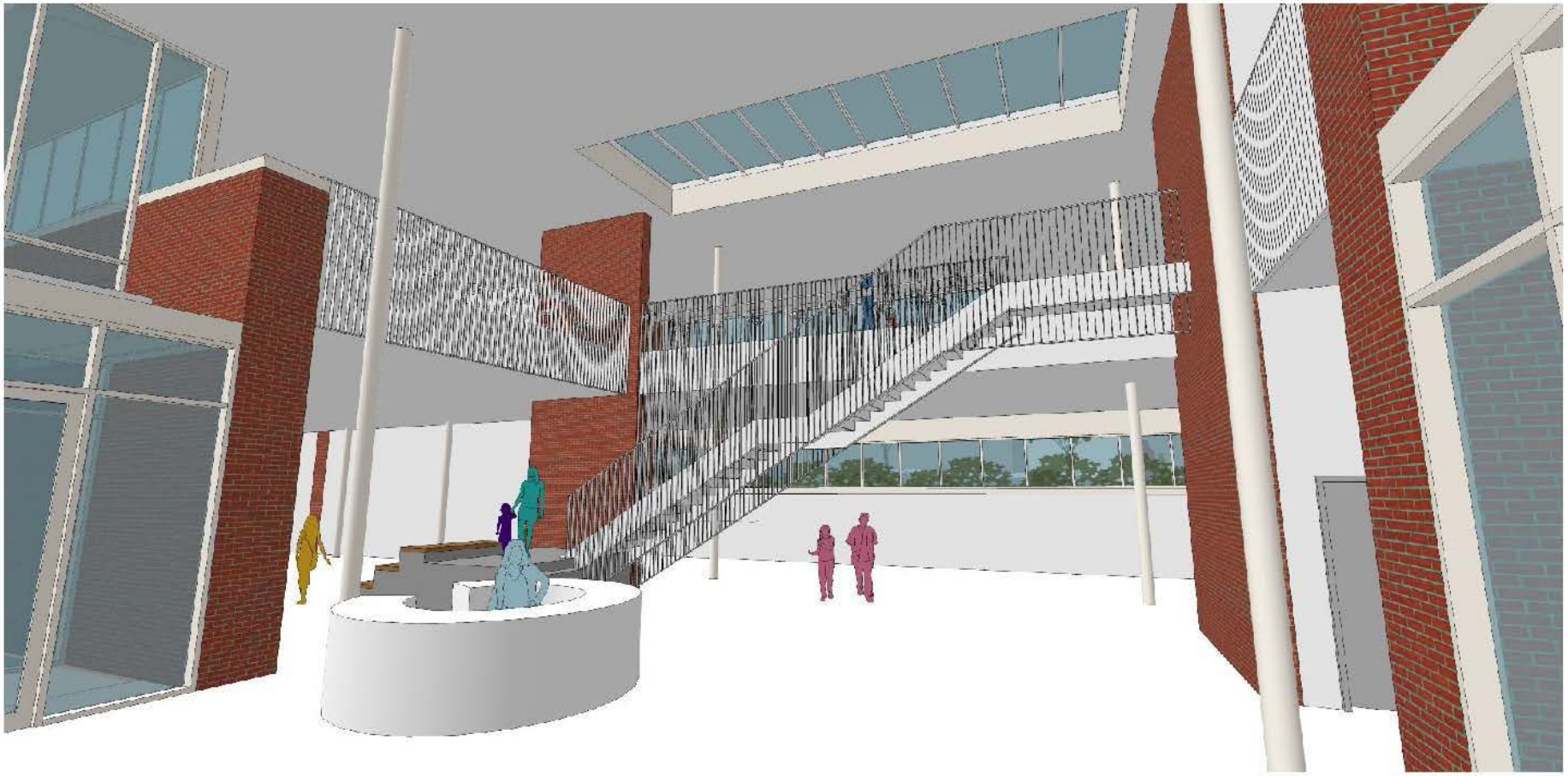
Oregon City Carnegie Library & Addition

View from 7th & Jefferson

SCOTT|EDWARDS ARCHITECTURE LLP

Oregon City Carnegie Library & Addition



View from Entry

SCOTT|EDWARDS ARCHITECTURE LLP

Oregon City Carnegie Library & Addition

View from Entry

SEA
SCOTT|EDWARDS ARCHITECTURE LLP

Oregon City Carnegie Library & Addition

View from Children's Library

S|E A
SCOTT|EDWARDS ARCHITECTURE LLP

Oregon City Carnegie Library & Addition

View from Second Floor

SCOTT|EDWARDS ARCHITECTURE LLP

Proposed

Oregon City Library Expansion

Transportation Impact Analysis and Parking Study

Prepared for

Oregon City Library

Prepared by

DKS

December 2014

720 SW Washington St.
Suite 500
Portland, OR 97205
503.243.3500
www.dksassociates.com

December 30, 2014

Maureen Cole
Oregon City Library
606 John Adams Street
Oregon City, OR 97045

P#/A#: P14174-000

Subject: Oregon City Library Expansion Transportation Impact Analysis and Parking Study

Dear Maureen:

DKS Associates is pleased to present this Transportation Impact Analysis and Parking Study for the proposed Oregon City Library Expansion Project, in Oregon City. It reflects comments provided by the Project team. Please feel free to contact me with any questions or comments regarding this study.

Sincerely,

DKS Associates

Julie Sosnovske

Julie Sosnovske, P.E.
Transportation Planner

REGISTERED PROFESSIONAL ENGINEER
18944PE
OREGON
FEB. 14, 1997
JULIE A. SOSNOVSKE
EXPIRES: 6/30/16

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CHAPTER 1: INTRODUCTION AND SUMMARY

This study evaluates the transportation impacts of the proposed expansion of the existing Oregon City Library, in Oregon City, Oregon. The proposed expansion would increase the size of the existing library from 7,600 square feet to a maximum of 22,600 square feet. There are currently 24 employees in total, many of whom work part-time. No more than ten people currently work at the Library at the same time. The library is expecting to add approximately one or two more employees with the expansion and expects to have a maximum of twelve employees working at one time.

The existing library is located on John Adams Street, between 7th Street and 6th Street, as shown in Figure 1. The library owns a parking lot on the southeast corner of the 7th Street/Jefferson Street intersection, and uses the lot for employee parking. Library patrons use on-street parking or city-owned public parking lots in the immediate vicinity of the library. The purpose of this study is to determine the transportation impacts of the library expansion in the study area. The report also provides recommendations for accommodation of the additional parking needs generated by the library expansion.

This report documents the evaluation of existing transportation conditions, trip generation and distribution, future conditions, transportation impacts within the study area, and a parking analysis. The study area is shown in Figure 1, including the following study intersections:

- 7th Street/Washington Street
- 7th Street/John Adams Street
- 7th Street/Jefferson Street
- 7th Street/Jackson Street
- 7th Street/Molalla Avenue/Taylor Street
- Molalla Avenue/Pearl Street
- 6th Street/John Adams Street
- 6th Street/Jefferson Street
- 5th Street/Jackson Street

This chapter provides an introduction to the library expansion and the steps taken to analyze the associated impacts on the transportation network. It highlights important elements from the remaining chapters, including a description of the project site and a summary of the project site evaluation. Table 1 lists important characteristics of the study area and proposed project.

LEGEND

- Study Intersection Number

DKS

Figure **1**

Study Area

Table 1: Key Study Area and Proposed Project Characteristics

Characteristics	Information
Study Area	
Number of Study Intersections	9
Analysis Period	Weekday PM peak hour (one hour from 3-6 pm)
Project Development	
Existing Land Use	Institutional Use - Library
Existing Size	7,600 square feet, 24 employees total (many part-time)
Proposed Addition	15,000 square feet, 1-2 employees
Existing Vehicle Trips Generated	88 (36 in, 52 out) PM peak hour trips, including 4 book drop-off trips
Proposed Expansion Vehicle Trips Generated	110 (45 in, 65 out) PM peak hour trips, including 8 book drop-off trips
Vehicle Access Points	None; vehicles will use on and off-street parking in the vicinity of the library. Only service vehicles will have direct access to the library property.
Anticipated Year of Opening	2016
Roadway Classifications[1]	
7th Street	Major Arterial, Proposed Bikeway
6th Street	Local
5th Street	Minor Arterial, Existing Bikeway
Washington Street	Minor Arterial, Existing Bikeway
John Adams Street	Local, Planned Family Friendly Route
Jefferson Street	Local
Jackson Street	Collector, Proposed Bikeway, Planned Family Friendly Route
Taylor Street	Collector
Molalla Avenue	Major Arterial, Existing Bikeway
Pearl Street	Collector, Proposed Bikeway
Other Transportation Facilities	
Pedestrian Facilities	Sidewalks are available on all blocks surrounding the library
Bicycle Facilities	Bike lanes are provided on 5th Avenue and on Molalla Avenue
Nearest Transit Stop	TriMet Route 33 travels along 5th Street with stops at Washington Street and Jefferson Street. TriMet Route 99 travel along Washington Street, 7th Street, and Molalla Avenue, with a stop at Pearl Street
Freight	There are no freight routes through the study area
Parking	On-street parking is available on sections of all the streets adjacent to the library. Public off-street parking is also available within a block of the library. The library also owns an existing off-street parking lot at the corner of Jefferson and 7th Avenue.

[1] Oregon City Transportation System Plan, Volume 1, Figures 8, 11, 19, and 20. Clackamas County Comprehensive Plan, Chapter 5: Transportation System Plan; Figure 5-2a

Existing Intersection Operations

Existing year 2014 traffic operations at the study intersections were determined for the p.m. peak hour based on the 2000 Highway Capacity Manual (HCM) methodology for signalized intersections[2] and the 2010 Highway Capacity Manual methodology for unsignalized intersections.[3] The level of service (LOS) and volume-to-capacity ratio (V/C) at each study intersection is shown in Table 2. As shown, all intersections meet the city's operating standards.

It should be noted that the HCM 2010 analysis of the 7th Street/Jackson Street intersection does not account for the vehicle platooning caused by the signal at 7th Street/Monroe Street. Therefore, the LOS F for the minor movements at the 7th Street/Jackson Street intersection does not accurately portray the traffic operational conditions observed in the field, which were significantly better than LOS F.

Table 2: Existing Study Intersection Operations

Intersection	Metro Classification	Intersection Control	Operating Standard[4]	Existing PM Peak	
				LOS	*V/C*
7th St/Washington St	Arterial and Throughway Network	Signalized	V/C < 0.99	C	0.65
7th St/John Adams St	Arterial and Throughway Network	Unsignalized	V/C < 0.99	A/C	0.12
7th St/Jefferson St	Arterial and Throughway Network	Unsignalized	V/C < 0.99	A/C	0.09
7th St/Jackson St	Arterial and Throughway Network	Unsignalized	V/C < 0.99	A/F	0.50
7th St/Molalla Ave/ Taylor St	Arterial and Throughway Network	Unsignalized	V/C < 0.99	A/D	0.52
Molalla Ave/Pearl St	Arterial and Throughway Network	Signalized	V/C < 0.99	B	0.71
6th St/John Adams St	Not Designated	Unsignalized	LOS E/LOS F	A/A	0.07
6th St/Jefferson St	Not Designated	Unsignalized	LOS E/LOS F	A/A	0.04
5th St/Jackson St	Arterial and Throughway Network	Unsignalized	V/C < 0.99	A/C	0.12

Signalized:
LOS = Level of Service of Intersection
V/C = Volume-to-Capacity Ratio of Intersection

Two-Way or All-Way Stop Controlled:
LOS = Level of Service of Major Street/Minor Street
V/C = Volume-to-Capacity Ratio of Worst Movement

[1]Oregon City operating standard

[2] *2000 Highway Capacity Manual*, Transportation Research Board, Washington DC, 2000.

[3] *2010 Highway Capacity Manual*, Transportation Research Board, Washington DC, 2010.

[4] Oregon City Municipal Code, Section 12.04.205 – Mobility Standards.

Project Traffic Impacts

Project traffic impacts were evaluated at the study intersections for the weekday p.m. peak hour for 2016, the estimated year of opening for the library expansion. Additional traffic was added to the roadway network based on trip generation and trip distribution assumptions associated with the floor space added to the site and assumed background traffic growth (assumptions are documented in Chapter 3). Table 3 lists the future traffic operating conditions at the study intersections. As shown, all nine study intersections are expected to meet Oregon City operating standards for the p.m. peak hour for the project build year.

Table 3: Future Build Study Intersection Operations

Intersection	Metro Classification	Intersection Control	Operating Standard[5]	2016 No Build PM Peak		2016 Build PM Peak	
				LOS	*V/C*	*LOS*	*V/C*
7th St/ Washington St	Arterial and Throughway Network	Signalized	V/C < 0.99	C	0.68	C	0.69
7th St/ John Adams St	Arterial and Throughway Network	Unsignalized	V/C < 0.99	A/D	0.13	A/D	0.17
7th St/ Jefferson St	Arterial and Throughway Network	Unsignalized	V/C < 0.99	A/C	0.10	A/C	0.13
7th St/ Jackson St	Arterial and Throughway Network	Unsignalized	V/C < 0.99	A/F	0.59	A/F	0.64
7th St/ Molalla Ave/ Taylor St	Arterial and Throughway Network	Unsignalized	V/C < 0.99	A/E	0.58	A/E	0.60
Molalla Ave/ Pearl St	Arterial and Throughway Network	Signalized	V/C < 0.99	B	0.74	B	0.76
6th St/ John Adams St	Not Designated	Unsignalized	LOS E /LOS F	A/A	0.07	A/A	0.09
6th St/ Jefferson St	Not Designated	Unsignalized	LOS E/ LOS F	A/A	0.04	A/A	0.08
5th St/ Jackson St	Arterial and Throughway Network	Unsignalized	V/C < 0.99	A/C	0.12	A/C	0.12

Signalized:
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Two-Way or All-Way Stop Controlled:
LOS = Level of Service of Major Street/Minor Street
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[1]Oregon City operating standard

As indicated by the results shown in Table 3, the library expansion does not significantly impact the operations at any of the nine intersections analyzed. No operational mitigations are required. However, some traffic mitigations are recommended to improve access to the library and maintain un-interrupted traffic flow on 7th Street. These mitigations are described later in this chapter.

[5] Oregon City Transportation System Plan, Volume 1, Mobility Standards; pg. 38-39

Project Parking Impact

Parking impacts associated with the proposed library expansion were evaluated for on and off-street parking in the surrounding areas. In addition, the library design team requested that the best use of the library owned lot on the southeast corner of the 7th Street/Jefferson Street intersection be considered and evaluated. The library recently purchased the lot and would like to determine whether the lot should be used for employees, patrons or a combination of both. In addition, it was requested that the possibility of leasing several of the spaces be considered.

The traffic analysis indicated that the existing on-street parking does have sufficient capacity to accommodate the added library parking demand. The analysis assumed that the added demand would only use on-street parking, so the actual capacity of the study area may be higher if library patrons choose to use public lots that are more than one block away from the library. Table 4 summarizes the on-street parking impacts of the library expansion, assuming that patrons will walk no more than one block from a street parking spot to the library site. On average, about two-thirds of the on-street parking spots within one block of the library will be occupied with the proposed expansion in place. The details of the on-street parking analysis are included in Chapter 3.

Table 4: Future Build On-Street Parking Occupancy (PM Peak Hour)

Street (Direction of Traffic)	Block		Capacity (vehicles)	Average Occupancy (vehicles)[6]	Average Vacancy (spaces)	Average Occupancy (%)
	From	*To*				
7th St (Westbound)	Madison St	Jefferson St	7	2	5	29%
	Jefferson St	John Adams St	7	6	1	86%
6th St (Westbound)	Madison St	Jefferson St	11	7	4	64%
	Jefferson St	John Adams St	6	6	0	100%
6th St (Eastbound)	Washington St	John Adams St	9	6	3	67%
	John Adams St	Jefferson St	9	6	3	67%
	Jefferson St	Madison St	12	8	4	67%
John Adams St (Southbound)	7th St	6th St	6	4	2	67%
	6th St	5th St	5	3	2	60%
John Adams St (Northbound)	5th St	6th St	9	5	4	56%
	6th St	7th St	6	5	1	83%
Jefferson St (Southbound)	7th St	6th St	11	10	1	91%
	6th St	5th St	12	7	5	58%
Jefferson St (Northbound)	5th St	6th St	12	5	7	42%
	6th St	7th St	11	9	2	82%
		Total	***133***	***89***	***44***	***67%***

[6] Based on October 9, 2014 PM peak hour (5:00 PM to 6:00 PM) on-street parking occupancy counts and increased by 10 parked vehicles per hour to account for added school day traffic. See Trip Generation section for more details

After reviewing the existing conditions and layout of the library owned parking lot at the southeast corner of the 7th Street/Jefferson Street intersection, it is recommended that at least 10 of the lot parking spaces be reserved for library employees, with additional spaces designated either for long-term daily volunteer parking or for lease to local businesses. Additional improvements to the off-street parking lot were included as recommended project traffic mitigations.

Project Mitigation Summary

The following list summarizes the mitigation strategies identified as part of the Oregon City Library Expansion Transportation Impact Study. These projects are recommended based on the operational analysis of the future traffic conditions, and the existing pedestrian, bicycle, and parking conditions in the study area.

Motor Vehicle Improvements

- Restripe 7th Street at John Adams Street to include a left-turn lane in the northwest direction. This project is included in the City's Transportation System Plan as D29. Although low (<20 vph) left turn volumes allow the intersection operations to meet City standards both under existing and future Build conditions, preliminary left-turn lane warrants indicate a need for a left-turn lane.
- Consider providing library signage on 7th Street, for vehicles traveling in the northwest direction, encouraging vehicles to turn left at Monroe Street, a signalized intersection. This will reduce the left-turn demand on 7th Street at the unsignalized intersections at Jefferson Street and John Adams Street.

Pedestrian and Bicycle Access

- Maintain pedestrian and bicycle accessibility to building entrances, providing bicycle parking near building entrances.

On-Street Parking

- Stripe on-street parking stalls adjacent to library parcel on Jefferson Street, 6th Street, and John Adams Street to maximize parking efficiency.
- Allocate three parking stalls to be used specifically for book drop-off. These stalls should be located on 6th Street, adjacent to the library. Signage adjacent to these stalls should include language similar to "10-minute parking only".
- Upgrade or add curb ramps to ADA standards at the following intersections to improve access between on-street parking and the library:
    - 6th Street/John Adams Street
    - 6th Street/Jefferson Street

Off-Street Parking

- Based on the current parking lot usage and geometry, the following improvements and options are recommended for the library owned parking lot:

- Remove the existing parking space nearest to 7th Street entrance. This space requires a departing vehicle to complete a blind back-up maneuver onto the sidewalk and possibly onto 7th Street if the parking lot is full.
- Restripe the existing one-way parking lot markings to emphasize the circulation.
- Install a "Do Not Enter" sign facing parking lot traffic at the 7th Street entrance. The sight distance restrictions caused by existing foliage and a retaining wall to the west and a building abutting the sidewalk to the east make exiting onto 7th Street undesirable.
- Redirect traffic exiting the parking lot to turn west on the alley toward Jefferson Street, rather than toward Madison Street, since sight distance is restricted where the alley accesses Madison Street.
- Sign the parking spaces required for staff as "library staff only" (approximately 10 spaces). The remaining spaces may be used for either:
  - Volunteer staff parking (revise sign to read "library staff and volunteers only")
  - Lease to nearby businesses

Overall, the only significant transportation impact of the library expansion is the increase in on-street parking demand, especially during the PM peak hour. However, the current on-street parking facilities in the area surrounding the library provide adequate capacity to meet the predicted future demand. The current network has adequate capacity to absorb the added library traffic, and intersection operations near the library should not be noticeably affected. Most transportation mitigation efforts associated with the library expansion should be focused on encouraging alternative modes of travel to the library with improved pedestrian and bicycle facilities in and around the project site.

CHAPTER 2: EXISTING CONDITIONS

This chapter provides documentation of existing study area conditions, including the project site, study area roadway network, parking, pedestrian, bicycle and transit facilities, and existing traffic volumes and operations. Supporting details are provided in the appendix.

Project Site

The proposed project involves the expansion of the existing 7,600 square foot library. The proposed expansion occurs on a single, full block parcel in Oregon City, Oregon. The site is the city block bounded by John Adams Street, 7th Street, Jefferson Street and 6th Street. As there is no existing dedicated off-street parking on the site parcel for the proposed development, the direct connections to the surrounding neighborhood only serve non-motorized modes.

Study Area Roadway Network

The study area was selected with the intention of capturing transportation impacts related to the proposed project. Table 5 lists the characteristics of key roadways in the study area.

Table 5: Study Area Roadway Characteristics

Roadway	Oregon City[7] Classification	Number of Lanes	Posted Speed	Sidewalks	Bike Lanes	On-Street Parking
7th St (Center St to Taylor St)	Primary Arterial, TriMet Transit Route, Proposed Bikeway	2/3	25 mph	Yes	No	Yes (one side)
6th St (Washington St to Madison St)	Local	2	25 mph	Yes	No	Yes
5th St/Linn Ave (Washington St to 4th St)	Minor Arterial, TriMet Transit Route, Existing Bikeway	2	25 mph	Some	Yes	Yes
Washington St (5th St to 8th St)	Minor Arterial, TriMet Transit Route, Existing Bikeway	2	25 mph	Yes	No	Yes
John Adams St (5th St to 8th St)	Local, Planned Family Friendly Route	2	25 mph	Yes	No	Yes
Jefferson St (5th St to 8th St)	Local	2	25 mph	Yes	No	Yes
Jackson St (5th St to 8th St)	Collector, Proposed Bikeway, Planned Family Friendly Route	2	25 mph	Yes	No	Yes
Taylor St (7th St to 8th St)	Collector	2	25 mph	Yes	No	Yes
Molalla Ave (Taylor St to Dewey St)	Major Arterial, TriMet Transit Route, Existing Bikeway	3	25 mph	Yes	Yes	No
Pearl St (Myrtle St to Warren St)	Collector, Proposed Bikeway	2	25 mph	Yes	No	Yes

[7] Oregon City Transportation System Plan, Volume 1, Figures 8, 11, 19, and 20. Clackamas County Comprehensive Plan, Chapter 5: Transportation System Plan; Figures 5-2a and 5-8a

Existing Traffic Volumes and Operations

Existing p.m. peak hour traffic operations were analyzed at the following study intersections, consistent with the City of Oregon City Guidelines for Transportation Impact Analyses[8]:

- 7th Street/Washington Street
- 7th Street/John Adams Street
- 7th Street/Jefferson Street
- 7th Street/Jackson Street
- 7th Street/Taylor Street/Molalla Avenue
- Molalla Avenue/Pearl Street
- 6th Street/John Adams Street
- 6th Street/Jefferson Street
- 5th Street/Jackson Street

To perform the intersection analysis, traffic counts were collected during the p.m. (3:00 to 6:00 p.m.) peak period on October 21, 2014. Existing peak hour traffic volumes are shown in Figure 2 with the detailed traffic counts included in the Appendix.

The purpose of intersection analysis is to ensure that the transportation network remains within desired performance levels as required by City code. Intersections are the focus of the analysis because they are the controlling bottlenecks of traffic flow and the ability of a roadway system to carry traffic efficiently is nearly always diminished in their vicinity.

Before the analysis results of the study intersections are presented, discussion is provided for two important analysis issues: intersection performance measures (definitions of typical measures) and required operating standards (as specified by the agency with roadway jurisdiction).

Intersection Performance Measures

Level of service (LOS) ratings and volume-to-capacity (V/C) ratios are two commonly used performance measures that provide a good picture of intersection operations. In addition, they are often incorporated into agency mobility standards.

- **Level of service (LOS):** A "report card" rating (A through F) based on the average delay experienced by vehicles at the intersection.[9] LOS A, B, and C indicate conditions where traffic moves without significant delays over periods of peak hour travel demand. LOS D and E are progressively worse operating conditions. LOS F represents conditions where average vehicle delay has become excessive and demand has exceeded capacity.
- **Volume-to-capacity (V/C) ratio:** A decimal representation (typically between 0.00 and 1.00) of the proportion of capacity that is being used at a turn movement, approach leg, or intersection. It is determined by dividing the peak hour traffic volume by the hourly capacity of a given intersection or movement. A lower ratio indicates smooth operations and minimal delays. As the ratio approaches 1.00, congestion increases and performance is reduced. If the ratio is greater than 1.00, the turn movement, approach leg, or intersection is oversaturated and usually results in excessive queues and long delays.

[8] City of Oregon City Guidelines for Transportation Impact Analyses, November 2, 2005.

[9] A description of Level of Service (LOS) is provided in the appendix and includes a list of the delay values (in seconds) that correspond to each LOS designation.

Required Operating Standards

The City of Oregon City's mobility standards are defined in the Oregon City Municipal Code[10], which is included in the Appendix. The relevant standards that apply to the study intersections are as follows:

- For intersections outside of the Regional Center but designated on the Arterial and Throughway Network, as defined in the Regional Transportation Plan, the following mobility standards apply:
    - During the first hour, a maximum v/c ratio of 0.99 shall be maintained. For signalized intersections, this standard applies to the intersection as a whole. For unsignalized intersections, this standard applies to movements on the major street. There is no performance standard for the minor street approaches.
    - During the second hour, a maximum v/c ratio of 0.99 shall be maintained at signalized intersections. For signalized intersections, this standard applies to the intersection as a whole. For unsignalized intersections, this standard applies to movements on the major street. There is no performance standard for the minor street approaches.
- For intersections outside the boundaries of the Regional Center and not designated on the Arterial and Throughway Network, as defined in the Regional Transportation Plan, the following mobility standards apply:
    - For signalized intersections:
        - During the first hour, LOS "D" or better will be required for the intersection as a whole and no approach operating at worse than LOS "E" and a v/c ratio not higher than 1.0 for the sum of the critical movements.
        - During the second hour, LOS "D" or better will be required for the intersection as a whole and no approach operating at worse than LOS "E" and a v/c ratio not higher than 1.0 for the sum of the critical movements.
    - For unsignalized intersections outside of the boundaries of the Regional Center:
        - For unsignalized intersections, during the peak hour, all movements serving more than twenty vehicles shall be maintained at LOS "E" or better. LOS "F" will be tolerated at movements serving no more than twenty vehicles during the peak hour.

