Land Use Application For

Proposed Modification to Approved Site Plan-

Parking Lot Striping/ Parking Lot Landscaping-
Lot 3 of Edy Road Industrial Park

City of Sherwood, Oregon

REVISED 11-24-14

October 10, 2014

Applicant

Brad Picking
P.O. Box 632
Sandy, OR 97055
Phone: (503) 807-4376

Representatives

Lance K. Forney
Ray Moore, P.E., P.L.S.
All County Surveyors & Planners, Inc.
P.O.Box 955
Sandy, OR 97055
Phone: 503-668-3151
Fax: 503-668-4730
Email: raym@allcountysurveyors.com

REGISTERED PROFESSIONAL ENGINEER
49710
OREGON
JULY 21, 1998
RAY L MOORE
RENEWAL DATE: 12/31/14

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Exhibit A

Application Form

City of Sherwood Oregon

Home of the Tualatin River National Wildlife Refuge

Case No. SP14-03
Fee 2891 -
Receipt # 382 745
Date 10-24-14
TYPE IV

City of Sherwood

Application for Land Use Action

Type of Land Use Action Requested: (check all that apply)

- ☐ Annexation
- ☐ Plan Amendment (Proposed Zone _____)
- ☐ Variance(list standard(s) to be varied in description
- ☐ Site Plan (Sq. footage of building and parking area)
- ☐ Planned Unit Development
- ☐ Conditional Use
- ☐ Partition (# of lots _____)
- ☐ Subdivision (# of lots _____)
- ☒ Other: Type IV Site Modification

By submitting this form the Owner, or Owner's authorized agent/ representative, acknowledges and agrees that City of Sherwood employees, and appointed or elected City Officials, have authority to enter the project site at all reasonable times for the purpose of inspecting project site conditions and gathering information related specifically to the project site.

Note: See City of Sherwood current Fee Schedule, which includes the "Publication/Distribution of Notice" fee, at **www.sherwoodoregon.gov.** Click on Departments/Planning/Fee Schedule.

Owner/Applicant Information:

Applicant: Brad Picking
Phone: 503-807-4376
Applicant Address: PO Box 632 Sandy OR 97055
Email: janzberry22@gmail.com
Owner: s/a/a
Phone: _____
Owner Address: _____
Email: _____
Contact for Additional Information: Ray Moore, PE/PLS phone: 503-668-3151
email: raym@allcountysurveyors.com

Property Information:

Street Location: 20551 Wildrose Place
Tax Lot and Map No: 01400 2S128A
Existing Structures/Use: _____
Existing Plan/Zone Designation: _____
Size of Property(ies) 4.98 acres 217,168 sq ft

Proposed Action:

Purpose and Description of Proposed Action: Proposing addition of 55 parking spaces for a total of 75 spaces and adding 8816 sq ft of parking landscape area. This includes a Manueving Plan

Proposed Use: Parking

Proposed No. of Phases (one year each): 1

Continued on Reverse

LAND USE APPLICATION FORM

Authorizing Signatures:

I am the owner/authorized agent of the owner empowered to submit this application and affirm that the information submitted with this application is correct to the best of my knowledge.

I further acknowledge that I have read the applicable standards for review of the land use action I am requesting and understand that I must demonstrate to the City review authorities compliance with these standards prior to approval of my request.

Applicant's Signature — Date: 10/22/14

Owner's Signature — Date: 10/21/14

The following materials must be submitted with your application or it will not be accepted at the counter. Once taken at the counter, the City has up to 30 days to review the materials submitted to determine if we have everything we need to complete the review.

- [x] **3 * copies of Application Form** completely filled out and signed by the property owner (or person with authority to make decisions on the property.
- [x] **Copy of Deed** to verify ownership, easements, etc.
- [x] **At least 3 * folded** sets of plans
- [x] **At least 3 * sets** of narrative addressing application criteria
- [x] **Fee** (along with calculations utilized to determine fee if applicable)
- [x] **Neighborhood Meeting Verification** including affidavit, sign-in sheet and meeting summary (required for Type III, IV and V projects)
- [x] **Signed checklist** verifying submittal includes specific materials necessary for the application process

* **Note** that the required numbers of copies identified on the checklist are required for completeness; however, upon initial submittal applicants are encouraged to submit only 3 copies for completeness review. Prior to completeness, the required number of copies identified on the checklist and one full electronic copy will be required to be submitted.

Exhibit B

Documentation of Neighborhood Meeting

All County Surveyors & Planners, Inc.

PO Box 955 • Sandy, Oregon 97055 • Phone: 503-668-3151 • Fax: 503-668-4730

NEIGHBORHOOD MEETING
Minutes

Meeting Date: Tuesday, September 30, 2014 in the proposed development site's lobby.
Location: 20551 Wildrose Place, Sherwood, OR 97140

Agenda: Early Neighborhood Notification Meeting regarding a proposed striping plan to an existing approved warehouse development located at 20551 Wildrose Place, Sherwood, OR 97140.
The existing development was approved under SP 00-04 Wildrose Industrial Park Site Plan.

Copies of the proposed lot and utility layout were placed on a table by the sign in sheet. The meeting began at approximately 6:30PM. Lance Forney from All County Surveyors and Planners, Inc. was in attendance. No members of the Neighborhood Association attended.

The meeting was adjourned at 7:30 PM

Affidavit of Mailing

DATE:

STATE OF OREGON)
)
Washington County)

I, Michele Dunn, representative for the 20551 Wildrose Pl., Sherwood, OR proposed development project do hereby certify that the attached notice to adjacent property owners and recognized neighborhood organizations that are within 1,000 feet of the subject project, was placed in a U.S. Postal receptacle on September 12, 2014.

Michele Dunn
Representatives Name:
Name of the Organization: All County Surveyors & Planners, Inc.

Updated October 2010

NEIGHBORHOOD MEETING SIGN IN SHEET

Proposed Project: Add 55 Parking Spaces & Addition of 886 sqft of Landscape Area

Proposed Project Location: 20551 Wildrose Pl., Sherwood, OR 97140

Project Contact: Ray Moore

Meeting Location: 20551 Wildrose Pl., Sherwood, OR 97140

Meeting Date: September 30, 2014

Name	Address	E-Mail	Please identify yourself (check all that apply)			
			Resident	Property owner	Business owner	Other
LANCE FORNEY	3904 SE 113TH AVE, PORTLAND, OR 97705	lance@allcountysurveys.com				X

Updated October 2010

All County Surveyors & Planners, Inc.
P.O. Box 955 • Sandy, Oregon 97055 • 503/668-3151 • FAX 503/668-4730

September 12, 2014

To: Neighborhood Meeting Attendee

NOTICE OF NEIGHBORHOOD MEETING

A Neighborhood Meeting will be held on September 30, 2014 at 20551 Wildrose Place, Sherwood, OR 97140 to inform the community about our proposed Site Modification. Interested community members are encouraged to attend this meeting. Please contact Ray Moore at 503-668-3151 for additional information.

PROJECT PROPOSAL: Brad Picking is proposing the addition of 55 parking spaces by striping the existing paved area for a total of 75 spaces which also includes a maneuvering Plan and the addition of 886 square feet of parking landscape area.

PROPOSED PLANS

SEE ATTACHED EXHIBIT "A" DESIGN PLANS
SEE ATTACHED EXHIBIT "B" TAX MAP
SEE ATTACHED EXHIBIT "C" AERIAL MAP

Open House Information

DATE: September 30, 2014
TIME: 6:30-8:30 PM
LOCATION: 20551 Wildrose Place, Sherwood, OR 97140
ROOM: Lobby
CONTACT: Ray Moore, Project Manager at All County Surveyors & Planners, Inc. at ph: 503-668-3151 or email: raym@allcountysurveyors.com

EXHIBIT "A"

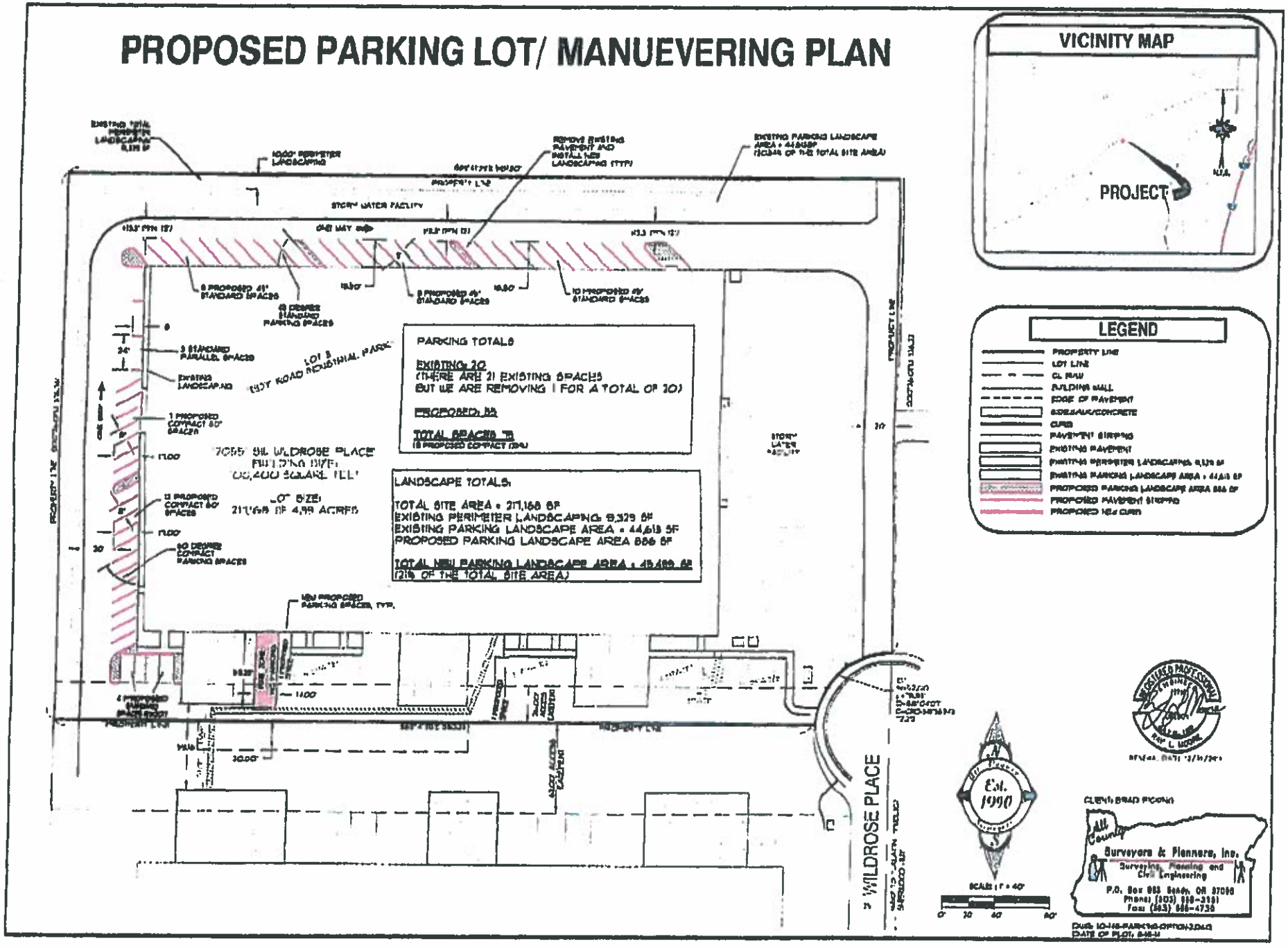

PROPOSED PARKING LOT/ MANUEVERING PLAN
VICINITY MAP
PROJECT
N.T.S.
LEGEND
PROPERTY LINE
LOT LINE
CL WAY
BUILDING WALL
EDGE OF PAVEMENT
SIDEWALK/CONCRETE
CURB
PAVEMENT STRIPING
EXISTING PAVEMENT
PROPOSED PAVEMENT STRIPING
PROPOSED NEW CURB
PARKING TOTALS
EXISTING: 20
(THERE ARE 21 EXISTING SPACES
BUT WE ARE REMOVING 1 FOR A TOTAL OF 20)
PROPOSED: 53
TOTAL SPACES: 73
LANDSCAPE TOTALS:
TOTAL SITE AREA = 217,168 SF
EXISTING PERIMETER LANDSCAPING: 8,329 SF
EXISTING PARKING LANDSCAPE AREA = 44,613 SF
PROPOSED PARKING LANDSCAPE AREA 886 SF
TOTAL NEW PARKING LANDSCAPE AREA = 45,499 SF
(21% OF THE TOTAL SITE AREA)
7055 SW WILDROSE PLACE
BUILDING SIZE:
68,400 SQUARE FEET
LOT SIZE:
217,168 SF 4.99 ACRES
LOT 3
NOT ROAD INDUSTRIAL PARK
STORM WATER FACILITY
PROPERTY LINE
SW WILDROSE PLACE
Est. 1990
SCALE: 1" = 40'
0' 20' 40' 80'
Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 883 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4736

EXHIBIT "B"

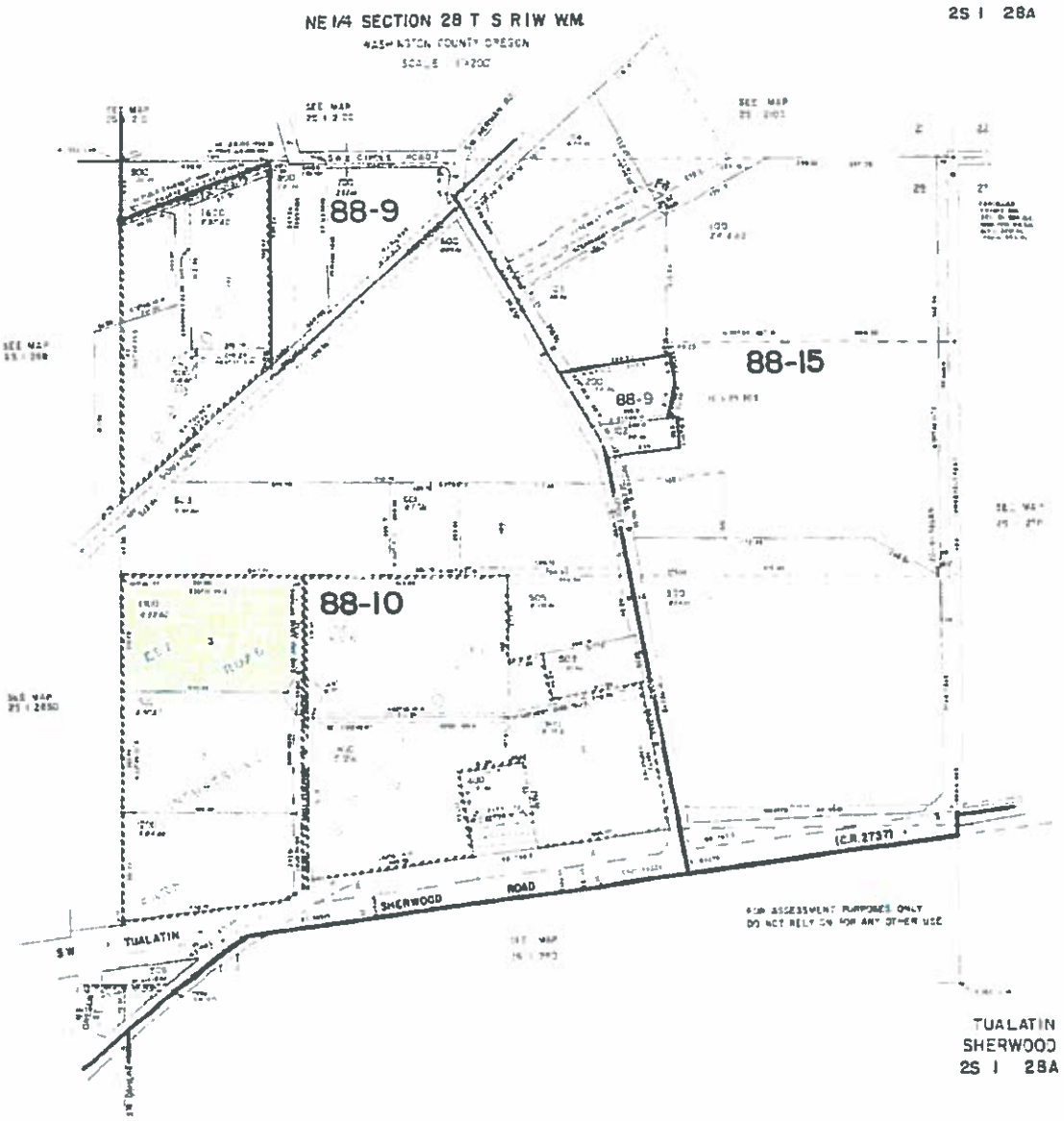

NE 1/4 SECTION 28 T S R1W WM
2S 1 28A
88-9
88-15
88-9
88-10
SHERWOOD ROAD
TUALATIN
SW
(C.R. 2737)
FOR ASSESSMENT PURPOSES ONLY
DO NOT RELY ON FOR ANY OTHER USE
TUALATIN
SHERWOOD
2S 1 28A

EXHIBIT "C"

Google earth

feet 600

meters 100

Exhibit C

Tax Map

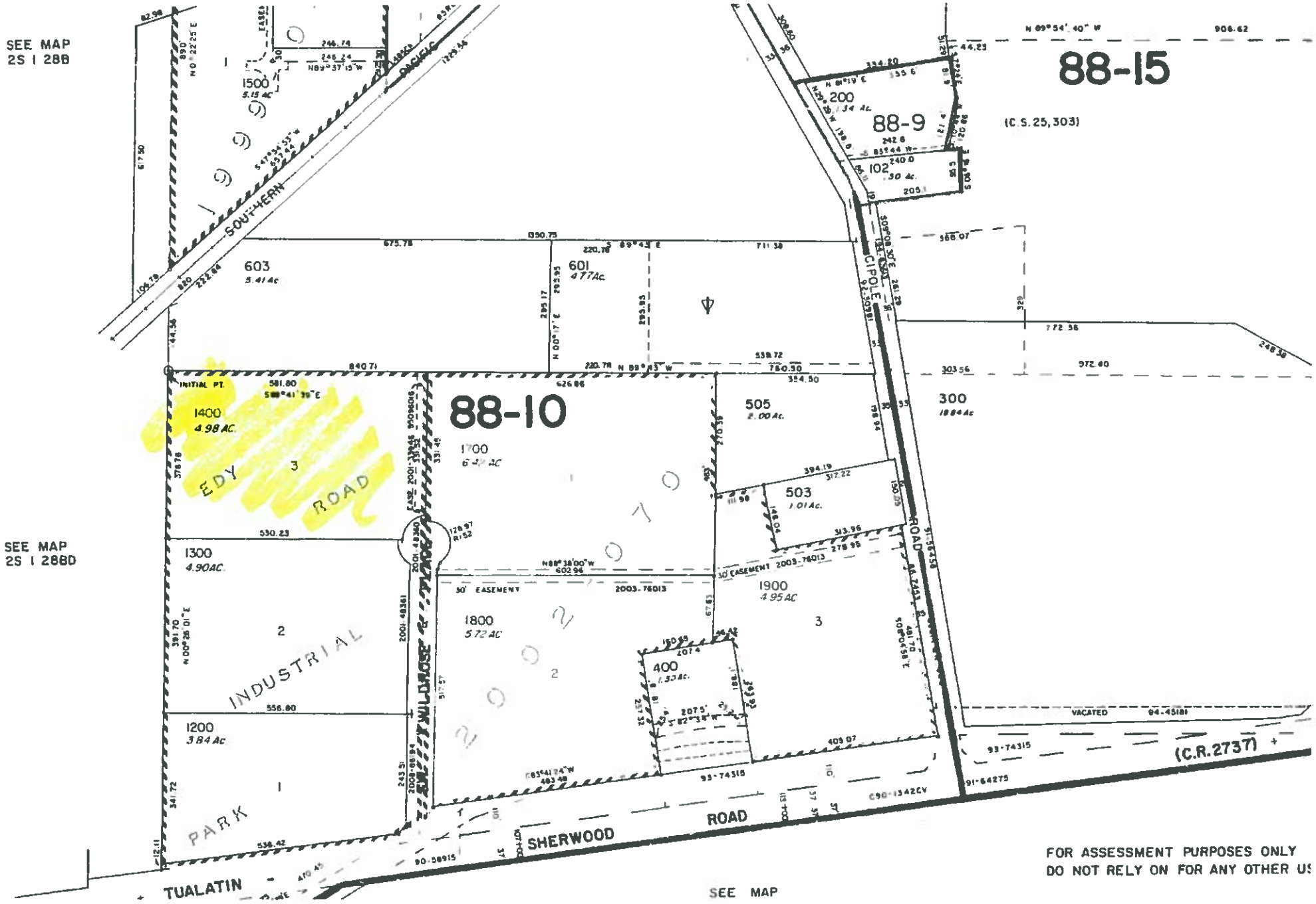

SEE MAP
2S 1 28B
SEE MAP
2S 1 28BD
88-15
(C.S. 25,303)
88-9
88-10
SOUTHERN PACIFIC
CIPOLE ROAD
EDY ROAD
INDUSTRIAL PARK
SHERWOOD ROAD
TUALATIN
(C.R.2737)
SEE MAP
1500
5.15 AC
603
5.41 Ac
601
4.77Ac
200
.34 Ac
102
.50 Ac
1400
4.98 AC
1300
4.90AC
1200
3.84 Ac
1700
505
2.00 Ac
503
1.01 Ac
300
1900
4.95 AC
1800
5.72 AC
400
1.33 Ac
30' EASEMENT 2003-76013
VACATED 94-45181
93-74315
91-64275
90-58915
FOR ASSESSMENT PURPOSES ONLY
DO NOT RELY ON FOR ANY OTHER US

Exhibit D

Mailing Labels

MAP 2S128A, LOTS 603, 1300, 1700, 1800

603
NORTHWEST NATURAL GAS CO
220 NW SECOND AVE
PORTLAND, OR 97209

1300
BULLFROG LLC
2322 S ROGERS ST
MESA, AZ 85202

1700
WIRKKALA SHERWOOD PROPERTY LLC
30905 NE MICHAEL RD
NEWBERG, OR 97132

1800
PM MARSHALL CO
PO BOX 278
TUALATIN, OR 97062

MAP 2S128BD, LOTS 600, 700

600
BULLOCK, J L REV TRUST &
BULLOCK, G L REV TRUST
BY JERRY L/GEORGIA L BULLOCK T
PO BOX 263
LAKE OSWEGO, OR 97034

700
LANZ PROPERTIES LLC
3025 W 7TH PL
EUGENE, OR 97402

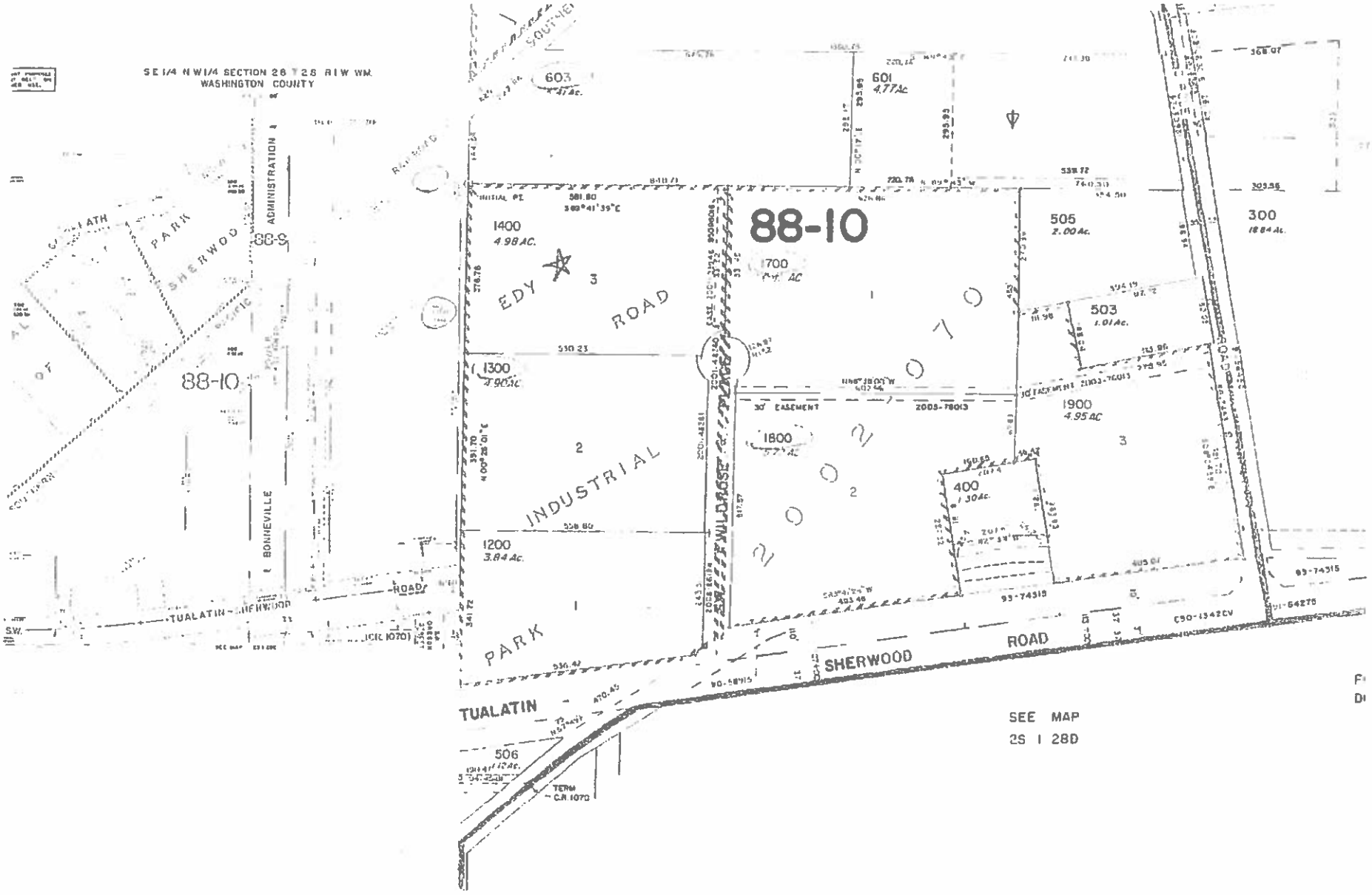
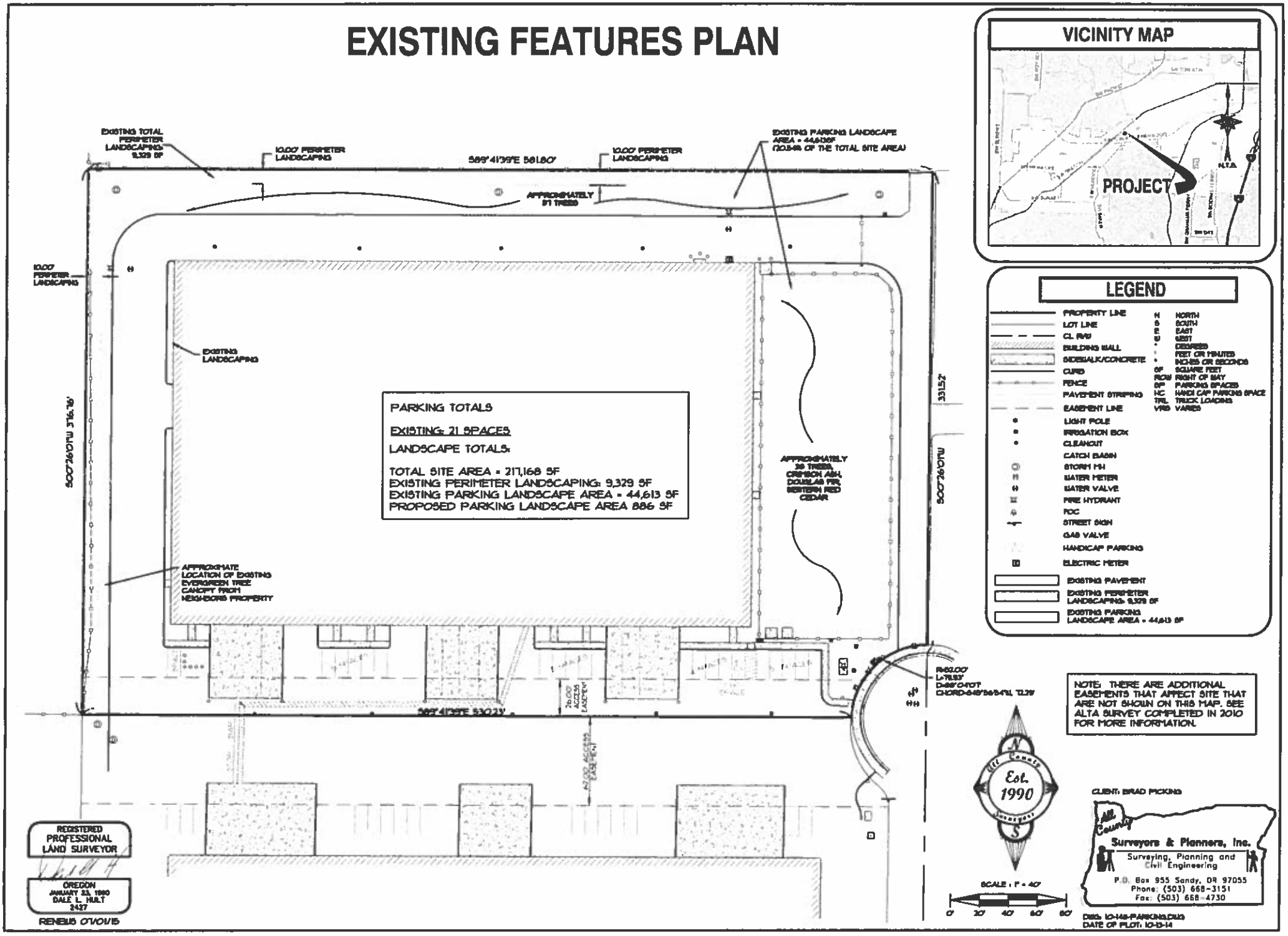

SE 1/4 NW 1/4 SECTION 26 T 2S R 1W WM
WASHINGTON COUNTY
88-10
88-9
PARK
SHERWOOD
ADMINISTRATION
BONNEVILLE
TUALATIN-SHERWOOD
ROAD
603
601
4.77Ac
1400
4.98AC.
EDY
ROAD
1300
2.90Ac
INDUSTRIAL
PARK
1200
3.84Ac
1700
1800
30' EASEMENT
2003-78013
505
2.00Ac.
503
1.01Ac.
1900
4.95AC
400
.30Ac.
300
506
TERM
C.R. 1070
SHERWOOD
ROAD
TUALATIN
SEE MAP
2S 1 28D

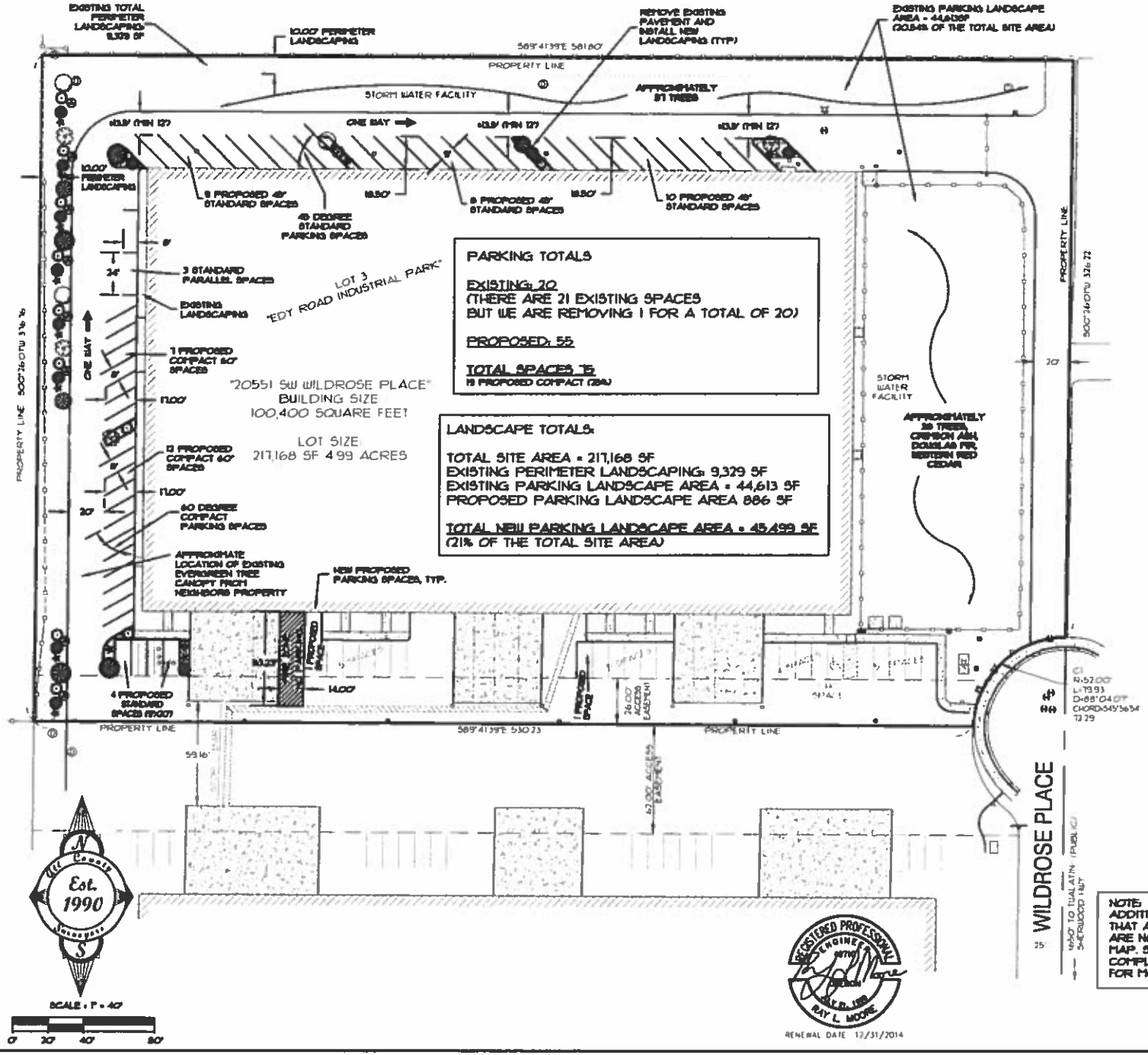
Exhibit E

Proposed Striping/ Landscape Plan with Vicinity Map

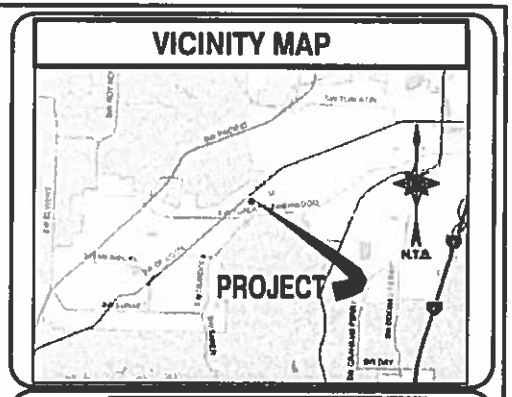
EXISTING FEATURES PLAN



PROPOSED STRIPING/ LANDSCAPE PLAN



VICINITY MAP



LEGEND

- PROPERTY LINE
- LOT LINE
- CL R/W
- BUILDING WALL
- EDGE OF PAVEMENT
- SIDEWALK/CONCRETE
- CURB
- PAVEMENT STRIPING
- EXISTING PAVEMENT
- EXISTING PERIMETER LANDSCAPING 9,329 SF
- EXISTING PARKING LANDSCAPE AREA = 44,613 SF
- PROPOSED PARKING LANDSCAPE AREA 886 SF
- PROPOSED PAVEMENT STRIPING
- PROPOSED NEW CURB

PROPOSED PLANTS

- "AUTUMN BLAZE MAPLE" MIN. 1-1/2" CALIPER OR 7' TALL, BALLED & BURLAPED
- "SCARLET OAK" MIN. 1-1/2" CALIPER OR 7' TALL, BALLED & BURLAPED
- "INCENSE CEDAR" MIN. 8-10' TALL, BALLED & BURLAPED
- "WESTERN RED CEDAR" MIN. 8-10' TALL, BALLED & BURLAPED
- RHODODENDRON 5 GALLON (EACH SYMBOL DENOTES 3 PLANTS) 36 TOTAL
- RED FLOWERING CURRANT MIN. 1 GALLON OR 2' IN HEIGHT (EACH SYMBOL DENOTES 3 PLANTS) 36 TOTAL
- SERVICEBERRY MIN. 1 GALLON OR 2' IN HEIGHT (EACH SYMBOL DENOTES 3 PLANTS) 36 TOTAL
- VINE MAPLE MIN. 1 GALLON OR 2' IN HEIGHT 8 TOTAL

55 SPACES X 3 SHRUBS PER SPACE: 110 SHRUBS REQUIRED
TOTAL SHRUBS PROPOSED: 117

1 LARGE TREE PER 4 SPACES: 13.75 LARGE TREES REQUIRED
TOTAL LARGE TREES PROPOSED: 14

NOTE: THERE ARE ADDITIONAL EASEMENTS THAT AFFECT SITE THAT ARE NOT SHOWN ON THIS MAP. SEE ALTA SURVEY COMPLETED IN 2010 FOR MORE INFORMATION.

REGISTERED PROFESSIONAL ENGINEER — OREGON — RAY L. MOORE
RENEWAL DATE 12/31/2014

CLIENT: BRAD PICKING

All County Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730

DWG: 14-184-PLANNING.DWG
DATE OF PLOT: 10-10-14

Exhibit F

Modification to Approved Site Plan Code

16.90.030 Site Plan Modifications and Revocation

A. Modifications to Approved Site Plans

1.Major Modifications to Approved Site Plans

a. Defined. The review authority shall determine that a major modification(s) review is required if one or more of the changes listed below are proposed:

(1) A change in land use (i.e. residential to commercial, commercial to industrial, etc.);

RESPONSE: N/A. The existing land use will remain the same with the proposed parking striping.

(2) An increase in density by more than ten (10) percent, provided the resulting density does not exceed that allowed by the land use district;

RESPONSE: N/A. The existing density will not be altered with the proposed striping.

(3) A change in setbacks or lot coverage by more than 10 percent, provided the resulting setback or lot coverage does not exceed that allowed by the land use district;

RESPONSE: N/A. The existing setbacks and lot coverage will remain the same as the existing approved development.

(4) A change in the type and/or location of access-ways, drives or parking areas negatively affecting off-site traffic or increasing Average Daily Trips (ADT) by more than 100;

RESPONSE: The access-ways will remain unchanged. The widths will still meet fire department standards as required. The fire department has approved the proposed parking striping plan. A trip generation has been completed by Group Mackenzie and the new tenant will be increasing the Average Daily Trips by 377 trips. The applicant therefore must apply for a Major Modification.

(5) An increase in the floor area or height proposed for non-residential use by more than 10 percent;

RESPONSE: N/A. No change to the building is proposed.

(6) A reduction of more than 10 percent of the area reserved for common open space; or

RESPONSE: N/A. No change to open space is proposed.

(7) Change to a condition of approval that was specifically applied to this approval (i.e. not a "standard condition"), or a change similar to items (1)-(2) as determined by the Review Authority.

RESPONSE: N/A. No change to an existing condition of approval is proposed.

b. Approval Criteria. An applicant may request a major modification as follows:

(1) Upon the review authority determining that the proposed modification is a major modification, the applicant shall submit an application form, filing fee and narrative, and a site plan using the same plan format as in the original approval. The review authority may require other relevant information, as necessary, to evaluate the request.

RESPONSE: The applicant is proposing a major modification.

(2) The application shall be subject to the same review procedure (Type II, III or IV), decision making body, and approval criteria used for the initial project approval, except that adding a conditional use to an approved project shall be reviewed using a Type III procedure.

(3) The scope of review shall be limited to the modification request and does not open the entire site up for additional review unless impacted by the proposed modification. For example, a request to modify a parking lot shall require site design review only for the proposed parking lot and any changes to associated access, circulation, pathways, lighting, trees, and landscaping.

RESPONSE: The applicant is proposing a modification to the parking areas. The circulation and landscaping have been addressed in this modification.

(4) Notice shall be provided in accordance with Chapter 16.72.020

(5) The decision maker shall approve, deny, or approve with conditions an application for major modification based on written findings of the criteria.

2. Minor Modifications to Approved Site Plans

RESPONSE: N/A. The applicant is proposing a major modification.

B. Revocation

Any departure from approved plans shall be cause for revocation of applicable building and occupancy permits. Furthermore if, in the City's determination, a condition or conditions of site plan approval are not or cannot be satisfied, the site plan approval, or building and occupancy permits, shall be revoked.

RESPONSE: N/A.

C. Reserved

D. Required Findings

No site plan approval shall be granted unless each of the following is found:

1. The proposed development meets applicable zoning district standards and design standards in Division II, and all provisions of Divisions V, VI, VIII and IX.

RESPONSE: The proposed development meets all of the applicable zoning district standards.

2. The proposed development can be adequately served by services conforming to the Community Development Plan, including but not limited to water, sanitary facilities, storm water, solid waste, parks and open space, public safety, electric power, and communications.

RESPONSE: The proposed use currently has adequate services.

3. Covenants, agreements, and other specific documents are adequate, in the City's determination, to assure an acceptable method of ownership, management, and maintenance of structures, landscaping, and other on-site features.

RESPONSE: The existing maintenance, ownership, and management of the property are not being changed with the new tenant.

4. The proposed development preserves significant natural features to the maximum extent feasible, including but not limited to natural drainage ways, wetlands, trees, vegetation (including but not limited to environmentally sensitive lands), scenic views, and topographical features, and conforms to the applicable provisions of Division VIII of this Code and Chapter 5 of the Community Development Code.

RESPONSE: No vegetation is proposed to be removed with this application. The only vegetation that will be affected is along the Fire Access Lane. The client is required to trim the existing vegetation to achieve a 13'-6" height as necessary to meet fire department requirements. New vegetation is proposed within parking isle planter strips.

5. For a proposed site plan in the Neighborhood Commercial (NC), Office Commercial (OC), Office Retail (OR), Retail Commercial (RC), General Commercial (GC), Light Industrial (LI), and General Industrial (GI) zones, except in the Old Town Overlay Zone, the proposed use shall satisfy the requirements of Section 16.108.070 Highway 99W Capacity Allocation Program, unless excluded herein.

RESPONSE: The proposed use within the existing building satisfies all of the requirements as required above.

6. For developments that are likely to generate more than 400 average daily trips (ADTs), or at the discretion of the City Engineer, the applicant shall provide adequate information, such as a traffic impact analysis or traffic counts, to demonstrate the level of impact to the surrounding street system. The developer shall be required to mitigate for impacts attributable to the project. The determination of impact or effect and the scope of the impact study shall be coordinated with the provider of the affected transportation facility.

RESPONSE: The development generates 377 average daily trips. A traffic analysis is being proposed. (See traffic count by "Group Mackenzie")

7. The proposed commercial, multi-family, institutional or mixed-use development is oriented to the pedestrian and bicycle, and to existing and planned transit facilities. Urban design standards shall include the following:

a. Primary, front entrances shall be located and oriented to the street, and have significant articulation and treatment, via facades, porticos, arcades, porches, portal, forecourt, or stoop to identify the entrance for pedestrians. Additional entrance/exit points for buildings, such as a postern, are allowed from secondary streets or parking areas.

RESPONSE: N/A. The existing building is not being altered and was approved meeting all of the above criterion.

b. Buildings shall be located adjacent to and flush to the street, subject to landscape corridor and setback standards of the underlying zone.

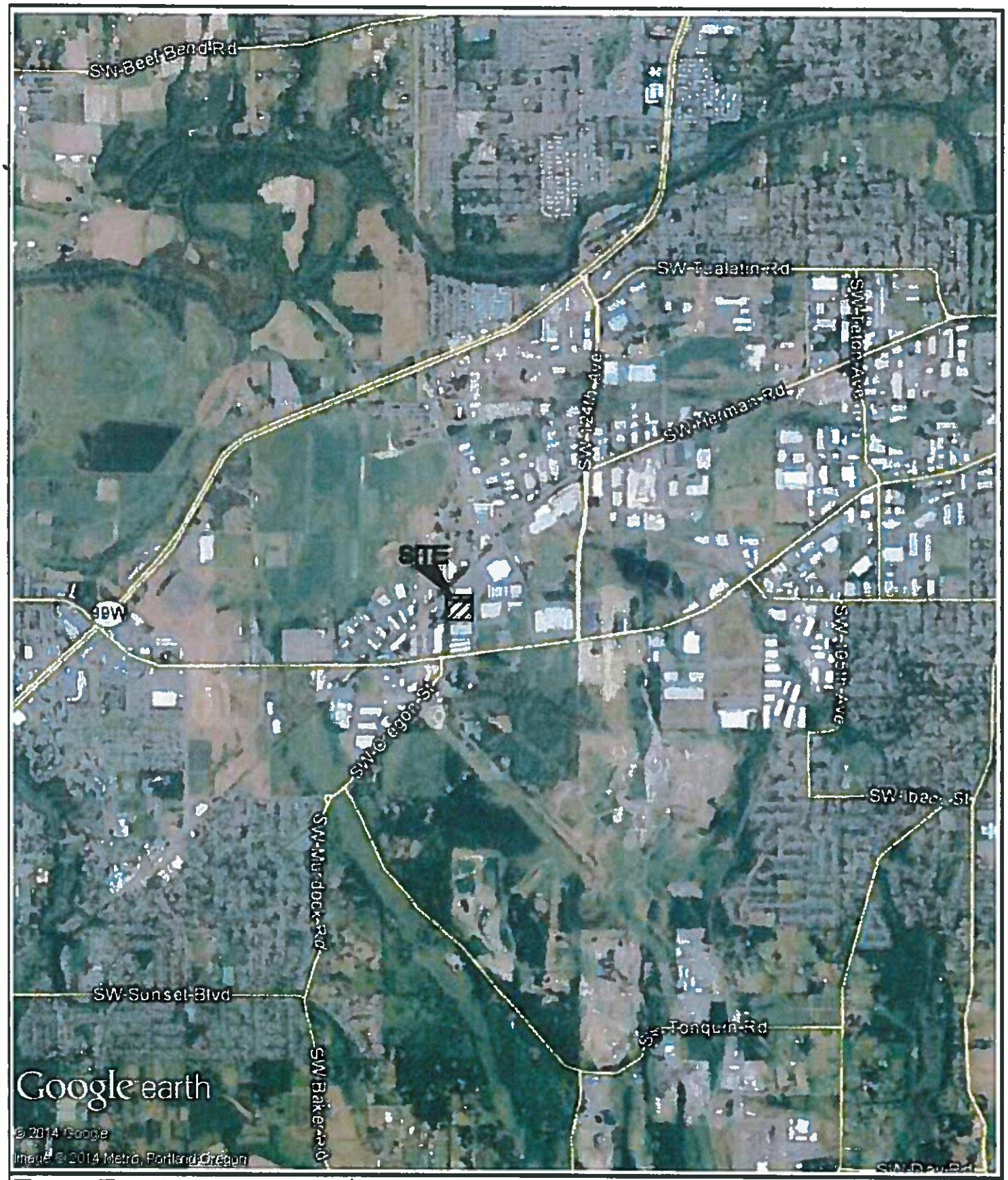
RESPONSE: N/A. The existing building is not being altered and was approved meeting all of the above criterion.

c. The architecture of buildings shall be oriented to the pedestrian and designed for the long term and be adaptable to other uses. Aluminum, vinyl, and T-111 siding shall be prohibited. Street facing elevations shall have windows, transparent fenestration, and divisions to break up the mass of any window. Roll up and sliding doors are acceptable. Awnings that provide a minimum 3 feet of shelter from rain shall be installed unless other architectural elements are provided for similar protection, such as an arcade.

RESPONSE: N/A. The existing building is not being altered and was approved meeting all of the above criterion.

Exhibit G

Narrative



Portland 503.224.9560 Vancouver 360.695.7879 Seattle 206.749.9993
www.mckinze.com
Architecture · Interiors
Planning · Engineering
MACKENZIE.

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DATE: 10.21.14
DRAWN BY: DWS
CHECKED BY: BTA
JOB NO: 2140370.00

VICINITY MAP

LAM WILDROSE SITE TRAFFIC ANALYSIS
TUALATIN, OREGON

FIGURE
1

Project Narrative

This application is for a Major Modification to an Approved Site Plan. The existing development is located on Lot 3 of "Edy Road Industrial Park". The site development was approved and constructed as "Wildrose Industrial Park", Building 2, under File Number SP 00-004.

The property is located at the at 20551 SW Wildrose Place in Sherwood, Oregon. The property is Tax Lot 1400, Map 2 South, 1 West, Section 28A and is approximately 4.99 acres.

The new tenants are requiring more parking for their business operation. The addition of ADT's (average daily trips), triggers a Major Modification. (See Traffic Analysis by others) The applicant is proposing to add an additional 55 parking spaces to allow the required parking for their operation. The following application shows how the client is modifying the existing approved site plan to meet new code criteria.

The addition of 55 parking spaces must meet the most recent code requirements for parking. The applicant is proposing a combination of 60° parking, 45° parking, and parallel parking. All of the proposed parking spaces and aisle widths meet the required sizes as shown in the City of Sherwood Chapter 16.94-Offstreet Parking and Loading code. The applicant is allowed to stripe 25% of the total spaces as compact. There will be a total of 75 spaces; the applicant is proposing 19 compact spaces. This yields 25% as allowed. (See Plan) The Fire Department has reviewed and approved the proposed layout. (See attached Fire Department approval)

The Applicant is requesting to meet the landscaping requirements by proposing 1 large tree per 4 spaces, and 2 shrubs per space. The required amount of large trees is 13.75. The applicant is proposing 14. The required amount of shrubs is 110. The applicant is proposing 117. The applicant is also proposing a minimum of 400 square feet of landscaping between a maximum of 12 spaces. (See Plan)

The proposed parking spaces meet the requirements enforced by the City Code.