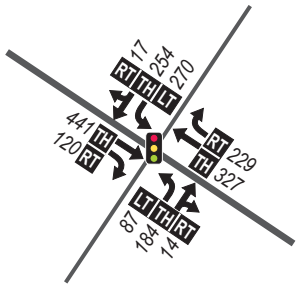
For this study, only first hour volumes were analyzed. None of the second hour volumes conditions would apply to any of the study intersections since none of the study intersections are expected to exceed the mobility standards for the first hour during any of the analysis scenarios.

[10] Oregon City Municipal Code, Section 12.04.205 – Mobility Standards.

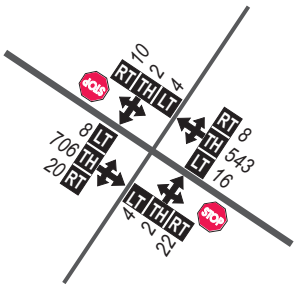
Key Map

No Scale

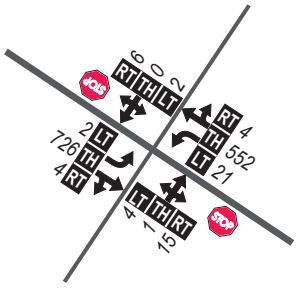
1. 7th St./Washington St.



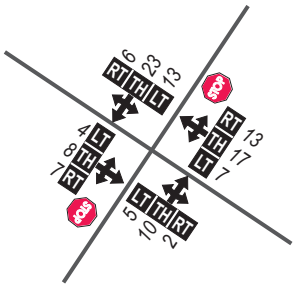
2. 7th St./John Adams St.



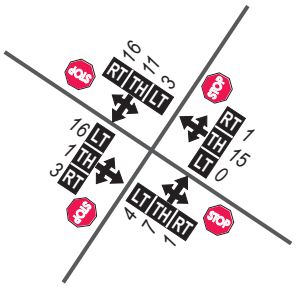
3. 7th St./Jefferson St.



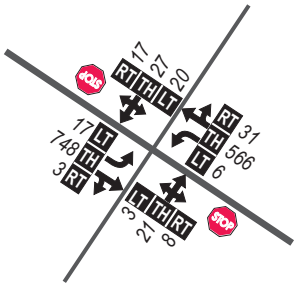
4. 6th St./John Adams St.



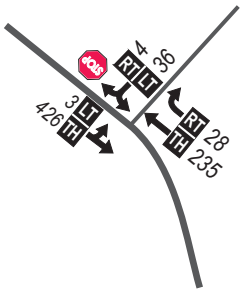
5. 6th St./Jefferson St.



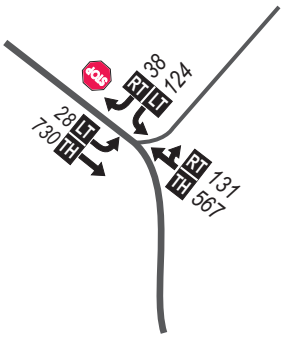
6. 7th St/Jackson St.



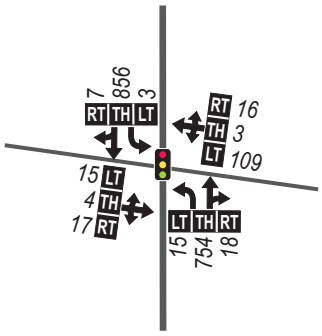
7. 5th St./Jackson St.



8. 7th St./Molalla St./Taylor St.



9. Molalla St./Pearl St.



LEGEND

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

DKS

Figure **2**

2014 Existing PM Peak Hour Traffic Volumes

Existing Operating Conditions

Existing traffic operations at the study intersections were determined for the p.m. peak hour based on the 2010 Highway Capacity Manual methodologies[11] for signalized and unsignalized intersections and compared with the City of Oregon City's mobility standards. The estimated LOS and V/C ratio of each study intersection are shown in Table 6.

Table 6: Existing Study Intersection Operations

Intersection	Metro Classification	Intersection Control	Operating Standard[12]	Existing PM Peak	
				LOS	*V/C*
7th St/Washington St	Arterial and Throughway Network	Signalized	V/C < 0.99	C	0.65
7th St/John Adams St	Arterial and Throughway Network	Unsignalized	V/C < 0.99	A/C	0.12
7th St/Jefferson St	Arterial and Throughway Network	Unsignalized	V/C < 0.99	A/C	0.09
7th St/Jackson St	Arterial and Throughway Network	Unsignalized	V/C < 0.99	A/F	0.50
7th St/Molalla Ave/Taylor St	Arterial and Throughway Network	Unsignalized	V/C < 0.99	A/D	0.52
Molalla Ave/Pearl St	Arterial and Throughway Network	Signalized	V/C < 0.99	B	0.71
6th St/John Adams St	Not Designated	Unsignalized	LOS E/LOS F	A/A	0.07
6th St/Jefferson St	Not Designated	Unsignalized	LOS E/LOS F	A/A	0.04
5th St/Jackson St	Arterial and Throughway Network	Unsignalized	V/C < 0.99	A/C	0.12

Signalized:
LOS = Level of Service of Intersection
V/C = Volume-to-Capacity Ratio of Intersection

Two-Way or All-Way Stop Controlled:
LOS = Level of Service of Major Street/Minor Street
V/C = Volume-to-Capacity Ratio of Worst Movement

The results indicate that the southbound movement from the Jackson Street minor approach at the 7th Street/Jackson Street intersection operates at LOS F under existing conditions. There is no mobility

[11] *2000 Highway Capacity Manual*, Transportation Research Board, Washington DC, 2000, for signalized intersections and *2010 Highway Capacity Manual*, Transportation Research Board, Washington DC, 2010, for unsignalizedunsignalized intersections.

[12] Oregon City Municipal Code, Section 12.04.205 – Mobility Standards. For intersections on the Regional Transportation Plan's (RTP) designated Arterial and Throughway Network, a v/c ratio < 0.99 shall be maintained for both the first and second hour. There is no performance standard for minor street approaches. For unsignalized intersections not designated in the RTP, all movements serving more than 20 vehicles shall be maintained at LOS "E". LOS "F" will be tolerated for movements serving no more than 20 vehicles during the peak hour.

standard for this approach since it is a minor street approach on the RTP Arterial and Throughway Network, however, it should be noted that project field observations at the intersection noted traffic platooning on 7th Street, due mainly to the traffic signal at 7th Street/Monroe Street two blocks west of Jackson Street. The HCM 2010 TWSC Analysis methodology does not account for vehicle platooning, resulting in calculated LOS F operations for the minor street movements. Based on field observations, the 7th Street/Jackson Street intersection minor approach operates closer to LOS C due to signal platooning.

Collision Analysis

Five years of collision records (2009-2013) for the study area were obtained from the Oregon Department of Transportation (ODOT) collision database. There were 55 total collisions between the nine study intersections over the five year period. As shown in Table 7, none of the intersections had collision rates in excess of 1.0 collisions per million entering vehicles, a common threshold used to identify intersection that require a more detailed safety analysis. Further analysis shows that all of the intersections fall below the statewide critical crash rates.

Table 7: Collision History (2009-2013)

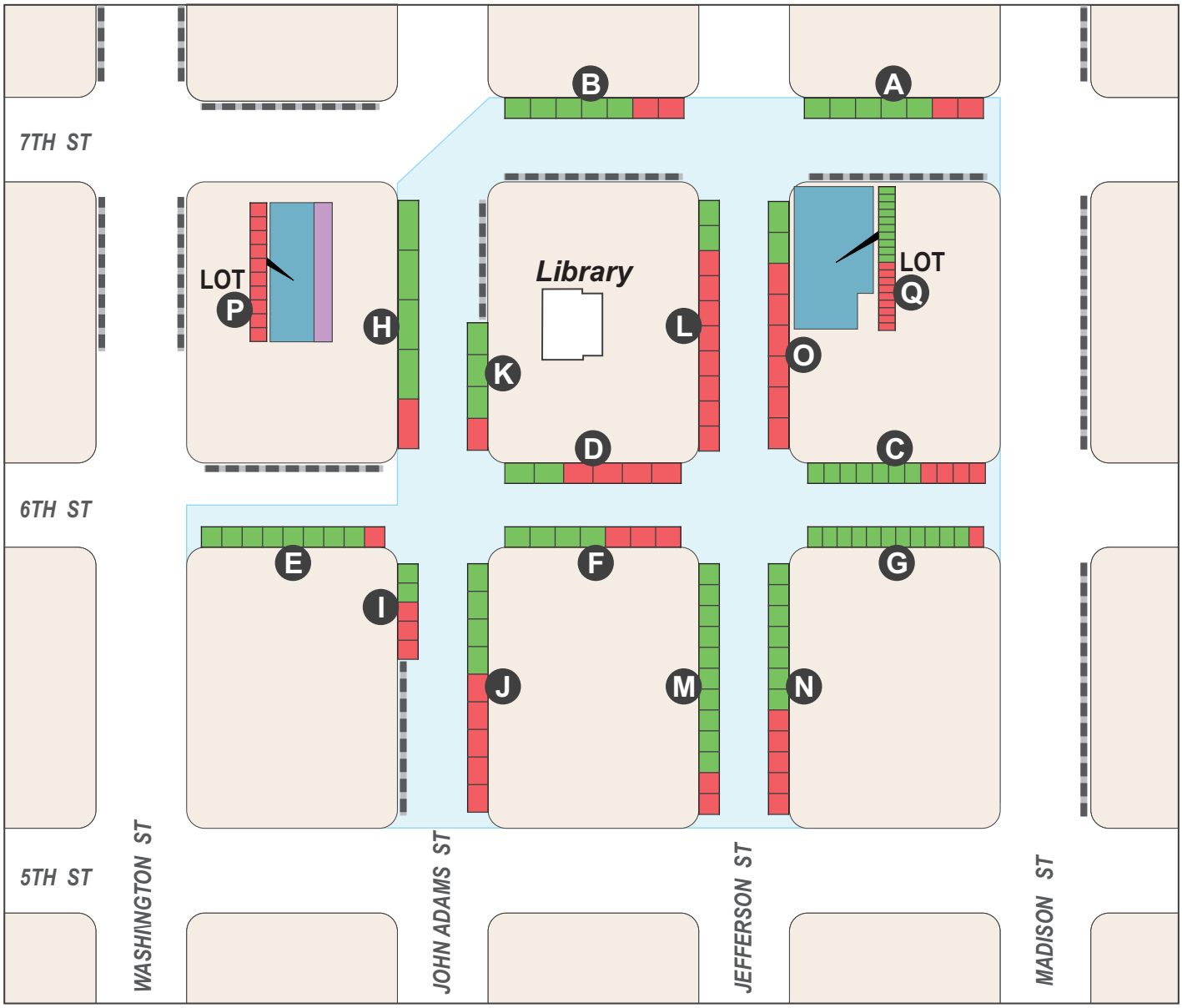
Intersection	Collisions (by Year)						Collision Rate[b]	Critical Rate[c]
	2009	*2010*	*2011*	*2012*	*2013*	*Total*		
7th St/Washington St	2	3	7	1	4	17	0.42	0.67
7th St/John Adams St	0	3	2	0	3	8	0.28	0.31
7th St/Jefferson St	0	1	0	1	0	1	0.04	0.31
7th St/Jackson St	0	1	1	1	0	3	0.10	0.30
7th St/Taylor St/Molalla Ave	1	0	0	0	1	2	0.06	0.48
Molalla Ave/Pearl St	5	1	8	4	3	21	0.55	0.68
6th St/John Adams St	1	0	0	0	0	1	0.41	0.80
6th St/Jefferson St	0	0	0	1	0	1	0.58	0.96
5th St/Jackson St	0	0	1	0	0	1	0.06	0.20

[a] PDO = Property damage only.
[b] Collision rate for intersections= average annual collisions per million entering vehicles (MEV); MEV estimates based on p.m. peak-hour traffic count and applicable factors.
[c] Critical Collision rate for intersections= statewide 90th percentile annual collisions per MEV for similar intersections

On and Off-Street Parking

The existing Oregon City Library does not have a dedicated off-street parking lot for patrons. Current library visitors either park on the streets surrounding the library or in nearby off-street public parking lots, typically owned by the City of Oregon City. The project team collected parking occupancy counts during the PM peak hour on October 9, 2014 and adjusted the counts to reflect a typical school day (see Trip Generation Section). Figure 3 shows the existing study area parking locations and PM peak hour average occupancies. The on-street parking blocks were selected as part of the study area based on their location relative to drivers approaching the library. Other on-street parking is available on the street blocks surrounding the library, but these spaces were removed from the analysis based on the walking distance from to the library. Figure 3 summarizes the existing on-street parking capacities, PM peak hour occupancies and vacancies within the study area.

Current library visitors use the 10 public parking spaces in the fire station parking lot. However, these spaces are generally occupied during the PM peak hour. The library has also purchased the public parking lot on the southeast corner of the 7th Street/Jefferson Street intersection. Currently, library employees use this parking lot. Figure 3 also shows the existing PM peak hour parking capacity and occupancy for the fire station (Lot P) and library owned (Lot Q) public parking lots.



Existing Peak Hour Average Parking Occupancies

Block-face/Lot	Capacity	Average Occupied	Average Vacant	Block-face/Lot	Capacity	Average Occupied	Average Vacant
A	7	2	5	J	9	5	4
B	7	2	5	K	4	1	3
C	11	5	6	L	10	8	2
D	6	4	2	M	12	2	10
E	9	1	8	N	12	5	7
F	7	3	4	O	8	6	2
G	12	1	11	LOT P	10	10	0
H	5	1	4	LOT Q	19	9	10
I	5	3	2	*Total*	*153*	*68*	*85*

LEGEND

- Library On-Street Parking
- Library Off-Street Parking
- Restricted Off-Street Parking
- No Parking Allowed

Block-face/Lot - *Bar Chart*

- Average Available Parking Spaces
- Average Occupied Parking Spaces

DKS

No Scale

Figure 3

Existing Parking by Block-face Weekday PM Peak Hour

Public Transit Service

The two transit stops closest to the library are located on 5th Street/Jefferson Street and 5th Street/Washington Street. The boardings and alightings for these two stops are shown in Table 8. Both stops are served by TriMet Route 33 (McLoughlin), which runs with approximately 15 minute daytime headways. TriMet Route 32 (Oatfield) has three stops within 0.25 miles of the library; 9th Street/Washington Street, 9th Street/Jefferson Street, and 9th Street/Monroe Street. The boardings and alightings for these stops are summarized in

Table 8. The Route 32 headways vary throughout the day from 15 minutes during the morning peak, 30 minutes during the evening peak, and 60 minutes at midday. TriMet Route 99 (McLoughlin Express) travels through the study area using Washington Street, 7th Street, and Molalla Avenue. However, Route 99 riders are not likely to walk to the library as the nearest stop is the Oregon City Transit Center, more than one-half mile to the north.

Table 8: Route 32 and 33 Boarding and Alighting Data

Bus Stop Location	Route	Weekday Daily Average			Monthly Lifts
		Ons	Offs	Total	
9th St/Washington St (Westbound)	32-Oatfield	1	4	5	1
900 Block Washington St (Southbound)	32-Oatfield	3	2	5	2
9th St/Jefferson St (Westbound)	32-Oatfield	1	2	3	0
9th St/Jefferson St (Eastbound)	32-Oatfield	1	2	3	1
9th St/Monroe St (Westbound)	32-Oatfield	1	1	2	0
9th St/Monroe St (Eastbound)	32-Oatfield	2	2	4	0
5th St/Washington St (Westbound)	33-McLoughlin	6	7	13	15
5th St/Washington St (Eastbound)	33-McLoughlin	8	10	18	13
5th St/Jefferson St (Westbound)	33-McLoughlin	2	6	8	7
5th St/Jefferson St (Eastbound)	33-McLoughlin	6	4	10	4
5th St/Monroe St (Westbound)	33-McLoughlin	10	10	20	1
5th St/Monroe St (Eastbound)	33-McLoughlin	9	13	22	3

Pedestrians and Bicyclists

Existing peak hour pedestrian traffic within the study area is summarized in Figure 4. Bicycle activity in the study area is generally low during the peak period, with fewer than five cyclists at each of the study intersections, except Molalla/Pearl, which had seven bicyclists.

Pedestrian activity is highest at Molalla/Pearl and along 7th Street in the immediate vicinity of the library (Washington Street, John Adams Street and Jefferson Street), with about 25-35 pedestrians at these intersections during the PM peak hour.

All of the streets within the study area have continuous sidewalks. The busy peak hour traffic on 7th Street presents the only major barrier to pedestrian movements to and from the library. However, a striped crosswalk with a push button activated pedestrian flasher (RRFB)[13] was recently installed at the intersection of John Adams Street and 7th Street (see Figure 5). This crossing improvement was constructed as part of a planned Family Friendly pedestrian and bicycle route along John Adams Street.[14]

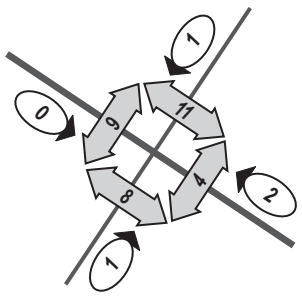
[13] Rectangular Rapid Flashing Beacon.

[14] Oregon City Transportation System Plan, Volume 1, Mobility Standards; Figure 19.

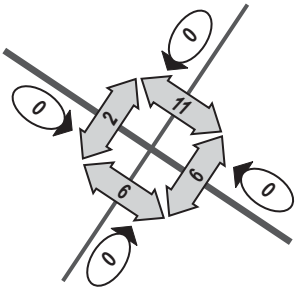
Key Map

No Scale

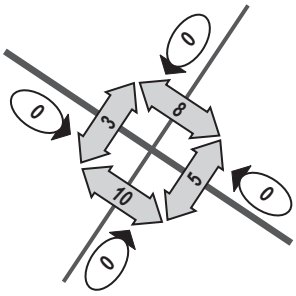
1. 7th St./Washington St.



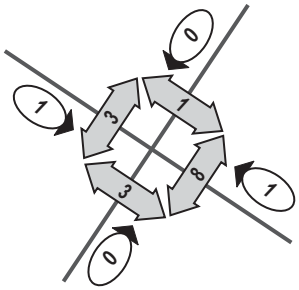
2. 7th St./John Adams St.



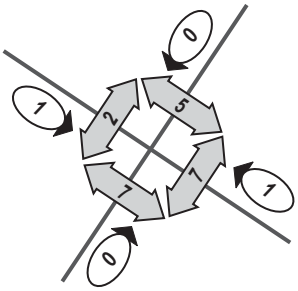
3. 7th St./Jefferson St.



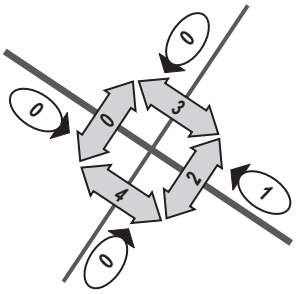
4. 6th St./John Adams St.



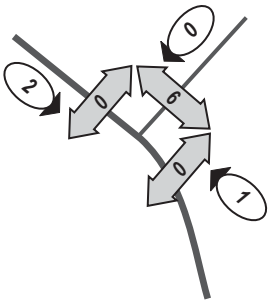
5. 6th St./Jefferson St.



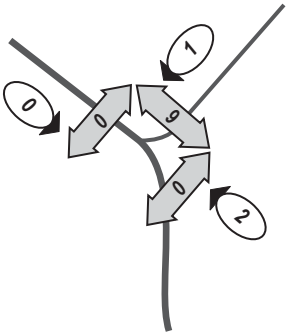
6. 7th St/Jackson St.



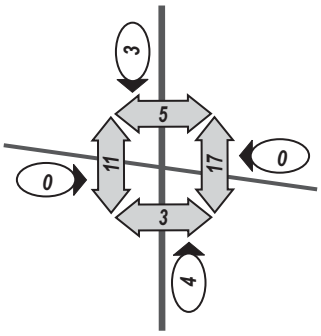
7. 5th St./Jackson St.



8. 7th St./Molalla St./Taylor St.



9. Molalla St./Pearl St.



LEGEND

- Study Intersection

00 - Pedestrian Peak Hour Volume

00 - Bicycle Peak Hour Volume

DKS

Figure 4

2014 PM Peak Bicycle & Pedestrian Volumes

Figure 5: 7th/John Adams Pedestrian Crossing

The 7th Street/Washington Street intersection provides pedestrians with pedestrian signal heads and crosswalks on all approaches. These crosswalks provide pedestrians with a second 7th Street crossing option. Each crossing has wide shared curb ramps.

People walking to the existing library generally use the 6th Street sidewalks between John Adams Street and Jefferson Street. The intersections of 6th Street/John Adams Street and 6th Street/Jefferson Street are currently all-way stop controlled with full striped crosswalks. However, the intersections do not have full ADA curb ramps at all crosswalk locations (see Figure 6 and Figure 7 for examples). The incomplete curb ramp layout hampers movement for disabled persons attempting to access the library from many of the nearby street parking locations. Table 9 show summarizes existing curb ramp deficiencies at the 6th Street intersections.

Table 9: Existing Curb Ramp Inventory on 6th Street

Intersection	Crossing	Curb Ramps
6th Street/John Adams Street	North John Adams Street	Shared ramp at northeast corner, shared ramp at northwest corner
	South John Adams Street	Ramp on southeast corner, no ramp on southwest corner
	East 6th Street	Shared ramp on northeast corner, ramp on southeast corner
	West 6th Street	Shared ramp on northwest corner, ramp on southwest corner
6th Street/Jefferson Street	North Jefferson Street	Ramp at northeast corner, no ramp at northwest corner
	South Jefferson Street	No ramp on southeast corner, ramp on southwest corner
	East 6th Street	No ramp on northeast corner, ramp on southeast corner
	West 6th Street	Ramp on northwest corner, Ramp on southwest corner

Figure 6: Share Curb Ramp at NE corner of John Adams and 6th Street

Figure 7: Missing Curb Ramp at SW corner of John Adams and 6th Street

The study area is served by limited bicycle facilities. As indicated in Table 5, 5th Street, Washington Street and Molalla Avenue are existing bikeways. However, only 5th Street and Molalla Avenue have striped bike lanes. Jackson Street, Pearl Street and 7th Street are all proposed bikeways, according to the Oregon City Transportation System Plan. The PM peak hour bicycle volumes within the study area are very light, as shown in Figure 4. However, higher bicycle volumes are likely during warmer and drier months. The existing library does provide some bicycle parking with a five space bike rack.

Planned Improvements

The Oregon City Transportation System Plan[15] indicates that the following transportation related projects are planned in the vicinity of the project site:

- **Washington Street Upgrade: Driving Solutions (Years 6 – 10, likely to be funded):** Construct Improve Washington Street to a Minor Arterial cross-section from 11th Street to 7th Street. Add curb-ramps at intersections.
- **Washington Street Traffic Surveillance: Driving Solutions (Years 10+, not likely to be funded):** Install video monitoring cameras and vehicle detection equipment to provide turn movement counts, hourly volumes, travel times, and speed measurements on Washington Street between 7th Street and OR 213.
- **Washington Street Speed Warning System: Driving Solutions (Years 10+, not likely to be funded):** Install a speed warning system on Washington Street near 9th Street. The system activates when a motorist approaches at a high speed.
- **Molalla Avenue/Beavercreek Road Adaptive Signal Timing: Driving Solutions (Year 0-5, likely to be funded):** Deploy adaptive signal timing that adjusts signal timings to match real-time traffic conditions on Molalla Avenue/7th Street from Washington Street to Gaffney Lane.
- **7th Street/Molalla Avenue Traffic Surveillance: Driving Solutions (Years 10+, not likely to be funded):** Install video monitoring cameras and vehicle detection equipment to provide turn movement counts, hourly volumes, travel times, and speed measurements on 7th Street/Molalla Avenue between Washington Street and OR 213.

[15] Oregon City Transportation System Plan, Volume 2, Planned and Financially Constrained Transportation Systems.

- **OR213/7th Street-Molalla Avenue/Washington Street Integrated Corridor Management: Driving Solutions (Years 10+, not likely to be funded):** Integrate traffic surveillance and traffic control equipment with ODOT on Washington Street/7th Street-Molalla Avenue corridor.
- **7th Street Speed Warning System: Driving Solutions (Years 10+, not likely to be funded):** Install a speed warning system on 7th Street near Harrison Street. The system activates when a motorist approaches at a high speed.
- **John Adams Street/7th Street Restriping: Driving Solutions (Years 10+, not likely to be funded):** Restripe 7th Street to include a northbound left-turn pocket from 7th Street to John Adams Street.
- **John Adams-Jefferson Street Family Friendly Route: Family Friendly Route Solutions (Years 10+, not likely to be funded):** Complete sidewalk gaps and add way finding and shared lane markings on John Adams and Jefferson Street from Water Board Park Road to 15th Street.
- **John Adams Street/7th Street Family Friendly Route Crossing: Street Crossing Solutions (already constructed):** Install crosswalk and pedestrian activated flasher on 7th Street at John Adams Street.
- **Jackson Street/7th Street Family Friendly Route Crossing: Street Crossing Solutions (Years 10+, not likely to be funded):** Install crosswalk and pedestrian activated flasher on 7th Street at Jackson Street.

CHAPTER 3: PROJECT IMPACTS

This chapter reviews the impacts of the proposed development plans on the study area transportation system. The study area intersections documented in previous sections of this report are the main focus of the analysis. The secondary focus of the analysis is on potential uses for the library leased parking lot on the southeast corner of the 7th Street/Jefferson Street intersection. The current parking lot usage is documented in previous sections of this report.