Exhibit H

Title Report

First American

First American Title Insurance Company of Oregon
222 SW Columbia St, Ste 400
Portland, OR 97201
Phn - (503)222-3651 (800)929-3651
Fax - (877)242-3513

Order No.: 7012-1649761
November 03, 2010

FOR QUESTIONS REGARDING YOUR CLOSING, PLEASE CONTACT:
SHELLEY BOLFIK, Escrow Officer/Closer
Phone: (503)667-1333 - Fax: (866)734-1402- Email:sbolfik@firstam.com
First American Title Insurance Company of Oregon
1500 NE Division, Gresham, OR 97030

FOR ALL QUESTIONS REGARDING THIS PRELIMINARY REPORT, PLEASE CONTACT:
Carol Bruney, Sr Title Officer
Toll Free: (800)929-3651 - Direct: (503)790-1827 - Fax: (877)242-2396 - Email: cbruney@titlego.net

Preliminary Title Report

2006 ALTA Owners Standard Coverage	Liability $		Premium	$	
2006 ALTA Owners Extended Coverage	Liability $		Premium	$	
2006 ALTA Lenders Standard Coverage	Liability $		Premium	$	
2006 ALTA Lenders Extended Coverage	Liability $	2,850,000.00	Premium	$	6,338.00
Endorsement 9, 22 & 8.1			Premium	$	100.00
Govt Service Charge			Cost	$	
City Lien/Service District Search			Cost	$	
Other			Cost	$	

We are prepared to issue Title Insurance Policy or Policies in the form and amount shown above, insuring title to the following described land:

The land referred to in this report is described in Exhibit A attached hereto.

and as of October 22, 2010 at 8:00 a.m., title to the fee simple estate is vested in:

Bradford G. Picking and Vicki L. Picking, as tenants by the entirety

Subject to the exceptions, exclusions, and stipulations which are ordinarily part of such Policy form and the following:

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records; proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the public records.

2. Facts, rights, interests or claims which are not shown by the public records but which could be ascertained by an inspection of the land or by making inquiry of persons in possession thereof.

This report is for the exclusive use of the parties herein shown and is preliminary to the issuance of a title insurance policy and shall become void unless a policy is issued, and the full premium paid.

3. Easements, or claims or easement, not shown by the public records; reservations or exceptions in patents or in Acts authorizing the issuance thereof; water rights, claims or title to water.

4. Discrepancies, conflicts in boundary lines, shortage in area, encroachments or other facts which a correct survey would disclose.

5. Any lien, or right to a lien, for services, labor, material, equipment rental or workers compensation heretofore or hereafter furnished, imposed by law and not shown by the public records.

The exceptions to coverage 1-5 inclusive as set forth above will remain on any subsequently issued Standard Coverage Title Insurance Policy.

In order to remove these exceptions to coverage in the issuance of an Extended Coverage Policy the following items are required to be furnished to the Company; additional exceptions to coverage may be added upon review of such information:

A. Survey or alternative acceptable to the company
B. Affidavit regarding possession
C. Proof that there is no new construction or remodeling of any improvement located on the premises. In the event of new construction or remodeling the following is required:
   i. Satisfactory evidence that no construction liens will be filed; or
   ii. Adequate security to protect against actual or potential construction liens;
   iii. Payment of additional premiums as required by the Industry Rate Filing approved by the Insurance Division of the State of Oregon

6. Taxes for the year 2010-2011

Tax Amount	$	68,715.41
Unpaid Balance:	$	68,715.41, plus interest and penalties, if any
Code No.:	088.10	
Map & Tax Lot No.:	2S128A-01400	
Property ID No.:	R2056006	

7. City liens, if any, of the City of Sherwood.

8. Statutory powers and assessments of Clean Water Services.

9. Easement, including terms and provisions contained therein:

Recording Information:	April 28, 1917 in Book 108, Page 558
In Favor of:	The Pacific Telephone and Telegraph Company
For:	Right of way for anchor and wires
Affects:	The exact location is not set out

10. Easement, including terms and provisions contained therein:

Recording Information:	August 17, 1984 as Fee No. 84032686
In Favor of:	City of Sherwood, a Municipal Corporation and County Service District of the State of Oregon
For:	Sewer line
Affects:	A 7.5 foot wide strip of land along the North line

11. Easement, including terms and provisions contained therein:

Recording Information:	August 17, 1984 as Fee No. 84032687
In Favor of:	City of Sherwood
For:	Sewer line
Affects:	A 15 foot wide strip, along the West line of said Lot and 7.5 feet in width along the North line of said Lot 3 - the easement is also shown on the recorded plat

12. Easement as shown on the recorded plat/partition

For:	Public storm drainage
Affects:	15 feet in width, in the Easterly portion of Lot 3; 12.5 feet in width, in the Northerly area of Lot 3

13. Easement as shown on the recorded plat/partition

For:	Non-exclusive access (for property owner to the North)
Affects:	25 feet in width, along the East line of Lot 3

14. Easement as shown on the recorded plat/partition

For:	Public utilities
Affects:	Adjacent to S.W. Wildrose Place, 8 feet in width, which affects the Easterly 8 feet of Lot 2 and the Southeasterly portion of Lot 3 as delineated on the recorded plat and also the Westerly 15 feet of Lot 2 as delineated on the recorded plat

15. Restrictions shown on the recorded plat/partition.

16. Restrictive Covenant to Waive Remonstrance, pertaining to Street Improvements including the terms and provisions thereof

Recorded:	December 29, 1995 as Fee No. 95096012
Affects:	The entire plat

17. Easement, including terms and provisions contained therein:

Recording Information:	December 29, 1995 as Fee No. 95096016
In Favor of:	H. William Gazeley (property owner to the North)
For:	Roadway and utilities
Affects:	25 feet in width, along the East line of Lot 3

Modification and/or amendment by instrument:

Recording Information:	April 18, 2001 as Fee No. 2001 033946

18. Storm Water Drainage Easement, including terms and provisions thereof.

	Recorded:	December 29, 1995 as Fee No. 95096017

19. Easement, including terms and provisions contained therein:

Recording Information:	February 2, 1996 as Fee No. 96009707
In Favor of:	City of Sherwood
For:	Public utility manhole access
Affects:	Various strips on the East and South areas of Lot 3

20. Easement, including terms and provisions contained therein:

Recording Information:	May 29, 1998 as Fee No. 98057152
In Favor of:	The Halton Company, an Oregon Corporation
For:	"A perpetual nonexclusive easement... for storm water drainage purposes and for the construction and maintenance of storm water ditch or drainage pipe only"

21. Easement, including terms and provisions contained therein:

Recording Information:	September 5, 1997 as Fee No. 97082794
In Favor of:	City of Sherwood
For:	Sewer, water, storm sewer and other public utilities
Affects:	25 feet in width, along the Easterly line of Lot 3

22. An unrecorded lease

Dated:	December 29, 1999
Landlord:	PNWP LLC#2
Tenant:	Pacific Foods of Oregon, an Oregon Corporation

23. Easement, including terms and provisions contained therein:

Recording Information:	September 5, 1997 as Fee No. 97082794
In Favor of:	The Halton Company
For:	Sewer, water, storm sewer and other public utilities
Affects:	Areas along the West and North line of Lot 3

24. Easement, including terms and provisions contained therein:

Recording Information:	March 6, 2001 as Fee No. 2001 018218
In Favor of:	City of Sherwood
For:	Stormwater line
Affects:	The Southerly area as referred to in the map attached to the document for location

25. Easement, including terms and provisions contained therein:

Recording Information:	March 6, 2001 as Fee No. 2001 018219
In Favor of:	City of Sherwood
For:	Stormwater line
Affects:	Westerly, Northerly and Easterly areas as referred to in the map attached to the document for location

26. Easement, including terms and provisions contained therein:

Recording Information:	May 23, 2001 as Fee No. 2001 048362
In Favor of:	City of Sherwood
For:	Underground utilities
Affects:	The area along the new dedicated SW Wildrose Place

27. Covenants, conditions, restrictions and/or easements; but deleting any covenant, condition or restriction indicating a preference, limitation or discrimination based on race, color, religion, sex, handicap, family status, or national origin to the extent such covenants, conditions or restrictions violate Title 42, Section 3604(c), of the United States Codes:

Recording Information:	December 12, 2002 as Fee No. 2002 151356

Modification and/or amendment by instrument:

Recording Information:	February 25, 2003 as Fee No. 2003 026728

Affects Lot 3

28. Deed of Trust and Assignment of Rents:

Grantor:	Bradford G. Picking and Vicki L. Picking, husband and wife
Trustee:	Fidelity National Title Company of Oregon
Beneficiary:	GE Life and Annuity Assurance Company, a Virginia Corporation
Amount:	$3,400,000.00
Dated:	February 25, 2003
Recorded:	February 25, 2003
Recording No.:	2003 026730

29. Unrecorded leases or periodic tenancies, if any.

- END OF EXCEPTIONS -

NOTE: This Preliminary Title Report does not include a search for Financing Statements filed in the Office of the Secretary of State, or in a county other than the county wherein the premises are situated, and no liability is assumed if a Financing Statement is filed in the Office of the County Clerk covering Fixtures on the premises wherein the lands are described other than by metes and bounds or under the rectangular survey system or by recorded lot and block.

NOTE: We find no judgments against the vestee herein, unless shown as a numbered exception above.

NOTE: According to the public record, the following deed(s) affecting the property herein described have been recorded within 24 months of the effective date of this report: NONE

NOTE: Proposed Insured: **Q10 National Mortgage Co.**

NOTE: Washington County Ordinance No. 267, filed August 5, 1982 in Washington County, Oregon, imposes a tax of $1.00 per $1,000.00 or fraction thereof on the transfer of real property located within Washington County.

Certain conveyances may be exempt from said ordinance, in which case, Washington County will require a correct and timely filing of an Affidavit of Exemption. For all deeds/conveyance documents which are

recorded (including situations to meet lender requirements) either the transfer tax must be paid or affidavit acceptable to the County must be filed.

Situs Address as disclosed on Washington County Tax Roll:

20551 SW Wildrose Place, Sherwood, OR 97140

THANK YOU FOR CHOOSING FIRST AMERICAN TITLE!
WE KNOW YOU HAVE A CHOICE!

RECORDING INFORMATION

Filing Address:	**Washington County** 155 North 1st Avenue Hillsboro, OR 97124-3087
Recording Fees:	$ **5.00** per page $ **5.00** per document (Public Land Corner Preservation Fund) $ **11.00** per document (OLIS assessment & Taxation Fee) $ **15.00** per document (Oregon Housing Alliance Fee) $ **5.00** for each additional document title $ **20.00** non-standard fee

First American Title Insurance Company of Oregon

SCHEDULE OF EXCLUSIONS FROM COVERAGE

ALTA LOAN POLICY (06/17/06)

The following matters are expressly excluded from the coverage of this policy, and the Company will not pay loss or damage, costs, attorneys' fees, or expenses that arise by reason of:

1. (a) Any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to
   (i) the occupancy, use, or enjoyment of the Land;
   (ii) the character, dimensions, or location of any improvement erected on the Land;
   (iii) the subdivision of land; or
   (iv) environmental protection;
   or the effect of any violation of these laws, ordinances, or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5.
   (b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 6.
2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.
3. Defects, liens, encumbrances, adverse claims, or other matters
   (a) created, suffered, assumed, or agreed to by the Insured Claimant;
   (b) not Known to the Company, not recorded in the Public Records at Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
   (c) resulting in no loss or damage to the Insured Claimant;
   (d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 11, 13, or 14); or
   (e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Insured Mortgage.
4. Unenforceability of the lien of the Insured Mortgage because of the inability or failure of an Insured to comply with applicable doing-business laws of the state where the Land is situated.
5. Invalidity or unenforceability in whole or in part of the lien of the Insured Mortgage that arises out of the transaction evidenced by the Insured Mortgage and is based upon usury or any consumer credit protection or truth-in-lending law.
6. Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that the transaction creating the lien of the Insured Mortgage, is
   (a) a fraudulent conveyance or fraudulent transfer, or
   (b) a preferential transfer for any reason not stated in Covered Risk 13(b) of this policy.
7. Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching between Date of Policy and the date of recording of the Insured Mortgage in the Public Records. This Exclusion does not modify or limit the coverage provided under Covered Risk 11(b).

ALTA OWNER'S POLICY (06/17/06)

The following matters are expressly excluded from the coverage of this policy, and the Company will not pay loss or damage, costs, attorneys' fees, or expenses that arise by reason of:

1. (a) Any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to
   (i) the occupancy, use, or enjoyment of the Land;
   (ii) the character, dimensions, or location of any improvement erected on the Land;
   (iii) the subdivision of land; or
   (iv) environmental protection;
   or the effect of any violation of these laws, ordinances, or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5.
   (b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 6.
2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.
3. Defects, liens, encumbrances, adverse claims, or other matters
   (a) created, suffered, assumed, or agreed to by the Insured Claimant;
   (b) not Known to the Company, not recorded in the Public Records at Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
   (c) resulting in no loss or damage to the Insured Claimant;
   (d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risks 9 and 10); or
   (e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Title.
4. Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that the transaction vesting the Title as shown in Schedule A, is
   (a) a fraudulent conveyance or fraudulent transfer; or
   (b) a preferential transfer for any reason not stated in Covered Risk 9 of this policy.
5. Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching between Date of Policy and the date of recording of the deed or other instrument of transfer in the Public Records that vests Title as shown in Schedule A.

SCHEDULE OF STANDARD EXCEPTIONS

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records; proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the public records.
2. Facts, rights, interests or claims which are not shown by the public records but which could be ascertained by an inspection of the land or by making inquiry of persons in possession thereof.
3. Easements, or claims of easement, not shown by the public records; reservations or exceptions in patents or in Acts authorizing the issuance thereof; water rights, claims or title to water.
4. Any encroachment (of existing improvements located on the subject land onto adjoining land or of existing improvements located on adjoining land onto the subject land), encumbrance, violation, variation, or adverse circumstance affecting the title that would be disclosed by an accurate and complete land survey of the subject land.
5. Any lien" or right to a lien, for services, labor, material, equipment rental or workers compensation heretofore or hereafter furnished, imposed by law and not shown by the public records.

NOTE: A SPECIMEN COPY OF THE POLICY FORM (OR FORMS) WILL BE FURNISHED UPON REQUEST

TI 149 Rev. 7-22-08

Exhibit "A"

Real property in the County of Washington, State of Oregon, described as follows:

A TRACT OF LAND LOCATED IN THE NORTHEAST ONE-QUARTER OF SECTION 28, TOWNSHIP 2 SOUTH, RANGE 1 WEST, WILLAMETTE MERIDIAN, CITY OF SHERWOOD, WASHINGTON COUNTY, OREGON, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

LOT 3, EDY ROAD INDUSTRIAL PARK, IN THE CITY OF SHERWOOD, WASHINGTON COUNTY, OREGON;

EXCEPTING THEREFROM THOSE PORTIONS INCLUDED IN THE DEDICATION DEED, FOR ROAD AND STREET PURPOSES RECORDED MAY 23, 2001, AS FEE NO. 2001048360.

NOTE: THIS LEGAL DESCRIPTION WAS CREATED PRIOR TO JANUARY 01, 2008.

Tax Parcel Number: R2056006

First American Title Insurance Company of Oregon

An assumed business name of TITLE INSURANCE COMPANY OF OREGON

This map is provided as a convenience in locating property
First American Title Insurance Company assumes no liability for any variations as may be disclosed by an actual survey

Reference Parcel Number 2S128A0 01400

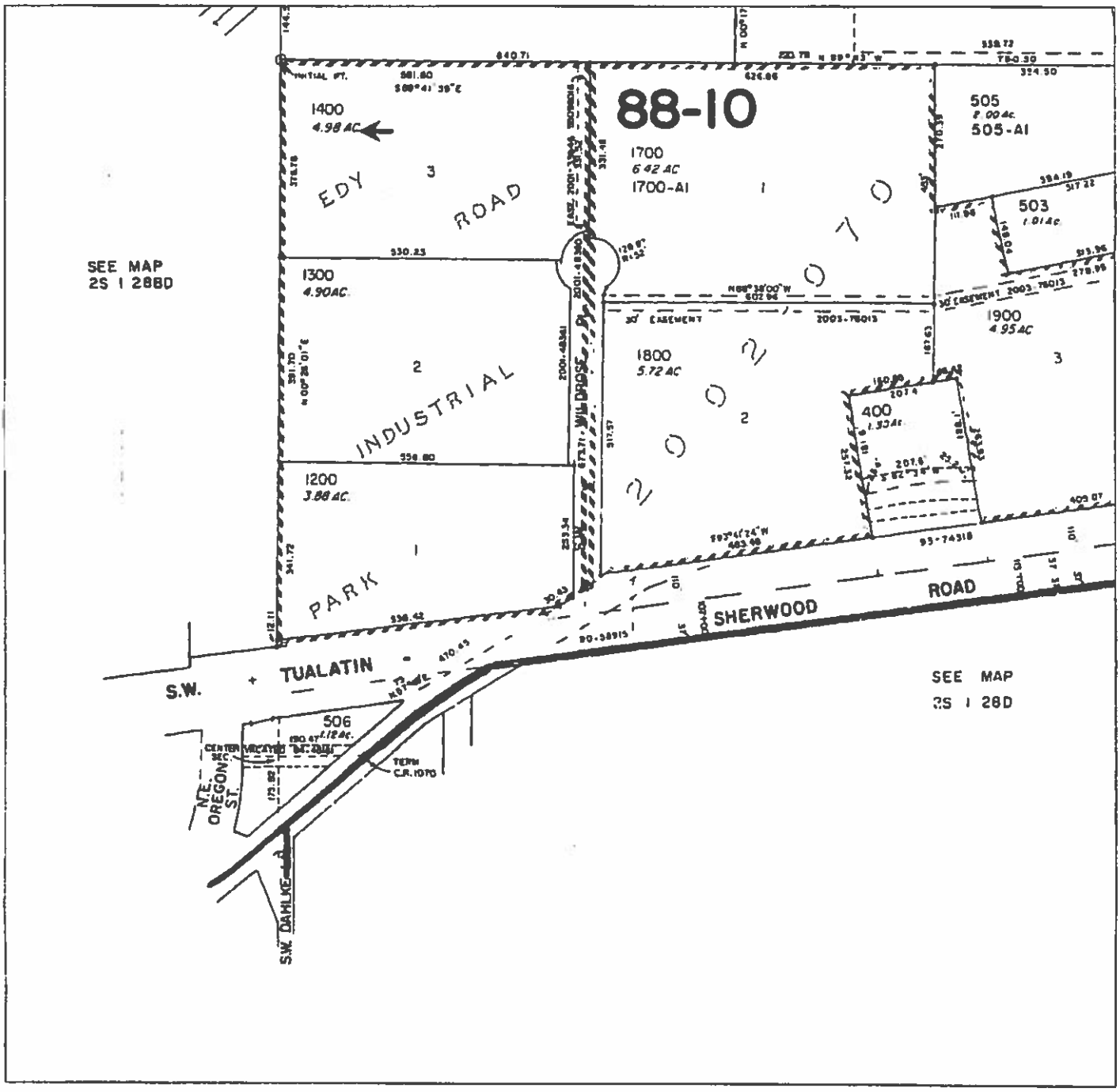

Exhibit I

CWS Service Provider Letter

Clean Water Services

Clean Water Services File Number
14-002456

Sensitive Area Pre-Screening Site Assessment

1. **Jurisdiction:** ~~Washington County~~ City of Sherwood

2. **Property Information** *(example 1S234AB01400)*
Tax lot ID(s): 2S128A001400

Site Address: 20551 Wildrose Place
City, State, Zip: Sherwood OR 97140
Nearest Cross Street: SW Tualatin Sherwood Rd

3. **Owner Information**
Name: Brad Picking
Company:
Address: PO Box 632
City, State, Zip: Sandy OR 97055
Phone/Fax: 503-807-4376
E-Mail: janzberry12@gmail.com

4. **Development Activity** *(check all that apply)*
- ☐ Addition to Single Family Residence (rooms, deck, garage)
- ☐ Lot Line Adjustment
- ☐ Minor Land Partition
- ☐ Residential Condominium
- ☐ Commercial Condominium
- ☐ Residential Subdivision
- ☐ Commercial Subdivision
- ☐ Single Lot Commercial
- ☐ Multi Lot Commercial

Other STRIPING PARKING SPACES ON EXISTING PAVEMENT.

5. **Applicant Information**
Name: Ray Moore
Company: All County Surveyors & Planners, Inc.
Address: PO Box 955
City, State, Zip: Sandy OR 97055
Phone/Fax: 503-668-3151 / F: 503-668-4730
E-Mail: rayn@allcountysurveyors.com

6. **Will the project involve any off-site work?** ☐ Yes ☒ No ☐ Unknown
Location and description of off-site work

7. **Additional comments or information that may be needed to understand your project** WE WILL BE REMOVING PAVEMENT TO MAKE ROOM FOR LANDSCAPING

This application does NOT replace Grading and Erosion Control Permits, Connection Permits, Building Permits, Site Development Permits, DEQ 1200-C Permit or other permits as issued by the Department of Environmental Quality, Department of State Lands and/or Department of the Army COE. All required permits and approvals must be obtained and completed under applicable local, state, and federal law.

By signing this form, the Owner or Owner's authorized agent or representative, acknowledges and agrees that employees of Clean Water Services have authority to enter the project site at all reasonable times for the purpose of inspecting project site conditions and gathering information related to the project site. I certify that I am familiar with the information contained in this document, and to the best of my knowledge and belief, this information is true, complete, and accurate.

Print/Type Name RAY MOORE **Print/Type Title** ENGINEER

Signature [signature] **Date** 8/27/14

FOR DISTRICT USE ONLY

☐ Sensitive areas potentially exist on site or within 200' of the site. **THE APPLICANT MUST PERFORM A SITE ASSESSMENT PRIOR TO ISSUANCE OF A SERVICE PROVIDER LETTER.** If Sensitive Areas exist on the site or within 200 feet on adjacent properties, a Natural Resources Assessment Report may also be required.

☐ Based on review of the submitted materials and best available information Sensitive areas do not appear to exist on site or within 200' of the site. This Sensitive Area Pre-Screening Site Assessment does NOT eliminate the need to evaluate and protect water quality sensitive areas if they are subsequently discovered. This document will serve as your Service Provider letter as required by Resolution and Order 07-20, Section 3.02.1. All required permits and approvals must be obtained and completed under applicable local, State, and federal law.

☒ Based on review of the submitted materials and best available information the above referenced project will not significantly impact the existing or potentially sensitive area(s) found near the site. This Sensitive Area Pre-Screening Site Assessment does NOT eliminate the need to evaluate and protect additional water quality sensitive areas if they are subsequently discovered. This document will serve as your Service Provider letter as required by Resolution and Order 07-20, Section 3.02.1. All required permits and approvals must be obtained and completed under applicable local, state and federal law.

☐ **This Service Provider Letter is not valid unless _____ CWS approved site plan(s) are attached.**

☐ The proposed activity does not meet the definition of development or the lot was platted after 9/9/95 ORS 92.040(2). NO SITE ASSESSMENT OR SERVICE PROVIDER LETTER IS REQUIRED.

Reviewed by Laurie Harris **Date** 09/04/14

Exhibit J

Trip Analysis (By Others)

M.

VII. APPENDIX

A. Figures

B. Traffic Count Summaries

C. Crash Data

D. Capacity Calculations

E. Mitigated Capacity Calculations

F. Queuing Calculations

VI. SUMMARY

This report has been prepared in accordance with the City of Sherwood and Washington County traffic impact analysis requirements. The following conclusions and recommendations are based on traffic operations and safety-related analyses contained in this report:

1. The proposed LAM Wildrose Industrial Park development consists of improvements to a 100,400 square foot existing warehouse building. The anticipated build-out year is 2015.

2. The site is currently occupied as a Pacific Foods Distribution Facility and zoned General Industrial (GI). It is bounded by other industrial uses.

3. Site access will be provided by three existing driveways to SW Wildrose Place, north of Tualatin-Sherwood Road.

4. Existing traffic volumes for the weekday AM and PM peak hours were collected on Thursday, October 9, 2014.

5. Sidewalks are provided throughout the study area. Bicycle lanes are also present along Tualatin-Sherwood Road.

6. Crash rates at the study area intersections are below the threshold rate of 1.0/mev.

7. Based on expected site activity, the proposed development is anticipated to generate 35 AM and 84 PM new peak hour trips.

8. All study intersections along Tualatin-Sherwood Road, except SW Wildrose Place, currently meet and will continue to meet Washington County operation standards upon site build out.

9. The SW Wildrose Place approach to Tualatin-Sherwood Road can be mitigated by striping for separate left and right turn lanes within the existing roadway width.

10. Based on anticipated trip generation and distribution parameters, the proposed development is not expected to adversely affect existing and forecast year 2015 queue lengths.

TABLE 5 –95TH PERCENTILE QUEUE LENGTHS (FEET)									
Intersection	Approach	Movement	Available Storage	2014 Existing		2015 Pre-Development		2015 Post-Development	
				AM	PM	AM	PM	AM	PM
SW Oregon Street/SW Tualatin Sherwood Road	WB	Lt	260	50	**350**	75	**375**	75	**350**
		Th, Rt	640	375	500	425	450	425	475
SW Wildrose Place /SW Tualatin Sherwood Road	EB	Lt	100	0	0	0	0	0	0
		Th	640	0	0	0	0	0	0
	WB	Th	>1,000	0	0	0	0	0	0
	SB	Lt, Th, Rt	200	25	50	25	50	25	150
SW Cipole Road/SW Tualatin Sherwood Road	EB	Lt	370	25	25	25	25	25	25
		Th	>1,000	475	375	525	450	525	475

Result reports in **BOLD** font exceed available storage.

Queues at site driveways were minimal; therefore, they are not reported in the table above. The addition of the proposed development does not cause any queues to exceed available storage.

TABLE 4 –INTERSECTION OPERATION ANALYSIS							
Intersection	Criteria	2014 Existing		2015 Pre-Development		2015 Post-Development	
		AM	PM	AM	PM	AM	PM
SW Wildrose Place/North Site Access	LOS	A	A	A	A	A	A
SW Wildrose Place/South Site Access	LOS	A	A	A	A	A	A
SW Oregon Street/SW Tualatin Sherwood Road	v/c	0.79	0.99	0.82	0.99	0.83	0.98
SW Wildrose Place /SW Tualatin Sherwood Road	v/c	0.07	0.39	0.07	0.46	0.10	**1.01**
SW Cipole Road/SW Tualatin Sherwood Road	v/c	0.76	0.82	0.83	0.87	0.84	0.86

Result reports in **BOLD** font exceed capacity standards.

Wildrose Place/Tualatin Sherwood Road exceeds acceptable v/c ratio standards during the 2015 PM Post-Development scenario. The southbound approach is not currently striped; however, it is wide enough to allow for a left turn lane and a separate right turn lane. Analysis done with this lane configuration indicates striping for the two lanes allows the intersection to operate at acceptable v/c ratio standards.

All intersections operate at an acceptable LOS and v/c ratio. The post-development traffic conditions only minimally affect the intersection operations. All capacity calculations, including calculations to account for mitigation, are included in the appendix.

Queuing Analysis

Queuing analysis was performed at study intersections to determine existing and anticipated 95th percentile queue lengths. Queuing calculations were conducted using Synchro analysis software.

The following table presents the queuing results at each of the study intersections in each scenario. The queuing calculations are included in the appendix.

V. INTERSECTION AND ROADWAY ANALYSIS

Operation Standards

Intersection operation characteristics are generally defined by two mobility standards: volume-to-capacity (v/c) ratio and level-of-service (LOS). At signalized intersections, the v/c ratio is a measurement of the intersection's capacity to accommodate only the critical movements, while the LOS is based on the average control delay per vehicle for the entire intersection. For unsignalized intersections, operational performance is measured by the volume-to-capacity ratio and level of service for the critical movement or approach (i.e., left-turn lane on stop-controlled approach).

All study intersections along SW Tualatin-Sherwood Road are under Washington County jurisdiction; therefore, the operating standards detailed in Washington County's A-Engrossed Ordinance No.588 (Exhibit 8) apply, which specify a v/c ratio of 0.99 or less in the first peak hour and 0.90 or less during the second peak hour at all intersections. The access driveways are under City of Sherwood Jurisdiction. City standard at unsignalized two-way stop control (TWSC) intersections is LOS E or a v/c ratio equal to or less than 0.90.

Intersection LOS and v/c ratios were assessed using Synchro analysis software, based on 2000 Highway Capacity Manual methodologies.

Operation Analysis

Operation analysis was performed for the weekday AM and PM peak hours at the study intersections for the following scenarios:

- 2014 Existing Conditions
- 2015 Pre-Development
- 2015 Post-Development

Results of the operation analysis are presented in the following table:

Post-Development Traffic Volumes

Post-development traffic volumes are the sum of the Pre-development and proposed development traffic volumes. Figure 8 illustrates the 2015 Post-development traffic volumes for the weekday AM and PM peak hours.

IV. SITE DEVELOPMENT

The existing warehouse is currently occupied as a Pacific Foods Distribution Facility. Based on a TIA prepared by Kittelson and Associates, Inc. on March 31, 2000, it is estimated the existing use generates 39 ADT, 4 AM weekday peak hour trips, and 5 PM weekday peak hour trips.

Trip generation calculations for the proposed use were prepared based on expected site activity, including trips for employees and deliveries. All trips are assumed primary trips. Trip generation and net trip impact for the proposed warehouse use is presented in the following table.

TABLE 3 –TRIP GENERATION

Type		Quantity	ADT	AM			PM		
				Total	Enter	Exit	Total	Enter	Exit
Employees	8AM-5PM	25	88	25	25	0	25	0	25
	5AM-5PM	25	88	0	0	0	25	0	25
	5PM-5AM	25	88	0	0	0	25	25	0
Deliveries	53' Trailers	5	10	2	1	1	2	1	1
	UPS Freight	2	4	2	1	1	2	1	1
	26' Box	2	128	8	4	4	8	4	4
	UPS	5	10	2	1	1	2	1	1
LAM Wildrose Trip Generation			**416**	**39**	**32**	**7**	**89**	**32**	**57**
Existing Trip Generation			**39**	**4**	**5**	**3**	**5**	**5**	**5**
Net New Trip Generation			**377**	**35**	**27**	**4**	**84**	**27**	**52**

The trip generation calculated for the proposed land use was compared to Institute of Transportation Engineers (ITE) *Trip Generation Manual,* 9th Edition, with similar land uses using 125 employees; the expected number of employees needed to cover all shifts. General Light Industrial (ITE 110) generates 378 ADT, Industrial Park (ITE 130) generates 418 ADT, Manufacturing (ITE 140) generates 266 ADT, and Warehousing (ITE 150) generates 486 ADT. The 416 ADT estimated is consistent with similar land uses.

The proposed development is anticipated to generate an additional 35 AM and 84 PM weekday peak hour trips.

Trip Distribution and Traffic Assignment

Trip distribution is based upon evaluation of existing traffic patterns at the study area intersections and engineering judgment and is estimated as follows:

- 15% to and from the south on SW Oregon Street
- 5% to and from the north on SW Cipole Road
- 60% to and from the east on SW Tualatin-Sherwood Road
- 20% to and from the west on SW Tualatin-Sherwood Road

Figure 7 illustrates trip distribution and traffic assignment during the Weekday AM and PM peak hours.

III. PRE-DEVELOPMENT CONDITIONS

Planned Transportation Improvements

Roadway improvements and widening on both Oregon Street and SW Tualatin-Sherwood Road are identified in the City of Sherwood's Transportation System Plan (TSP). These projects are identified as aspirational and projected fundable transportation projects; therefore, they are not included in this analysis. No planned public projects were identified in the study area that would affect traffic volumes for the analysis scenarios.

In-Process Traffic Volumes

In-process traffic volumes are generated by approved projects not yet complete at the time of this analysis. We requested information on in-process projects from City of Sherwood staff, but none were provided, so no in-process projects were assumed in this analysis.

Background Traffic Growth

Background growth is general growth in traffic not related to specific projects. A growth rate of 3% per year was assumed for the project area. This growth rate was applied to existing traffic volumes to determine 2015 volumes. Background growth traffic volumes at the study area intersections are presented in Figure 5 for the weekday AM and PM peak hours.

Pre-Development Traffic Volumes

Pre-development traffic volumes are the sum of existing volumes and background traffic growth traffic without the proposed development. Figure 6 presents the 2015 pre-development traffic volumes during the weekday AM and PM peak hours.

to be 7:40-8:40 AM. The PM peak hour was found to be 4:40-5:40 PM. All count data is provided in the appendix. 2014 Existing weekday AM and PM peak hour traffic volumes are presented in Figure 4.

Crash Analysis

When evaluating relative intersection safety, consideration is given to the total number and type of crashes occurring and the number of vehicles entering the intersection. This leads to the concept known as "crash rate," usually expressed in terms of the number of crashes occurring per one million vehicles entering the intersection (crashes/MEV). Intersections having a crash rate less than 1.0/mev are generally considered relatively safe; with crash rates higher than 1.0/mev, consideration may be given to correcting operational problems.

Intersection and segment crash data was provided by the ODOT Crash Analysis and Reporting Unit (CARU) for January 2011 through December 2013. The following table represents calculated intersection crash rates for the three-year data period. Annual traffic entering the intersections was estimated by multiplying the average daily traffic (ADT) entering the intersection by 365. ADT was estimated by multiplying the intersection PM peak hour volumes by a factor of 10.

TABLE 2 – CRASH DATA BY YEAR

Intersection	2011	2012	2013	Total	ADT	Crash Rate
SW Oregon Street/SW Tualatin Sherwood Road	3	2	9	14	25,140	0.51
SW Wildrose Place /SW Tualatin Sherwood Road	0	1	2	3	21,580	0.13
SW Cipole Road/SW Tualatin Sherwood Road	3	2	5	10	22,390	0.41

Crash rates within the study area are below the 1.0 mev threshold. The majority of crashes at the signalized study area intersections were rear end crashes and involved turns not yielding to the right-of-way. These types of crashes are common at signalized intersections due to the stop and go nature of the traffic.

Based on the reported crash rates and trend, there are no significant safety concerns regarding the existing driveways, intersections, and roadway segments in the study area.

II. EXISTING CONDITIONS

Site Conditions

The subject site is currently a Pacific Foods distribution facility. This facility consists of a 100,400 square foot building. The site has three access points. Two driveways are at the end of the Wildrose Place cul-de-sac; one accesses the back of the property and the other the main drive aisle. The main drive aisle access also acts as the main access for the property directly south of the subject property. The third access is further south on Wildrose Place. This driveway is striped to be the main exit for the property directly south of the subject property. There is the ability for vehicles to access the subject site via this driveway. All three accesses will remain.

Transportation Facilities

The following table summarizes the study area roadway classifications and descriptions:

TABLE 1 – ROADWAY CHARACTERISTICS

Roadway	Classification	Posted Speed	Travel Lanes	Bike Lanes	On-Street Parking	Sidewalks
SW Tualatin Sherwood Road	Arterial	45	3	Yes	No	Yes
SW Oregon Street	Arterial	35	3	No	No	Yes
SW Cipole Road	Collector	45	2	No	No	Yes
SW Wildrose Place	Local	Not Posted	2	No	Yes	Yes

The intersections of SW Tualatin Sherwood Road with SW Oregon Street and SW Cipole Road are both signalized. The access driveways to SW Wildrose Place and SW Wildrose Place/SW Tualatin Sherwood Road intersection are not signed; however, they act as stop controlled intersections. Figure 3 illustrates the study area intersections' lane configurations and traffic control devices.

Pedestrian and Bicycle

All the roadways within the study area have sidewalks. Bicycle facilities are limited in the study area, as SW Tualatin Sherwood Road is the only roadway with striped bike lanes. SW Oregon Street has striped bike lanes south of the study area.

Transit

No transit bus service is provided in the study area, specifically along SW Tualatin Sherwood Road.

Existing Traffic Counts

Traffic volume data was collected at the study intersections on Thursday, October 13, 2014. Counts were taken during the AM (7:00-9:00 AM) and PM (4:00-6:00 PM) peak hours. The AM peak hour was found

I. INTRODUCTION

This transportation impact analysis supports the proposed LAM Wildrose Industrial Park located in Sherwood, Oregon, north of SW Tualatin Sherwood Road on the west side SW Wildrose Place at 20551 SW Wildrose Place. The project proposes repurposing the existing warehouse. The existing warehouse is currently occupied as a Pacific Foods Distribution Facility. Figure 1 is a vicinity map indicating the property location.

Project Description

The site is located in the north lot of the Edy Road Industrial Park, which is identified by Assessor's Map Township 2S Range 1W Section 28 Tax Lot 1400. The lot is approximately 5 acres and zoned General Industrial (GI). Currently, the site is occupied by the Pacific Foods Distribution Facility warehouse. The proposed development will simply repurpose the 100,400 square feet warehouse and add parking.

The existing site has 21 parking spaces. The proposed development will remove one existing space and add 55 spaces, for a total of 75 spaces. The property can be accessed from two driveways at the end of the SW Wildrose Place cul-de-sac and a shared access with the industrial building directly south of the subject property. Figure 2 presents the proposed site plan.

Scope of Report

Due to project location, both the City of Sherwood and Washington County have jurisdiction over study area intersections. Based on correspondence with City and County staff, the analysis study area includes the following intersections:

- SW Wildrose Place/SW Tualatin-Sherwood Road
- SW Cipole Road/SW Tualatin Sherwood Road
- SW Oregon Street/SW Tualatin Sherwood Road
- SW Wildrose Place/Industrial Park cul-de-sac
- SW Wildrose Place/South Driveway

Analysis was conducted for the AM and PM peak hours for the following scenarios:

- 2014 Existing
- 2015 Pre-Development
- 2015 Post-Development

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1. Vicinity Map
2. Site Plan
3. Existing Lane Configuration & Intersection Control
4. 2014 Existing Traffic Volumes – Weekday AM and PM Peak Hours
5. 1-Year Background Growth Traffic Volumes – Weekday AM and PM Peak Hours
6. 2015 Pre-Development Traffic Volumes – Weekday AM and PM Peak Hours
7. Site Trip Distribution and Traffic Assignment – Weekday AM and PM Peak Hours
8. 2015 Post Development Traffic Volumes – Weekday AM and PM Peak Hour

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TRANSPORTATION IMPACT ANALYSIS

To
City of Sherwood
Washington County

For
LAM Wildrose Industrial Park
Sherwood, Oregon

Submitted
October 21, 2014

Project Number
2140370.00

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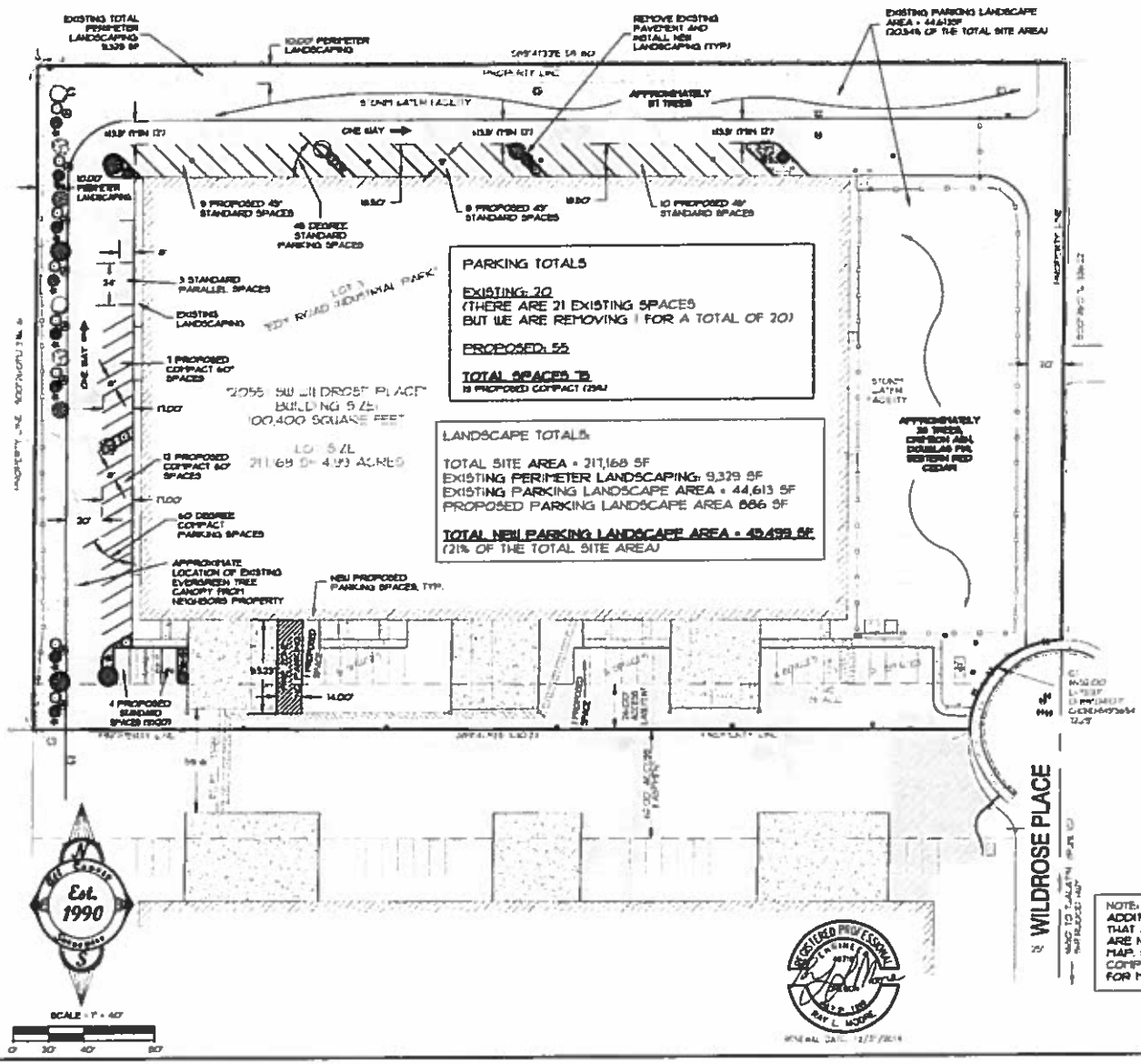
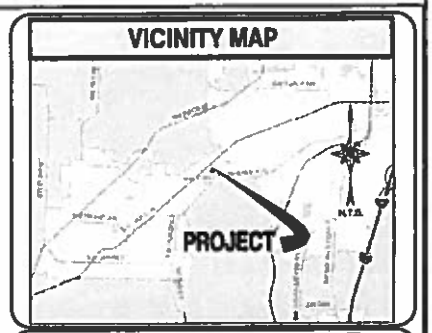
PROPOSED STRIPING/ LANDSCAPE PLAN



VICINITY MAP



LEGEND

- PROPERTY LINE
- LOT LINE
- CL WAY
- BUILDING WALL
- EDGE OF PAVEMENT
- SIDEWALK/CONCRETE
- CURB
- PAVEMENT STRIPING
- EXISTING PAVEMENT
- EXISTING PERIMETER LANDSCAPING 9,329 SF
- EXISTING PARKING LANDSCAPE AREA = 44,613 SF
- PROPOSED PARKING LANDSCAPE AREA 886 SF
- PROPOSED PAVEMENT STRIPING
- PROPOSED NEW CURB

PROPOSED PLANTS

- 'AUTUMN BLAZE MAPLE' MIN. 1-1/2" CALIPER OR 7' TALL, BALLED & BURLAPED
- 'SCARLET OAK' MIN. 1-1/2" CALIPER OR 7' TALL, BALLED & BURLAPED
- 'INCENSE CEDAR' MIN. 8-10' TALL, BALLED & BURLAPED
- 'WESTERN RED CEDAR' MIN. 8-10' TALL, BALLED & BURLAPED
- RHODODENDRON 5 GALLON (EACH SYMBOL DENOTES 3 PLANTS) 36 TOTAL
- RED FLOWERING CURRANT MIN. 1 GALLON OR 2' IN HEIGHT (EACH SYMBOL DENOTES 3 PLANTS) 36 TOTAL
- SERVICEBERRY MIN. 1 GALLON OR 2' IN HEIGHT (EACH SYMBOL DENOTES 3 PLANTS) 36 TOTAL
- VINE MAPLE MIN. 1 GALLON OR 2' IN HEIGHT 3 TOTAL

55 SPACES X 2 SHRUBS PER SPACE 110 SHRUBS REQUIRED
TOTAL SHRUBS PROPOSED 111

1 LARGE TREE PER 4 SPACES (13.75) LARGE TREES REQUIRED
TOTAL LARGE TREES PROPOSED 14

NOTE: THERE ARE ADDITIONAL EASEMENTS THAT AFFECT SITE THAT ARE NOT SHOWN ON THIS MAP. SEE ALTA SURVEY COMPLETED IN 2010 FOR MORE INFORMATION.

REGISTERED PROFESSIONAL ENGINEER — OREGON — RAY L. MOORE

CLIENT: BRAD PICKING

All County Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4750

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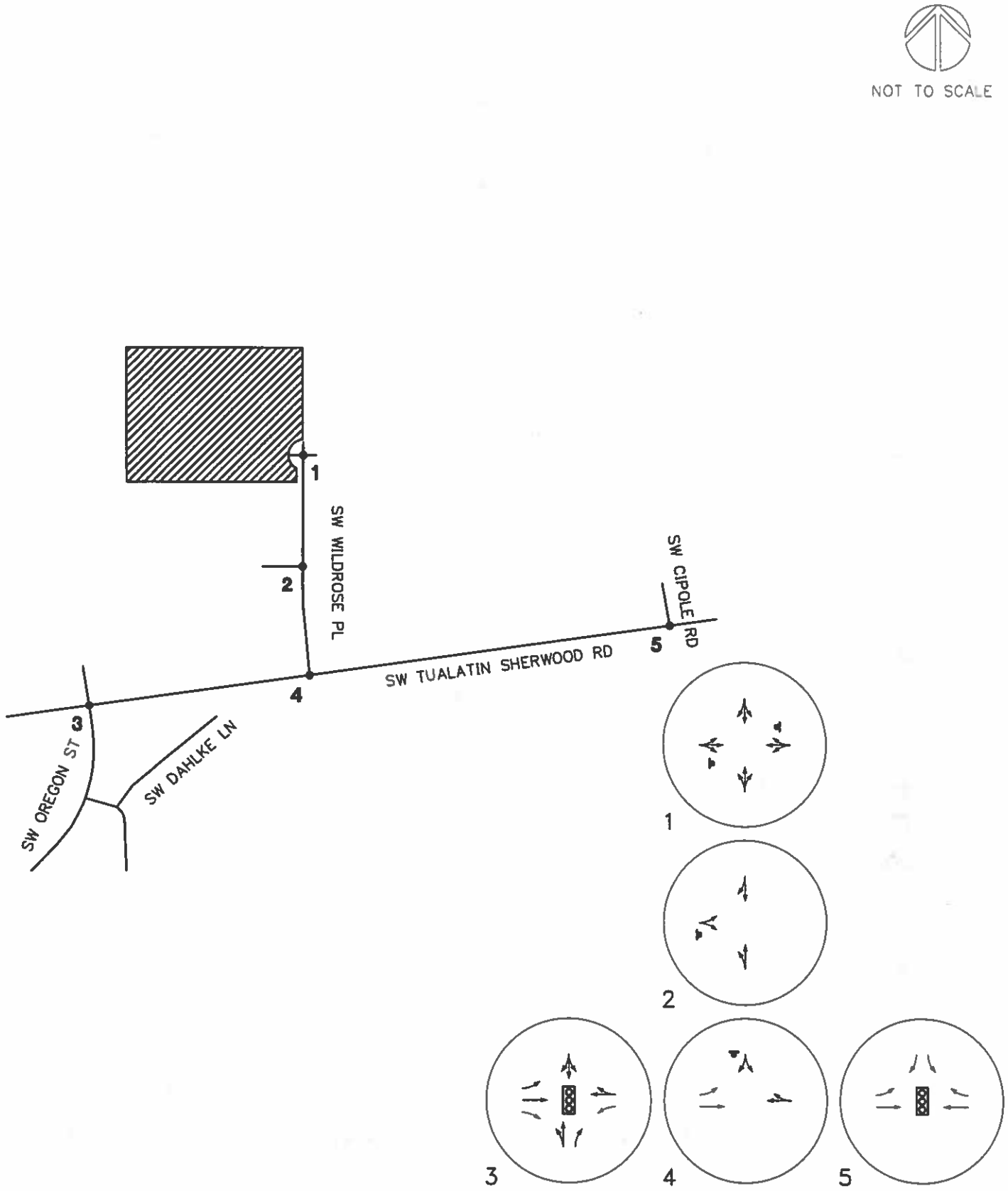
SITE PLAN