Proposed Project

The proposed project will expand the existing Oregon City Library in Oregon City, Oregon. The existing Carnegie style library building has 7,600 square feet of gross floor area. The proposed expansion would add up to an additional 15,000 square feet of gross floor area to the existing structure, for a maximum total of 22,600 square feet. A site plan is included in the appendix. The existing library currently has 24 staff members (total, many of whom are part-time) and the library expects to add only one to two additional staff with the expansion. A small amount of added off-street parking adjacent to the library site is assumed with the proposed project, gained through the efficiency of striped parking stalls relative to the unstructured on-street parking that occurs today. The library expansion design team proposes to restrict parking along the north side of Jefferson Street, adjacent to the library, to two-hour parking. The expansion is scheduled for completion by the year 2016.

Trip Generation

This study focuses on the impacts of the existing and proposed library on the surrounding street network during the adjacent street (7th Street) PM peak hour, which occurs between approximately 4:45 PM and 5:45 PM during a normal weekday. The actual library peak hour occurs earlier in the day. However, traffic conditions on the adjacent street network are less busy earlier in the day. The library currently does not open until after the 7th Street AM peak hour. Therefore, the 7th Street PM peak hour was selected for analysis as the most representative time period for peak library expansion traffic impacts.

The ITE Trip Generation Manual[16] contains daily and adjacent street PM peak hour trip rates for libraries calculated based on gross floor area. However, there are a limited number of trip generation studies for libraries of similar size and location to the Oregon City Library. User data was provided by the library, which records visitor entrances and exits throughout each day. In addition, a mode choice survey of library visitors was conducted on October 9, 2014 between 3 PM and 6 PM. The results are shown in Table 10.

Given the urban residential location and parking restrictions of the existing library, a trip generation comparison between the ITE Trip Generation Manual and the existing library usage data was undertaken to determine whether ITE trip rates were appropriate. It was anticipated that the Oregon City Library might generate fewer trips than indicated by ITE due to its proximity to fairly dense residential neighborhoods, where patrons may be more likely to walk or bicycle to the library than in a typical suburban location.

The mode choice survey was collected during a non-school weekday. Door count data indicated approximately 25% more trips during the PM Peak Hour on a school day. To better represent a typical

[16] *Trip Generation, 9th Edition*, Institute of Transportation Engineers, 2012, Land use code 210 (Single Family Detached Housing).

day, the vehicle mode choice data was applied to door counts from a school day the week before the survey.[17] The combined mode choice, entrance, and exit data provided the existing vehicle trip generation for the library. The resulting trip generation was compared to the ITE Trip Generation Manual average trip rate results for a library, as shown in Table 11. The door count data was also used to calculate the entering/exiting trip split during the peak hour of adjacent street traffic (7th Street).

Table 10: Mode Split Survey Results

Mode Split	Total Survey Responses	% of Respondents
Driver	104	58%
Passenger	33	18%
Transit	5	3%
Bike	6	3%
Walk	32	18%
Total	180	100%
Additional Observed Modes		
Book Drop-off (vehicle trips)*	10	

*Persons observed making book drop-offs without entering the library during the survey

Table 11: Existing Trip Generation Comparison

Calculation Method	Average Daily Rate (trip ends per 1000 GFA)	Gross Floor Area (GFA)	Existing Daily Vehicle Trip Ends		Average Daily Rate (trip ends per 1000 GFA)	Existing Adjacent Street PM Peak Hour Vehicle Trip Ends		
			Total	In/Out		Total	In/Out	Split (%In/%Out)
ITE Rate (Code 590)	56.24	7,600	427	214/213	7.30	55	26/29	47%/53%
Calculated from Survey*	92.63	7,600	704	352/352	11.58	88	36/52	41%/59%

*Using mode split data obtained from October 9, 2014 survey and October 2, 2014 door counts. Includes 8 (4 in/4 out) book drop-off trip ends

As indicated in Table 11, the trips generated by the library were higher than the trips calculated using ITE average trip rates.[18] In reviewing the ITE data, it was noted that smaller libraries tend to have higher

[17] The Oregon City Library provided door counts throughout the year. October was found to be a fairly typical month in the year and the count date selected was determined to be representative of a typical school day in October.

[18] The ITE regression equation has a relatively low r-squared value (0.68) and only 11 data points. The ITE Trip Generation

trip generation rates than larger libraries. Since the observed trip rate was not lower than estimated by ITE, as originally anticipated, and since trip rates tend to decrease with increased library size, the average ITE trip rate was used to estimate the proposed project trip generation. This lower rate is supported by the fact that the library anticipates adding only one to two additional staff with the proposed expansion.

Table 12 summarizes the existing and proposed project daily and peak hour library trips. Since the proposed library expansion is expected to approximately triple the size of the existing library, book drop-off portion of total trip ends is also expected to triple with the expected increased book selection. The added book drop-off trips are shown separately in Table 12, but would be included in the PM peak hour trip generation total (110 trips).

Table 12: Proposed Library Expansion Trip Generation

Land Use	Quantity	Units	Daily		PM Peak Hour		
			Rate (trips/unit)	Total	Rate (trips/unit)	Trip Generation (In/Out/Total)[c]	Book Drop-off (In/Out/Total)
Library (ITE Code 590)	15,000	GFA	56.24	844	7.30	45/65/110	8/8/16

[c] Includes book drop-off trips

Typically, a new development generates two trip types: pass-by and non-pass by. Pass-by trips are already on the network, stopping at the development and then continue on without route modification. Non-pass by trips can be broken down into two further trip types; primary and diverted. Primary trips are added to the network by the new development and enter and leave the study area by the same route. Diverted trips are already on the network but modify a specific route to reach the development.

No pass-by trip reduction was applied to the calculated trips added by the proposed library expansion. The existing library parking availability discourages pass-by trips from 7th Street, which is the only busy street adjacent to the library. Given the small size of the study area, no diverted trip reduction was applied to the generated trips. Therefore, all trips added by the library expansion were assumed to be primary trips.

Trip Distribution

The trips generated by the proposed library expansion were distributed based on the existing travel patterns in the study area and the distribution of population and employment in the library's service area (similar to the Oregon City School District boundary). Most of the distributed trips were assumed to be directionally balanced, with equal percentages of trips entering and leaving the study area. However, a higher percentage of trips were assumed to enter the study area from the north (southbound Washington Street) and the west (eastbound 7th Street) and exit to the south either on Molalla Avenue

Handbook recommends using the regression equation when data points exceed 20 and the r-squared value is >0.75.

or Center Street. These un-balanced distributions were selected based on overall peak hour traffic patterns in the study area. The existing traffic patterns indicated that during the peak hour, trips would enter the study area from eastbound 7th Street and leave heading either southbound to 5th Street or continue eastbound on 7th Street. These trips are most likely commuters stopping by the library on their way home from work. The trip distribution for the library expansion trips is shown in Figure 8.

Future Traffic Volumes

Two future traffic volume scenarios were developed, based on an expected year of opening of 2016:

- 2016 No Build (includes background traffic growth)
- 2016 Build (includes background + proposed project traffic growth)

Background Growth

The Oregon City TSP provided existing and year 2035 forecasted traffic volumes on Washington Street, 7th Street and Molalla Avenue. These forecasted volumes were used to calculate the expected through traffic growth along 7th Street and Washington Street by the project year of opening (2016), assuming linear growth. No growth was assumed on the other streets within the network as the area is already developed and does not serve any major through traffic movements. The resulting traffic growth is shown in Table 13. The growth rates were applied to the major (through) movements of the existing 2014 intersection counts.

Table 13: Assumed Through Volume Growth

Roadway	Direction	Total Growth
Washington Street	Both	3%
7th Street	Both	3%
Molalla Avenue	Both	2%
All other streets	Both	0%

The trips added by the future developments summarized below were also included in the future background traffic shown in Figure 8.

Three approved developments within the study area are scheduled for construction in the near future:

- **Olson Pharmacy:** The existing Olson Pharmacy is located at the corner of 7th Street and Monroe Street. The approved development would replace the existing pharmacy with a two-story mixed-use retail/residential building.
- **Mike's Drive-In:** The existing Mike's Drive-In restaurant is located at the northeast corner of 7th Street and Madison Street. The approved development would expand the existing restaurant from 1,600 SF (square feet) to 3,000 SF and add 2,800 SF of office space.
- **512-514 7th Street Vacant Lot Development:** The approved development location is the vacant lot at the southwest corner of 7th Street and Washington Street. The approved development includes 2,540 SF of retail space and 2,000 SF of medical/dental office space.

The three proposed developments will only impact the through trips on 7th Street within the study area. The trips generated by each development were summarized in Traffic Analysis Letters submitted to the City of Oregon City. All primary trips were assumed to stay on 7th Street, and were distributed based on the existing travel patterns in the study area. The added peak hour approved development trips affecting study area intersections are summarized in Table 14.

Table 14: Added Peak Hour Trips from Approved Developments

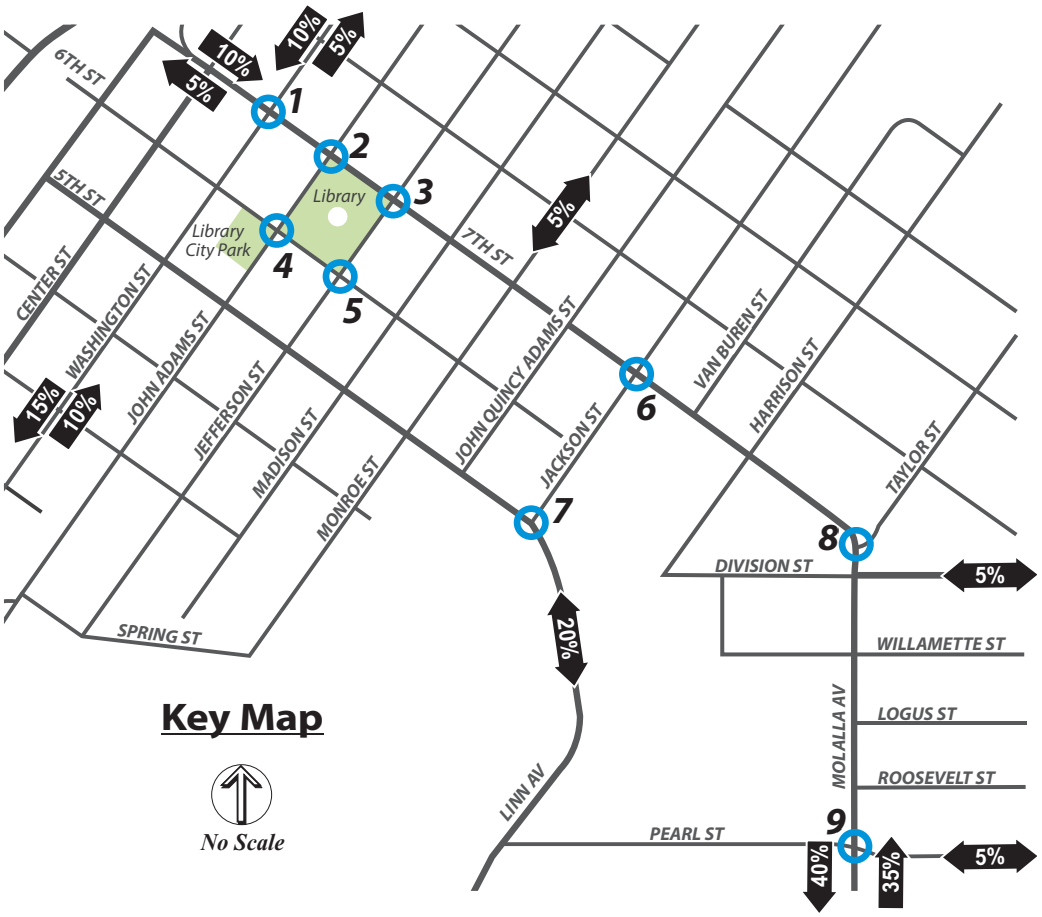
Development	Additional Peak Hour Trips				7th Street/ Molalla Avenue Study Area Impacts			
					Eastbound		Westbound	
	Total	In	Out	Pass-by	West of site	East of site	West of site	East of site
Olson Pharmacy Re-development	*	*	*	*	0	0	0	0
Mike's Drive In Expansion	24	7	12	5	3	7	5	4
7th Street Vacant Lot Development	80	37	38	5	16	21	17	21

*Approved development trips are less than the amount generated by the existing land use

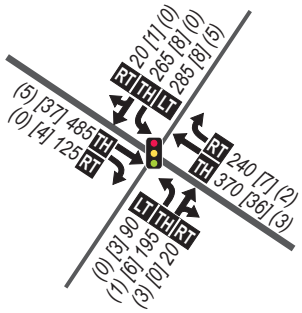
The trips added by background through traffic growth (Table 13) and the approved developments (Table 14) were added to existing traffic volumes, resulting in the future background traffic shown in Figure 8.

Added Traffic Assignment

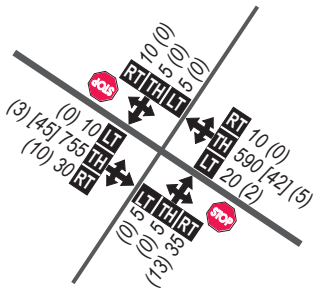
The 110 PM peak hour additional trips generated by the proposed library expansion (see Table 12) were assigned to the study area using the trip distribution percentages shown in Figure 8. Traffic assignment around the library was based on the availability of on-street parking, discussed in more detail in a later section of the report. The final assigned project trips resulted in the PM peak hour volumes that were added to the existing and background volumes at the study intersections, as shown in Figure 8.



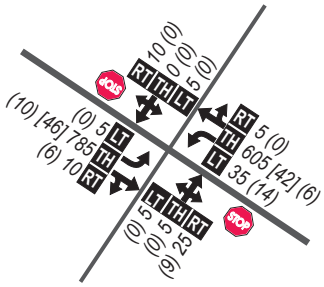
1. *7th St./Washington St.*



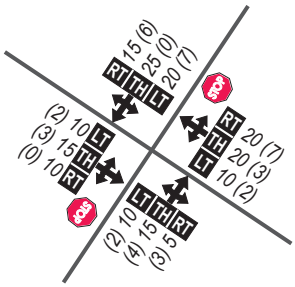
2. *7th St./John Adams St.*



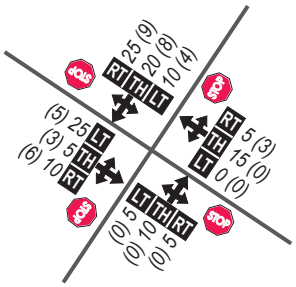
3. *7th St./Jefferson St.*



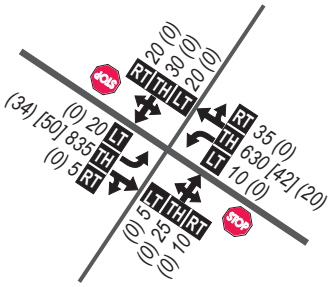
4. *6th St./John Adams St.*



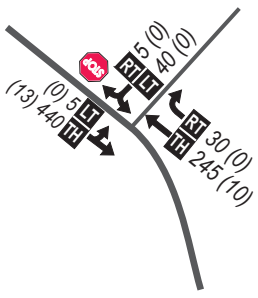
5. *6th St./Jefferson St.*



6. *7th St/Jackson St.*

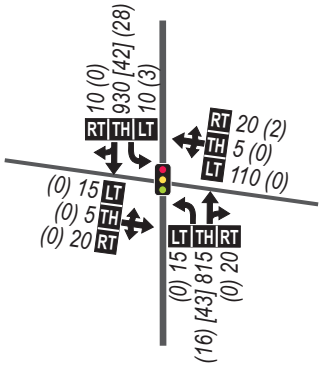


7. *5th St./Jackson St.*



8. *7th St./Molalla St./Taylor St.*

9. *Molalla St./Pearl St.*



LEGEND

- # - Study Intersection
- Traffic Signal
- STOP - Stop Sign
- 00% - Trip Distribution
- ← - Lane Configuration
- *000* - 2016 Build PM Peak Hour Traffic Volumes
- *[000]* - Background Traffic Volume
- *(000)* - Project Traffic Volume
- LT TH RT - Volume Turn Movement (Left•Thru•Right)

DKS

Figure **8**

2016 Build PM Peak Hour Traffic Volumes

Intersection Operations

The PM peak hour traffic volumes shown in Figure 8 were analyzed both with (Build Scenario) and without (No-Build Scenario) the library expansion trips. The HCM 2000 methodology was used to analyze the signalized intersections, and the HCM 2010 methodology was used for all-way stop control and two-way stop control intersections.[19] The resulting No-Build Scenario and Build Scenario study intersection operations are summarized in Table 15.

2016 No-Build Scenario:

Under 2016 No Build traffic conditions, all of the study intersections meet Oregon City operational standards. The Jackson Street approaches at the 7th Street/Jackson Street intersection operates at LOS F. As discussed in Chapter 2 and observed in the field, platooning from the 7th Street/Monroe Street intersection signal creates gaps in the 7th Street traffic, resulting in better operations than reported. Therefore, no future traffic operational needs are identified under No-Build Scenario conditions.

2016 Build Scenario:

The added traffic from the proposed library expansion does not significantly affect the future operations at any of the study intersections. All future No-Build Scenario study intersection Levels of Service are maintained under the future Build Scenario conditions.

Table 15: Future Study Intersection Operations

Intersection	Metro Classification	Intersection Control	Operating Standard[20]	No-Build PM Peak		Build PM Peak	
				LOS	*V/C*	*LOS*	*V/C*
7th St/Washington St	Arterial and Throughway Network	Signalized	V/C < 0.99	C	0.68	C	0.69
7th St/John Adams St	Arterial and Throughway Network	Unsignalized	V/C < 0.99	A/D	0.13	A/D	0.17
7th St/Jefferson St	Arterial and Throughway Network	Unsignalized	V/C < 0.99	A/C	0.10	A/C	0.13
7th St/Jackson St	Arterial and Throughway Network	Unsignalized	V/C < 0.99	A/F	0.59	A/F	0.64
7th St/Molalla Ave/ Taylor St	Arterial and Throughway Network	Unsignalized	V/C < 0.99	A/E	0.58	A/E	0.60
Molalla Ave/Pearl St	Arterial and Throughway Network	Signalized	V/C < 0.99	B	0.74	B	0.76
6th St/John Adams St	Not Designated	Unsignalized	LOS E/ LOS F	A/A	0.07	A/A	0.09
6th St/Jefferson St	Not Designated	Unsignalized	LOS E/ LOS F	A/A	0.04	A/A	0.08
5th St/Jackson St	Arterial and Throughway Network	Unsignalized	V/C < 0.99	A/C	0.12	A/C	0.12

Signalized:
LOS = Level of Service of Intersection
V/C = Volume-to-Capacity Ratio of Intersection

Two-Way or All-Way Stop Controlled:
LOS = Level of Service of Major Street/Minor Street
V/C = Volume-to-Capacity Ratio of Worst Movement

[19] *2000 Highway Capacity Manual*, Transportation Research Board, Washington DC, 2000. *2010 Highway Capacity Manual,* Transportation Research Board, Washington DC, 2010.

[20] Oregon City Municipal Code, 12.04.205 – Mobility Standards.

Preliminary Left Turn Lane Warrants

All study intersections operate within city mobility standards for the existing, 2016 No-Build Scenario, and 2016 Build Scenario. All intersections along 7th Street currently have striped left-turn lanes except at 7th Street/John Adams Street. Therefore, the need for a left-turn lane in either direction was investigated at 7th Street/John Adams Street. Left-turn lane warrants were calculated using both the Highway Research Board (HRB) and ODOT methods.[21] The results are summarized in Table 16.

Table 16: Peak Hour Left Turn Lane Warrants

Intersection	Direction	2014 (Existing)		2016 (No-Build)		2024 (Build)	
		HRB	ODOT	HRB	ODOT	HRB	ODOT
7th Street/John Adams Street	EB	No	No	No	No	No	No
7th Street/John Adams Street	WB	Yes	Yes	Yes	Yes	Yes	Yes

The westbound 7th Street approach has adequate width to provide a striped left-turn lane, only requiring removal of a small amount on-street parking along westbound 7th Street to accommodate approximately 50' of left turn storage. Project D29 of the Oregon City 2013 TSP Update identifies a low priority restriping project to incorporate a striped westbound left-turn lane at this location. The 2016 Build Scenario operating conditions for the intersection are summarized in Table 17, both without and with an added 50' westbound left turn lane. No improvement is apparent when the added left-turn lane is analyzed using HCM methodology, however, a striped left-turn lane would allow westbound 7th Street through traffic to travel unimpeded when a left-turning vehicle is present, thereby reducing overall intersection delay.

Table 17: Future Mitigated Intersection Operations

Intersection	Intersection Control	Operating Standard[22]	Build PM Peak (no left-turn lane)		Mitigated PM Peak (with left-turn lane)	
			LOS	*V/C*	*LOS*	*V/C*
7th St/John Adams St	Unsignalized	V/C < 0.99	A/D	0.17	A/D	0.17

Signalized:
LOS = Level of Service of Intersection
V/C = Volume-to-Capacity Ratio of Intersection

Two-Way or All-Way Stop Controlled:
LOS = Level of Service of Major Street/Minor Street
V/C = Volume-to-Capacity Ratio of Worst Movement

[21] Highway Research Record Number 211, Highway Research Board, 1967. ODOT Analysis Procedures Manual, updated November 2014.

[22] Oregon City Transportation System Plan, Volume 1, Mobility Standards; pg. 38-39

On-Street Parking Impacts

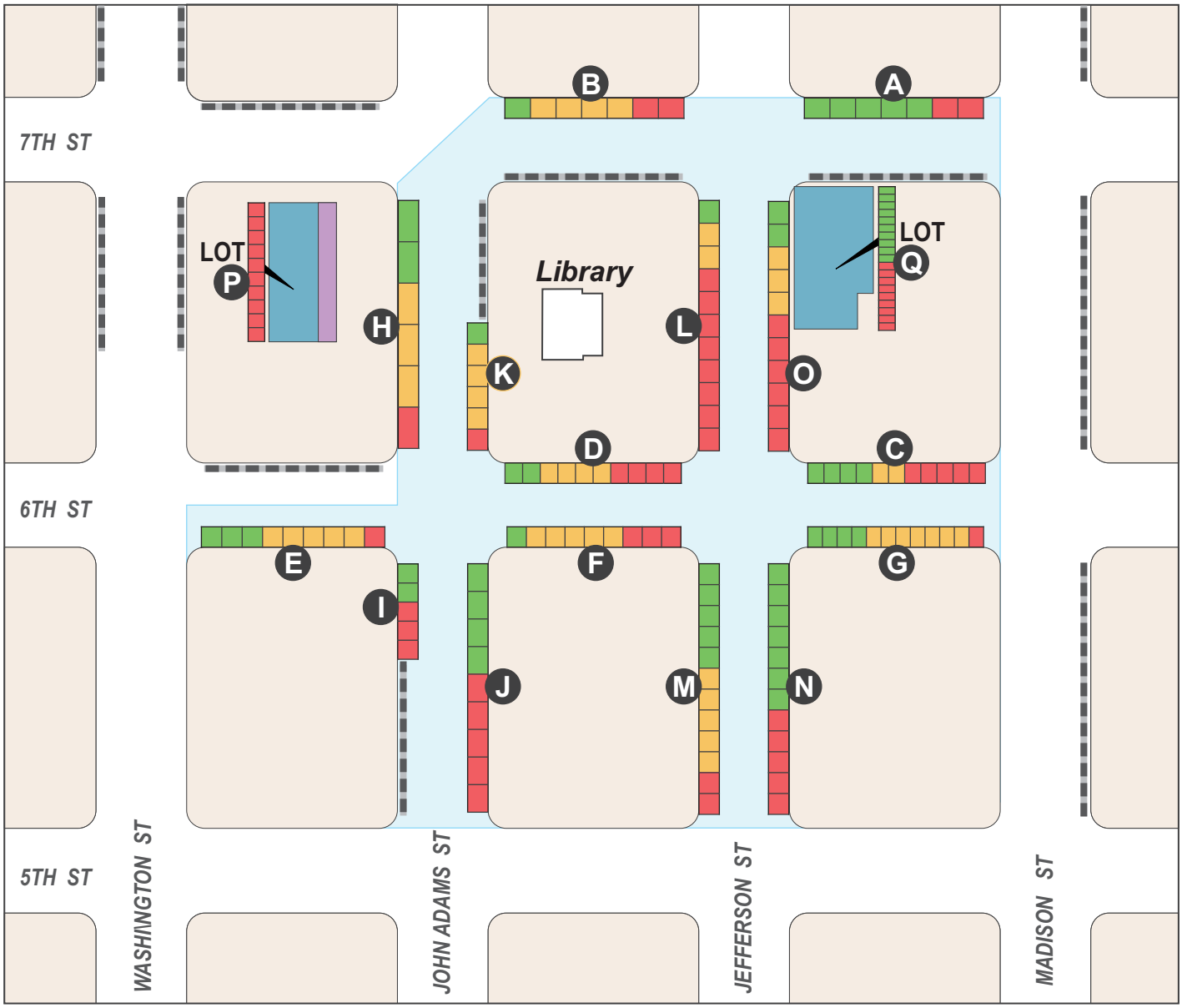
All added project trips were assumed to use on-street parking. A few additional on-street parking stalls were assumed since on-street parking stalls will be striped as part of the library expansion project. The public portion of the fire station lot remains full during the PM peak hour, and current library patrons rarely use the library owned lot on the southeast corner of the 7th Street/Jefferson Street intersection. Other public off-street lots in the area provide additional capacity during the day but require more than one block of walking to reach the library.