LAM WILDROSE SITE TRAFFIC ANALYSIS
TUALATIN, OREGON

FIGURE 2



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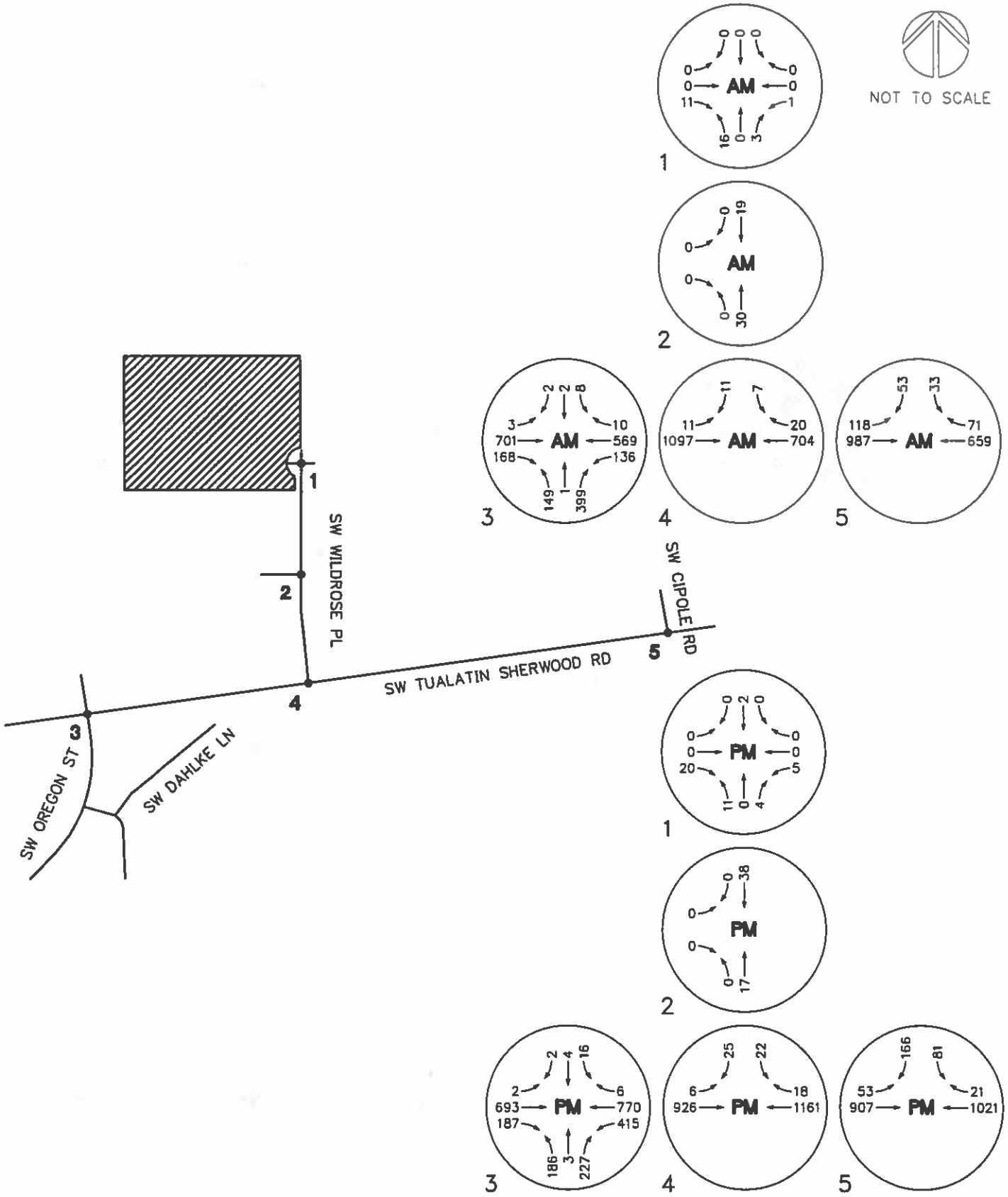
EXISITNG LANE CONFIGURATION AND INTERSECTION CONTROL

LAM WILDROSE SITE TRAFFIC ANALYSIS
TUALATIN, OREGON

FIGURE 3



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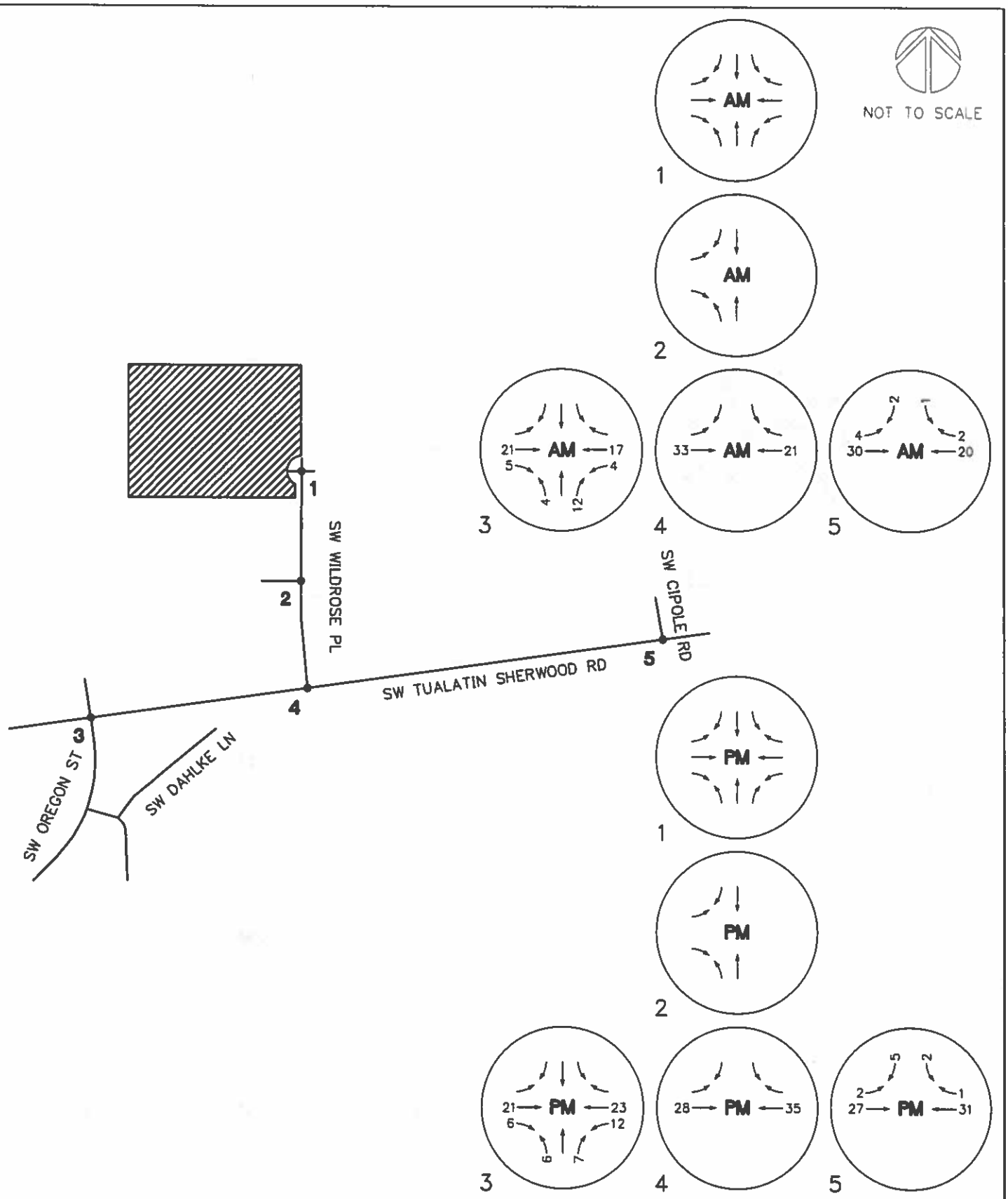
2014 EXISTING TRAFFIC VOLUMES - WEEKDAY AM AND PM PEAK HOURS

LAM WILDROSE SITE TRAFFIC ANALYSIS
TUALATIN, OREGON

FIGURE 4



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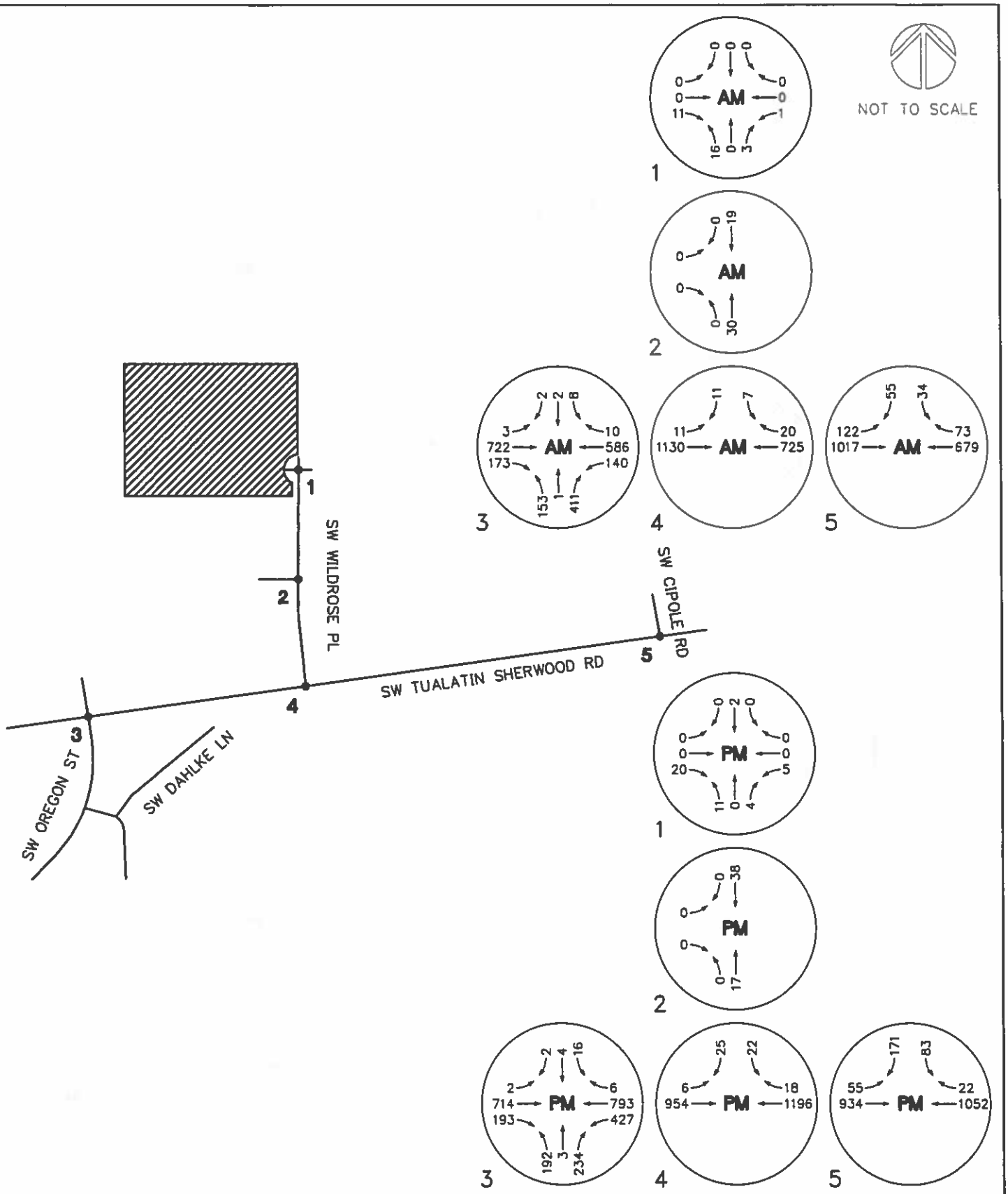
1-YEAR BACKGROUND GROWTH TRAFFIC VOLUMES - WEEKDAY AM AND PM PEAK HOURS

LAM WILDROSE SITE TRAFFIC ANALYSIS
TUALATIN, OREGON

FIGURE 5



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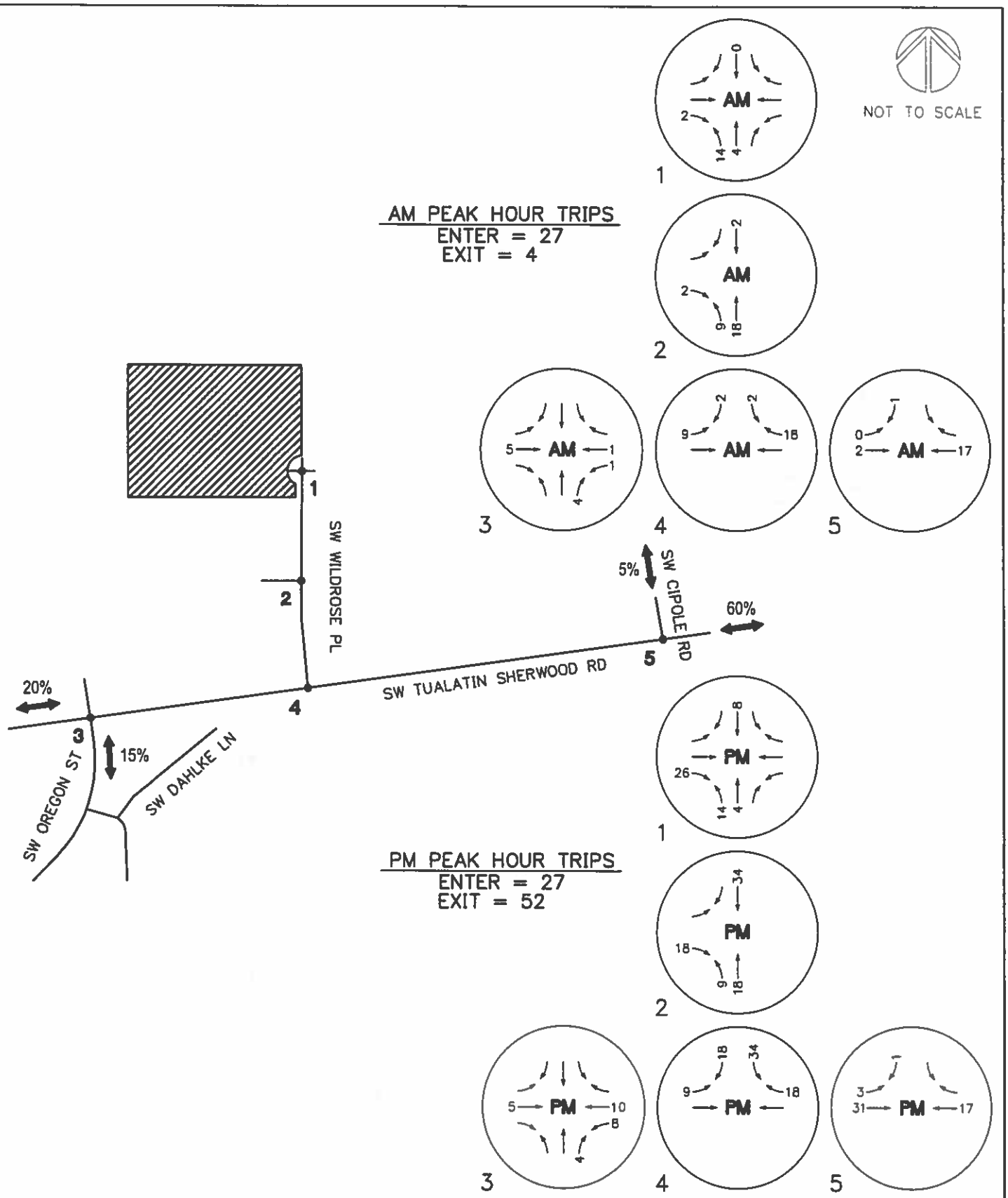
2015 PRE-DEVELOPMENT TRAFFIC VOLUMES - WEEKDAY AM AND PM PEAK HOURS

LAM WILDROSE SITE TRAFFIC ANALYSIS
TUALATIN, OREGON

FIGURE 6



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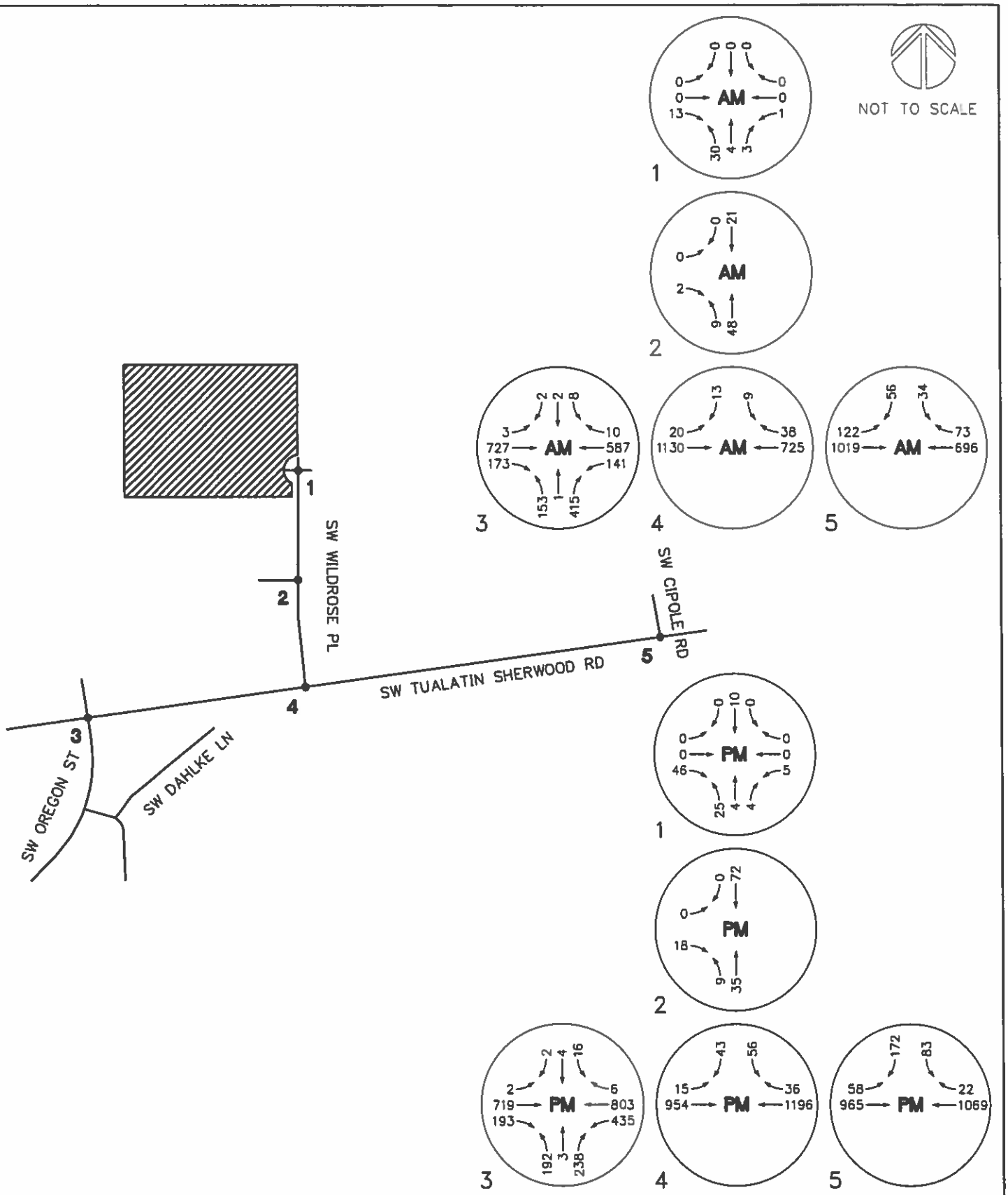
SITE TRIP DISTRIBUTION AND TRAFFIC ASSIGNMENT - WEEKDAY AM AND PM PEAK HOURS

LAM WILDROSE SITE TRAFFIC ANALYSIS
TUALATIN, OREGON

FIGURE 7



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2015 POST DEVELOPMENT TRAFFIC VOLUMES - WEEKDAY AM AND PM PEAK HOUR

LAM WILDROSE SITE TRAFFIC ANALYSIS
TUALATIN, OREGON

FIGURE 8

APPENDIX B

TRAFFIC COUNT SUMMARIES

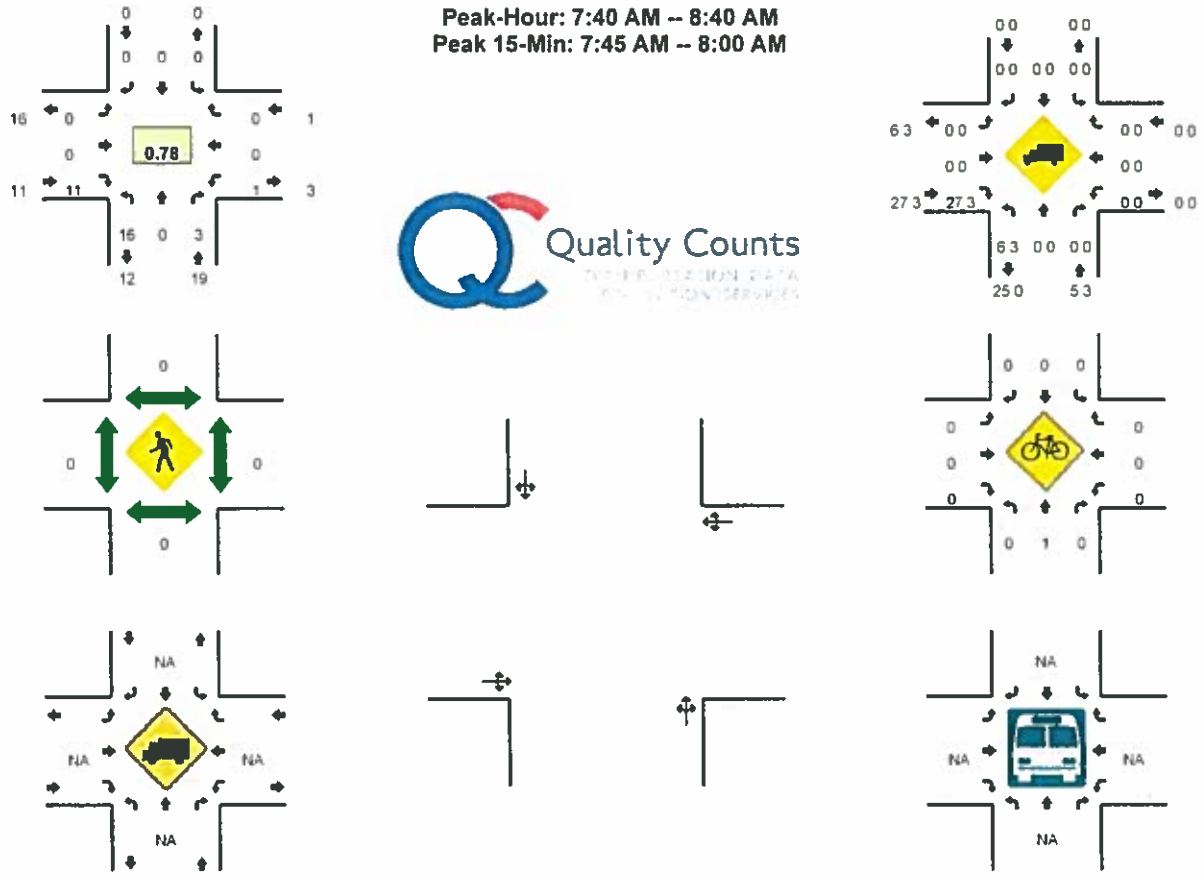
Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: SW Wildrose Pl – Industrial Park North Acc
CITY/STATE: Sherwood, OR

QC JOB #: 12766001
DATE: Tue, Oct 14 2014

Peak-Hour: 7:40 AM -- 8:40 AM
Peak 15-Min: 7:45 AM -- 8:00 AM



5-Min Count Period Beginning At	SW Wildrose Pl (Northbound)				SW Wildrose Pl (Southbound)				Industrial Park North Acc (Eastbound)				Industrial Park North Acc (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	2	0	2	0	0	0	0	0	0	0	2	0	1	0	0	0	7	
7:05 AM	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
7:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:20 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
7:25 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
7:30 AM	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
7:35 AM	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3	
7:40 AM	1	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	4	
7:45 AM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	
7:50 AM	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
7:55 AM	4	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	5	30
8:00 AM	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3	26
8:05 AM	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	26
8:10 AM	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	28
8:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	29
8:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28
8:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27
8:30 AM	2	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	5	30
8:35 AM	2	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	4	31
8:40 AM	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	3	30
8:45 AM	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	30
8:50 AM	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	30
8:55 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	26

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	24	0	0	0	0	0	0	0	0	0	16	0	0	0	0	0	40
Heavy Trucks	0	0	0		0	0	0		0	0	12		0	0	0		12
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/19/2014 2:35 PM

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

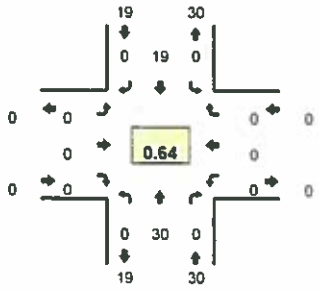
Type of peak hour being reported: User-Defined

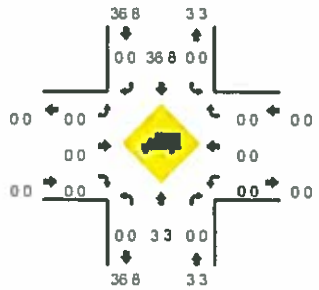
Method for determining peak hour: Total Entering Volume

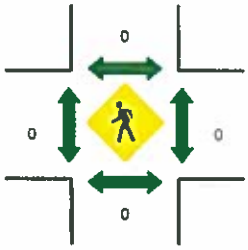
LOCATION: SW Wildrose Pl -- Industrial Park South Acc
CITY/STATE: Sherwood, OR

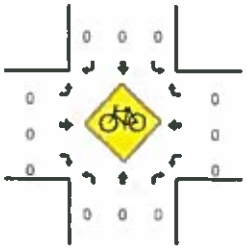
QC JOB #: 12766003
DATE: Thu, Oct 09 2014

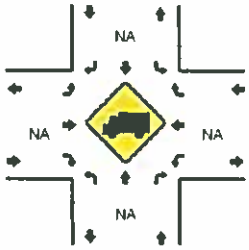
Peak-Hour: 7:40 AM -- 8:40 AM
Peak 15-Min: 7:40 AM -- 7:55 AM

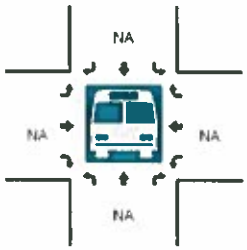












5-Min Count Period Beginning At	SW Wildrose Pl (Northbound)				SW Wildrose Pl (Southbound)				Industrial Park South Acc (Eastbound)				Industrial Park South Acc (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	8	
7:05 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
7:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:20 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
7:25 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
7:30 AM	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	4	
7:35 AM	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
7:40 AM	0	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	6	
7:45 AM	0	1	0	0	0	4	0	0	0	0	0	0	0	0	0	0	5	
7:50 AM	0	6	0	0	0	2	0	0	0	0	0	0	0	0	0	0	8	
7:55 AM	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0	0	5	43
8:00 AM	0	4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	5	40
8:05 AM	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	4	43
8:10 AM	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3	46
8:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	47
8:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46
8:25 AM	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	4	48
8:30 AM	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	4	48
8:35 AM	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	4	49
8:40 AM	0	4	0	0	0	2	0	0	0	0	0	0	0	0	0	0	6	49
8:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	45
8:50 AM	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3	40
8:55 AM	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	3	38

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	48	0	0	0	28	0	0	0	0	0	0	0	0	0	0	76
Heavy Trucks	0	0	0		0	20	0		0	0	0		0	0	0		20
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/19/2014 2:35 PM

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

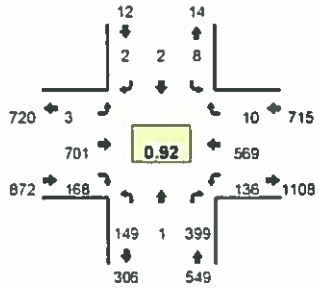
Type of peak hour being reported: User-Defined

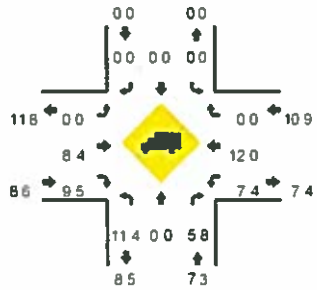
Method for determining peak hour: Total Entering Volume

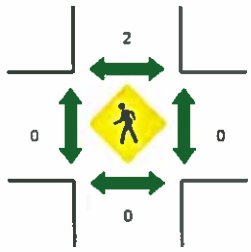
LOCATION: SW Oregon St -- SW Tualatin-Sherwood Rd
CITY/STATE: Sherwood, OR

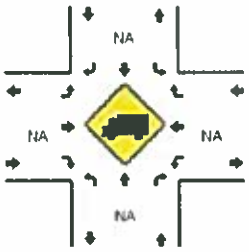
QC JOB #: 12766005
DATE: Thu, Oct 09 2014

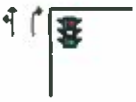
Peak-Hour: 7:40 AM -- 8:40 AM
Peak 15-Min: 8:00 AM -- 8:15 AM

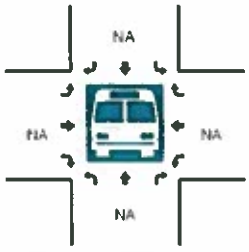












5-Min Count Period Beginning At	SW Oregon St (Northbound)				SW Oregon St (Southbound)				SW Tualatin-Sherwood Rd (Eastbound)				SW Tualatin-Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	3	0	29	0	0	0	0	0	2	71	9	0	13	53	1	0	181	
7:05 AM	7	0	41	0	1	0	0	0	2	65	9	0	3	31	1	0	160	
7:10 AM	3	1	27	0	1	0	0	0	0	74	11	0	4	45	2	0	168	
7:15 AM	12	1	47	0	2	1	0	0	0	51	16	0	11	35	1	0	177	
7:20 AM	9	0	31	0	1	0	0	0	3	67	17	0	11	46	1	0	186	
7:25 AM	11	1	24	0	1	3	0	0	1	40	9	0	12	26	4	0	132	
7:30 AM	14	1	41	0	2	1	1	0	1	39	14	0	12	35	0	0	161	
7:35 AM	11	1	16	0	2	0	0	0	0	54	20	0	7	42	1	0	154	
7:40 AM	11	0	36	0	1	0	0	0	0	62	18	0	10	42	1	0	179	
7:45 AM	23	0	54	0	1	0	0	0	0	47	18	0	12	47	1	0	203	
7:50 AM	18	0	38	0	2	1	0	0	0	49	10	0	21	49	0	0	186	
7:55 AM	10	0	41	0	1	0	0	0	0	59	10	0	10	44	2	0	177	2064
8:00 AM	18	0	40	0	1	1	1	0	2	61	12	0	9	51	0	0	196	2079
8:05 AM	13	0	41	0	1	0	0	0	0	64	14	0	20	45	1	0	199	2118
8:10 AM	10	0	33	0	0	0	0	0	0	71	20	0	13	39	0	0	186	2136
8:15 AM	9	0	19	0	0	0	0	0	1	87	19	0	3	41	4	0	183	2142
8:20 AM	10	1	25	0	0	0	1	0	0	47	15	0	13	57	0	0	169	2125
8:25 AM	10	0	21	0	0	0	0	0	0	53	9	0	15	47	0	0	155	2148
8:30 AM	11	0	23	0	0	0	0	0	0	53	13	0	5	41	1	0	147	2134
8:35 AM	8	0	28	0	1	0	0	0	0	48	12	0	5	56	0	0	158	2148
8:40 AM	6	1	24	0	2	0	0	0	0	50	10	0	9	47	0	0	149	2118
8:45 AM	10	0	26	0	0	0	0	0	0	42	10	0	7	32	0	0	127	2042
8:50 AM	5	0	15	0	1	0	0	0	1	51	10	0	6	59	0	0	148	2004
8:55 AM	4	0	26	0	1	0	0	0	1	51	13	0	10	46	3	0	155	1982

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	164	0	456	0	8	4	4	0	8	764	184	0	168	540	4	0	2324
Heavy Trucks	20	0	16		0	0	0		0	56	12		12	48	0		164
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		1	1	0		2
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/19/2014 2:35 PM

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

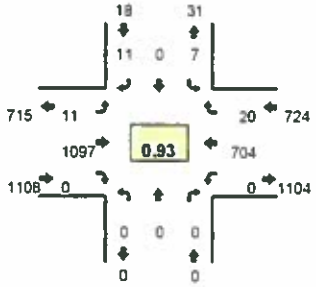
Type of peak hour being reported: User-Defined

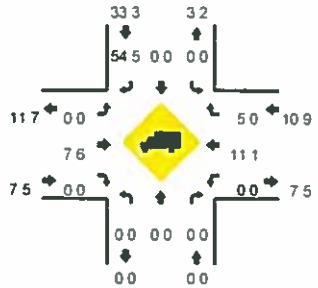
Method for determining peak hour: Total Entering Volume

LOCATION: SW Wildrose Pl -- SW Tualatin-Sherwood Rd
CITY/STATE: Sherwood, OR

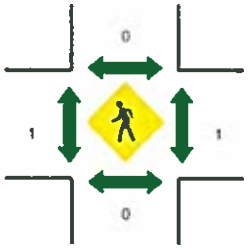
QC JOB #: 12766009
DATE: Thu, Oct 09 2014

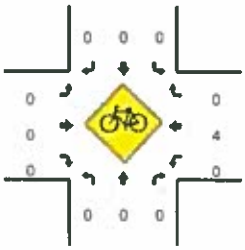
Peak-Hour: 7:40 AM -- 8:40 AM
Peak 15-Min: 7:55 AM -- 8:10 AM

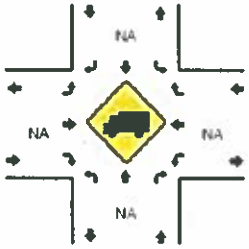


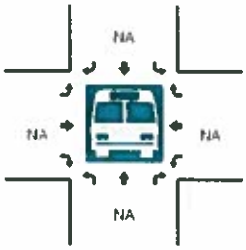


Quality Counts









5-Min Count Period Beginning At	SW Wildrose Pl (Northbound)				SW Wildrose Pl (Southbound)				SW Tualatin-Sherwood Rd (Eastbound)				SW Tualatin-Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	1	0	2	0	2	99	0	0	0	54	3	0	161	
7:05 AM	0	0	0	0	0	0	0	0	0	109	0	0	0	43	2	0	154	
7:10 AM	0	0	0	0	0	0	0	0	0	96	0	0	0	46	0	0	142	
7:15 AM	0	0	0	0	0	0	0	0	0	106	0	0	0	57	0	0	163	
7:20 AM	0	0	0	0	0	0	2	0	1	85	0	0	0	50	0	0	138	
7:25 AM	0	0	0	0	0	0	0	0	0	69	0	0	0	49	1	0	119	
7:30 AM	0	0	0	0	0	0	1	0	0	81	0	0	0	43	4	0	129	
7:35 AM	0	0	0	0	0	0	0	0	2	75	0	0	0	49	2	0	128	
7:40 AM	0	0	0	0	1	0	1	0	1	101	0	0	0	48	3	0	155	
7:45 AM	0	0	0	0	0	0	3	0	0	94	0	0	0	65	2	0	164	
7:50 AM	0	0	0	0	0	0	2	0	1	98	0	0	0	59	5	0	165	
7:55 AM	0	0	0	0	0	0	2	0	2	96	0	0	0	57	2	0	159	1777
8:00 AM	0	0	0	0	1	0	0	0	3	98	0	0	0	69	0	0	171	1787
8:05 AM	0	0	0	0	0	0	1	0	1	107	0	0	0	55	2	0	166	1799
8:10 AM	0	0	0	0	1	0	0	0	1	99	0	0	0	49	2	0	152	1809
8:15 AM	0	0	0	0	1	0	0	0	0	103	0	0	0	56	0	0	160	1806
8:20 AM	0	0	0	0	0	0	0	0	0	75	0	0	0	64	0	0	139	1807
8:25 AM	0	0	0	0	2	0	0	0	1	75	0	0	0	67	1	0	146	1834
8:30 AM	0	0	0	0	1	0	1	0	1	75	0	0	0	42	1	0	121	1826
8:35 AM	0	0	0	0	0	0	1	0	0	76	0	0	0	73	2	0	152	1850
8:40 AM	0	0	0	0	2	0	1	0	1	77	0	0	0	52	3	0	136	1831
8:45 AM	0	0	0	0	0	0	0	0	1	62	0	0	0	54	0	0	117	1784
8:50 AM	0	0	0	0	0	0	1	0	1	66	0	0	0	52	1	0	121	1740
8:55 AM	0	0	0	0	1	0	3	0	1	76	0	0	0	60	1	0	142	1723

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	4	0	12	0	24	1204	0	0	0	724	16	0	1984
Heavy Trucks	0	0	0		0	0	8		0	64	0		0	52	0		124
Pedestrians		0				0				0				4			4
Bicycles	0	0	0		0	0	0		0	0	0		0	3	0		3
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/19/2014 2:35 PM

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

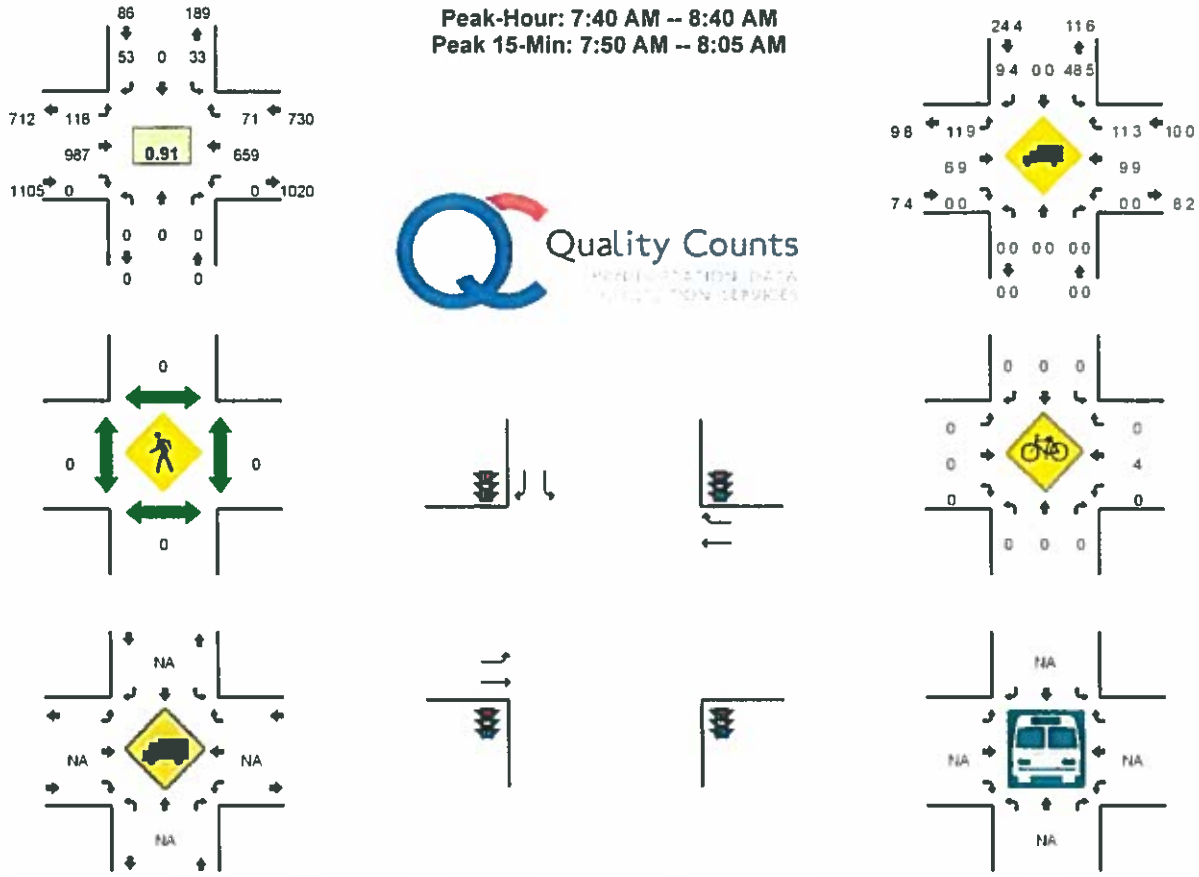
Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: SW Cipole Rd -- SW Tualatin-Sherwood Rd
CITY/STATE: Sherwood, OR

QC JOB #: 12766007
DATE: Thu, Oct 09 2014

Peak-Hour: 7:40 AM -- 8:40 AM
Peak 15-Min: 7:50 AM -- 8:05 AM



5-Min Count Period Beginning At	SW Cipole Rd (Northbound)				SW Cipole Rd (Southbound)				SW Tualatin-Sherwood Rd (Eastbound)				SW Tualatin-Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	3	0	5	0	7	107	0	0	0	61	7	0	190	
7:05 AM	0	0	0	0	9	0	2	0	8	88	0	0	0	33	6	0	146	
7:10 AM	0	0	0	0	6	0	1	0	8	86	0	0	0	48	5	0	154	
7:15 AM	0	0	0	0	6	0	1	0	12	81	0	0	0	53	2	0	155	
7:20 AM	0	0	0	0	1	0	4	0	10	71	0	0	0	54	10	0	150	
7:25 AM	0	0	0	0	5	0	5	0	14	56	0	0	0	35	5	0	120	
7:30 AM	0	0	0	0	4	0	3	0	15	65	0	0	0	49	9	0	145	
7:35 AM	0	0	0	0	7	0	2	0	13	60	0	0	0	45	3	0	130	
7:40 AM	0	0	0	0	1	0	3	0	16	85	0	0	0	50	0	0	155	
7:45 AM	0	0	0	0	2	0	6	0	14	72	0	0	0	52	5	0	151	
7:50 AM	0	0	0	0	5	0	4	0	11	93	0	0	0	63	7	0	183	
7:55 AM	0	0	0	0	1	0	6	0	21	76	0	0	0	45	6	0	155	1834
8:00 AM	0	0	0	0	2	0	5	0	11	91	0	0	0	74	8	0	191	1835
8:05 AM	0	0	0	0	1	0	6	0	12	93	0	0	0	51	6	0	169	1858
8:10 AM	0	0	0	0	1	0	5	0	9	97	0	0	0	44	4	0	160	1864
8:15 AM	0	0	0	0	2	0	1	0	5	87	0	0	0	44	8	0	147	1856
8:20 AM	0	0	0	0	2	0	6	0	8	82	0	0	0	64	5	0	167	1873
8:25 AM	0	0	0	0	4	0	1	0	5	63	0	0	0	65	11	0	149	1902
8:30 AM	0	0	0	0	7	0	4	0	3	81	0	0	0	44	3	0	142	1899
8:35 AM	0	0	0	0	5	0	6	0	3	87	0	0	0	63	8	0	152	1921
8:40 AM	0	0	0	0	1	0	9	0	4	79	0	0	0	51	4	0	148	1914
8:45 AM	0	0	0	0	8	0	2	0	6	45	0	0	0	42	1	0	104	1867
8:50 AM	0	0	0	0	1	0	1	0	11	62	0	0	0	56	4	0	135	1819
8:55 AM	0	0	0	0	1	0	7	0	5	62	0	0	0	52	6	0	133	1797

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	32	0	60	0	172	1040	0	0	0	728	84	0	2116
Heavy Trucks	0	0	0		12	0	0		16	68	0		0	60	0		156
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	2	0		2
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/19/2014 2:35 PM

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

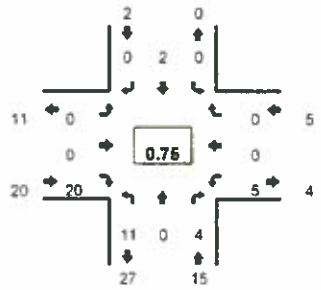
Type of peak hour being reported: User-Defined

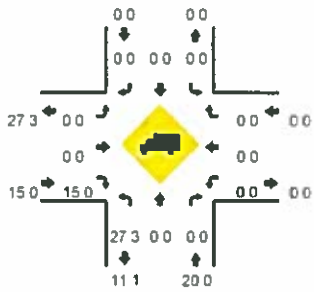
Method for determining peak hour: Total Entering Volume

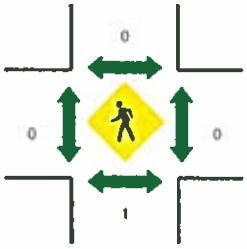
LOCATION: SW Wildrose Pl – Industrial Park North Acc
CITY/STATE: Sherwood, OR

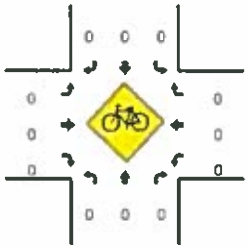
QC JOB #: 12766002
DATE: Tue, Oct 14 2014

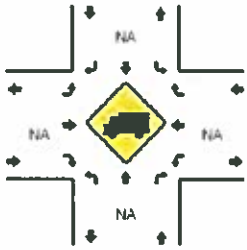
Peak-Hour: 4:40 PM -- 5:40 PM
Peak 15-Min: 4:40 PM -- 4:55 PM

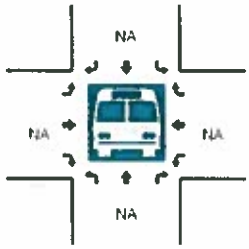












5-Min Count Period Beginning At	SW Wildrose Pl (Northbound)				SW Wildrose Pl (Southbound)				Industrial Park North Acc (Eastbound)				Industrial Park North Acc (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	1	0	0	1	0	0	0	0	1	0	1	0	0	0	4	
4:05 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	
4:10 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	
4:15 PM	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	
4:20 PM	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	
4:25 PM	0	0	1	0	0	1	0	0	0	0	2	0	1	0	0	0	5	
4:30 PM	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	4	
4:35 PM	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	
4:40 PM	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	3	
4:45 PM	1	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	4	
4:50 PM	4	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	7	
4:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37
5:00 PM	1	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	7	40
5:05 PM	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	40
5:10 PM	1	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	4	42
5:15 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	41
5:20 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	40
5:25 PM	1	0	1	0	0	2	0	0	0	0	0	0	1	0	0	0	5	40
5:30 PM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	5	41
5:35 PM	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	3	42
5:40 PM	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	2	41
5:45 PM	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	39
5:50 PM	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	34
5:55 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	37

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	24	0	4	0	0	0	0	0	0	0	20	0	8	0	0	0	56
Heavy Trucks	4	0	0		0	0	0		0	0	4		0	0	0		8
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 10/19/2014 2:36 PM

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

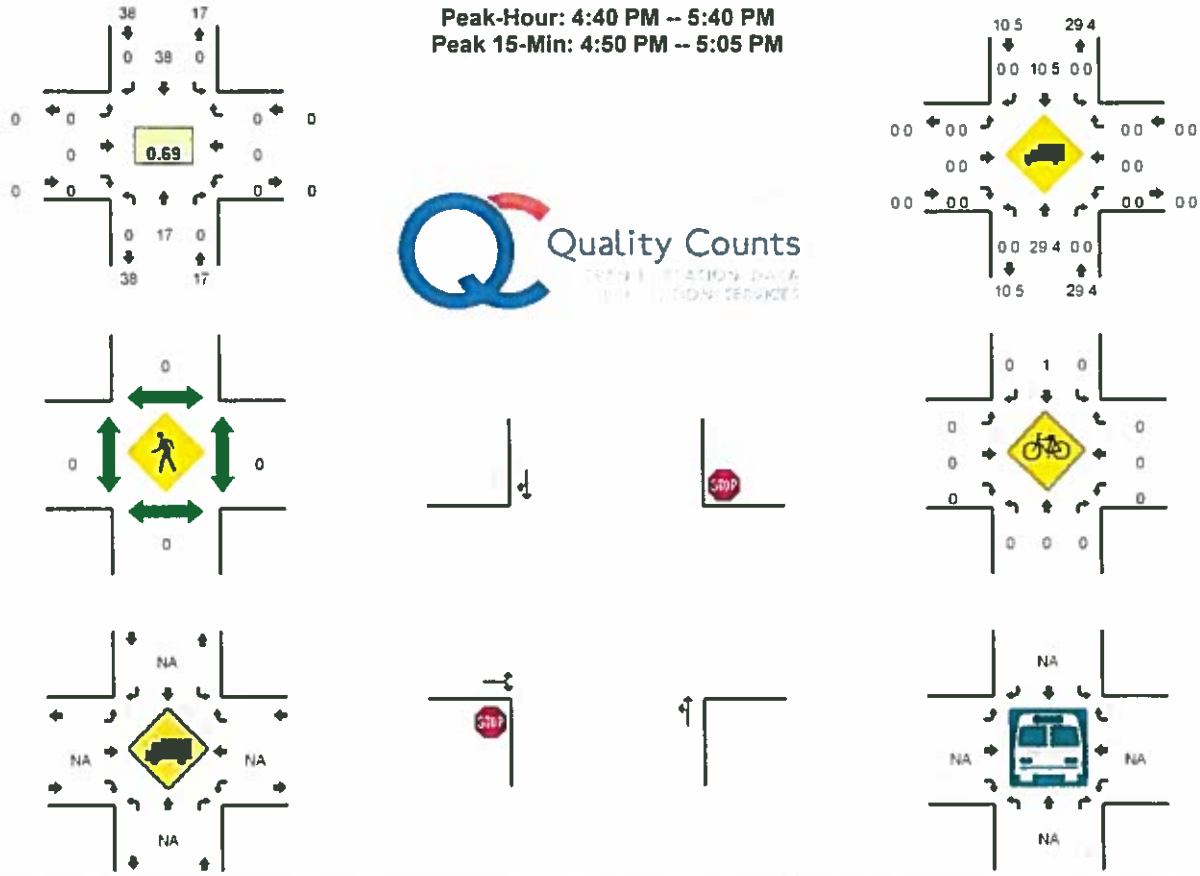
LOCATION: SW Wildrose Pl -- Industrial Park South Acc