One potential site improvement involves restricting parking on three of the westbound 6th Street on-street parking spaces between Jefferson Street and John Adams Street to 10 minute parking. This would restrict the use these parking spaces to book drop-off library patrons only. Three spaces would serve the average future book drop-off demand during the PM peak hour. The library expansion design team proposes to restrict on-street parking on Jefferson Street, adjacent to the library, to two-hour parking. This restriction is reasonable and consistent with the analysis conducted in this study.

To estimate the added parking demand on the existing on-street parking, the average library user's parking dwell time was calculated using the ITE Parking Generation Rate[23] for a library (2.67 spaces per 1,000 SF GFA) and the ITE PM Peak Hour Trip Generation Rate for a library (7.30 total, 3.8 in, 3.5 out trip ends per 1,000 SF GFA). Assuming the peak utilization occurs during the library peak hour, the maximum average peak hour dwell time is 2.67/3.8 hours, or approximately 40-45 minutes. This calculated average dwell time was multiplied by the average hourly vacancy of each on-street parking block to determine how much of the library expansion parking demand could be served. The PM peak hour added trips were assigned to on-street parking based on the calculated parking availability. The resulting on-street parking utilization is shown in Figure 9.

As shown in Figure 9, the existing on-street parking within the study area has adequate capacity to serve the added library demand. Additional library parking could be accommodated in surrounding public lots or farther from the site during special events.

[23] ITE Parking Generation, 4th Edition, 2010.



Build Peak Hour Average Parking Occupancies

	Block-face/Lot	Capacity	Average Occupied	Average Added	Average Vacant	Block-face/Lot	Capacity	Average Occupied	Average Added	Average Vacant
7	A	7	2	0	5	J	9	5	0	4
7	B	7	2	4	1	K	6	1	4	1
11	C	11	5	2	4	L	11	8	2	1
6	D	6	4	2	0	M	12	2	5	5
9	E	9	1	5	3	N	12	5	0	7
7	F	9	3	5	1	O	11	6	3	2
12	G	12	1	7	4	LOT P	10	10	0	0
5	H	6	1	3	2	LOT Q	19	9	0	10
5	I	5	3	0	2	*Total*	162	68	42	52

LEGEND

- Library On-Street Parking
- Library Off-Street Parking
- Restricted Off-Street Parking
- No Parking Allowed

Block-face/Lot - *Bar Chart*

- Average Available Parking Spaces
- Average Proposed Expansion Parking Spaces
- Average Existing Occupied Parking Spaces

DKS

No Scale

Figure 9

Build Parking by Block-face Weekday PM Peak Hour

Library Owned Parking Lot Utilization

As described in Chapter 2, the library currently owns the parking lot on the southeast corner of the 7th Street/Jefferson Street intersection. Access to this parking lot is restricted by steep grade approaches, restricting wheelchair accessibility. The lot is also difficult for a westbound 7th Street vehicle to access during the peak hour, as the left turn lane for Jefferson Street is not yet opened at the driveway. The lot circulation is striped as one-way, with vehicles entering from 7th Street and exiting onto the alley at the southeast corner of the lot. Parking lot traffic is then directed east along the alley, re-entering the local street network at Madison Street.

Currently, the parking lot is used partially by library employees and partially by employees of the surrounding businesses. Since this study has shown that the existing on-street parking within the study area is sufficient for the added demand generated by the library expansion, it is recommended that the parking lot be restricted to library staff, volunteers, and long-term parking for other local businesses. The restricted circulation conditions, operational restrictions with 7th Street, and steep grades of the existing parking lot are not desirable conditions for library patron use.

Due to restricted sight distance from the alley connecting the parking lot to Madison Street, it is recommended that traffic from the parking lot be directed west to Jefferson Street rather than east to Madison Street. While this represents a change in traffic flow, very few vehicles would be affected.

The proposed upgrades and mitigations for the library owned parking lot are summarized in the following chapter, with an overall goal of removing as many long-term library or other business employees from on-street parking as possible.

CHAPTER 4: PROJECT MITIGATION SUMMARY

The following list summarizes the mitigation strategies identified as part of the Oregon City Library Expansion Transportation Impact Study. These projects are recommended based on the operational analysis of the future traffic conditions, and the existing pedestrian, bicycle, and parking conditions in the study area.

Motor Vehicle Improvements

- Restripe 7th Street at John Adams Street to include a left-turn lane in the northwest direction. This project is included in the City's Transportation System Plan as D29. Although low (<20 vph) left turn volumes allow the intersection operations to meet City standards both under existing and future Build conditions, preliminary left-turn lane warrants indicate a need for a left-turn lane.
- Consider providing library signage on 7th Street, for vehicles traveling in the northwest direction, encouraging vehicles to turn left at Monroe Street, a signalized intersection. This will reduce the left-turn demand on 7th Street at the unsignalized intersections at Jefferson Street and John Adams Street.

Pedestrian and Bicycle Access

- Maintain pedestrian and bicycle accessibility to building entrances, providing bicycle parking near building entrances.

On-Street Parking

- Stripe on-street parking stalls adjacent to library parcel on Jefferson Street, 6th Street, and John Adams Street to maximize parking efficiency.
- Allocate three parking stalls to be used specifically for book drop-off. These stalls should be located on 6th Street, adjacent to the library. Signage adjacent to these stalls should include language similar to "10-minute parking only".
- Upgrade or add curb ramps to ADA standards at the following intersections to improve access between on-street parking and the library:
    - 6th Street/John Adams Street
    - 6th Street/Jefferson Street

Off-Street Parking

- Based on the current parking lot usage and geometry, the following improvements and options are recommended for the library owned parking lot:
    - Remove the existing parking space nearest to 7th Street entrance. This space requires a departing vehicle to complete a blind back-up maneuver onto the sidewalk and possibly onto 7th Street if the parking lot is full.
    - Restripe the existing one-way parking lot markings to emphasize the circulation.

- Install a "Do Not Enter" sign facing parking lot traffic at the 7th Street entrance. The sight distance restrictions caused by existing foliage and a retaining wall to the west and a building abutting the sidewalk to the east make exiting onto 7th Street undesirable.
- Redirect traffic exiting the parking lot to turn west on the alley toward Jefferson Street, rather than toward Madison Street, since sight distance is restricted where the alley accesses Madison Street.
- Sign the parking spaces required for staff as "library staff only" (approximately 10 spaces). The remaining spaces may be used for either:
    - Volunteer staff parking (revise sign to read "library staff and volunteers only")
    - Lease to nearby businesses

Overall, the only significant transportation impact of the library expansion is the increase in on-street parking demand, especially during the PM peak hour. However, the current on-street parking facilities in the area surrounding the library provide adequate capacity to meet the predicted future demand. The current network has adequate capacity to absorb the added library traffic, and intersection operations near the library should not be noticeably affected. Most transportation mitigation efforts associated with the library expansion should be focused on encouraging alternative modes of travel to the library with improved pedestrian and bicycle facilities in and around the project site.

APPENDIX

Proposed Site Plan

Traffic Counts

Level of Service Definitions

Oregon City Mobility Standards

Highway Capacity Calculations

Crash Rate Calculations

Turn Lane Warrants

Appendix

Proposed Site Plan

Traffic Counts

Level of Service Descriptions

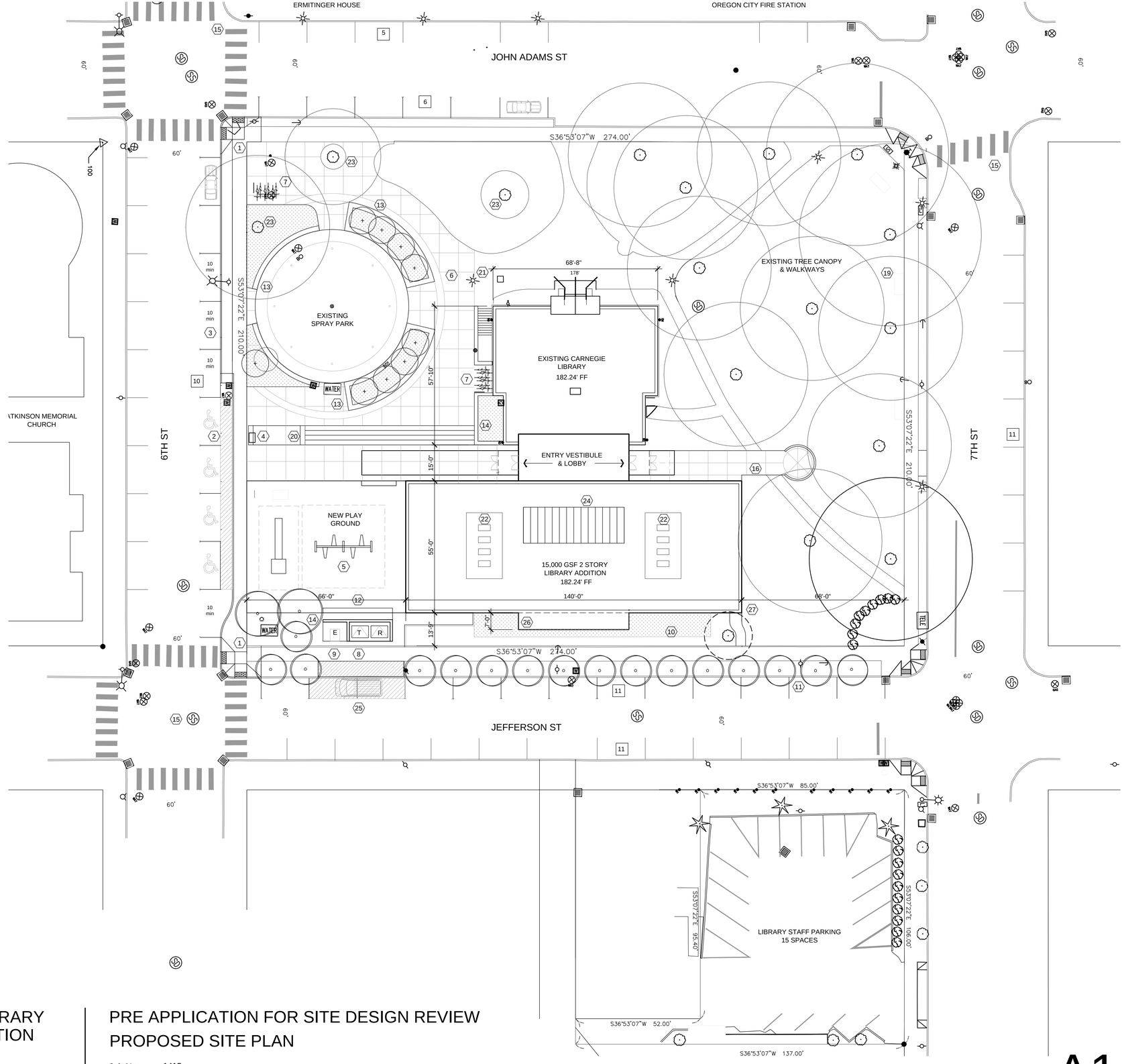
Oregon City Mobility Standards

Highway Capacity Calculations

Crash Rate Calculations

Turn Lane Warrants

Proposed Site Plan



GENERAL NOTES

1. PROTECT ALL BUILDINGS, UTILITIES, VEGETATION ETC TO REMAIN, .
2. SEE CIVIL DRAWINGS FOR BALANCE OF INFORMATION.
3. MAINTAIN 2% MAX CROSS SLOPE AT ALL NEW CONCRETE WALKWAYS & ACCESSIBLE AISLES.
4. DEMO (E) VEGETATION, OBSOLETE POWER POLES, MISC ITEMS AS NECESSARY FOR NEW CONSTRUCTION.
5. MOVE (E) UTILITIES & UTILITY MONUMENTS AS NECESSARY FOR NEW CONSTRUCTION.

KEYNOTES

SYMBOL	DESCRIPTION
1	NEW SIDEWALK, STREET CURB & CORNER CURB ENTIRE LENGTH OF 6TH ST
2	ADA ACCESSIBLE PARKING SPACES (4) W/ ACCESSIBLE AISLE, CURB RAMP & SIGNAGE.
3	(4) 10 MINUTE DROP OFF SPACES AS RECOMMENDED BY TRAFFIC STUDY
4	BOOK DROP
5	NEW PLAY EQUIP & SOFT SURFACE TO REPLACE EXISTING
6	NEW PAVING, SEAT WALL & PLANTING AT EXISTING SPRAY PARK . REMOVE EXISTING CONC WALL.
7	BIKE RACK (6)
8	TRASH & RECYCLING ENCLOSURE
9	TRANSFORMER & PAD
10	STORM WATER PLANTING
11	NEW STREET TREES ALONG JEFFERSON
12	ENTRY CANOPY
13	NEW SEAT WALL & PLANTING
14	LANDSCAPE PLANTING
15	EXISTING STRIPING FOR PEDESTRIAN CROSSING
16	NEW WALKWAY, CONNECT TO EXISTING
17	EXISTING SIDEWALK & CURB TO REMAIN
18	STRIPE & SIGN PARKING FOR 2 HOUR LIMIT
19	EXISTING BENCHES TO REMAIN
20	BUILDING SIGNAGE
21	EXISTING SITE LIGHTING TO REMAIN & RELOCATED IF NECESSARY
22	MECHANICAL W/ SCREEN
23	EXISTING TREE W/ NEW LANDSCAPE
24	SKYLIGHT
25	TRUCK LOADING ONLY W/ CONC APRON ADJ. TO EXISTING SIDEWALK
26	LINE OF BUILDING SHOWN DASHED BELOW
27	SECOND FLOOR EGRESS STAIR EXIT
#	PARKING COUNT

OREGON CITY LIBRARY
REMODEL & ADDITION

606 JOHN ADAMS AVE
OREGON CITY, OREGON

PRE APPLICATION FOR SITE DESIGN REVIEW
PROPOSED SITE PLAN

Job No: 1415
Date: December 17, 2014

A1.1

0 10' 20' 40"
SCALE 1" = 20'
PLAN NORTH

S|E A
SCOTT|EDWARDS ARCHITECTURE LLP

Traffic Counts

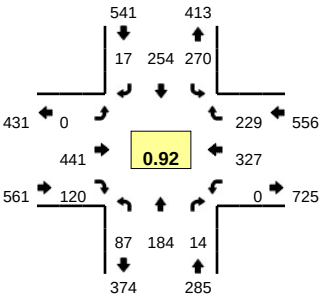
Type of peak hour being reported: User-Defined

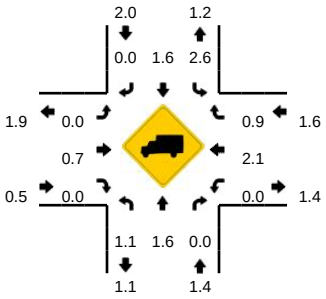
Method for determining peak hour: Total Entering Volume

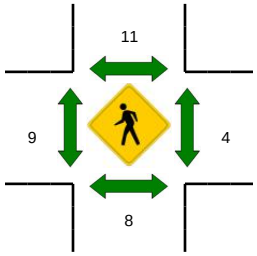
LOCATION: Washington St -- 7th St
CITY/STATE: Oregon City, OR

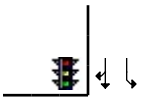
QC JOB #: 13125401
DATE: Tue, Oct 21 2014

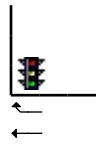
Peak-Hour: 4:50 PM -- 5:50 PM
Peak 15-Min: 5:05 PM -- 5:20 PM

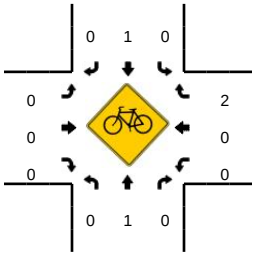


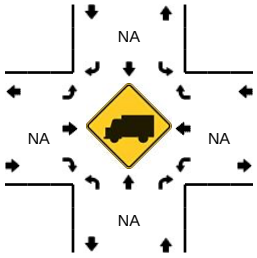


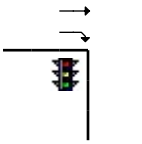


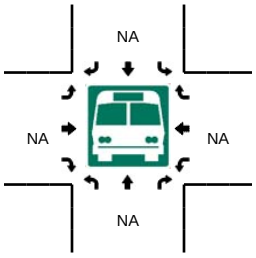












5-Min Count Period Beginning At	Washington St (Northbound)				Washington St (Southbound)				7th St (Eastbound)				7th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	7	12	2	0	31	24	1	0	0	24	7	0	0	26	15	0	149	
4:05 PM	4	14	2	0	15	9	1	0	0	55	3	0	0	32	22	0	157	
4:10 PM	12	13	1	0	24	25	3	0	0	37	8	0	0	28	20	0	171	
4:15 PM	5	14	2	0	25	13	1	0	0	47	12	0	0	26	13	0	158	
4:20 PM	10	7	2	0	23	29	1	0	0	38	8	0	0	28	17	0	163	
4:25 PM	5	15	3	0	18	12	3	0	0	34	11	0	0	20	15	0	136	
4:30 PM	6	15	1	0	23	20	4	0	0	30	14	0	0	30	21	0	164	
4:35 PM	8	12	1	0	29	21	2	0	0	30	4	0	0	25	24	0	156	
4:40 PM	3	6	2	0	17	28	2	0	0	30	7	0	0	30	14	0	139	
4:45 PM	5	12	2	0	24	15	1	0	0	48	10	0	0	24	17	0	158	
4:50 PM	5	13	1	0	22	24	1	0	0	34	8	0	0	31	15	0	154	
4:55 PM	8	18	1	0	20	22	4	0	0	31	9	0	0	22	17	0	152	1857
5:00 PM	8	20	2	0	28	20	1	0	0	26	10	0	0	28	19	0	162	1870
5:05 PM	5	21	0	0	23	20	4	0	0	38	11	0	0	35	27	0	184	1897
5:10 PM	8	22	1	0	16	19	1	0	0	45	9	0	0	27	25	0	173	1899
5:15 PM	4	11	1	0	21	20	4	0	0	43	11	0	0	37	17	0	169	1910
5:20 PM	10	13	2	0	23	16	1	0	0	39	7	0	0	16	14	0	141	1888
5:25 PM	8	19	1	0	26	26	0	0	0	39	9	0	0	33	15	0	176	1928
5:30 PM	13	10	0	0	25	22	0	0	0	32	11	0	0	25	11	0	149	1913
5:35 PM	4	12	1	0	20	17	0	0	0	43	10	0	0	21	19	0	147	1904
5:40 PM	8	10	2	0	17	24	0	0	0	36	15	0	0	22	28	0	162	1927
5:45 PM	6	15	2	0	29	24	1	0	0	35	10	0	0	30	22	0	174	1943
5:50 PM	4	13	1	0	17	16	0	0	0	53	8	0	0	17	12	0	141	1930
5:55 PM	5	12	0	0	25	16	3	0	0	19	12	0	0	29	17	0	138	1916

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	68	216	8	0	240	236	36	0	0	504	124	0	0	396	276	0	2104
Heavy Trucks	0	0	0		8	4	0		0	8	0		0	0	4		24
Pedestrians		0				4				8				8			20
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/5/2014 9:59 AM

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

Type of peak hour being reported: User-Defined

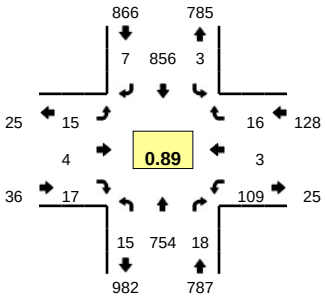
Method for determining peak hour: Total Entering Volume

LOCATION: Molalla Ave -- Pearl St

QC JOB #: 13125402

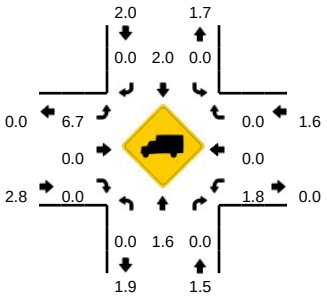
CITY/STATE: Oregon City, OR

DATE: Tue, Oct 21 2014



Peak-Hour: 4:50 PM -- 5:50 PM

Peak 15-Min: 5:05 PM -- 5:20 PM



Quality Counts
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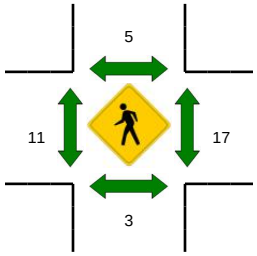
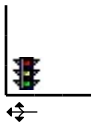
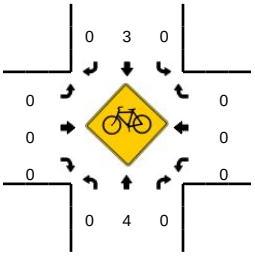
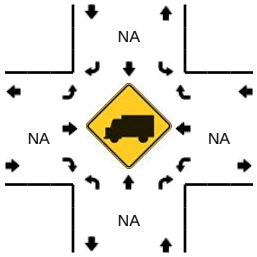
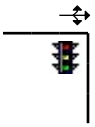
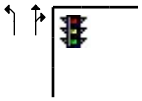


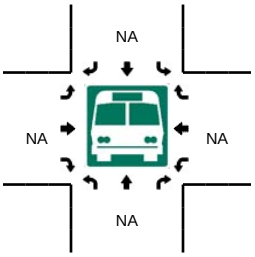












5-Min Count Period Beginning At	Molalla Ave (Northbound)				Molalla Ave (Southbound)				Pearl St (Eastbound)				Pearl St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	53	3	0	0	87	0	0	1	3	0	0	5	0	4	0	156	
4:05 PM	1	62	4	0	0	66	0	0	1	0	1	0	10	1	0	0	146	
4:10 PM	2	55	1	0	3	66	2	0	1	0	2	0	10	1	2	0	145	
4:15 PM	1	56	1	0	1	75	1	0	1	1	0	0	10	1	0	0	148	
4:20 PM	2	57	1	0	0	71	0	0	2	2	1	0	9	1	1	0	147	
4:25 PM	1	50	2	0	1	70	1	0	1	0	2	0	9	2	2	0	141	
4:30 PM	2	65	3	0	1	63	1	0	0	0	1	0	11	0	2	0	149	
4:35 PM	0	58	1	0	0	72	2	0	1	0	1	0	11	1	2	0	149	
4:40 PM	0	49	1	0	0	68	1	0	0	1	1	0	5	0	2	0	128	
4:45 PM	2	63	0	0	0	64	0	0	0	1	3	0	9	0	1	0	143	
4:50 PM	2	66	2	0	1	70	1	0	0	0	1	0	12	0	1	0	156	
4:55 PM	1	63	3	0	0	79	0	0	0	0	0	0	6	0	1	0	153	1761
5:00 PM	2	62	1	0	0	69	0	0	1	0	1	0	8	0	3	0	147	1752
5:05 PM	1	72	2	0	0	74	1	0	1	0	6	0	10	0	1	0	168	1774
5:10 PM	0	87	1	0	2	73	1	0	0	0	3	0	12	0	1	0	180	1809
5:15 PM	1	65	1	0	0	77	0	0	3	0	1	0	9	2	1	0	160	1821
5:20 PM	1	50	0	0	0	57	1	0	1	2	2	0	7	0	0	0	121	1795
5:25 PM	0	57	0	0	0	69	0	0	5	0	0	0	13	0	3	0	147	1801
5:30 PM	1	45	2	0	0	77	1	0	1	0	1	0	7	1	3	0	139	1791
5:35 PM	2	55	4	0	0	77	1	0	2	1	1	0	9	0	0	0	152	1794
5:40 PM	1	71	0	0	0	59	1	0	1	0	1	0	10	0	1	0	145	1811
5:45 PM	3	61	2	0	0	75	0	0	0	1	0	0	6	0	1	0	149	1817
5:50 PM	1	42	0	0	0	72	3	0	0	0	1	0	5	0	1	0	125	1786
5:55 PM	2	63	2	0	1	60	1	0	0	0	4	0	8	0	1	0	142	1775

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	896	16	0	8	896	8	0	16	0	40	0	124	8	12	0	2032
Heavy Trucks	0	4	0		0	16	0		0	0	0		0	0	0		20
Pedestrians		0				0				8				16			24
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/5/2014 9:59 AM

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

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

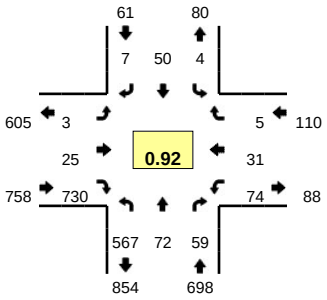
LOCATION: Taylor St/Molalla Ave -- 7th St

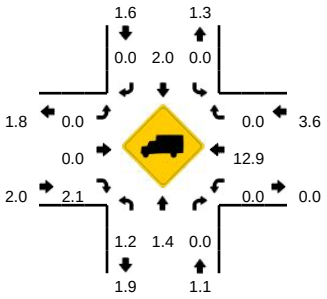
QC JOB #: 13125403

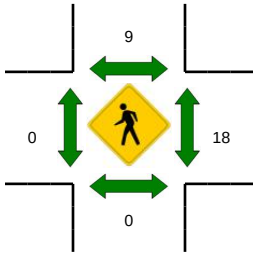
CITY/STATE: Oregon City, OR

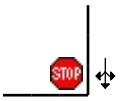
DATE: Tue, Oct 21 2014

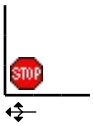
Peak-Hour: 4:50 PM -- 5:50 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

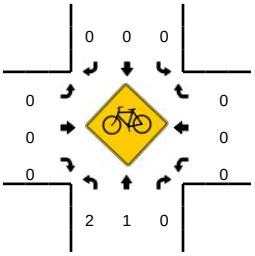


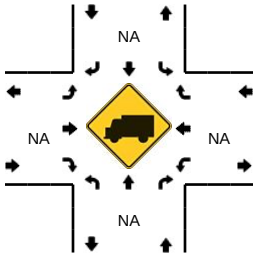


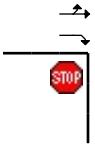


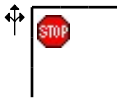


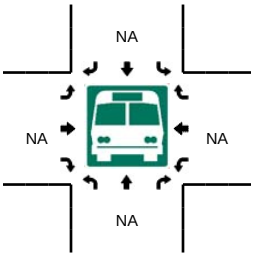












5-Min Count Period Beginning At	Taylor St/Molalla Ave (Northbound)				Taylor St/Molalla Ave (Southbound)				7th St (Eastbound)				7th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	45	9	1	0	0	1	0	0	1	0	73	0	8	3	1	0	142	
4:05 PM	37	5	3	0	0	1	0	0	0	1	64	0	3	4	1	0	119	
4:10 PM	45	4	4	0	0	4	0	0	0	6	54	0	9	3	1	0	130	
4:15 PM	41	6	2	0	0	3	1	0	1	3	62	0	13	2	0	0	134	
4:20 PM	49	4	6	0	0	4	0	0	0	1	52	0	6	6	0	0	128	
4:25 PM	32	4	1	0	0	1	0	0	0	0	57	0	10	4	1	0	110	
4:30 PM	51	6	5	0	0	5	0	0	1	3	58	0	8	3	1	0	141	
4:35 PM	49	2	1	0	0	4	0	0	0	3	52	0	14	1	3	0	129	
4:40 PM	38	3	3	0	0	2	0	0	0	3	54	0	8	4	0	0	115	
4:45 PM	43	3	7	0	1	2	0	0	0	3	56	0	7	2	0	0	124	
4:50 PM	45	12	5	0	1	2	1	0	0	2	66	0	6	7	1	0	148	
4:55 PM	45	4	2	0	2	6	1	0	0	2	58	0	3	1	0	0	124	1544
5:00 PM	50	4	5	0	0	7	0	0	1	3	67	0	6	4	1	0	148	1550
5:05 PM	49	14	6	0	0	8	1	0	0	1	52	0	7	2	1	0	141	1572
5:10 PM	59	5	4	0	1	4	1	0	0	4	66	0	6	1	1	0	152	1594
5:15 PM	50	1	5	0	0	1	0	0	0	1	69	0	5	4	0	0	136	1596
5:20 PM	37	2	3	0	0	5	1	0	1	2	45	0	9	4	0	0	109	1577
5:25 PM	55	8	3	0	0	2	1	0	0	4	65	0	8	2	1	0	149	1616
5:30 PM	36	7	4	0	0	3	0	0	0	5	67	0	7	0	0	0	129	1604
5:35 PM	43	4	10	0	0	4	0	0	0	0	56	0	8	3	0	0	128	1603
5:40 PM	45	9	4	0	0	1	0	0	1	0	51	0	6	3	0	0	120	1608
5:45 PM	53	2	8	0	0	7	1	0	0	1	68	0	3	0	0	0	143	1627
5:50 PM	29	7	2	0	0	7	0	0	0	0	49	0	8	3	1	0	106	1585
5:55 PM	47	10	4	0	0	2	0	0	1	4	60	0	3	5	1	0	137	1598

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	632	92	60	0	4	76	8	0	4	32	740	0	76	28	12	0	1764
Heavy Trucks	4	0	0		0	4	0		0	0	16		0	0	0		24
Pedestrians		0				12				0				16			28
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/5/2014 9:59 AM

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

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: Jackson St -- 7th St

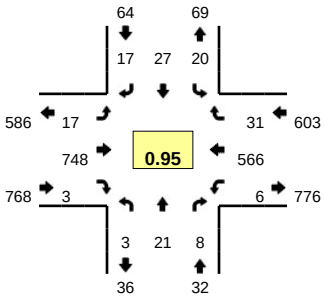
CITY/STATE: Oregon City, OR

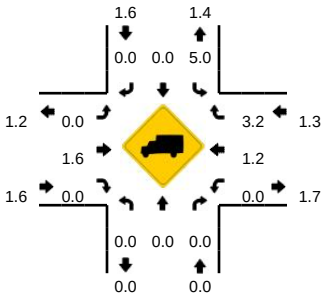
QC JOB #: 13125404

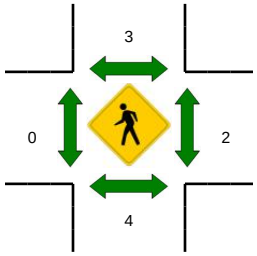
DATE: Tue, Oct 21 2014

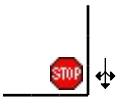
Peak-Hour: 4:50 PM -- 5:50 PM

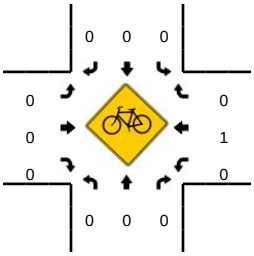
Peak 15-Min: 5:05 PM -- 5:20 PM

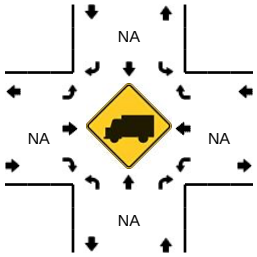


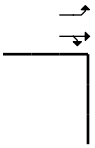


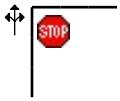


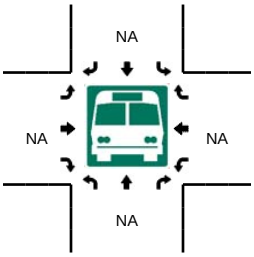












5-Min Count Period Beginning At	Jackson St (Northbound)				Jackson St (Southbound)				7th St (Eastbound)				7th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	3	0	0	3	0	1	0	1	67	0	0	1	47	1	0	124	
4:05 PM	0	1	2	0	1	1	1	0	0	63	0	0	1	45	4	0	119	
4:10 PM	0	2	0	0	0	1	2	0	2	57	1	0	3	44	0	0	112	
4:15 PM	0	0	1	0	2	0	3	0	2	83	0	0	2	41	1	0	135	
4:20 PM	0	2	1	0	3	0	5	0	0	52	2	0	1	58	2	0	126	
4:25 PM	0	3	2	0	2	1	2	0	0	56	0	0	0	40	2	0	108	
4:30 PM	0	0	1	0	0	0	2	0	0	60	0	0	0	50	0	0	113	
4:35 PM	0	0	2	0	3	1	1	0	0	54	0	0	0	50	2	0	113	
4:40 PM	0	0	3	0	2	0	0	0	2	46	0	0	0	44	2	0	99	
4:45 PM	1	0	0	0	0	2	2	0	2	57	0	0	0	44	2	0	110	
4:50 PM	0	0	0	0	2	2	1	0	3	72	0	0	1	51	2	0	134	
4:55 PM	0	0	0	0	0	2	1	0	0	61	2	0	0	46	2	0	114	1407
5:00 PM	0	0	1	0	2	2	3	0	1	63	0	0	1	49	1	0	123	1406
5:05 PM	0	2	0	0	4	5	1	0	2	54	0	0	1	51	1	0	121	1408
5:10 PM	0	3	1	0	4	2	1	0	1	63	0	0	1	55	3	0	134	1430
5:15 PM	0	3	1	0	1	4	1	0	2	65	0	0	0	49	4	0	130	1425
5:20 PM	0	1	0	0	1	2	1	0	2	51	1	0	1	37	1	0	98	1397
5:25 PM	0	6	1	0	1	2	1	0	0	72	0	0	0	55	3	0	141	1430
5:30 PM	1	0	2	0	1	3	3	0	0	68	0	0	0	36	0	0	114	1431
5:35 PM	0	2	0	0	2	0	1	0	1	52	0	0	1	42	4	0	105	1423
5:40 PM	1	2	2	0	1	0	0	0	3	55	0	0	0	47	6	0	117	1441
5:45 PM	1	2	0	0	1	3	3	0	2	72	0	0	0	48	4	0	136	1467
5:50 PM	0	4	0	0	1	3	0	0	0	53	1	0	0	33	1	0	96	1429
5:55 PM	1	3	0	0	1	1	0	0	1	55	0	0	0	49	4	0	115	1430

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	32	8	0	36	44	12	0	20	728	0	0	8	620	32	0	1540
Heavy Trucks	0	0	0		0	0	0		0	16	0		0	4	0		20
Pedestrians		4				0				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/5/2014 9:59 AM

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

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: Jefferson St -- 7th St

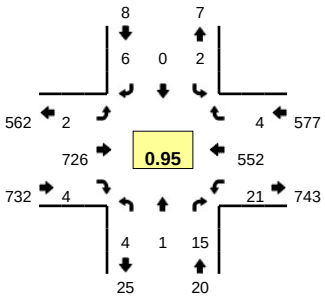
CITY/STATE: Oregon City, OR

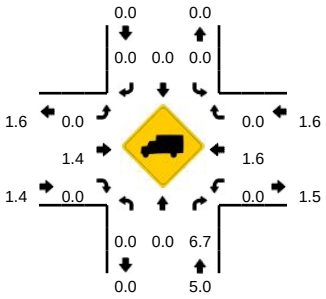
QC JOB #: 13125405

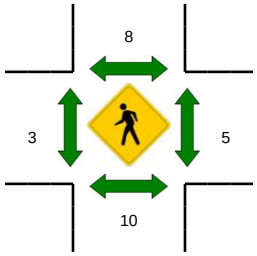
DATE: Tue, Oct 21 2014

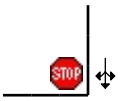
Peak-Hour: 4:50 PM -- 5:50 PM

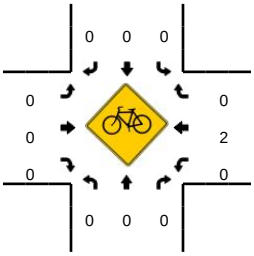
Peak 15-Min: 5:05 PM -- 5:20 PM

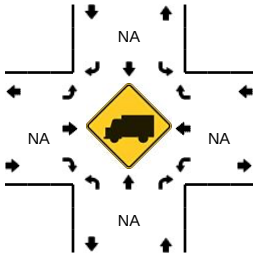


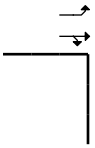


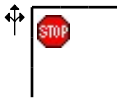


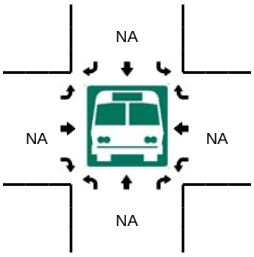












5-Min Count Period Beginning At	Jefferson St (Northbound)				Jefferson St (Southbound)				7th St (Eastbound)				7th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	1	0	0	0	0	0	1	64	0	0	4	51	0	0	121	
4:05 PM	0	0	1	0	0	0	0	0	0	60	1	0	1	45	0	0	108	
4:10 PM	0	0	1	0	0	0	0	0	1	76	0	0	0	54	0	0	132	
4:15 PM	0	1	0	0	0	0	1	0	0	71	0	0	0	35	0	0	108	
4:20 PM	0	0	1	0	0	1	3	0	0	55	1	0	3	51	0	0	115	
4:25 PM	0	0	1	0	0	0	1	0	1	48	1	0	2	48	0	0	102	
4:30 PM	0	0	0	0	0	0	0	0	2	58	0	0	1	42	0	0	103	
4:35 PM	1	0	2	0	0	0	0	0	2	47	1	0	0	53	0	0	106	
4:40 PM	1	0	0	0	0	0	0	0	1	47	3	0	1	46	0	0	99	
4:45 PM	0	0	1	0	0	0	0	0	1	56	3	0	1	40	1	0	103	
4:50 PM	0	0	2	0	0	0	0	0	0	70	0	0	2	51	1	0	126	
4:55 PM	1	0	2	0	0	0	1	0	0	49	0	0	3	44	0	0	100	1323
5:00 PM	0	1	1	0	0	0	0	0	0	62	1	0	2	44	0	0	111	1313
5:05 PM	0	0	1	0	2	0	1	0	0	47	0	0	0	57	1	0	109	1314
5:10 PM	1	0	1	0	0	0	0	0	0	62	0	0	1	53	1	0	119	1301
5:15 PM	0	0	0	0	0	0	0	0	0	67	1	0	3	53	0	0	124	1317
5:20 PM	0	0	2	0	0	0	0	0	0	58	0	0	4	38	0	0	102	1304
5:25 PM	0	0	1	0	0	0	0	0	0	68	0	0	3	45	1	0	118	1320
5:30 PM	0	0	1	0	0	0	2	0	1	61	1	0	1	41	0	0	108	1325
5:35 PM	1	0	2	0	0	0	1	0	0	53	0	0	2	34	0	0	93	1312
5:40 PM	1	0	1	0	0	0	0	0	1	60	0	0	0	45	0	0	108	1321
5:45 PM	0	0	1	0	0	0	1	0	0	69	1	0	0	47	0	0	119	1337
5:50 PM	0	0	1	0	0	0	0	0	1	55	1	0	3	36	0	0	97	1308
5:55 PM	0	0	1	0	0	0	0	0	3	63	0	0	2	44	0	0	113	1321

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	0	8	0	8	0	4	0	0	704	4	0	16	652	8	0	1408
Heavy Trucks	0	0	0		0	0	0		0	12	0		0	8	0		20
Pedestrians		8				4				12				8			32
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/5/2014 9:59 AM

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

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

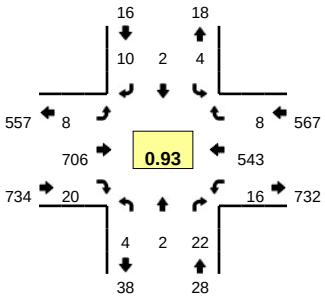
LOCATION: John Adams St -- 7th St

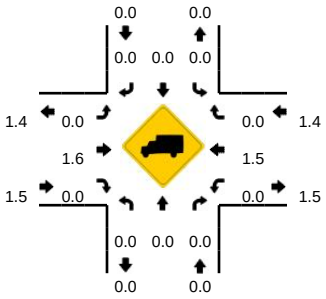
QC JOB #: 13125406

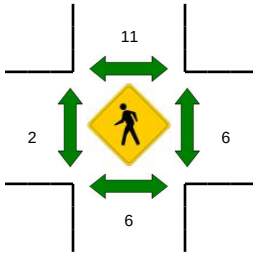
CITY/STATE: Oregon City, OR

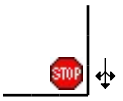
DATE: Tue, Oct 21 2014

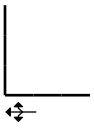
Peak-Hour: 4:50 PM -- 5:50 PM
Peak 15-Min: 5:05 PM -- 5:20 PM

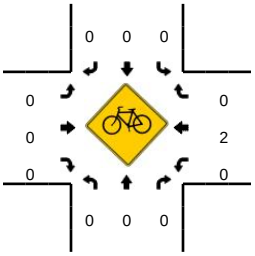


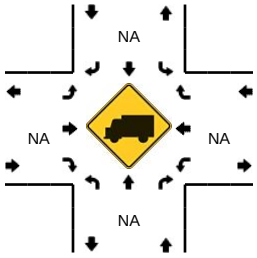


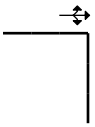


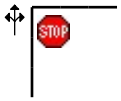


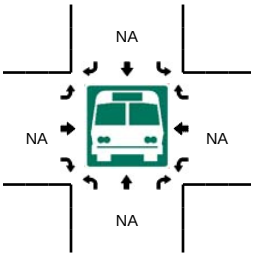












5-Min Count Period Beginning At	John Adams St (Northbound)				John Adams St (Southbound)				7th St (Eastbound)				7th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	1	1	1	0	3	0	0	0	0	58	0	0	0	50	4	0	118	
4:05 PM	1	0	0	0	1	0	2	0	0	67	1	0	1	32	1	0	106	
4:10 PM	0	2	2	0	0	0	1	0	0	69	1	0	0	62	0	0	137	
4:15 PM	0	0	2	0	1	0	0	0	1	71	3	0	3	32	1	0	114	
4:20 PM	0	0	2	0	0	0	1	0	2	52	0	0	4	45	0	0	106	
4:25 PM	1	0	4	0	0	0	0	0	2	47	3	0	6	38	2	0	103	
4:30 PM	0	0	1	0	0	0	0	0	1	59	0	0	3	46	1	0	111	
4:35 PM	0	1	0	0	0	0	0	0	1	52	3	0	1	55	0	0	113	
4:40 PM	0	1	3	0	0	0	1	0	4	49	2	0	2	36	1	0	99	
4:45 PM	1	0	2	0	1	1	0	0	0	62	1	0	1	43	0	0	112	
4:50 PM	0	0	2	0	1	0	0	0	0	61	1	0	1	47	1	0	114	
4:55 PM	0	0	3	0	0	1	1	0	2	53	3	0	0	48	0	0	111	1344
5:00 PM	1	1	1	0	0	0	1	0	1	57	0	0	5	39	0	0	106	1332
5:05 PM	0	0	1	0	0	0	1	0	0	49	1	0	2	58	2	0	114	1340
5:10 PM	0	0	0	0	0	0	1	0	0	67	2	0	0	52	1	0	123	1326
5:15 PM	1	0	0	0	2	1	1	0	0	61	0	0	1	57	0	0	124	1336
5:20 PM	1	0	1	0	1	0	1	0	0	59	6	0	1	26	2	0	98	1328
5:25 PM	0	1	2	0	0	0	0	0	1	64	3	0	2	45	0	0	118	1343
5:30 PM	0	0	2	0	0	0	2	0	2	60	2	0	1	40	0	0	109	1341
5:35 PM	0	0	2	0	0	0	1	0	1	53	0	0	1	35	0	0	93	1321
5:40 PM	0	0	1	0	0	0	0	0	1	60	0	0	0	45	1	0	108	1330
5:45 PM	1	0	7	0	0	0	1	0	0	62	2	0	2	51	1	0	127	1345
5:50 PM	0	0	1	0	0	1	0	0	1	63	2	0	4	35	0	0	107	1338
5:55 PM	0	0	2	0	0	0	1	0	1	51	1	0	0	41	1	0	98	1325

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	0	4	0	8	4	12	0	0	708	12	0	12	668	12	0	1444
Heavy Trucks	0	0	0		0	0	0		0	20	0		0	4	0		24
Pedestrians		0				4				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/5/2014 9:59 AM

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

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: Jefferson St -- 6th St

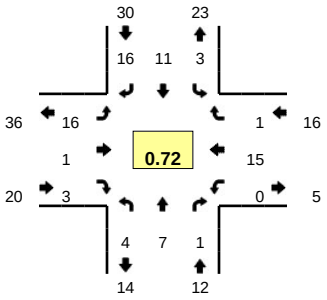
CITY/STATE: Oregon City, OR

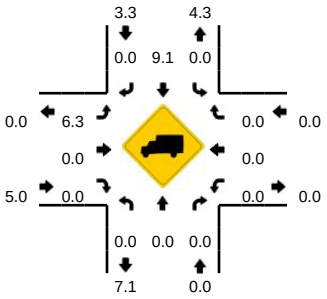
QC JOB #: 13125407

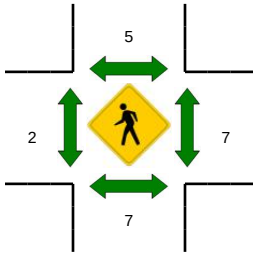
DATE: Tue, Oct 21 2014

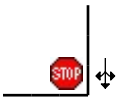
Peak-Hour: 4:50 PM -- 5:50 PM

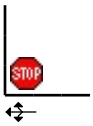
Peak 15-Min: 4:50 PM -- 5:05 PM

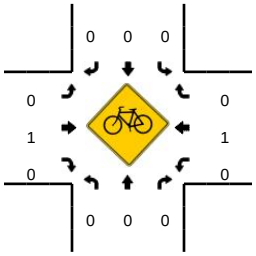


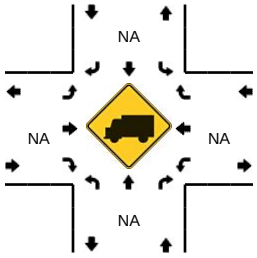


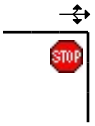


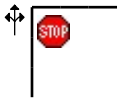


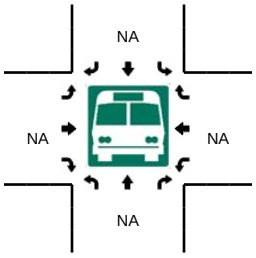












5-Min Count Period Beginning At	Jefferson St (Northbound)				Jefferson St (Southbound)				6th St (Eastbound)				6th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	1	1	2	0	1	0	0	0	0	1	0	0	6	
4:05 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	
4:10 PM	0	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	3	
4:15 PM	0	0	0	0	0	1	3	0	1	0	0	0	0	1	0	0	6	
4:20 PM	1	0	0	0	0	1	1	0	0	1	0	0	0	1	0	0	5	
4:25 PM	0	0	1	0	0	0	0	0	1	1	1	0	0	1	0	0	5	
4:30 PM	0	2	0	0	0	0	1	0	1	0	1	0	0	0	0	0	5	
4:35 PM	1	0	0	0	1	1	1	0	0	0	0	0	0	1	0	0	5	
4:40 PM	0	0	0	0	0	1	2	0	0	0	1	0	0	1	0	0	5	
4:45 PM	0	2	0	0	0	0	1	0	1	0	1	0	1	1	0	0	7	
4:50 PM	0	2	0	0	1	0	4	0	2	0	0	0	0	1	1	0	11	
4:55 PM	0	1	0	0	1	1	3	0	1	1	0	0	0	3	0	0	11	71
5:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	4	0	0	5	70
5:05 PM	0	1	0	0	0	2	0	0	1	0	0	0	0	1	0	0	5	73
5:10 PM	1	0	0	0	0	0	3	0	1	0	0	0	0	0	0	0	5	75
5:15 PM	0	0	1	0	1	1	1	0	0	0	0	0	0	2	0	0	6	75
5:20 PM	0	0	0	0	0	2	2	0	3	0	0	0	0	0	0	0	7	77
5:25 PM	0	0	0	0	0	0	1	0	2	0	1	0	0	1	0	0	5	77
5:30 PM	1	2	0	0	0	0	2	0	2	0	1	1	0	1	0	0	10	82
5:35 PM	1	1	0	0	0	1	0	0	1	0	0	0	0	1	0	0	5	82
5:40 PM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	79
5:45 PM	0	0	0	0	0	2	0	0	2	0	1	0	0	1	0	0	6	78
5:50 PM	1	1	0	0	0	0	3	0	0	0	0	0	0	0	0	0	5	72
5:55 PM	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	2	63

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	12	0	0	8	8	28	0	12	4	0	0	0	32	4	0	108
Heavy Trucks	0	0	0		0	4	0		0	0	0		0	0	0		4
Pedestrians		12				4				0				0			16
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/5/2014 9:59 AM

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

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

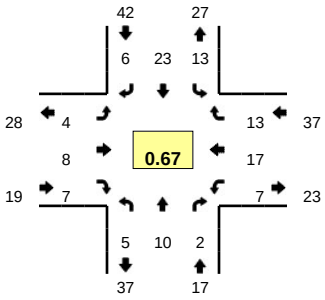
LOCATION: John Adams St -- 6th St

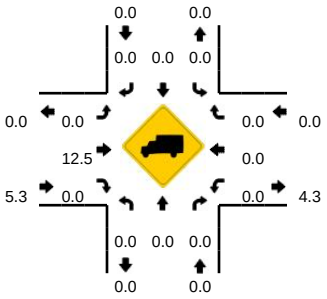
QC JOB #: 13125408

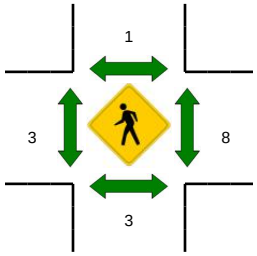
CITY/STATE: Oregon City, OR

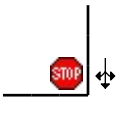
DATE: Tue, Oct 21 2014

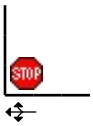
Peak-Hour: 4:50 PM -- 5:50 PM
Peak 15-Min: 5:20 PM -- 5:35 PM

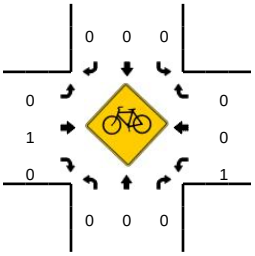


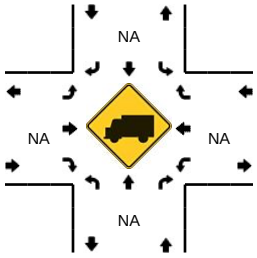


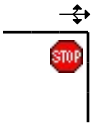


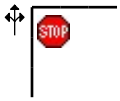


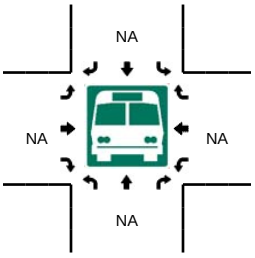












5-Min Count Period Beginning At	John Adams St (Northbound)				John Adams St (Southbound)				6th St (Eastbound)				6th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	1	1	0	0	1	0	0	0	0	0	0	0	0	3	2	0	8	
4:05 PM	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	2	
4:10 PM	0	3	0	0	0	0	2	0	0	2	0	0	0	1	0	0	8	
4:15 PM	0	1	0	0	0	1	3	0	0	0	1	0	0	0	1	0	7	
4:20 PM	0	0	0	0	0	2	2	0	1	2	0	0	0	2	0	0	9	
4:25 PM	0	3	0	0	1	2	2	0	0	2	0	0	0	1	3	0	14	
4:30 PM	0	0	1	0	1	2	1	0	0	1	0	0	0	1	1	0	8	
4:35 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	3	
4:40 PM	0	0	0	0	0	1	2	0	1	0	0	0	1	1	3	0	9	
4:45 PM	0	1	0	0	2	0	0	0	1	0	0	0	0	2	2	0	8	
4:50 PM	0	0	0	0	1	1	2	0	0	1	0	0	0	3	2	0	10	
4:55 PM	0	0	0	0	1	2	1	0	1	1	0	0	0	2	2	0	10	96
5:00 PM	0	3	0	0	0	5	0	0	0	0	0	0	1	2	0	0	11	99
5:05 PM	1	0	0	0	1	2	0	0	0	1	2	0	0	2	1	0	10	107
5:10 PM	1	0	0	0	1	1	0	0	0	0	0	0	0	1	1	0	5	104
5:15 PM	0	1	0	0	0	2	0	0	0	0	2	0	0	0	0	0	5	102
5:20 PM	1	0	0	0	1	5	2	0	1	2	1	0	3	1	2	0	19	112
5:25 PM	2	1	0	0	3	3	0	0	0	2	1	0	0	1	2	0	15	113
5:30 PM	0	0	1	0	1	1	1	0	0	0	0	0	2	2	1	0	9	114
5:35 PM	0	0	1	0	1	0	0	0	1	0	0	0	1	0	1	0	5	116
5:40 PM	0	3	0	0	1	0	0	0	0	0	0	0	0	2	0	0	6	113
5:45 PM	0	2	0	0	2	1	0	0	1	1	1	0	0	1	1	0	10	115
5:50 PM	0	0	0	0	1	3	0	0	2	0	0	0	0	1	0	0	7	112
5:55 PM	0	1	0	0	0	0	0	0	0	0	1	0	0	3	0	0	5	107