CITY/STATE: Sherwood, OR

QC JOB #: 12766004

DATE: Thu, Oct 09 2014

Peak-Hour: 4:40 PM -- 5:40 PM
Peak 15-Min: 4:50 PM -- 5:05 PM



5-Min Count Period Beginning At	SW Wildrose Pl (Northbound)				SW Wildrose Pl (Southbound)				Industrial Park South Acc (Eastbound)				Industrial Park South Acc (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	1	0	0	0	7	0	0	0	0	0	0	0	0	0	0	8	
4:05 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
4:10 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	
4:15 PM	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	3	
4:20 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
4:25 PM	0	1	0	0	0	4	0	0	0	0	0	0	0	0	0	0	5	
4:30 PM	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	4	
4:35 PM	0	1	0	0	0	4	0	0	0	0	0	0	0	0	0	0	5	
4:40 PM	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	4	
4:45 PM	0	1	0	0	0	4	0	0	0	0	0	0	0	0	0	0	5	
4:50 PM	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	8	
4:55 PM	0	1	0	0	0	4	0	0	0	0	0	0	0	0	0	0	5	51
5:00 PM	0	1	0	0	0	6	0	0	0	0	0	0	0	0	0	0	7	50
5:05 PM	0	1	0	0	0	4	0	0	0	0	0	0	0	0	0	0	5	54
5:10 PM	0	2	0	0	0	3	0	0	0	0	0	0	0	0	0	0	5	57
5:15 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	56
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55
5:25 PM	0	2	0	0	0	6	0	0	0	0	0	0	0	0	0	0	8	58
5:30 PM	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	4	58
5:35 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	55
5:40 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	53
5:45 PM	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	3	51
5:50 PM	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	4	47
5:55 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	44

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	28	0	0	0	52	0	0	0	0	0	0	0	0	0	0	80
Heavy Trucks	0	8	0		0	12	0		0	0	0		0	0	0		20
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/19/2014 2:36 PM

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

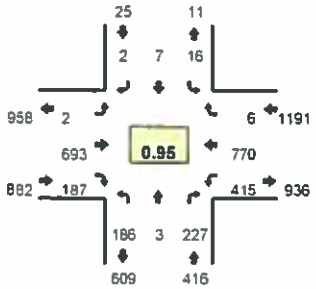
Type of peak hour being reported: User-Defined

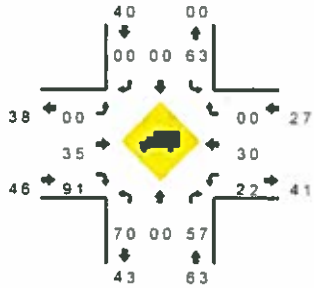
Method for determining peak hour: Total Entering Volume

LOCATION: SW Oregon St -- SW Tualatin-Sherwood Rd
CITY/STATE: Sherwood, OR

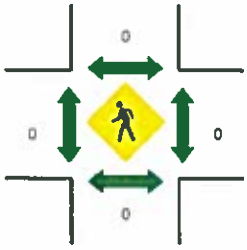
QC JOB #: 12766006
DATE: Thu, Oct 09 2014

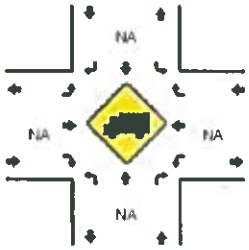
Peak-Hour: 4:40 PM -- 5:40 PM
Peak 15-Min: 4:45 PM -- 5:00 PM

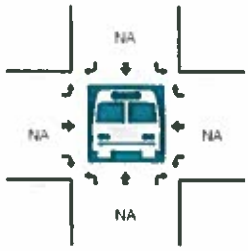




Quality Counts







5-Min Count Period Beginning At:	SW Oregon St (Northbound)				SW Oregon St (Southbound)				SW Tualatin-Sherwood Rd (Eastbound)				SW Tualatin-Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	13	0	17	0	2	2	0	0	0	55	18	0	29	73	0	0	209	
4:05 PM	15	0	21	0	2	0	0	0	2	57	23	0	16	58	1	0	195	
4:10 PM	22	0	10	0	2	0	1	0	2	40	12	0	42	71	0	0	202	
4:15 PM	16	0	20	0	0	2	1	0	0	45	14	0	34	72	0	0	204	
4:20 PM	20	0	14	0	1	0	0	0	1	63	12	0	29	58	1	0	199	
4:25 PM	18	0	20	0	2	0	2	0	0	52	15	0	27	61	0	0	197	
4:30 PM	11	0	15	0	2	0	1	0	1	45	16	0	32	64	0	0	187	
4:35 PM	7	0	15	0	2	0	0	0	0	56	18	0	38	61	1	0	198	
4:40 PM	22	1	22	0	2	0	1	0	1	62	9	0	27	55	0	0	202	
4:45 PM	20	0	22	0	5	0	0	0	1	64	15	0	27	74	0	0	228	
4:50 PM	14	1	20	0	2	0	0	0	0	65	19	0	42	63	0	0	226	
4:55 PM	7	0	25	0	0	0	0	0	0	65	18	0	34	60	1	0	210	2457
5:00 PM	14	0	19	0	1	3	0	0	0	47	21	0	42	72	1	0	220	2468
5:05 PM	21	0	16	0	1	0	1	0	0	56	21	0	34	75	0	0	225	2498
5:10 PM	20	1	22	0	2	2	0	0	0	50	15	0	37	68	1	0	218	2514
5:15 PM	11	0	11	0	0	0	0	0	0	62	18	0	30	63	0	0	195	2505
5:20 PM	19	0	20	0	3	1	0	0	0	45	10	0	42	48	0	0	188	2494
5:25 PM	13	0	13	0	0	0	0	0	0	72	12	0	33	63	0	0	206	2503
5:30 PM	11	0	13	0	0	0	0	0	0	38	17	0	33	65	1	0	178	2494
5:35 PM	14	0	24	0	0	1	0	0	0	67	12	0	34	64	2	0	218	2514
5:40 PM	17	1	15	0	0	0	0	0	0	68	14	0	31	57	4	0	207	2519
5:45 PM	13	0	18	0	0	0	0	0	0	53	13	0	32	60	1	0	190	2481
5:50 PM	11	0	14	0	1	1	0	0	1	41	22	0	29	44	0	0	164	2419
5:55 PM	7	0	10	0	0	1	1	0	0	64	14	0	18	55	0	0	170	2379

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	164	4	268	0	28	0	0	0	4	776	208	0	412	788	4	0	2656
Heavy Trucks	12	0	12		0	0	0		0	12	4		12	20	0		72
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/19/2014 2:36 PM

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

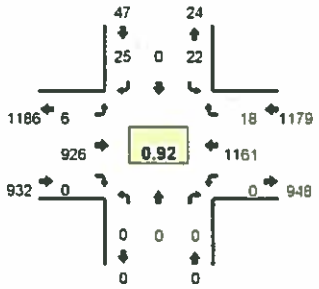
Type of peak hour being reported: User-Defined

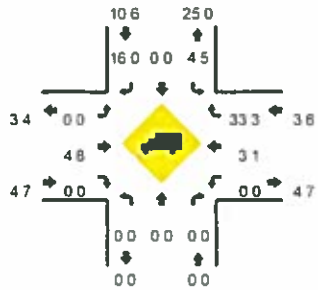
Method for determining peak hour: Total Entering Volume

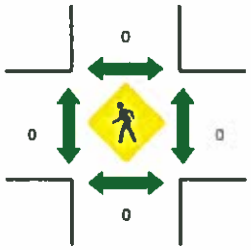
LOCATION: SW Wildrose Pl – SW Tualatin-Sherwood Rd
CITY/STATE: Sherwood, OR

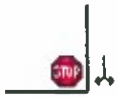
QC JOB #: 12766010
DATE: Thu, Oct 09 2014

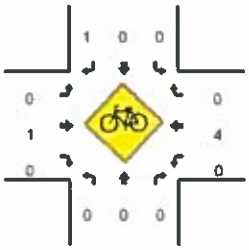
Peak-Hour: 4:40 PM – 5:40 PM
Peak 15-Min: 4:45 PM – 5:00 PM

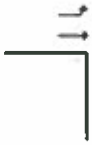


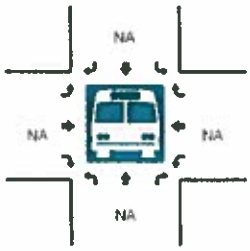












5-Min Count Period Beginning At	SW Wildrose Pl (Northbound)				SW Wildrose Pl (Southbound)				SW Tualatin-Sherwood Rd (Eastbound)				SW Tualatin-Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	3	0	4	0	0	76	0	0	0	102	1	0	186	
4:05 PM	0	0	0	0	2	0	2	0	0	78	0	0	0	86	1	0	171	
4:10 PM	0	0	0	0	1	0	2	0	0	54	0	0	0	106	0	0	163	
4:15 PM	0	0	0	0	1	0	1	0	0	66	0	0	0	97	1	0	166	
4:20 PM	0	0	0	0	0	0	0	0	0	72	0	0	0	88	1	0	161	
4:25 PM	0	0	0	0	4	0	3	0	0	75	0	0	0	84	1	0	167	
4:30 PM	0	0	0	0	1	0	0	0	1	63	0	0	0	98	2	0	165	
4:35 PM	0	0	0	0	1	0	1	0	0	72	0	0	0	105	1	0	180	
4:40 PM	0	0	0	0	2	0	2	0	0	86	0	0	0	87	1	0	178	
4:45 PM	0	0	0	0	3	0	3	0	2	88	0	0	0	105	2	0	203	
4:50 PM	0	0	0	0	1	0	0	0	1	90	0	0	0	98	2	0	192	
4:55 PM	0	0	0	0	3	0	3	0	0	91	0	0	0	98	1	0	194	2126
5:00 PM	0	0	0	0	5	0	1	0	0	68	0	0	0	91	3	0	168	2108
5:05 PM	0	0	0	0	1	0	6	0	0	67	0	0	0	102	1	0	177	2114
5:10 PM	0	0	0	0	2	0	1	0	1	71	0	0	0	103	1	0	179	2130
5:15 PM	0	0	0	0	0	0	4	0	2	75	0	0	0	92	0	0	173	2137
5:20 PM	0	0	0	0	0	0	0	0	0	67	0	0	0	89	2	0	158	2134
5:25 PM	0	0	0	0	2	0	2	0	0	83	0	0	0	97	1	0	185	2152
5:30 PM	0	0	0	0	3	0	2	0	0	53	0	0	0	94	2	0	154	2141
5:35 PM	0	0	0	0	0	0	1	0	0	87	0	0	0	107	2	0	197	2158
5:40 PM	0	0	0	0	1	0	1	0	1	84	0	0	0	88	0	0	175	2155
5:45 PM	0	0	0	0	0	0	2	0	1	72	0	0	0	96	0	0	171	2123
5:50 PM	0	0	0	0	3	0	2	0	0	58	0	0	0	71	1	0	135	2066
5:55 PM	0	0	0	0	1	0	1	0	0	71	0	0	0	73	0	0	146	2018

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	28	0	24	0	12	1076	0	0	0	1196	20	0	2356
Heavy Trucks	0	0	0		4	0	8		0	36	0		0	28	8		84
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad Stopped Buses																	

Comments:

Report generated on 10/19/2014 2:36 PM

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

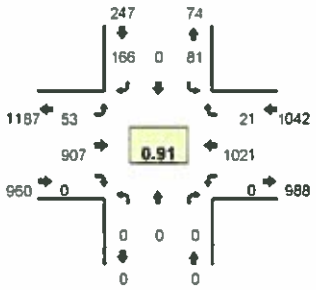
Type of peak hour being reported: User-Defined

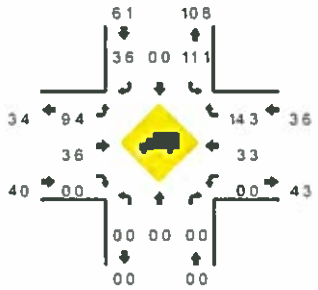
Method for determining peak hour: Total Entering Volume

LOCATION: SW Cipole Rd -- SW Tualatin-Sherwood Rd
CITY/STATE: Sherwood, OR

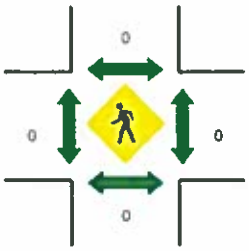
QC JOB #: 12766008
DATE: Thu, Oct 09 2014

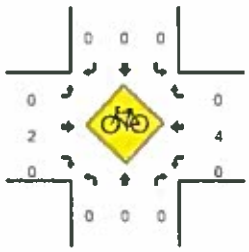
Peak-Hour: 4:40 PM -- 5:40 PM
Peak 15-Min: 4:45 PM -- 5:00 PM

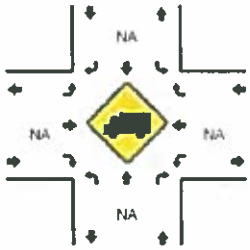


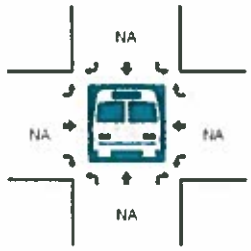


Quality Counts









5-Min Count Period Beginning At	SW Cipole Rd (Northbound)				SW Cipole Rd (Southbound)				SW Tualatin-Sherwood Rd (Eastbound)				SW Tualatin-Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	13	0	18	0	9	63	0	0	0	74	2	0	179	
4:05 PM	0	0	0	0	14	0	11	0	8	60	0	0	0	82	4	0	179	
4:10 PM	0	0	0	0	6	0	15	0	2	61	0	0	0	96	1	0	181	
4:15 PM	0	0	0	0	5	0	9	0	4	68	0	0	0	86	4	0	176	
4:20 PM	0	0	0	0	3	0	13	0	3	62	0	0	0	67	5	0	153	
4:25 PM	0	0	0	0	2	0	9	0	4	71	0	0	0	82	2	0	170	
4:30 PM	0	0	0	0	6	0	17	0	3	61	0	0	0	85	3	0	175	
4:35 PM	0	0	0	0	9	0	14	0	4	59	0	0	0	82	2	0	170	
4:40 PM	0	0	0	0	8	0	10	0	7	75	0	0	0	75	4	0	179	
4:45 PM	0	0	0	0	2	0	24	0	5	84	0	0	0	92	0	0	207	
4:50 PM	0	0	0	0	9	0	19	0	4	94	0	0	0	87	0	0	213	
4:55 PM	0	0	0	0	5	0	12	0	7	90	0	0	0	81	1	0	196	2178
5:00 PM	0	0	0	0	11	0	15	0	4	62	0	0	0	89	1	0	182	2181
5:05 PM	0	0	0	0	10	0	21	0	3	94	0	0	0	85	2	0	215	2217
5:10 PM	0	0	0	0	13	0	13	0	2	61	0	0	0	86	1	0	176	2212
5:15 PM	0	0	0	0	4	0	12	0	6	67	0	0	0	79	1	0	169	2205
5:20 PM	0	0	0	0	1	0	10	0	7	53	0	0	0	83	5	0	159	2211
5:25 PM	0	0	0	0	7	0	12	0	4	69	0	0	0	92	3	0	187	2228
5:30 PM	0	0	0	0	5	0	9	0	3	80	0	0	0	80	1	0	178	2231
5:35 PM	0	0	0	0	6	0	9	0	1	78	0	0	0	92	2	0	188	2249
5:40 PM	0	0	0	0	2	0	15	0	4	72	0	0	0	79	1	0	173	2243
5:45 PM	0	0	0	0	4	0	7	0	3	69	0	0	0	87	3	0	173	2209
5:50 PM	0	0	0	0	3	0	5	0	4	64	0	0	0	61	3	0	140	2136
5:55 PM	0	0	0	0	6	0	5	0	0	57	0	0	0	64	4	0	136	2076

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	64	0	220	0	64	1072	0	0	0	1040	4	0	2464
Heavy Trucks	0	0	0		8	0	12		8	32	0		0	28	0		88
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/19/2014 2:36 PM

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

APPENDIX C

CRASH DATA

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

SW Oregon Street & SW Tualatin-Sherwood Road
January 1, 2011 through December 31, 2013

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2013														
ANGLE	0	1	0	1	0	2	0	1	0	1	0	1	0	0
REAR-END	0	1	2	3	0	2	0	2	1	3	0	3	0	0
TURNING MOVEMENTS	0	0	5	5	0	0	1	5	0	4	1	5	0	0
2013 TOTAL	0	2	7	9	0	4	1	8	1	8	1	9	0	0
YEAR: 2012														
REAR-END	0	1	1	2	0	1	0	2	0	0	2	2	0	0
2012 TOTAL	0	1	1	2	0	1	0	2	0	0	2	2	0	0
YEAR: 2011														
REAR-END	0	1	1	2	0	5	0	1	1	1	1	2	0	0
TURNING MOVEMENTS	0	0	1	1	0	0	0	0	1	0	1	1	0	0
2011 TOTAL	0	1	2	3	0	5	0	1	2	1	2	3	0	0
FINAL TOTAL	0	4	10	14	0	10	1	11	3	9	5	14	0	0

Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.

CITY OF SHERWOOD, WASHINGTON COUNTY

SW Oregon Street & SW Tualatin-Sherwood Road
January 1, 2011 through December 31, 2013

SER# INVEST	SPED	ALC	DRUG	SCHL	WORK	DATE DAY TIME	CLASS DIST FROM	CITY STREET FIRST STREET SECOND STREET	RD CHAR DIRECT LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL TRAF-CONTL	OFF-RD RNDBT DRVWY	WTHR SURF LIGHT	CRASH TYP COLL TYP SVRTY	V#	SPCL USE TRLR QTY OWNER VEH TYPE	MOVE FROM TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
05476	N	N	N	N	N	10/05/2011	16	SW OREGON ST	INTER	3-LEG	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										093	27
CITY						Wed	0	SW TUALATIN-SHERWOOD	E		TRF SIGNAL	N	WET	REAR		PRVTE	W E									000		00
						7P			05	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	43	M	OR-Y		016,026	038	093	27
																							OR<25					
															02	NONE 0	STOP											
																PRVTE	W E									011		00
																PSNGR CAR		01	DRVR	INJC	36	F	OR-Y		000	000		00
																							OR<25					
																		02	PSNG	INJC	12	M			000	000		00
																		03	PSNG	INJC	08	M			000	000		00
																		04	PSNG	INJC	12	M			000	000		00
																		05	PSNG	INJC	07	F			000	000		00
02976	N	N	N			06/08/2011	17	SW OREGON ST	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NONE						Wed	0	SW TUALATIN-SHERWOOD	S		TRF SIGNAL	N	DRY	REAR		PRVTE	S N									000		00
						11A			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	38	M	OR-Y		026	000		07
																							OR<25					
															02	NONE 0	STOP											
																PRVTE	S N									012		00
																PSNGR CAR		01	DRVR	NONE	67	M	OR-Y		000	000		00
																							OR<25					
01798	N	N	N			04/09/2013	16	SW OREGON ST	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	TURN-L											08
NONE						Tue	0	SW TUALATIN-SHERWOOD	S		TRF SIGNAL	N	DRY	TURN		PRVTE	E S									000		00
						1P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	32	M	OR-Y		002,007	000		08
																							OR<25					
															02	NONE 0	STOP											
																PRVTE	S W									012		00
																PSNGR CAR		01	DRVR	NONE	39	M	OR-Y		000	000		00
																							OR<25					
																		02	PSNG	NO<5	04	M			000	000		00
																		03	PSNG	NO<5	02	F			000	000		00
01779	Y	N	N			04/06/2012	16	SW OREGON ST	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										013	01
NONE						Fri	0	SW TUALATIN-SHERWOOD	W		TRF SIGNAL	N	DRY	REAR		UNKN	W E									000		00
						8P			06	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	M	OTH-Y		047,026	000		01
																							UNK					
															02	NONE 0	STOP											
																PRVTE	W E									011	013	00
																PSNGR CAR		01	DRVR	NONE	66	M	OR-Y		000	000		00
																							OR>25					
															03	NONE 0	STOP											
																UNKN	W E									022		00
																PSNGR CAR		01	DRVR	NONE	00	F	UNK		000	000		00
																							UNK					
06571	N	N	N			11/21/2012	16	SW OREGON ST	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NONE						Wed	0	SW TUALATIN-SHERWOOD	W		TRF SIGNAL	N	DRY	REAR		PRVTE	W E									000		00
						5P			06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	37	M	OR-Y		026	000		07
																							OR<25					

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF SHERWOOD, WASHINGTON COUNTY

SW Oregon Street & SW Tualatin-Sherwood Road
January 1, 2011 through December 31, 2013

SER# INVEST	SPED	ALC	DRUGS	SCHL	WORK	DATE DAY TIME	CLASS DIST FROM	CITY STREET FIRST STREET SECOND STREET	RD CHAR DIRECT LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL TRAF-CONTL	OFF-RD RNDBT DRVWY	WTHR SURF LIGHT	CRASH TYP COLL TYP SVRTY	V#	SPCL USE TRLR QTY OWNER VEN TYPE	MOVE FROM TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
															02	NONE 0 PRVTE PSNGR CAR	STOP W E	01	DRVR	INJC	45	F	OR-Y OR<25		000	011 000		00 00
03712 NONE	N	N	N			07/11/2013 Thu 11A	16 0	SW OREGON ST SW TUALATIN-SHERWOOD	INTER W 06	3-LEG 0	N TRF SIGNAL	N N N	CLR DRY DAY	S-1STOP REAR PDO	01	NONE 0 PRVTE PSNGR CAR	STRGHT W E	01	DRVR	NONE	00	F	OR-Y UNK		026	000 000		07 00 07
															02	NONE 0 PRVTE PSNGR CAR	STOP W E	01	DRVR	NONE	35	M	OR-Y OR<25		000	011 000		00 00
04348 CITY	N	N	N	N	N	08/08/2013 Thu 7P	16 0	SW OREGON ST SW TUALATIN-SHERWOOD	INTER W 06	3-LEG 0	N TRF SIGNAL	N N N	CLR WET DAY	S-1STOP REAR INJ	01	NONE 1 PRVTE PSNGR CAR	STRGHT W E	01	DRVR	NONE	53	M	OR-Y OR>25		043,026	000 000		07 00 07
															02	NONE 0 PRVTE PSNGR CAR	STOP W E	01	DRVR	INJC	21	F	OR-Y OR<25		000	011 000		00 00
																		02	PSNG	INJC	69	F			000	000		00
06265 CITY	N	N	N	N	N	10/30/2013 Wed 2P	16 0	SW OREGON ST SW TUALATIN-SHERWOOD	INTER W 06	3-LEG 0	N TRF SIGNAL	N N N	CLR DRY DAY	S-1STOP REAR PDO	01	NONE 0 RENTL PSNGR CAR	STRGHT W E	01	DRVR	NONE	40	M	OR-Y OR<25		016,043,026	000 038	013	27,07 00 27,07
															02	NONE 0 PRVTE PSNGR CAR	STOP W E	01	DRVR	NONE	23	M	OR-Y OR>25		000	011 000	013	00 00
															03	NONE 0 PRVTE PSNGR CAR	STOP W E	01	DRVR	NONE	24	M	OR-Y OR<25		000	011 000		00 00
00555 CITY	N	N	N	N	N	02/01/2013 Fri 9A	16 0	SW OREGON ST SW TUALATIN-SHERWOOD	INTER CN 02	3-LEG 0	N TRF SIGNAL	N N Y	CLD DRY DAY	ANGL-OTH ANGL INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT S N	01	DRVR	INJC	87	M	OR-Y OR<25		052,020	019 000	040 040	32,04 00 32,04
															02	NONE 0 PRVTE PSNGR CAR	STRGHT E W	01	DRVR	INJC	65	F	OR-Y OR<25		000	000 000		00 00
00521 CITY	N	N	N	N	N	01/28/2011 Fri 5P	16 0	SW OREGON ST SW TUALATIN-SHERWOOD	INTER CN 03	3-LEG 0	N TRF SIGNAL	N N N	CLD WET DLIT	O-1TURN TURN PDO	01	NONE 0 PRVTE PSNGR CAR	TURN-L E S	01	DRVR	NONE	73	M	OR-Y OR<25		004,028	000 000		02 00 02

CITY OF SHERWOOD, WASHINGTON COUNTY

SW Oregon Street & SW Tualatin-Sherwood Road
January 1, 2011 through December 31, 2013