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	4	4	0	20	36	12	0	4	16	8	0	20	16	20	0	172
Heavy Trucks	0	0	0		0	0	0		0	4	0		0	0	0		4
Pedestrians		4				4				0				16			24
Bicycles	0	0	0		0	0	0		0	0	0		1	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/5/2014 9:59 AM

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

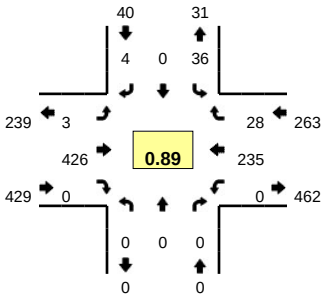
Type of peak hour being reported: User-Defined

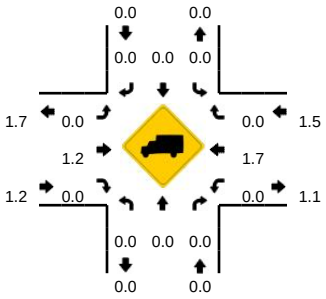
Method for determining peak hour: Total Entering Volume

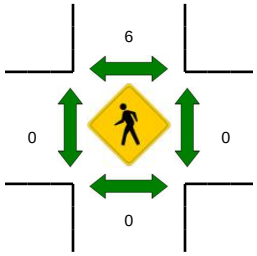
LOCATION: Jackson St -- 5th St
CITY/STATE: Oregon City, OR

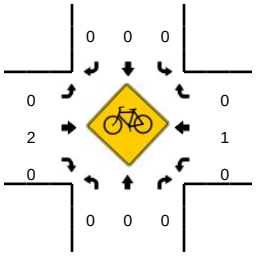
QC JOB #: 13125409
DATE: Tue, Oct 21 2014

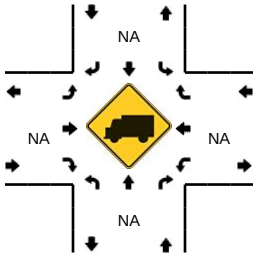
Peak-Hour: 4:50 PM -- 5:50 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

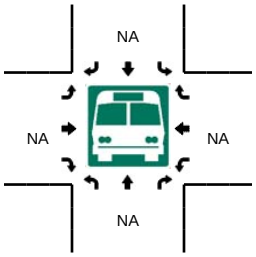












5-Min Count Period Beginning At	Jackson St (Northbound)				Jackson St (Southbound)				5th St (Eastbound)				5th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	1	0	0	0	0	42	0	0	0	13	3	0	59	
4:05 PM	0	0	0	0	1	0	1	0	0	26	0	0	0	21	1	0	50	
4:10 PM	0	0	0	0	2	0	1	0	0	31	0	0	0	21	2	0	57	
4:15 PM	0	0	0	0	1	0	1	0	0	34	0	0	0	16	1	0	53	
4:20 PM	0	0	0	0	2	0	1	0	0	46	0	0	0	10	3	0	62	
4:25 PM	0	0	0	0	1	0	0	0	1	27	0	0	0	26	3	0	58	
4:30 PM	0	0	0	0	0	0	0	0	0	38	0	0	0	22	3	0	63	
4:35 PM	0	0	0	0	1	0	0	0	0	29	0	0	0	19	1	0	50	
4:40 PM	0	0	0	0	0	0	0	0	1	37	0	0	0	8	2	0	48	
4:45 PM	0	0	0	0	2	0	0	0	0	38	0	0	0	20	1	0	61	
4:50 PM	0	0	0	0	3	0	0	0	0	28	0	0	0	18	0	0	49	
4:55 PM	0	0	0	0	3	0	0	0	0	33	0	0	0	15	1	0	52	662
5:00 PM	0	0	0	0	2	0	1	0	1	35	0	0	0	21	2	0	62	665
5:05 PM	0	0	0	0	6	0	2	0	0	43	0	0	0	23	1	0	75	690
5:10 PM	0	0	0	0	3	0	0	0	0	42	0	0	0	19	5	0	69	702
5:15 PM	0	0	0	0	1	0	0	0	0	38	0	0	0	17	4	0	60	709
5:20 PM	0	0	0	0	7	0	1	0	0	27	0	0	0	21	3	0	59	706
5:25 PM	0	0	0	0	2	0	0	0	1	41	0	0	0	22	5	0	71	719
5:30 PM	0	0	0	0	3	0	0	0	0	31	0	0	0	21	1	0	56	712
5:35 PM	0	0	0	0	2	0	0	0	0	34	0	0	0	22	2	0	60	722
5:40 PM	0	0	0	0	1	0	0	0	1	37	0	0	0	18	3	0	60	734
5:45 PM	0	0	0	0	3	0	0	0	0	37	0	0	0	18	1	0	59	732
5:50 PM	0	0	0	0	3	0	1	0	0	32	0	0	0	24	6	0	66	749
5:55 PM	0	0	0	0	1	0	0	0	1	31	0	0	0	13	3	0	49	746

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	44	0	12	0	4	480	0	0	0	252	32	0	824
Heavy Trucks	0	0	0		0	0	0		0	16	0		0	4	0		20
Pedestrians		0				12				0				0			12
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/5/2014 9:59 AM

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

Level of Service Descriptions

TRAFFIC LEVELS OF SERVICE

Analysis of traffic volumes is useful in understanding the general nature of traffic in an area, but by itself indicates neither the ability of the street network to carry additional traffic nor the quality of service afforded by the street facilities. For this, the concept of *level of service* (LOS) has been developed to subjectively describe traffic performance. Level of service can be measured at intersections and along key roadway segments.

Level of service categories are similar to report card ratings for traffic performance. Intersections are typically the controlling bottlenecks of traffic flow and the ability of a roadway system to carry traffic efficiently is generally diminished in their vicinities. Levels of Service A, B and C indicate conditions where traffic moves without significant delays over periods of peak travel demand. Level of service D and E are progressively worse peak hour operating conditions and F conditions represent where demand exceeds the capacity of an intersection. Most urban communities set level of service D as the minimum acceptable level of service for peak hour operation and plan for level of service C or better for all other times of the day. The *Highway Capacity Manual* provides level of service calculation methodology for both intersections and arterials[1]. The following sections provide interpretations of the analysis approaches.

[1] *Highway Capacity Manual 2000*, Transportation Research Board, Washington D.C., 2000, Chapters 16 and 17 and Highway Capacity Manual 2010, Transportation Research Board, Washington D.C., 2010, Chapter 19..

UNSIGNALIZED INTERSECTIONS (TWO-WAY STOP CONTROLLED)

Unsignalized intersection level of service is reported for each minor street movement (or shared movement) and major street left turns. The method assesses available and critical gaps in the traffic stream which make it possible for side street traffic to enter the main street flow. The *Highway Capacity Manual 2010* describes the detailed methodology. It is not unusual for an intersection to experience level of service E or F conditions for the minor street left turn movement. It should be understood that, often, a poor level of service is experienced by only a few vehicles and the intersection as a whole operates acceptably.

Unsignalized intersection levels of service are described in the following table.

Delay (sec/veh)	LOS by Volume-to-Capacity Ratio	
	v/c <=1.0	**v/c > 1.0**
0 – 10	A	F
> 10 – 15	B	F
> 15 – 25	C	F
> 25 – 35	D	F
> 35 – 50	E	F
> 50	F	F

Note: The LOS criteria apply to each lane on a given approach and to each approach on the minor street. LOS is not calculated for major-street approaches or for the intersection as a whole.

SIGNALIZED INTERSECTIONS

For signalized intersections, level of service is evaluated based upon average vehicle delay experienced by vehicles entering an intersection. Control delay (or signal delay) includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. In previous versions of this chapter of the *HCM* (1994 and earlier), delay included only stopped delay. As delay increases, the level of service decreases. Calculations for signalized and unsignalized intersections are different due to the variation in traffic control. The *Highway Capacity Manual 2000* provides the basis for these calculations.

Level of Service	Delay (sec/veh)	Description
A	0 – 10	**Free Flow/Insignificant Delays:** No approach phase is fully utilized by traffic and no vehicle waits longer than one red indication. Most vehicles do not stop at all. Progression is extremely favorable and most vehicles arrive during the green phase.
B	> 10 – 20	**Stable Operation/Minimal Delays:** An occasional approach phase is fully utilized. Many drivers begin to feel somewhat restricted within platoons of vehicles. This level generally occurs with good progression, short cycle lengths, or both.
C	> 20 – 35	**Stable Operation/Acceptable Delays:** Major approach phases fully utilized. Most drivers feel somewhat restricted. Higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level, and the number of vehicles stopping is significant.
D	> 35 – 55	**Approaching Unstable/Tolerable Delays:** The influence of congestion becomes more noticeable. Drivers may have to wait through more than one red signal indication. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. The proportion of vehicles not stopping declines, and individual cycle failures are noticeable.
E	> 55 – 80	**Unstable Operation/Significant Delays:** Volumes at or near capacity. Vehicles may wait though several signal cycles. Long queues form upstream from intersection. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are a frequent occurrence.
F	> 80	**Forced Flow/Excessive Delays:** Represents jammed conditions. Queues may block upstream intersections. This level occurs when arrival flow rates exceed intersection capacity, and is considered to be unacceptable to most drivers. Poor progression, long cycle lengths, and v/c ratios approaching 1.0 may contribute to these high delay levels.

Source: *Highway Capacity Manual 2000*, Exhibit 16-2

Oregon City Mobility Standards

12.04.205 - Mobility standards.

Development shall demonstrate compliance with intersection mobility standards. When evaluating the performance of the transportation system, the City of Oregon City requires all intersections, except for the facilities identified in subsection D below, to be maintained at or below the following mobility standards during the two-hour peak operating conditions. The first hour has the highest weekday traffic volumes and the second hour is the next highest hour before or after the first hour. Except as provided otherwise below, this may require the installation of mobility improvements as set forth in the transportation system plan or as otherwise identified by the city transportation engineer.

A. For intersections within the regional center, the following mobility standards apply:

   1. During the first hour, a maximum v/c ratio of 1.10 shall be maintained. For signalized intersections, this standard applies to the intersection as a whole. For unsignalized intersections, this standard applies to movements on the major street. There is no performance standard for the minor street approaches.

   2. During the second hour, a maximum v/c ratio of 0.99 shall be maintained at signalized intersections. For signalized intersections, this standard applies to the intersection as a whole. For unsignalized intersections, this standard applies to movements on the major street. There is no performance standard for the minor street approaches.

   3. Intersections located on the Regional Center boundary shall be considered within the Regional Center.

B. For intersections outside of the Regional Center but designated on the Arterial and Throughway Network, as defined in the Regional Transportation Plan, the following mobility standards apply:

   1. During the first hour, a maximum v/c ratio of 0.99 shall be maintained. For signalized intersections, this standard applies to the intersection as a whole. For unsignalized intersections, this standard applies to movements on the major street. There is no performance standard for the minor street approaches.

   2. During the second hour, a maximum v/c ratio of 0.99 shall be maintained at signalized intersections. For signalized intersections, this standard applies to the intersection as a whole. For unsignalized intersections, this standard applies to movements on the major street. There is no performance standard for the minor street approaches.

C. For intersections outside the boundaries of the Regional Center and not designated on the Arterial and Throughway Network, as defined in the Regional Transportation Plan, the following mobility standards apply:

   1. For signalized intersections:

      a. During the first hour, LOS "D" or better will be required for the intersection as a whole and no approach operating at worse than LOS "E" and a v/c ratio not higher than 1.0 for the sum of the critical movements.

      b. During the second hour, LOS "D" or better will be required for the intersection as a whole and no approach operating at worse than LOS "E" and a v/c ratio not higher than 1.0 for the sum of the critical movements.

   2. For unsignalized intersections outside of the boundaries of the Regional Center:

      a. For unsignalized intersections, during the peak hour, all movements serving more than twenty vehicles shall be maintained at LOS "E" or better. LOS "F" will be tolerated at movements serving no more than twenty vehicles during the peak hour.

D. Until the city adopts new performance measures that identify alternative mobility targets, the city shall exempt proposed development that is permitted, either conditionally, outright, or through detailed development master plan approval, from compliance with the above-referenced mobility standards for the following state-owned facilities:

I-205/OR 99E Interchange

I-205/OR 213 Interchange

OR 213/Beavercreek Road

State intersections located within or on the Regional Center Boundaries

1. In the case of conceptual development approval for a master plan that impacts the above references intersections:
    a. The form of mitigation will be determined at the time of the detailed development plan review for subsequent phases utilizing the Code in place at the time the detailed development plan is submitted; and
    b. Only those trips approved by a detailed development plan review are vested.
2. Development which does not comply with the mobility standards for the intersections identified in [Section] 12.04.205.D shall provide for the improvements identified in the Transportation System Plan (TSP) in an effort to improve intersection mobility as necessary to offset the impact caused by development. Where required by other provisions of the Code, the applicant shall provide a traffic impact study that includes an assessment of the development's impact on the intersections identified in this exemption and shall construct the intersection improvements listed in the TSP or required by the Code.

(Ord. No. 10-1003, § 1(Exh. 1), 7-7-2010; Ord. No. 13-1003, § 1(Exh. 1), 7-17-2013)

Editor's note—

Ord. No. 13-1003, § 1, Exhibit 1, adopted July 17, 2013, retitled § 12.04.205 from "Intersection level of service standards" to "Mobility standards."

Highway Capacity Calculations

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	441	120	0	327	229	87	184	14	270	254	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	10	12	10	10	10	11	1	10	11	1
Total Lost time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00	0.95		1.00	0.94	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1739	1402		1739	1385	1652	1777		1652	1778	
Flt Permitted		1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1739	1402		1739	1385	1652	1777		1652	1778	
Peak-hour factor, PHF	0.90	0.92	0.92	0.90	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	479	130	0	355	249	95	200	15	293	276	18
RTOR Reduction (vph)	0	0	28	0	0	126	0	2	0	0	2	0
Lane Group Flow (vph)	0	479	102	0	355	123	95	213	0	293	292	0
Confl. Peds. (#/hr)			8			11	9		4	4		9
Turn Type		NA	Perm		NA	Perm	Split	NA		Split	NA	
Protected Phases		2			4		1	1		3	3	
Permitted Phases			2			4						
Actuated Green, G (s)		58.3	58.3		58.3	58.3	20.0	20.0		26.7	26.7	
Effective Green, g (s)		58.3	58.3		58.3	58.3	20.0	20.0		26.7	26.7	
Actuated g/C Ratio		0.49	0.49		0.49	0.49	0.17	0.17		0.23	0.23	
Clearance Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		855	689		855	681	278	299		372	400	
v/s Ratio Prot		c0.28			0.20		0.06	c0.12		c0.18	0.16	
v/s Ratio Perm			0.07			0.09						
v/c Ratio		0.56	0.15		0.42	0.18	0.34	0.71		0.79	0.73	
Uniform Delay, d1		21.1	16.5		19.2	16.8	43.4	46.5		43.2	42.5	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.6	0.5		0.3	0.1	0.7	7.7		10.5	6.5	
Delay (s)		23.8	16.9		19.5	16.9	44.2	54.3		53.8	49.1	
Level of Service		C	B		B	B	D	D		D	D	
Approach Delay (s)		22.3			18.5			51.2			51.4	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	33.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	118.5	Sum of lost time (s)	13.5
Intersection Capacity Utilization	60.2%	ICU Level of Service	B
Analysis Period (min)	15		

Description: Washington Street/7th Street

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.9

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Vol, veh/h	8	706	20	16	543	8	4	2	22	4	2	10
Conflicting Peds, #/hr	0	0	0	0	0	0	4	0	6	6	0	4
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	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	759	22	17	584	9	4	2	24	4	2	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	598	0	0	787	0	0	1428	1426	780	1435	1433	600
Stage 1	-	-	-	-	-	-	793	793	-	629	629	-
Stage 2	-	-	-	-	-	-	635	633	-	806	804	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	979	-	-	832	-	-	113	135	395	111	134	501
Stage 1	-	-	-	-	-	-	382	400	-	470	475	-
Stage 2	-	-	-	-	-	-	467	473	-	376	396	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	974	-	-	829	-	-	104	127	392	99	126	496
Mov Cap-2 Maneuver	-	-	-	-	-	-	104	127	-	99	126	-
Stage 1	-	-	-	-	-	-	374	392	-	460	458	-
Stage 2	-	-	-	-	-	-	438	456	-	345	388	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.1	0.3	21.1	23.8
HCM LOS			C	C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SER	SWLn1
Capacity (veh/h)	254	829	-	-	974	-	-	209
HCM Lane V/C Ratio	0.119	0.021	-	-	0.009	-	-	0.082
HCM Control Delay (s)	21.1	9.4	0	-	8.7	0	-	23.8
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.4	0.1	-	-	0	-	-	0.3

Intersection	
Int Delay, s/veh	0.6

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Vol, veh/h	2	726	4	21	552	4	4	1	15	2	0	6
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	70	-	-	70	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	7	2	0	2
Mvmt Flow	2	764	4	22	581	4	4	1	16	2	0	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	585	0	0	768	0	0	1402	1400	766	1406	1400	583
Stage 1	-	-	-	-	-	-	771	771	-	627	627	-
Stage 2	-	-	-	-	-	-	631	629	-	779	773	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.27	7.12	6.5	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.5	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.363	3.518	4	3.318
Pot Cap-1 Maneuver	990	-	-	846	-	-	117	140	395	117	142	512
Stage 1	-	-	-	-	-	-	393	410	-	471	479	-
Stage 2	-	-	-	-	-	-	469	475	-	389	412	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	990	-	-	846	-	-	113	136	395	109	138	512
Mov Cap-2 Maneuver	-	-	-	-	-	-	113	136	-	109	138	-
Stage 1	-	-	-	-	-	-	392	409	-	470	467	-
Stage 2	-	-	-	-	-	-	451	463	-	372	411	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0	0.3	20.9	19
HCM LOS			C	C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SER	SWLn1
Capacity (veh/h)	248	846	-	-	990	-	-	266
HCM Lane V/C Ratio	0.085	0.026	-	-	0.002	-	-	0.032
HCM Control Delay (s)	20.9	9.4	-	-	8.6	-	-	19
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	3.4

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Vol, veh/h	17	748	3	6	566	31	3	21	8	20	27	17
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	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	3	2	2	2	5	2	2
Mvmt Flow	18	787	3	6	596	33	3	22	8	21	28	18

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	628	0	0	791	0	0	1473	1466	789	1465	1451	612
Stage 1	-	-	-	-	-	-	825	825	-	625	625	-
Stage 2	-	-	-	-	-	-	648	641	-	840	826	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.15	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.15	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.15	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.545	4.018	3.318
Pot Cap-1 Maneuver	954	-	-	829	-	-	105	128	391	105	131	493
Stage 1	-	-	-	-	-	-	367	387	-	468	477	-
Stage 2	-	-	-	-	-	-	459	469	-	355	387	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	954	-	-	829	-	-	82	125	391	87	128	493
Mov Cap-2 Maneuver	-	-	-	-	-	-	82	125	-	87	128	-
Stage 1	-	-	-	-	-	-	360	380	-	459	474	-
Stage 2	-	-	-	-	-	-	413	466	-	321	380	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.2	0.1	38.1	55.7
HCM LOS			E	F

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SER	SWLn1
Capacity (veh/h)	142	829	-	-	954	-	-	135
HCM Lane V/C Ratio	0.237	0.008	-	-	0.019	-	-	0.499
HCM Control Delay (s)	38.1	9.4	-	-	8.8	-	-	55.7
HCM Lane LOS	E	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	0.9	0	-	-	0.1	-	-	2.3

Intersection	
Int Delay, s/veh	3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	124	38	567	131	28	730
Conflicting Peds, #/hr	5	5	0	0	5	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	0	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	11	2	2	2	2
Mvmt Flow	135	41	616	142	30	793

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1547	698	0	0	764	0
Stage 1	693	-	-	-	-	-
Stage 2	854	-	-	-	-	-
Critical Hdwy	6.42	6.31	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.399	-	-	2.218	-
Pot Cap-1 Maneuver	~ 126	425	-	-	849	-
Stage 1	496	-	-	-	-	-
Stage 2	417	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 121	421	-	-	845	-
Mov Cap-2 Maneuver	257	-	-	-	-	-
Stage 1	494	-	-	-	-	-
Stage 2	402	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	29	0	0.3
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	257	421	845	-
HCM Lane V/C Ratio	-	-	0.524	0.098	0.036	-
HCM Control Delay (s)	-	-	33.5	14.5	9.4	-
HCM Lane LOS	-	-	D	B	A	-
HCM 95th %tile Q(veh)	-	-	2.8	0.3	0.1	-

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												
Volume (vph)	15	4	17	109	3	16	15	754	18	3	856	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	1	10	1	1	10	1	10	12	1	10	12	1
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	1.00	
Frt		0.94			0.98		1.00	1.00		1.00	1.00	
Flt Protected		0.98			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1534			1622		1652	1854		1652	1860	
Flt Permitted		0.88			0.73		0.12	1.00		0.18	1.00	
Satd. Flow (perm)		1382			1233		204	1854		311	1860	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	17	4	19	122	3	18	17	847	20	3	962	8
RTOR Reduction (vph)	0	14	0	0	6	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	26	0	0	137	0	17	866	0	3	970	0
Confl. Peds. (#/hr)	5		3	3		5	11		17	17		11
Heavy Vehicles (%)	7%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			4			1			3	
Permitted Phases	2			4			1			3		
Actuated Green, G (s)		23.0			23.0		53.0	53.0		53.0	53.0	
Effective Green, g (s)		23.0			23.0		53.0	53.0		53.0	53.0	
Actuated g/C Ratio		0.27			0.27		0.62	0.62		0.62	0.62	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		2.5			2.5		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		373			333		127	1156		193	1159	
v/s Ratio Prot								0.47			c0.52	
v/s Ratio Perm		0.02			c0.11		0.08			0.01		
v/c Ratio		0.07			0.41		0.13	0.75		0.02	0.84	
Uniform Delay, d1		23.0			25.4		6.6	11.3		6.1	12.6	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4			0.6		0.5	2.7		0.0	5.4	
Delay (s)		23.4			26.1		7.1	14.0		6.1	18.0	
Level of Service		C			C		A	B		A	B	
Approach Delay (s)		23.4			26.1			13.9			17.9	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		
Description: Molalla Avenue/Pearl Street			
c Critical Lane Group			

Intersection	
Intersection Delay, s/veh	7.3
Intersection LOS	A

Movement	SEU	SEL	SET	SER	NWU	NWL	NWT	NWR	NEU	NEL	NET	NER
Vol, veh/h	0	4	8	7	0	7	17	13	0	5	10	2
Peak Hour Factor	0.90	0.67	0.67	0.67	0.90	0.67	0.67	0.67	0.90	0.67	0.67	0.67
Heavy Vehicles, %	2	2	13	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	6	12	10	0	10	25	19	0	7	15	3
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	SE	NW	NE
Opposing Approach	NW	SE	SW
Opposing Lanes	1	1	1
Conflicting Approach Left	SW	NE	SE
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NE	SW	NW
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.1	7.2	7.3
HCM LOS	A	A	A

Lane	NELn1	NWLn1	SELn1	SWLn1
Vol Left, %	29%	19%	21%	31%
Vol Thru, %	59%	46%	42%	55%
Vol Right, %	12%	35%	37%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	17	37	19	42
LT Vol	10	17	8	23
Through Vol	2	13	7	6
RT Vol	5	7	4	13
Lane Flow Rate	25	55	28	63
Geometry Grp	1	1	1	1
Degree of Util (X)	0.029	0.06	0.031	0.071
Departure Headway (Hd)	4.115	3.936	3.951	4.074
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	865	905	900	876
Service Time	2.161	1.983	2.002	2.113
HCM Lane V/C Ratio	0.029	0.061	0.031	0.072
HCM Control Delay	7.3	7.2	7.1	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.2	0.1	0.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SWU	SWL	SWT	SWR
Vol, veh/h	0	13	23	6
Peak Hour Factor	0.90	0.67	0.67	0.67
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	19	34	9
Number of Lanes	0	0	1	0

Approach	SW
Opposing Approach	NE
Opposing Lanes	1
Conflicting Approach Left	NW
Conflicting Lanes Left	1
Conflicting Approach Right	SE
Conflicting Lanes Right	1
HCM Control Delay	7.4
HCM LOS	A

Lane

Intersection	
Intersection Delay, s/veh	7.1
Intersection LOS	A

Movement	SEU	SEL	SET	SER	NWU	NWL	NWT	NWR	NEU	NEL	NET	NER
Vol, veh/h	0	16	1	3	0	0	15	1	0	4	7	1
Peak Hour Factor	0.90	0.72	0.72	0.72	0.90	0.72	0.72	0.72	0.90	0.72	0.72	0.72
Heavy Vehicles, %	2	6	2	2	2	0	2	2	2	2	2	2
Mvmt Flow	0	22	1	4	0	0	21	1	0	6	10	1
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	SE	NW	NE
Opposing Approach	NW	SE	SW
Opposing Lanes	1	1	1
Conflicting Approach Left	SW	NE	SE
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NE	SW	NW
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.4	7.1	7.2
HCM LOS	A	A	A

Lane	NELn1	NWLn1	SELn1	SWLn1
Vol Left, %	33%	0%	80%	10%
Vol Thru, %	58%	94%	5%	37%
Vol Right, %	8%	6%	15%	53%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	12	16	20	30
LT Vol	7	15	1	11
Through Vol	1	1	3	16
RT Vol	4	0	16	3
Lane Flow Rate	17	22	28	42
Geometry Grp	1	1	1	1
Degree of Util (X)	0.019	0.025	0.032	0.043
Departure Headway (Hd)	4.07	4.019	4.191	3.734
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	879	890	854	958
Service Time	2.099	2.045	2.215	1.761
HCM Lane V/C Ratio	0.019	0.025	0.033	0.044
HCM Control Delay	7.2	7.1	7.4	6.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.1	0.1	0.1

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SWU	SWL	SWT	SWR
Vol, veh/h	0	3	11	16
Peak Hour Factor	0.90	0.72	0.72	0.72
Heavy Vehicles, %	2	2	9	2
Mvmt Flow	0	4	15	22
Number of Lanes	0	0	1	0

Approach	SW
Opposing Approach	NE
Opposing Lanes	1
Conflicting Approach Left	NW
Conflicting Lanes Left	1
Conflicting Approach Right	SE
Conflicting Lanes Right	1
HCM Control Delay	6.9
HCM LOS	A

Lane

Intersection	
Int Delay, s/veh	0.9

Movement	SEL	SET	NWT	NWR	SWL	SWR
Vol, veh/h	3	426	235	28	36	4
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	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	479	264	31	40	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	296	0	-	0	765	280
Stage 1	-	-	-	-	280	-
Stage 2	-	-	-	-	485	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1265	-	-	-	371	759
Stage 1	-	-	-	-	767	-
Stage 2	-	-	-	-	619	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1265	-	-	-	370	759
Mov Cap-2 Maneuver	-	-	-	-	370	-
Stage 1	-	-	-	-	767	-
Stage 2	-	-	-	-	617	-

Approach	SE	NW	SW
HCM Control Delay, s	0.1	0	15.4
HCM LOS			C

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1
Capacity (veh/h)	-	-	1265	-	390
HCM Lane V/C Ratio	-	-	0.003	-	0.115
HCM Control Delay (s)	-	-	7.9	0	15.4
HCM Lane LOS	-	-	A	A	C
HCM 95th %tile Q(veh)	-	-	0	-	0.4

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	478	124	0	363	236	90	190	14	278	262	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	10	12	10	10	10	11	1	10	11	1
Total Lost time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00	0.95		1.00	0.94	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1739	1402		1739	1385	1652	1778		1652	1777	
Flt Permitted		1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1739	1402		1739	1385	1652	1778		1652	1777	
Peak-hour factor, PHF	0.90	0.92	0.92	0.90	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	520	135	0	395	257	98	207	15	302	285	20
RTOR Reduction (vph)	0	0	28	0	0	133	0	2	0	0	2	0
Lane Group Flow (vph)	0	520	107	0	395	124	98	220	0	302	303	0
Confl. Peds. (#/hr)			8			11	9		4	4		9
Turn Type		NA	Perm		NA	Perm	Split	NA		Split	NA	
Protected Phases		2			4		1	1		3	3	
Permitted Phases			2			4						
Actuated Green, G (s)		57.3	57.3		57.3	57.3	20.4	20.4		27.3	27.3	
Effective Green, g (s)		57.3	57.3		57.3	57.3	20.4	20.4		27.3	27.3	
Actuated g/C Ratio		0.48	0.48		0.48	0.48	0.17	0.17		0.23	0.23	
Clearance Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		840	677		840	669	284	306		380	409	
v/s Ratio Prot		c0.30			0.23		0.06	c0.12		c0.18	0.17	
v/s Ratio Perm			0.08			0.09						
v/c Ratio		0.62	0.16		0.47	0.19	0.35	0.72		0.79	0.74	
Uniform Delay, d1		22.6	17.1		20.5	17.4	43.2	46.3		43.0	42.3	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		3.4	0.5		0.4	0.1	0.7	7.8		10.9	7.0	
Delay (s)		26.0	17.6		20.9	17.5	43.9	54.1		53.9	49.4	
Level of Service		C	B		C	B	D	D		D	D	
Approach Delay (s)		24.2			19.5			51.0			51.6	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	34.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	118.5	Sum of lost time (s)	13.5
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		

Description: Washington Street/7th Street

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.9

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Vol, veh/h	8	751	20	16	585	8	4	2	22	4	2	10
Conflicting Peds, #/hr	0	0	0	0	0	0	4	0	6	6	0	4
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	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	808	22	17	629	9	4	2	24	4	2	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	644	0	0	835	0	0	1521	1519	828	1528	1526	645
Stage 1	-	-	-	-	-	-	841	841	-	674	674	-
Stage 2	-	-	-	-	-	-	680	678	-	854	852	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	941	-	-	798	-	-	97	119	371	96	118	472
Stage 1	-	-	-	-	-	-	359	380	-	444	454	-
Stage 2	-	-	-	-	-	-	441	452	-	353	376	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	936	-	-	796	-	-	89	112	368	84	111	467
Mov Cap-2 Maneuver	-	-	-	-	-	-	89	112	-	84	111	-
Stage 1	-	-	-	-	-	-	351	371	-	434	437	-
Stage 2	-	-	-	-	-	-	413	435	-	321	367	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.1	0.3	23.2	26.6
HCM LOS			C	D

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SER	SWLn1
Capacity (veh/h)	228	796	-	-	936	-	-	184
HCM Lane V/C Ratio	0.132	0.022	-	-	0.009	-	-	0.094
HCM Control Delay (s)	23.2	9.6	0	-	8.9	0	-	26.6
HCM Lane LOS	C	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0.4	0.1	-	-	0	-	-	0.3

Intersection	
Int Delay, s/veh	0.6

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Vol, veh/h	2	772	4	21	595	4	4	1	15	2	0	6
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	70	-	-	70	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	7	2	0	2
Mvmt Flow	2	813	4	22	626	4	4	1	16	2	0	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	631	0	0	817	0	0	1495	1494	815	1500	1494	628
Stage 1	-	-	-	-	-	-	819	819	-	673	673	-
Stage 2	-	-	-	-	-	-	676	675	-	827	821	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.27	7.12	6.5	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.5	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.363	3.518	4	3.318
Pot Cap-1 Maneuver	951	-	-	811	-	-	101	123	370	100	124	483
Stage 1	-	-	-	-	-	-	369	389	-	445	457	-
Stage 2	-	-	-	-	-	-	443	453	-	366	391	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	951	-	-	811	-	-	97	119	370	93	120	483
Mov Cap-2 Maneuver	-	-	-	-	-	-	97	119	-	93	120	-
Stage 1	-	-	-	-	-	-	368	388	-	444	445	-
Stage 2	-	-	-	-	-	-	425	441	-	349	390	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0	0.3	22.9	20.8
HCM LOS			C	C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SER	SWLn1
Capacity (veh/h)	222	811	-	-	951	-	-	236
HCM Lane V/C Ratio	0.095	0.027	-	-	0.002	-	-	0.036
HCM Control Delay (s)	22.9	9.6	-	-	8.8	-	-	20.8
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	4.1

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Vol, veh/h	17	798	3	6	608	31	3	21	8	20	27	17
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	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	3	2	2	2	5	2	2
Mvmt Flow	18	840	3	6	640	33	3	22	8	21	28	18

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	673	0	0	843	0	0	1569	1562	842	1562	1548	656
Stage 1	-	-	-	-	-	-	877	877	-	669	669	-
Stage 2	-	-	-	-	-	-	692	685	-	893	879	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.15	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.15	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.15	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.545	4.018	3.318
Pot Cap-1 Maneuver	918	-	-	793	-	-	90	112	364	89	114	465
Stage 1	-	-	-	-	-	-	343	366	-	442	456	-
Stage 2	-	-	-	-	-	-	434	448	-	332	365	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	918	-	-	793	-	-	68	109	364	72	111	465
Mov Cap-2 Maneuver	-	-	-	-	-	-	68	109	-	72	111	-
Stage 1	-	-	-	-	-	-	336	359	-	433	453	-
Stage 2	-	-	-	-	-	-	388	445	-	298	358	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.2	0.1	44.5	73.3
HCM LOS			E	F

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SER	SWLn1
Capacity (veh/h)	124	793	-	-	918	-	-	115
HCM Lane V/C Ratio	0.272	0.008	-	-	0.019	-	-	0.586
HCM Control Delay (s)	44.5	9.6	-	-	9	-	-	73.3
HCM Lane LOS	E	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	1	0	-	-	0.1	-	-	2.9

Intersection	
Int Delay, s/veh	3.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	124	38	606	134	28	755
Conflicting Peds, #/hr	5	5	0	0	5	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	120	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	11	2	2	2	2
Mvmt Flow	137	41	672	149	30	837

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1649	756	0	0	825	0
Stage 1	751	-	-	-	-	-
Stage 2	898	-	-	-	-	-
Critical Hdwy	6.42	6.31	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.399	-	-	2.218	-
Pot Cap-1 Maneuver	~ 109	394	-	-	805	-
Stage 1	466	-	-	-	-	-
Stage 2	398	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 105	391	-	-	801	-
Mov Cap-2 Maneuver	239	-	-	-	-	-
Stage 1	464	-	-	-	-	-
Stage 2	383	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	33.3	0	0.3
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	239	391	801	-
HCM Lane V/C Ratio	-	-	0.575	0.106	0.038	-
HCM Control Delay (s)	-	-	38.7	15.3	9.7	-
HCM Lane LOS	-	-	E	C	A	-
HCM 95th %tile Q(veh)	-	-	3.2	0.4	0.1	-

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												
Volume (vph)	15	4	17	109	3	16	15	782	18	3	881	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	1	10	1	1	10	1	10	12	1	10	12	1
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	1.00	
Frt		0.94			0.98		1.00	1.00		1.00	1.00	
Flt Protected		0.98			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1534			1622		1652	1854		1652	1860	
Flt Permitted		0.88			0.73		0.10	1.00		0.16	1.00	
Satd. Flow (perm)		1379			1233		173	1854		277	1860	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	100%	102%	100%	100%	102%	100%
Adj. Flow (vph)	17	4	19	122	3	18	17	896	20	3	1010	8
RTOR Reduction (vph)	0	14	0	0	6	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	26	0	0	137	0	17	915	0	3	1018	0
Confl. Peds. (#/hr)	5		3	3		5	11		17	17		11
Heavy Vehicles (%)	7%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			4			1			3	
Permitted Phases	2			4			1			3		
Actuated Green, G (s)		22.0			22.0		54.0	54.0		54.0	54.0	
Effective Green, g (s)		22.0			22.0		54.0	54.0		54.0	54.0	
Actuated g/C Ratio		0.26			0.26		0.64	0.64		0.64	0.64	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		2.5			2.5		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		356			319		109	1177		175	1181	
v/s Ratio Prot								0.49			c0.55	
v/s Ratio Perm		0.02			c0.11		0.10			0.01		
v/c Ratio		0.07			0.43		0.16	0.78		0.02	0.86	
Uniform Delay, d1		23.8			26.3		6.3	11.2		5.7	12.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4			0.7		0.7	3.3		0.0	6.7	
Delay (s)		24.2			26.9		6.9	14.5		5.8	19.1	
Level of Service		C			C		A	B		A	B	
Approach Delay (s)		24.2			26.9			14.3			19.1	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	68.7%	ICU Level of Service	C
Analysis Period (min)	15		
Description: Molalla Avenue/Pearl Street			

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	7.3
Intersection LOS	A

Movement	SEU	SEL	SET	SER	NWU	NWL	NWT	NWR	NEU	NEL	NET	NER
Vol, veh/h	0	4	8	7	0	7	17	13	0	5	10	2
Peak Hour Factor	0.90	0.67	0.67	0.67	0.90	0.67	0.67	0.67	0.90	0.67	0.67	0.67
Heavy Vehicles, %	2	2	13	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	6	12	10	0	10	25	19	0	7	15	3
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	SE	NW	NE
Opposing Approach	NW	SE	SW
Opposing Lanes	1	1	1
Conflicting Approach Left	SW	NE	SE
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NE	SW	NW
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.1	7.2	7.3
HCM LOS	A	A	A

Lane	NELn1	NWLn1	SELn1	SWLn1
Vol Left, %	29%	19%	21%	31%
Vol Thru, %	59%	46%	42%	55%
Vol Right, %	12%	35%	37%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	17	37	19	42
LT Vol	10	17	8	23
Through Vol	2	13	7	6
RT Vol	5	7	4	13
Lane Flow Rate	25	55	28	63
Geometry Grp	1	1	1	1
Degree of Util (X)	0.029	0.06	0.031	0.071
Departure Headway (Hd)	4.115	3.936	3.951	4.074
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	865	905	900	876
Service Time	2.161	1.983	2.002	2.113
HCM Lane V/C Ratio	0.029	0.061	0.031	0.072
HCM Control Delay	7.3	7.2	7.1	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.2	0.1	0.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SWU	SWL	SWT	SWR
Vol, veh/h	0	13	23	6
Peak Hour Factor	0.90	0.67	0.67	0.67
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	19	34	9
Number of Lanes	0	0	1	0

Approach	SW
Opposing Approach	NE
Opposing Lanes	1
Conflicting Approach Left	NW
Conflicting Lanes Left	1
Conflicting Approach Right	SE
Conflicting Lanes Right	1
HCM Control Delay	7.4
HCM LOS	A

Lane

Intersection	
Intersection Delay, s/veh	7.1
Intersection LOS	A

Movement	SEU	SEL	SET	SER	NWU	NWL	NWT	NWR	NEU	NEL	NET	NER
Vol, veh/h	0	16	1	3	0	0	15	1	0	4	7	1
Peak Hour Factor	0.90	0.72	0.72	0.72	0.90	0.72	0.72	0.72	0.90	0.72	0.72	0.72
Heavy Vehicles, %	2	6	2	2	2	0	2	2	2	2	2	2
Mvmt Flow	0	22	1	4	0	0	21	1	0	6	10	1
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	SE	NW	NE
Opposing Approach	NW	SE	SW
Opposing Lanes	1	1	1
Conflicting Approach Left	SW	NE	SE
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NE	SW	NW
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.4	7.1	7.2
HCM LOS	A	A	A

Lane	NELn1	NWLn1	SELn1	SWLn1
Vol Left, %	33%	0%	80%	10%
Vol Thru, %	58%	94%	5%	37%
Vol Right, %	8%	6%	15%	53%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	12	16	20	30
LT Vol	7	15	1	11
Through Vol	1	1	3	16
RT Vol	4	0	16	3
Lane Flow Rate	17	22	28	42
Geometry Grp	1	1	1	1
Degree of Util (X)	0.019	0.025	0.032	0.043
Departure Headway (Hd)	4.07	4.019	4.191	3.734
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	879	890	854	958
Service Time	2.099	2.045	2.215	1.761
HCM Lane V/C Ratio	0.019	0.025	0.033	0.044
HCM Control Delay	7.2	7.1	7.4	6.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.1	0.1	0.1

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SWU	SWL	SWT	SWR
Vol, veh/h	0	3	11	16
Peak Hour Factor	0.90	0.72	0.72	0.72
Heavy Vehicles, %	2	2	9	2
Mvmt Flow	0	4	15	22
Number of Lanes	0	0	1	0

Approach	SW
Opposing Approach	NE
Opposing Lanes	1
Conflicting Approach Left	NW
Conflicting Lanes Left	1
Conflicting Approach Right	SE
Conflicting Lanes Right	1
HCM Control Delay	6.9
HCM LOS	A

Lane

Intersection	
Int Delay, s/veh	0.9

Movement	SEL	SET	NWT	NWR	SWL	SWR
Vol, veh/h	3	426	235	28	36	4
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	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	479	264	31	40	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	296	0	-	0	765	280
Stage 1	-	-	-	-	280	-
Stage 2	-	-	-	-	485	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1265	-	-	-	371	759
Stage 1	-	-	-	-	767	-
Stage 2	-	-	-	-	619	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1265	-	-	-	370	759
Mov Cap-2 Maneuver	-	-	-	-	370	-
Stage 1	-	-	-	-	767	-
Stage 2	-	-	-	-	617	-

Approach	SE	NW	SW
HCM Control Delay, s	0.1	0	15.4
HCM LOS			C

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1
Capacity (veh/h)	-	-	1265	-	390
HCM Lane V/C Ratio	-	-	0.003	-	0.115
HCM Control Delay (s)	-	-	7.9	0	15.4
HCM Lane LOS	-	-	A	A	C
HCM 95th %tile Q(veh)	-	-	0	-	0.4

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	483	124	0	366	238	90	191	17	283	262	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	10	12	10	10	10	11	1	10	11	1
Total Lost time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00	0.95		1.00	0.94	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1739	1402		1739	1385	1652	1774		1652	1777	
Flt Permitted		1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1739	1402		1739	1385	1652	1774		1652	1777	
Peak-hour factor, PHF	0.90	0.92	0.92	0.90	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	525	135	0	398	259	98	208	18	308	285	20
RTOR Reduction (vph)	0	0	29	0	0	135	0	3	0	0	2	0
Lane Group Flow (vph)	0	525	106	0	398	124	98	223	0	308	303	0
Confl. Peds. (#/hr)			8			11	9		4	4		9
Turn Type		NA	Perm		NA	Perm	Split	NA		Split	NA	
Protected Phases		2			4		1	1		3	3	
Permitted Phases			2			4						
Actuated Green, G (s)		56.7	56.7		56.7	56.7	20.6	20.6		27.7	27.7	
Effective Green, g (s)		56.7	56.7		56.7	56.7	20.6	20.6		27.7	27.7	
Actuated g/C Ratio		0.48	0.48		0.48	0.48	0.17	0.17		0.23	0.23	
Clearance Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		832	670		832	662	287	308		386	415	
v/s Ratio Prot		c0.30			0.23		0.06	c0.13		c0.19	0.17	
v/s Ratio Perm			0.08			0.09						
v/c Ratio		0.63	0.16		0.48	0.19	0.34	0.72		0.80	0.73	
Uniform Delay, d1		23.1	17.4		20.9	17.7	43.0	46.3		42.8	41.9	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		3.6	0.5		0.4	0.1	0.7	8.1		10.9	6.3	
Delay (s)		26.7	17.9		21.3	17.8	43.7	54.4		53.7	48.3	
Level of Service		C	B		C	B	D	D		D	D	
Approach Delay (s)		24.9			20.0			51.2			51.0	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	34.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	118.5	Sum of lost time (s)	13.5
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		

Description: Washington Street/7th Street

c Critical Lane Group

Intersection	
Int Delay, s/veh	1.1

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Vol, veh/h	8	754	30	18	590	8	4	2	35	4	2	10
Conflicting Peds, #/hr	0	0	0	0	0	0	4	0	6	6	0	4
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	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	811	32	19	634	9	4	2	38	4	2	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	649	0	0	849	0	0	1540	1538	837	1553	1549	651
Stage 1	-	-	-	-	-	-	850	850	-	683	683	-
Stage 2	-	-	-	-	-	-	690	688	-	870	866	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	937	-	-	789	-	-	94	116	367	92	114	469
Stage 1	-	-	-	-	-	-	355	377	-	439	449	-
Stage 2	-	-	-	-	-	-	435	447	-	346	370	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	932	-	-	787	-	-	86	108	364	77	107	464
Mov Cap-2 Maneuver	-	-	-	-	-	-	86	108	-	77	107	-
Stage 1	-	-	-	-	-	-	347	368	-	429	430	-
Stage 2	-	-	-	-	-	-	405	428	-	302	362	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.1	0.3	22.1	27.9
HCM LOS			C	D

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SER	SWLn1
Capacity (veh/h)	254	787	-	-	932	-	-	174
HCM Lane V/C Ratio	0.174	0.025	-	-	0.009	-	-	0.099
HCM Control Delay (s)	22.1	9.7	0	-	8.9	0	-	27.9
HCM Lane LOS	C	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0.6	0.1	-	-	0	-	-	0.3

Intersection	
Int Delay, s/veh	0.8

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Vol, veh/h	2	782	10	35	601	4	4	1	24	2	0	6
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	70	-	-	70	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	7	2	0	2
Mvmt Flow	2	823	11	37	633	4	4	1	25	2	0	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	637	0	0	834	0	0	1545	1544	828	1554	1546	635
Stage 1	-	-	-	-	-	-	833	833	-	708	708	-
Stage 2	-	-	-	-	-	-	712	711	-	846	838	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.27	7.12	6.5	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.5	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.363	3.518	4	3.318
Pot Cap-1 Maneuver	947	-	-	799	-	-	93	115	363	92	116	478
Stage 1	-	-	-	-	-	-	363	384	-	426	441	-
Stage 2	-	-	-	-	-	-	423	436	-	357	384	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	947	-	-	799	-	-	88	109	363	82	110	478
Mov Cap-2 Maneuver	-	-	-	-	-	-	88	109	-	82	110	-
Stage 1	-	-	-	-	-	-	362	383	-	425	421	-
Stage 2	-	-	-	-	-	-	398	416	-	331	383	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0	0.5	22.2	22.3
HCM LOS			C	C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SER	SWLn1
Capacity (veh/h)	240	799	-	-	947	-	-	217
HCM Lane V/C Ratio	0.127	0.046	-	-	0.002	-	-	0.039
HCM Control Delay (s)	22.2	9.7	-	-	8.8	-	-	22.3
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.4	0.1	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	4.6

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Vol, veh/h	17	832	3	6	628	31	3	21	8	20	27	17
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	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	3	2	2	2	5	2	2
Mvmt Flow	18	876	3	6	661	33	3	22	8	21	28	18

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	694	0	0	879	0	0	1626	1619	877	1618	1605	677
Stage 1	-	-	-	-	-	-	913	913	-	690	690	-
Stage 2	-	-	-	-	-	-	713	706	-	928	915	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.15	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.15	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.15	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.545	4.018	3.318
Pot Cap-1 Maneuver	901	-	-	769	-	-	82	103	348	82	105	453
Stage 1	-	-	-	-	-	-	328	352	-	431	446	-
Stage 2	-	-	-	-	-	-	423	439	-	317	352	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	901	-	-	769	-	-	61	100	348	65	102	453
Mov Cap-2 Maneuver	-	-	-	-	-	-	61	100	-	65	102	-
Stage 1	-	-	-	-	-	-	321	345	-	422	443	-
Stage 2	-	-	-	-	-	-	377	436	-	284	345	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.2	0.1	49.9	86.7
HCM LOS			E	F

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SER	SWLn1
Capacity (veh/h)	113	769	-	-	901	-	-	105
HCM Lane V/C Ratio	0.298	0.008	-	-	0.02	-	-	0.642
HCM Control Delay (s)	49.9	9.7	-	-	9.1	-	-	86.7
HCM Lane LOS	E	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	1.1	0	-	-	0.1	-	-	3.2

Intersection	
Int Delay, s/veh	3.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	126	40	624	134	31	801
Conflicting Peds, #/hr	5	5	0	0	5	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	120	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	11	2	2	2	2
Mvmt Flow	137	43	678	146	34	871

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1694	761	0	0	829	0
Stage 1	756	-	-	-	-	-
Stage 2	938	-	-	-	-	-
Critical Hdwy	6.42	6.31	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.399	-	-	2.218	-
Pot Cap-1 Maneuver	~ 102	391	-	-	803	-
Stage 1	464	-	-	-	-	-
Stage 2	381	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 97	388	-	-	799	-
Mov Cap-2 Maneuver	230	-	-	-	-	-
Stage 1	462	-	-	-	-	-
Stage 2	365	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	35.1	0	0.4
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	230	388	799	-
HCM Lane V/C Ratio	-	-	0.595	0.112	0.042	-
HCM Control Delay (s)	-	-	41.3	15.4	9.7	-
HCM Lane LOS	-	-	E	C	A	-
HCM 95th %tile Q(veh)	-	-	3.4	0.4	0.1	-

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												
Volume (vph)	15	4	17	109	3	18	15	813	18	6	926	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	1	10	1	1	10	1	10	12	1	10	12	1
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	1.00	
Frt		0.94			0.98		1.00	1.00		1.00	1.00	
Flt Protected		0.98			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1534			1620		1652	1854		1652	1860	
Flt Permitted		0.88			0.73		0.09	1.00		0.15	1.00	
Satd. Flow (perm)		1377			1235		151	1854		268	1860	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	17	4	19	122	3	20	17	913	20	7	1040	8
RTOR Reduction (vph)	0	14	0	0	7	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	26	0	0	138	0	17	932	0	7	1048	0
Confl. Peds. (#/hr)	5		3	3		5	11		17	17		11
Heavy Vehicles (%)	7%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			4			1			3	
Permitted Phases	2			4			1			3		
Actuated Green, G (s)		21.5			21.5		54.5	54.5		54.5	54.5	
Effective Green, g (s)		21.5			21.5		54.5	54.5		54.5	54.5	
Actuated g/C Ratio		0.25			0.25		0.64	0.64		0.64	0.64	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		2.5			2.5		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		348			312		96	1188		171	1192	
v/s Ratio Prot								0.50			c0.56	
v/s Ratio Perm		0.02			c0.11		0.11			0.03		
v/c Ratio		0.07			0.44		0.18	0.78		0.04	0.88	
Uniform Delay, d1		24.2			26.7		6.2	11.0		5.6	12.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4			0.7		0.9	3.5		0.1	7.6	
Delay (s)		24.6			27.4		7.1	14.5		5.7	20.2	
Level of Service		C			C		A	B		A	C	
Approach Delay (s)		24.6			27.4			14.3			20.1	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		
Description: Molalla Avenue/Pearl Street			
c Critical Lane Group			

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	SEU	SEL	SET	SER	NWU	NWL	NWT	NWR	NEU	NEL	NET	NER
Vol, veh/h	0	6	11	7	0	9	20	20	0	7	14	5
Peak Hour Factor	0.90	0.67	0.67	0.67	0.90	0.67	0.67	0.67	0.90	0.67	0.67	0.67
Heavy Vehicles, %	2	2	13	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	9	16	10	0	13	30	30	0	10	21	7
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	SE	NW	NE
Opposing Approach	NW	SE	SW
Opposing Lanes	1	1	1
Conflicting Approach Left	SW	NE	SE
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NE	SW	NW
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.3	7.4	7.4
HCM LOS	A	A	A

Lane	NELn1	NWLn1	SELn1	SWLn1
Vol Left, %	27%	18%	25%	36%
Vol Thru, %	54%	41%	46%	42%
Vol Right, %	19%	41%	29%	22%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	26	49	24	55
LT Vol	14	20	11	23
Through Vol	5	20	7	12
RT Vol	7	9	6	20
Lane Flow Rate	39	73	36	82
Geometry Grp	1	1	1	1
Degree of Util (X)	0.044	0.08	0.041	0.093
Departure Headway (Hd)	4.125	3.962	4.074	4.094
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	860	895	869	869
Service Time	2.19	2.028	2.146	2.15
HCM Lane V/C Ratio	0.045	0.082	0.041	0.094
HCM Control Delay	7.4	7.4	7.3	7.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.3	0.1	0.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SWU	SWL	SWT	SWR
Vol, veh/h	0	20	23	12
Peak Hour Factor	0.90	0.67	0.67	0.67
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	30	34	18
Number of Lanes	0	0	1	0

Approach	SW
Opposing Approach	NE
Opposing Lanes	1
Conflicting Approach Left	NW
Conflicting Lanes Left	1
Conflicting Approach Right	SE
Conflicting Lanes Right	1
HCM Control Delay	7.6
HCM LOS	A

Lane

Intersection	
Intersection Delay, s/veh	7.3
Intersection LOS	A

Movement	SEU	SEL	SET	SER	NWU	NWL	NWT	NWR	NEU	NEL	NET	NER
Vol, veh/h	0	21	4	9	0	0	15	4	0	4	7	1
Peak Hour Factor	0.90	0.72	0.72	0.72	0.90	0.72	0.72	0.72	0.90	0.72	0.72	0.72
Heavy Vehicles, %	2	6	2	2	2	0	2	2	2	2	2	2
Mvmt Flow	0	29	6	13	0	0	21	6	0	6	10	1
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	SE	NW	NE
Opposing Approach	NW	SE	SW
Opposing Lanes	1	1	1
Conflicting Approach Left	SW	NE	SE
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NE	SW	NW
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.4	7.2	7.3
HCM LOS	A	A	A

Lane	NELn1	NWLn1	SELn1	SWLn1
Vol Left, %	33%	0%	62%	14%
Vol Thru, %	58%	79%	12%	37%
Vol Right, %	8%	21%	26%	49%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	12	19	34	51
LT Vol	7	15	4	19
Through Vol	1	4	9	25
RT Vol	4	0	21	7
Lane Flow Rate	17	26	47	71
Geometry Grp	1	1	1	1
Degree of Util (X)	0.019	0.029	0.054	0.075
Departure Headway (Hd)	4.132	3.996	4.139	3.807
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	862	892	863	937
Service Time	2.178	2.038	2.175	1.845
HCM Lane V/C Ratio	0.02	0.029	0.054	0.076
HCM Control Delay	7.3	7.2	7.4	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.1	0.2	0.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SWU	SWL	SWT	SWR
Vol, veh/h	0	7	19	25
Peak Hour Factor	0.90	0.72	0.72	0.72
Heavy Vehicles, %	2	2	9	2
Mvmt Flow	0	10	26	35
Number of Lanes	0	0	1	0

Approach	SW
Opposing Approach	NE
Opposing Lanes	1
Conflicting Approach Left	NW
Conflicting Lanes Left	1
Conflicting Approach Right	SE
Conflicting Lanes Right	1
HCM Control Delay	7.2
HCM LOS	A

Lane

Intersection	
Int Delay, s/veh	0.9

Movement	SEL	SET	NWT	NWR	SWL	SWR
Vol, veh/h	3	439	244	28	36	4
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	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	493	274	31	40	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	306	0	-	0	790	290
Stage 1	-	-	-	-	290	-
Stage 2	-	-	-	-	500	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1255	-	-	-	359	749
Stage 1	-	-	-	-	759	-
Stage 2	-	-	-	-	609	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1255	-	-	-	358	749
Mov Cap-2 Maneuver	-	-	-	-	358	-
Stage 1	-	-	-	-	759	-
Stage 2	-	-	-	-	607	-

Approach	SE	NW	SW
HCM Control Delay, s	0.1	0	15.8
HCM LOS			C

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1
Capacity (veh/h)	-	-	1255	-	378
HCM Lane V/C Ratio	-	-	0.003	-	0.119
HCM Control Delay (s)	-	-	7.9	0	15.8
HCM Lane LOS	-	-	A	A	C
HCM 95th %tile Q(veh)	-	-	0	-	0.4

Intersection	
Int Delay, s/veh	1.1

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER
Vol, veh/h	8	754	30	18	590	8	4	2	35
Conflicting Peds, #/hr	0	0	0	0	0	0	4	0	6
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	811	32	19	634	9	4	2	38

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	649	0	0	849	0	0	1540	1538	837
Stage 1	-	-	-	-	-	-	850	850	-
Stage 2	-	-	-	-	-	-	690	688	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	937	-	-	789	-	-	94	116	367
Stage 1	-	-	-	-	-	-	355	377	-
Stage 2	-	-	-	-	-	-	435	447	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	932	-	-	787	-	-	87	110	364
Mov Cap-2 Maneuver	-	-	-	-	-	-	87	110	-
Stage 1	-	-	-	-	-	-	347	368	-
Stage 2	-	-	-	-	-	-	411	434	-

Approach	SE	NW	NE
HCM Control Delay, s	0.1	0.3	22
HCM LOS			C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SER	SWLn1
Capacity (veh/h)	256	787	-	-	932	-	-	175
HCM Lane V/C Ratio	0.172	0.025	-	-	0.009	-	-	0.098
HCM Control Delay (s)	22	9.7	-	-	8.9	0	-	27.8
HCM Lane LOS	C	A	-	-	A	A	-	D
HCM 95th %tile Q(veh)	0.6	0.1	-	-	0	-	-	0.3

Intersection	
Int Delay, s/veh	

Movement	SWL	SWT	SWR
Vol, veh/h	4	2	10
Conflicting Peds, #/hr	6	0	4
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	-	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	93	93	93
Heavy Vehicles, %	2	2	2
Mvmt Flow	4	2	11

Major/Minor	Minor2		
Conflicting Flow All	1553	1549	651
Stage 1	683	683	-
Stage 2	870	866	-
Critical Hdwy	7.12	6.52	6.22
Critical Hdwy Stg 1	6.12	5.52	-
Critical Hdwy Stg 2	6.12	5.52	-
Follow-up Hdwy	3.518	4.018	3.318
Pot Cap-1 Maneuver	92	114	469
Stage 1	439	449	-
Stage 2	346	370	-
Platoon blocked, %			
Mov Cap-1 Maneuver	78	108	464
Mov Cap-2 Maneuver	78	108	-
Stage 1	429	436	-
Stage 2	302	362	-

Approach	SW
HCM Control Delay, s	27.8
HCM LOS	D

Minor Lane/Major Mvmt

Crash Rate Calculations

General & Site Information	
Analyst:	ADB
Agency/Company:	DKS Associates
Date:	11/18/2014
Project Name:	Oregon City Library TIA

Intersection Crash Data

Intersection	Intersection Type	Year					Total
		2009	2010	2011	2012	2013	
7th St/Washington St	Urban 4SG	2	3	7	1	4	17
7th St/John Adams St	Urban 4ST	0	3	2	0	3	8
7th St/Jefferson St	Urban 4ST	0	1	0	1	0	2
7th St/Jackson St	Urban 4ST	0	1	1	1	0	3
7th St/Taylor St	Rural 3ST	1	0	0	0	1	2
Molalla Ave/Pearl St	Urban 4SG	5	1	8	4	3	21
6th St/John Adams St	Urban 4ST	1	0	0	0	0	1
6th St/Jefferson St	Urban 4ST	0	0	0	1	0	1
5th St/Jackson St	Urban 3ST	0	0	1	0	0	1
							0
							0
							0
							0
							0
							0
							0
							0
							0
							0
							0
							0
							0
							0
							0
							0
							0
							0
							0
							0
							0
							0
	Total	9	9	19	8	11	56

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	2	34	0.0586	1
Rural 4SG	0	0		
Rural 4ST	0	0		
Urban 3ST	1	15	0.0649	1
Urban 3SG	0	0		
Urban 4ST	15	91	0.1645	5
Urban 4SG	38	79	0.4818	2

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
7th St/Washington St	22,333	40.8	17	Urban 4SG	0.42	0.48	0.67	Under
7th St/John Adams St	15,460	28.2	8	Urban 4ST	0.28	0.16	0.31	Under
7th St/Jefferson St	15,368	28.0	2	Urban 4ST	0.07	0.16	0.31	Under
7th St/Jackson St	16,862	30.8	3	Urban 4ST	0.10	0.16	0.30	Under
7th St/Taylor St	18,701	34.1	2	Rural 3ST	0.06	APM Exhibit 4-1		
Molalla Ave/Pearl St	20,885	38.1	21	Urban 4SG	0.55	0.48	0.68	Under
6th St/John Adams St	1,333	2.4	1	Urban 4ST	0.41	0.16	0.80	Under
6th St/Jefferson St	943	1.7	1	Urban 4ST	0.58	0.16	0.96	Under
5th St/Jackson St	8,437	15.4	1	Urban 3ST	0.06	0.06	0.20	Under

Turn Lane Warrants

Left Turn Lane Warrant Analysis

Project: Oregon City Library Expansion TIA
Scenario(s): 2014, 2016 Scenarios

0

Intersection	Approach (NB,SB, EB,WB)	Number of Advancing Lanes	Number of Opposing Lanes	Volume Advancing (Va)	LT Vol	LT %	Volume Opposing (Vo)	Warrant Factor	5% Warrant Va	Va Warrant Threshold	HRB Warrant Met?	ODOT Volume	ODOT LT Threshold	ODOT Criteria Met?	Max. Est. Queue	Storage Length (ft)
7th Street/John Adams Street (existir	WB	1	1	567	16	3%	726	1.32	357	470	Yes	1293	10	Yes	#N/A	#N/A
7th Street/John Adams Street (No-Bu	WB	1	1	609	16	3%	771	1.36	341	465	Yes	1380	10	Yes	3	75
7th Street/John Adams Street (Build)	WB	1	1	616	18	3%	784	1.29	338	438	Yes	1400	10	Yes	3	75
#N/A	0	0	0	#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	0	0	#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

Intersection	Approach (NB,SB, EB,WB)	Number of Advancing Lanes	Number of Opposing Lanes	Volume Advancing (Va)	LT Vol	LT %	Volume Opposing (Vo)	Warrant Factor	5% Warrant Va	Va Warrant Threshold	HRB Warrant Met?	ODOT Volume	ODOT LT Threshold	ODOT Criteria Met?	Max. Est. Queue	Storage Length (ft)
#N/A	0	0	0	#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	0	0	#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	0	0	#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	0	0	#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	0	0	#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

*The "Consider" note applies when there are high through volumes but less than 10 left turning vehicles.

ODOT LEFT TURN CRITERIA IS BASED ON THE **8-13-03** LEFT TURN CRITERIA
MAX QUEUE AND STORAGE ESTIMATES BASED ON GARD METHOD

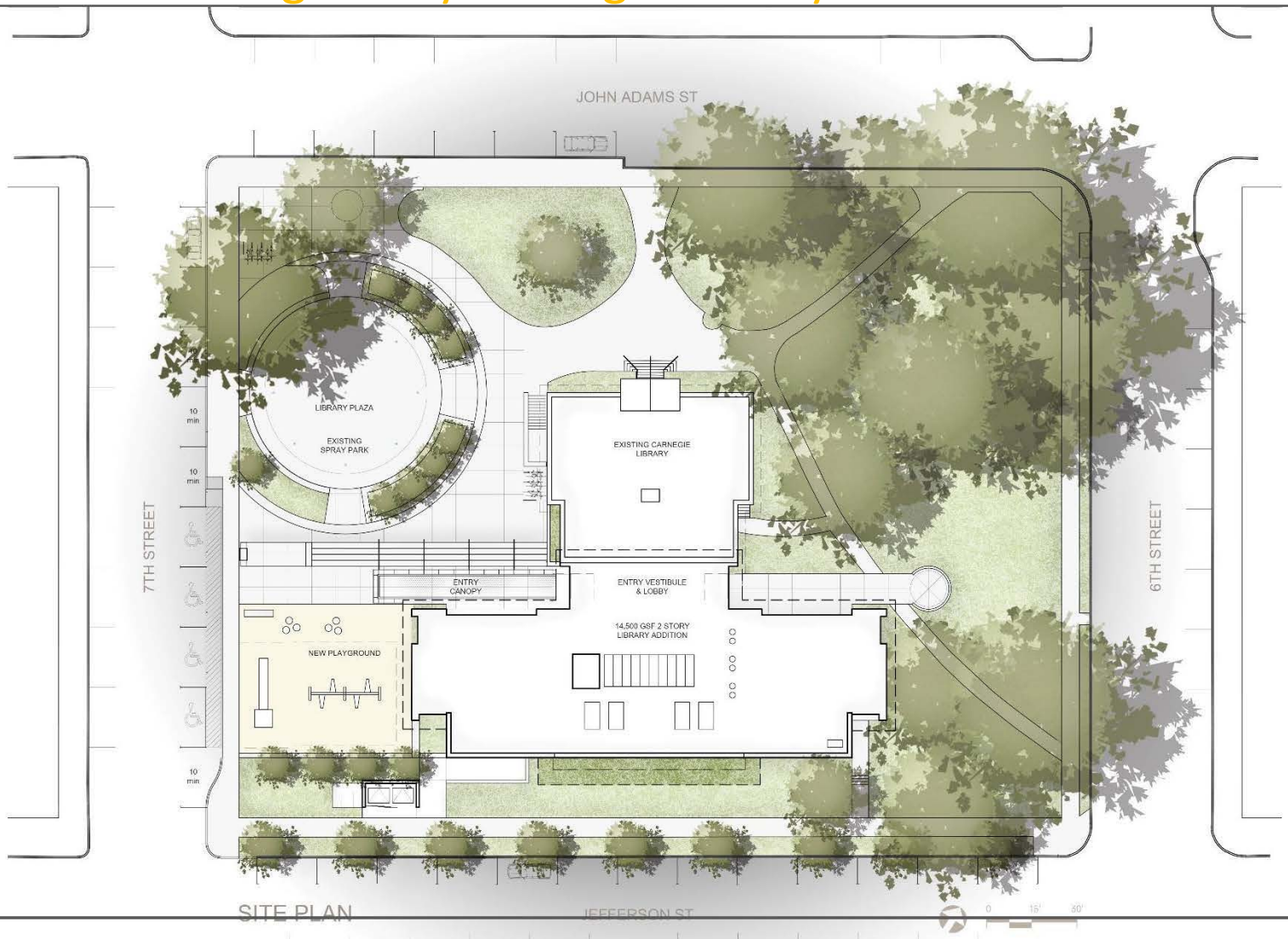
Oregon City Carnegie Library & Addition

Schematic Design Presentation

January 13, 2015

SEA
SCOTT|EDWARDS ARCHITECTURE LLP

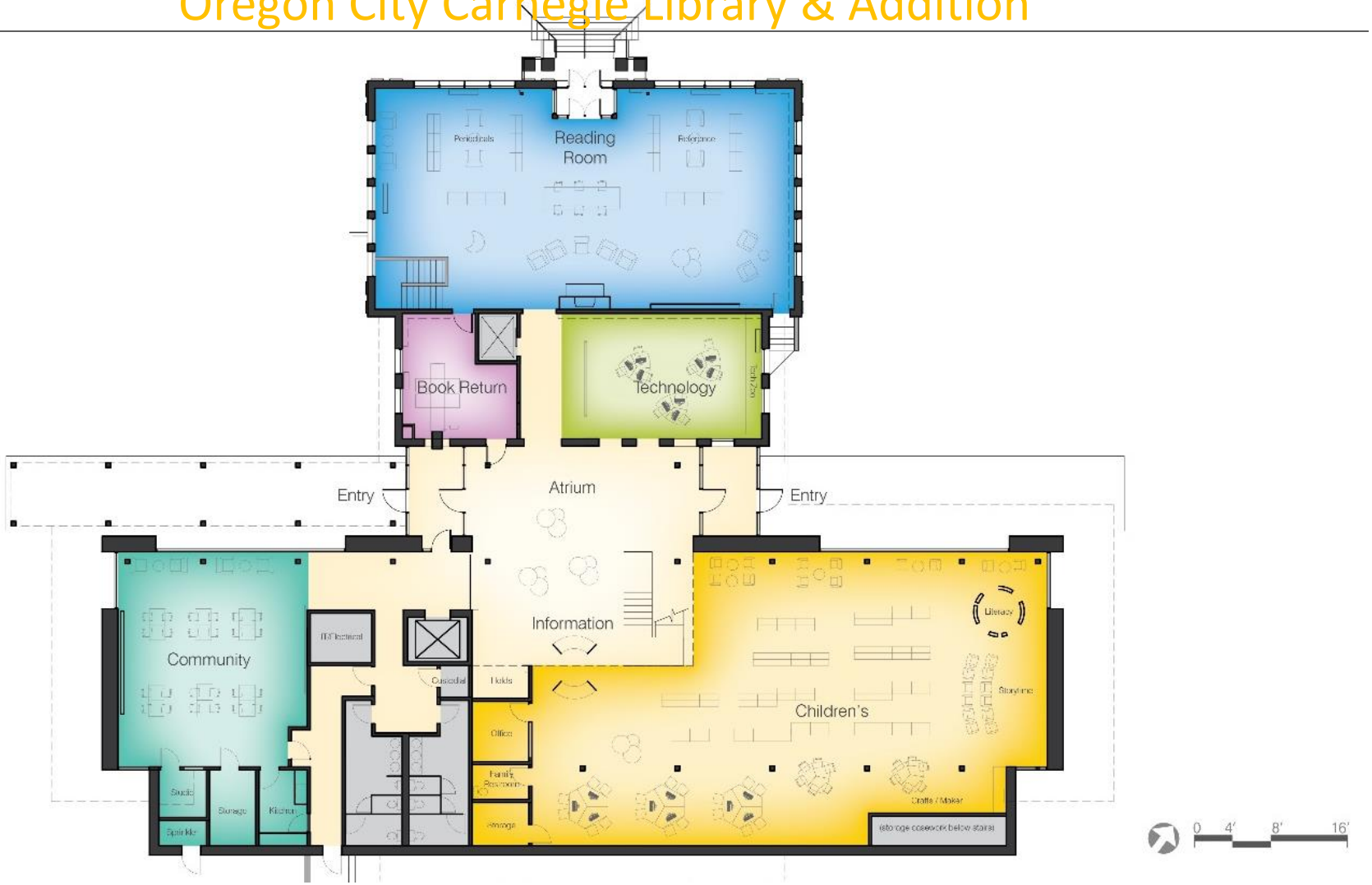
Oregon City Carnegie Library & Addition



Site Plan

SEA
SCOTT|EDWARDS ARCHITECTURE LLP

Oregon City Carnegie Library & Addition



Ground Floor Plan

Schematic Floor Plan

SCOTT|EDWARDS ARCHITECTURE LLP

Oregon City Carnegie Library & Addition

Second Floor Plan

0 4' 8' 16'

Schematic Floor Plan

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Oregon City Carnegie Library & Addition

View from 7th Street

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Oregon City Carnegie Library & Addition

View from John Adams & 6th

S|E A
SCOTT|EDWARDS ARCHITECTURE LLP

Oregon City Carnegie Library & Addition

Option 1 –view from 6th Street

SEA
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Oregon City Carnegie Library & Addition

View from 7th & Jefferson

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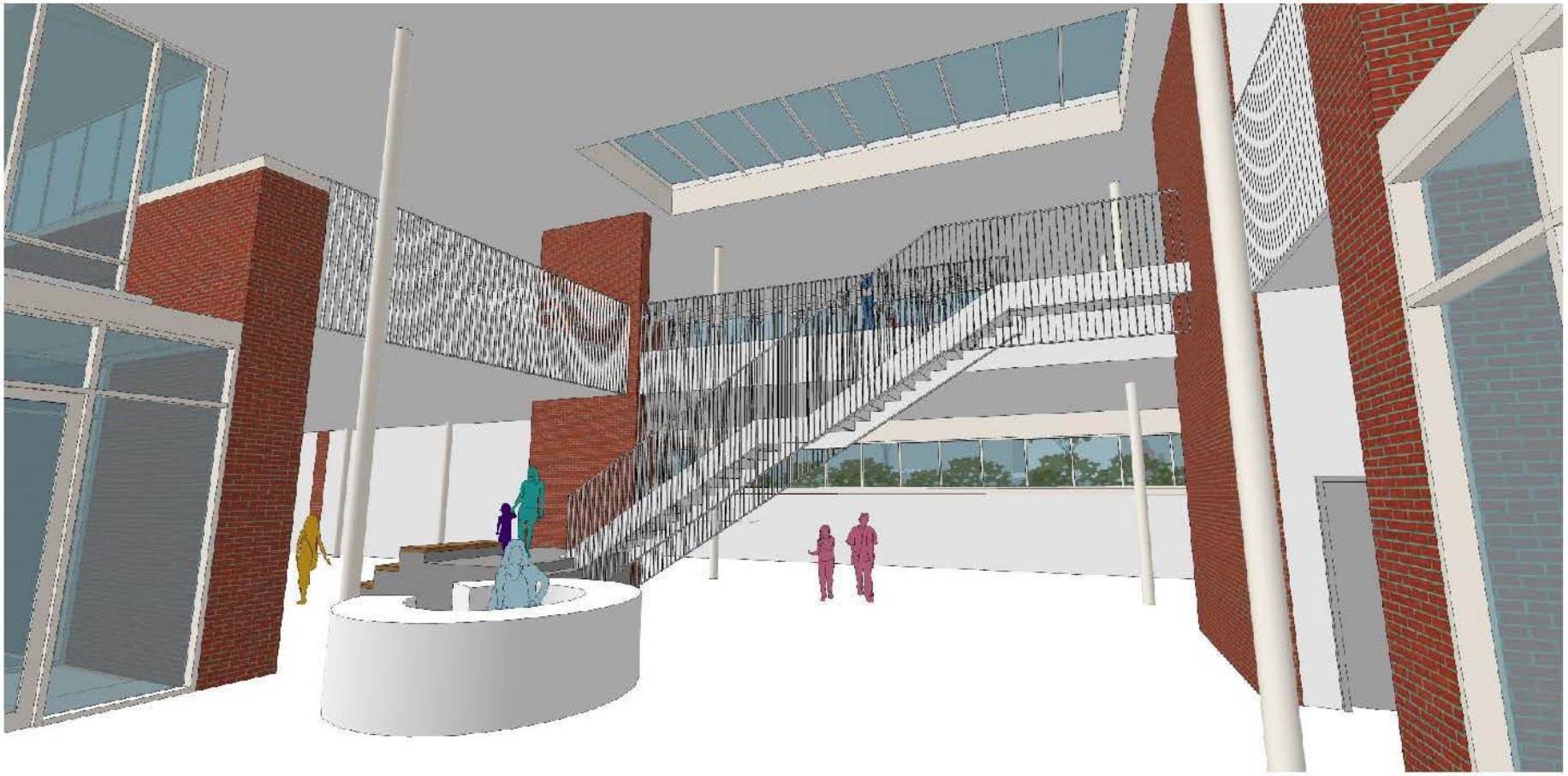
Oregon City Carnegie Library & Addition



View from Entry

SCOTT|EDWARDS ARCHITECTURE LLP

Oregon City Carnegie Library & Addition

View from Entry

SEA
SCOTT|EDWARDS ARCHITECTURE LLP

Oregon City Carnegie Library & Addition

View from Children's Library

S|E A
SCOTT|EDWARDS ARCHITECTURE LLP

Oregon City Carnegie Library & Addition

View from Second Floor

SCOTT|EDWARDS ARCHITECTURE LLP

COMMENT FORM

OREGON CITY

*****PLEASE PRINT CLEARLY*****

- SPEAK INTO THE MICROPHONE AND STATE YOUR NAME AND RESIDING CITY
- Limit Comments to ***3 MINUTES***.
- Give to the Clerk in Chambers ***prior*** to the meeting.

Date of Meeting 1/13/15

Item Number From Agenda 3a

NAME: Sid Scott + Joan Jasper, Scott/Edwards ~~Architecture~~ Architecture

ADDRESS: **Street:** _____

City, State, Zip: _____

PHONE NUMBER: _____

E-MAIL ADDRESS: _____

SIGNATURE: _____