SER# INVEST	SPEED	DALC	DRUGS	SCHL	WORK	DATE DAY TIME	CLASS DIST FROM	CITY STREET FIRST STREET SECOND STREET	RD CHAR DIRECT LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL TRAF-CONTL	OFF-RD RNDBT DRVWY	WTHR SURF LIGHT	CRASH TYP COLL TYP SVRTY	V#	SPCL USE TRLR QTY OWNER VEH TYPE	MOVE FROM TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
															02	NONE 0 PRVTE PSNGR CAR	STRGHT W E	01	DRVR	NONE	52	M	OR-Y OR<25		000 000	000 000	00 00
															03	NONE 0 PRVTE PSNGR CAR	STRGHT E W	01	DRVR	NONE	51	F	OR-Y OR<25		000	022 000	00 00
03722 CITY	N	N	N	N	N	07/12/2013 Fri 12P	16 0	SW OREGON ST SW TUALATIN-SHERWOOD	INTER CN 03	3-LEG 0	N TRF SIGNAL	N N N	CLR DRY DAY	O-1TURN TURN PDO	01	NONE 0 PRVTE PSNGR CAR	STRGHT W E	01	DRVR	NONE	52	M	OTH-Y N-RES		000 000	000 000	02 00 00
															02	NONE 0 PRVTE PSNGR CAR	TURN-L E S	01	DRVR	NONE	40	F	OR-Y OR<25		028	000 000	00 02
06903 CITY	N	N	N	N	N	11/29/2013 Fri 5P	16 0	SW OREGON ST SW TUALATIN-SHERWOOD	INTER CN 03	3-LEG 0	N TRF SIGNAL	N N N	CLR DRY DLIT	O-1TURN TURN PDO	01	NONE 0 PRVTE PSNGR CAR	TURN-L E S	01	DRVR	NONE	00	U	UNK UNK		020	000 000	04 00 04
															02	NONE 0 PRVTE PSNGR CAR	STRGHT W E	01	DRVR	NONE	43	F	OR-Y OR<25		000	000 000	00 00
03956 CITY	N	N	N	N	N	07/22/2013 Mon 11A	16 0	SW OREGON ST SW TUALATIN-SHERWOOD	INTER CN 04	3-LEG 0	N TRF SIGNAL	N N N	CLR DRY DAY	ANGL-OTH TURN PDO	01	NONE 0 PRVTE PSNGR CAR	STRGHT W E	01	DRVR	NONE	20	F	OR-Y OR<25		097	000 000	04 00 00
															02	NONE 1 PRVTE SEMI TOW	TURN-R S E	01	DRVR	NONE	60	M	OR-Y OR<25		097	000 000	00 00
81100 NONE	N	N	N			10/17/2013 Thu 1P	16 0	SW OREGON ST SW TUALATIN-SHERWOOD	INTER CN 04	3-LEG 0	N TRF SIGNAL	N N N	CLR DRY DAY	ANGL-OTH TURN PDO	01	NONE 0 PRVTE PSNGR CAR	TURN-R S E	01	DRVR	NONE	00	F	OR-Y UNK		028	000 000	02 00 02
															02	NONE 0 PRVTE PSNGR CAR	STRGHT W E	01	DRVR	NONE	64	F	OR-Y OR<25		000	000 000	00 00

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

SW Wildrose Place & SW Tualatin-Sherwood Road
January 1, 2011 through December 31, 2013

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2013														
TURNING MOVEMENTS	0	1	1	2	0	1	0	0	2	0	2	2	0	0
2013 TOTAL	0	1	1	2	0	1	0	0	2	0	2	2	0	0
YEAR: 2012														
TURNING MOVEMENTS	0	0	1	1	0	0	2	0	1	1	0	1	0	0
2012 TOTAL	0	0	1	1	0	0	2	0	1	1	0	1	0	0
FINAL TOTAL	0	1	2	3	0	1	2	0	3	1	2	3	0	0

Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF SHERWOOD, WASHINGTON COUNTY

SW Wildrose Place & SW Tualatin-Sherwood Road
January 1, 2011 through December 31, 2013

SER# INVEST	SPED	ALC	DRUG	SCHL	WORK	DATE DAY TIME	CLASS DIST FROM	CITY STREET FIRST STREET SECOND STREET	RD CHAR DIRECT LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL TRAF-CONTL	OFF-RD RNDBT DRVWY	WTHR SURF LIGHT	CRASH TYP COLL TYP SVRTY	V#	SPCL USE TRLR QTY OWNER VEH TYPE	MOVE FROM TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00818 CITY	N	N	N			02/16/2012 Thu 11A	16 0	SW TUALATIN-SHERWOOD SW WILDROSE PL	INTER CN 01	3-LEG 0	N STOP SIGN	N N N	RAIN WET DAY	ANGL-OTH TURN PDO	01	NONE 1 PRVTE SEMI TOW	STRGHT E W	01	DRVR	NONE	51	M	OTH-Y N-RES		000	000		02 00 00
															02	NONE 0 PRVTE TRUCK	TURN-L N E	01	DRVR	NONE	37	M	OR-Y OR<25		028	015 000		00 02
00102 CITY	N	N	N	N	N	01/07/2013 Mon 7A	16 0	SW TUALATIN-SHERWOOD SW WILDROSE PL	INTER CN 01	3-LEG 0	N STOP SIGN	N N N	CLD WET DAWN	ANGL-OTH TURN PDO	01	NONE 0 RENTL PSNGR CAR	TURN-L N E	01	DRVR	NONE	67	F	OR-Y OR<25		028	015 000		02 00 02
															02	NONE 0 PRVTE PSNGR CAR	STRGHT E W	01	DRVR	NONE	48	M	OH-Y OR<25		000	000 000		00 00
07658 NONE	N	N	N			12/31/2013 Tue 6A	16 0	SW TUALATIN-SHERWOOD SW WILDROSE PL	INTER CN 04	3-LEG 0	N STOP SIGN	N N N	RAIN WET DLIT	ANGL-OTH TURN INJ	01	NONE 0 PRVTE PSNGR CAR	TURN-L N E	01	DRVR	NONE	29	M	OR-Y UNK		028	000 000		02 00 02
															02	NONE 0 PRVTE PSNGR CAR	TURN-L W N	01	DRVR	INJC	29	M	OR-Y OR<25		000	000 000		00 00

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

SW Cipole Road & SW Tualatin-Sherwood Road
January 1, 2011 through December 31, 2013

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2013														
REAR-END	0	4	0	4	0	5	0	3	1	3	1	4	0	0
TURNING MOVEMENTS	0	1	0	1	0	1	0	1	0	0	1	1	0	0
2013 TOTAL	0	5	0	5	0	6	0	4	1	3	2	5	0	0
YEAR: 2012														
REAR-END	0	1	1	2	0	1	2	2	0	2	0	2	0	0
2012 TOTAL	0	1	1	2	0	1	2	2	0	2	0	2	0	0
YEAR: 2011														
REAR-END	0	2	1	3	0	3	0	3	0	3	0	3	0	0
2011 TOTAL	0	2	1	3	0	3	0	3	0	3	0	3	0	0
FINAL TOTAL	0	8	2	10	0	10	2	9	1	8	2	10	0	0

Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF SHERWOOD, WASHINGTON COUNTY

SW Cipole Road & SW Tualatin-Sherwood Road
January 1, 2011 through December 31, 2013

SER# INVEST	SPED	ALC	DRUG	SCHL	WORK	DATE DAY TIME	CLASS DIST FROM	CITY STREET FIRST STREET SECOND STREET	RD CHAR DIRECT LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL TRAF-CONTL	OFF-RD RNDBT DRVWY	WTHR SURF LIGHT	CRASH TYP COLL TYP SVRTY	V#	SPCL USE TRLR QTY OWNER VEH TYPE	MOVE FROM TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
01251	N	N	N	N	N	03/07/2011	16	SW CIPOLE RD	INTER	3-LEG	N	N	CLD	S-1STOP	01	NONE 0	STRGHT										093	32,27
CITY						Mon	0	SW TUALATIN-SHERWOOD	W		TRF SIGNAL	N	DRY	REAR		PRVTE	W E									000		00
						10A			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	68	M	OR-Y		052,016,026	038	093	32,27
																							OR<25					
															02	NONE 0	STOP											
																PRVTE	W E									011		00
																PSNGR CAR		01	DRVR	INJC	37	F	OR-Y		000	000		00
																							OR<25					
03507	N	N	N	N	N	07/05/2011	16	SW CIPOLE RD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
CITY						Tue	0	SW TUALATIN-SHERWOOD	W		TRF SIGNAL	N	DRY	REAR		PRVTE	W E									000		00
						12P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	17	F	OR-Y		043,026	000		07
																							OR>25					
															02	NONE 0	STOP											
																PRVTE	W E									011		00
																PSNGR CAR		01	DRVR	INJC	65	M	OR-Y		000	000		00
																							OR>25					
06803	N	N	N			12/01/2011	16	SW CIPOLE RD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NONE						Thu	0	SW TUALATIN-SHERWOOD	W		TRF SIGNAL	N	DRY	REAR		UNKN	W E									000		00
						3P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	F	OR-Y		026	000		07
																							OR>25					
															02	NONE 0	STOP											
																PRVTE	W E									011		00
																PSNGR CAR		01	DRVR	NONE	50	F	OR-Y		000	000		00
																							OR>25					
05125	N	N	N	N	N	09/13/2013	16	SW CIPOLE RD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										013	27,07
CITY						Fri	0	SW TUALATIN-SHERWOOD	W		TRF SIGNAL	N	DRY	REAR		PRVTE	W E									000		00
						4P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	26	M	OR-Y		016,043,026	038		27,07
																							OR<25					
															02	NONE 0	STOP											
																PRVTE	W E									011	013	00
																PSNGR CAR		01	DRVR	INJC	34	F	OR-Y		000	000		00
																							OR<25					
															03	NONE 0	STOP											
																PRVTE	W E									011	013	00
																PSNGR CAR		01	DRVR	NONE	59	M	OR-Y		000	000		00
																							OR>25					
															04	NONE 0	STOP											
																PRVTE	W E									011		00
																PSNGR CAR		01	DRVR	NONE	47	F	OR-Y		000	000		00
																							OR<25					
05542	N	N	N	N	N	09/30/2013	16	SW CIPOLE RD	INTER	3-LEG	N	N	RAIN	S-STRGHT	01	NONE 0	STRGHT											07
CITY						Mon	0	SW TUALATIN-SHERWOOD	W		NONE	N	WET	REAR		PRVTE	W E									000		00
						12P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	65	M	OTH-Y		043,042	000		07
																							N-RES					

CITY OF SHERWOOD, WASHINGTON COUNTY

SW Cipole Road & SW Tualatin-Sherwood Road
January 1, 2011 through December 31, 2013

SER# INVEST	SPED	ALC	DRUGS	SCHL	WORK	DATE DAY TIME	CLASS DIST FROM	CITY STREET FIRST STREET SECOND STREET	RD CHAR DIRECT LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL TRAF-CONTL	OFF-RD RNDBT DRVWY	WTHR SURF LIGHT	CRASH TYP COLL TYP SVRTY	V#	SPCL USE TRLR QTY OWNER VEH TYPE	HOVE FROM TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
															02	NONE 0 PRVTE PSNGR CAR	STRGHT W E	01	DRVR	INJC	42	M	OR-Y OR<25	000	000	000	00 00
06576 CITY	N	N	N	N	N	11/14/2013 Wed 6P	16 0	SW CIPOLE RD SW TUALATIN-SHERWOOD	INTER W 06	3-LEG 0	N TRF SIGNAL	N N N	CLD DRY DLIT	S-ISTOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT W E	01	DRVR	NONE	23	F	OR-Y OR<25	043,026	000	000	07 00 07
															02	NONE 0 PRVTE PSNGR CAR	STOP W E	01	DRVR	INJC	28	M	OR-Y OR<25	000	011	000	00 00

CITY OF TUALATIN, WASHINGTON COUNTY

SW Cipole Road & SW Tualatin-Sherwood Road
January 1, 2011 through December 31, 2013

SER# INVEST	SPED	ALC	DRUG	SCHL	SWOR	DATE DAY TIME	CLASS DIST FROM	CITY STREET FIRST STREET SECOND STREET	RD CHAR DIRECT LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL TRAF-CONTL	OFF-RD RNDBT DRVWY	WTHR SURF LIGHT	CRASH TYP COLL TYP SVRTY	V#	SPCL USE TRLR QTY OWNER VEH TYPE	MOVE FROM TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00194	N	N	N			01/12/2012	16	SW CIPOLE RD	INTER	3-LEG	N		N	CLR	S-STRGHT	01	NONE 1	STRGHT										07
NONE						Thu	0	SW TUALATIN-SHERWOOD	E		TRF SIGNAL		N	DRY	REAR		PRVTE	W E								000		00
						3P			05	0			N	DAY	PDO		SEMI TOW		01	DRVR	NONE	52	M	OTH-Y		000		07
																								N-RES				
																02	NONE 1	STRGHT										
																	PRVTE	W E								000		00
																	SEMI TOW		01	DRVR	NONE	52	M	OR-Y		000		00
																								OR>25				
03395	N	N	N	N	N	07/03/2012	16	SW CIPOLE RD	INTER	3-LEG	N		N	CLR	S-1STOP	01	NONE 0	STRGHT										32,27
COUNTY						Tue	0	SW TUALATIN-SHERWOOD	E		TRF SIGNAL		N	DRY	REAR		PRVTE	E W								000		00
						6P			06	0			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	18	M	OR-Y	052,016,026	038		32,27
																								OR<25				
																02	NONE 0	STOP										
																	PRVTE	E W								011		00
																	PSNGR CAR		01	DRVR	INJC	47	F	OR-Y		000		00
																								OR<25				
02582	N	N	N			05/19/2013	16	SW CIPOLE RD	INTER	3-LEG	N		N	CLR	S-1STOP	01	NONE 0	STRGHT										07
NONE						Sun	0	SW TUALATIN-SHERWOOD	E		TRF SIGNAL		N	DRY	REAR		PRVTE	E W								000		00
						1P			06	0			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	29	F	OR-Y		000		07
																								OR<25				
																02	NONE 0	STOP										
																	PRVTE	E W								011		00
																	PSNGR CAR		01	DRVR	INJC	50	F	OR-Y		000		00
																								OR<25				
03646	N	N	N	N	N	07/09/2013	16	SW CIPOLE RD	INTER	3-LEG	N		N	CLR	O-1TURN	01	NONE 0	TURN-L										04
CITY						Tue	0	SW TUALATIN-SHERWOOD	CN		TRF SIGNAL		N	DRY	TURN		PRVTE	W N								000		00
						2A			02	0			N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	18	M	OR-Y		000		00
																								OR<25				
																02	NONE 0	STRGHT										
																	PRVTE	E W								000		00
																	PSNGR CAR		01	DRVR	INJC	23	M	OR-Y		000		04
																								OR<25				

APPENDIX D

CAPACITY CALCULATIONS

HCM Unsignalized Intersection Capacity Analysis
1: SW Wildrose Place & Site Access

10/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	11	1	0	0	16	0	3	0	0	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	0	0	14	1	0	0	21	0	4	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	43	45	0	57	43	2	0			4		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	43	45	0	57	43	2	0			4		
tC, single (s)	7.1	6.5	6.5	7.1	6.5	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.5	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	100	100	99	100	100	100	99			100		
cM capacity (veh/h)	955	840	1016	923	842	1088	1597			1631		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	14	1	24	0
Volume Left	0	1	21	0
Volume Right	14	0	4	0
cSH	1016	923	1597	1700
Volume to Capacity	0.01	0.00	0.01	0.00
Queue Length 95th (ft)	1	0	1	0
Control Delay (s)	8.6	8.9	6.1	0.0
Lane LOS	A	A	A	
Approach Delay (s)	8.6	8.9	6.1	0.0
Approach LOS	A	A		

Intersection Summary			
Average Delay	7.1		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
2: SW Wildrose Place & South Site Access

10/21/2014

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	30	19	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.64	0.64	0.64	0.64	0.64	0.64
Hourly flow rate (vph)	0	0	0	47	30	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	77	30	30			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	77	30	30			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	932	1051	1596			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	47	30
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1596	1700
Volume to Capacity	0.00	0.00	0.02
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
3: SW Oregon Street & SW Tualatin Sherwood Road

10/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	701	168	136	569	10	149	1	399	8	2	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5			5.0	5.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85		0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.97	
Satd. Flow (prot)	1805	1759	1468	1687	1695			1632	1524		1798	
Flt Permitted	0.36	1.00	1.00	0.17	1.00			0.72	1.00		0.84	
Satd. Flow (perm)	687	1759	1468	294	1695			1230	1524		1563	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	762	183	148	618	11	162	1	434	9	2	2
RTOR Reduction (vph)	0	0	49	0	1	0	0	0	198	0	2	0
Lane Group Flow (vph)	3	762	134	148	628	0	0	163	236	0	11	0
Heavy Vehicles (%)	0%	8%	10%	7%	12%	0%	11%	0%	6%	0%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	37.8	37.0	37.0	46.2	41.4			13.6	13.6		14.6	
Effective Green, g (s)	37.8	37.0	37.0	46.2	41.4			13.6	13.6		14.6	
Actuated g/C Ratio	0.54	0.53	0.53	0.66	0.59			0.19	0.19		0.21	
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5			5.0	5.0		4.0	
Vehicle Extension (s)	1.0	3.5	3.5	1.0	3.5			1.0	1.0		1.0	
Lane Grp Cap (vph)	382	925	772	296	998			237	294		324	
v/s Ratio Prot	0.00	c0.43		c0.04	0.37							
v/s Ratio Perm	0.00		0.09	0.29				0.13	c0.16		0.01	
v/c Ratio	0.01	0.82	0.17	0.50	0.63			0.69	0.80		0.04	
Uniform Delay, d1	7.8	13.9	8.7	9.3	9.4			26.4	27.1		22.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.0	6.2	0.1	0.5	1.3			6.5	13.9		0.0	
Delay (s)	7.8	20.1	8.8	9.8	10.8			32.8	41.0		22.2	
Level of Service	A	C	A	A	B			C	D		C	
Approach Delay (s)		17.9			10.6			38.7			22.2	
Approach LOS		B			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	20.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	70.3	Sum of lost time (s)	14.5
Intersection Capacity Utilization	77.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	11	1097	704	20	7	11
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	12	1180	757	22	8	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)		668	1181			
pX, platoon unblocked	0.77				0.73	0.77
vC, conflicting volume	778				1971	768
vC1, stage 1 conf vol					768	
vC2, stage 2 conf vol					1203	
vCu, unblocked vol	561				1431	547
tC, single (s)	4.1				6.4	6.8
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.8
p0 queue free %	98				96	97
cM capacity (veh/h)	784				201	344

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	12	1180	778	19
Volume Left	12	0	0	8
Volume Right	0	0	22	12
cSH	784	1700	1700	270
Volume to Capacity	0.02	0.69	0.46	0.07
Queue Length 95th (ft)	1	0	0	6
Control Delay (s)	9.7	0.0	0.0	19.4
Lane LOS	A			C
Approach Delay (s)	0.1		0.0	19.4
Approach LOS				C

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	67.7%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	118	987	659	71	33	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	5.5	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1612	1776	1727	1455	1211	1482
Flt Permitted	0.30	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	504	1776	1727	1455	1211	1482
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	130	1085	724	78	36	58
RTOR Reduction (vph)	0	0	0	17	0	54
Lane Group Flow (vph)	130	1085	724	61	36	4
Heavy Vehicles (%)	12%	7%	10%	11%	49%	9%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	73.8	73.8	63.8	63.8	5.7	5.7
Effective Green, g (s)	73.8	73.8	63.8	63.8	5.7	5.7
Actuated g/C Ratio	0.82	0.82	0.71	0.71	0.06	0.06
Clearance Time (s)	4.0	5.5	5.5	5.5	5.0	5.0
Vehicle Extension (s)	2.0	5.0	5.0	5.0	1.0	1.0
Lane Grp Cap (vph)	487	1456	1224	1031	76	93
v/s Ratio Prot	0.02	c0.61	0.42		c0.03	
v/s Ratio Perm	0.20			0.04		0.00
v/c Ratio	0.27	0.75	0.59	0.06	0.47	0.04
Uniform Delay, d1	3.4	3.7	6.6	4.0	40.7	39.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	3.5	2.1	0.1	1.7	0.1
Delay (s)	3.5	7.3	8.7	4.1	42.4	39.6
Level of Service	A	A	A	A	D	D
Approach Delay (s)		6.9	8.2		40.7	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
1: SW Wildrose Place & Site Access

10/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	20	5	0	0	11	0	4	0	2	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	22	5	0	0	12	0	4	0	2	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	28	30	2	50	28	2	2			4		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	28	30	2	50	28	2	2			4		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	98	99	100	100	99			100		
cM capacity (veh/h)	976	856	1082	925	858	1082	1620			1617		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	22	5	16	2
Volume Left	0	5	12	0
Volume Right	22	0	4	0
cSH	1082	925	1620	1617
Volume to Capacity	0.02	0.01	0.01	0.00
Queue Length 95th (ft)	2	0	1	0
Control Delay (s)	8.4	8.9	5.3	0.0
Lane LOS	A	A	A	
Approach Delay (s)	8.4	8.9	5.3	0.0
Approach LOS	A	A		

Intersection Summary			
Average Delay	7.0		
Intersection Capacity Utilization	18.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
2: SW Wildrose Place & South Site Access

10/21/2014

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	17	38	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	18	41	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	60	41	41			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	60	41	41			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	947	1030	1568			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	18	41
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1568	1700
Volume to Capacity	0.00	0.00	0.02
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
3: SW Oregon Street & SW Tualatin Sherwood Road

10/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	693	187	415	770	6	186	3	227	16	4	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5			5.0	5.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			0.95	0.95		1.00	
Frt	1.00	1.00	0.85	1.00	1.00			0.98	0.85		0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.96	
Satd. Flow (prot)	1770	1863	1583	1770	1860			1663	1504		1775	
Flt Permitted	0.31	1.00	1.00	0.09	1.00			0.74	1.00		0.77	
Satd. Flow (perm)	579	1863	1583	174	1860			1285	1504		1415	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	753	203	451	837	7	202	3	247	17	4	2
RTOR Reduction (vph)	0	0	68	0	0	0	0	7	175	0	2	0
Lane Group Flow (vph)	2	753	135	451	844	0	0	230	40	0	21	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	39.9	38.9	38.9	62.5	57.5			16.6	16.6		17.6	
Effective Green, g (s)	39.9	38.9	38.9	62.5	57.5			16.6	16.6		17.6	
Actuated g/C Ratio	0.45	0.43	0.43	0.70	0.64			0.19	0.19		0.20	
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5			5.0	5.0		4.0	
Vehicle Extension (s)	1.0	3.5	3.5	1.0	3.5			1.0	1.0		1.0	
Lane Grp Cap (vph)	271	808	687	470	1193			238	278		277	
v/s Ratio Prot	0.00	0.40		c0.21	0.45							
v/s Ratio Perm	0.00		0.08	c0.46				c0.18	0.03		0.02	
v/c Ratio	0.01	0.93	0.20	0.96	0.71			0.97	0.14		0.08	
Uniform Delay, d1	13.9	24.1	15.7	27.1	10.5			36.2	30.5		29.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.0	17.5	0.2	30.7	2.0			48.7	0.1		0.0	
Delay (s)	13.9	41.6	15.8	57.8	12.5			84.9	30.6		29.4	
Level of Service	B	D	B	E	B			F	C		C	
Approach Delay (s)		36.1			28.3			59.1			29.4	
Approach LOS		D			C			E			C	

Intersection Summary			
HCM 2000 Control Delay	36.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	89.6	Sum of lost time (s)	14.5
Intersection Capacity Utilization	88.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	6	926	1161	18	22	25
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	1007	1262	20	24	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)		668	1181			
pX, platoon unblocked	0.34				0.54	0.34
vC, conflicting volume	1282				2291	1272
vC1, stage 1 conf vol					1272	
vC2, stage 2 conf vol					1020	
vCu, unblocked vol	858				1275	830
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	98				83	78
cM capacity (veh/h)	266				140	126

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	7	1007	1282	51
Volume Left	7	0	0	24
Volume Right	0	0	20	27
cSH	266	1700	1700	132
Volume to Capacity	0.02	0.59	0.75	0.39
Queue Length 95th (ft)	2	0	0	41
Control Delay (s)	18.9	0.0	0.0	48.4
Lane LOS	C			E
Approach Delay (s)	0.1		0.0	48.4
Approach LOS				E

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	53	907	1021	21	81	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	5.5	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1863	1863	1583	1770	1583
Flt Permitted	0.10	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	191	1863	1863	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	58	986	1110	23	88	180
RTOR Reduction (vph)	0	0	0	3	0	154
Lane Group Flow (vph)	58	986	1110	20	88	26
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	71.4	71.4	63.1	63.1	8.1	8.1
Effective Green, g (s)	71.4	71.4	63.1	63.1	8.1	8.1
Actuated g/C Ratio	0.79	0.79	0.70	0.70	0.09	0.09
Clearance Time (s)	4.0	5.5	5.5	5.5	5.0	5.0
Vehicle Extension (s)	2.0	5.0	5.0	5.0	1.0	1.0
Lane Grp Cap (vph)	226	1477	1306	1109	159	142
v/s Ratio Prot	0.01	c0.53	c0.60		c0.05	
v/s Ratio Perm	0.19			0.01		0.02
v/c Ratio	0.26	0.67	0.85	0.02	0.55	0.18
Uniform Delay, d1	12.9	4.1	9.9	4.1	39.2	37.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	2.4	7.1	0.0	2.4	0.2
Delay (s)	13.2	6.5	17.0	4.1	41.6	38.1
Level of Service	B	A	B	A	D	D
Approach Delay (s)		6.9	16.8		39.3	
Approach LOS		A	B		D	

Intersection Summary			
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1: SW Wildrose Place & Site Access

10/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	11	1	0	0	16	0	3	0	0	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	0	0	14	1	0	0	21	0	4	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	43	45	0	57	43	2	0			4		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	43	45	0	57	43	2	0			4		
tC, single (s)	7.1	6.5	6.5	7.1	6.5	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.5	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	100	100	99	100	100	100	99			100		
cM capacity (veh/h)	955	840	1016	923	842	1088	1597			1631		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	14	1	24	0
Volume Left	0	1	21	0
Volume Right	14	0	4	0
cSH	1016	923	1597	1700
Volume to Capacity	0.01	0.00	0.01	0.00
Queue Length 95th (ft)	1	0	1	0
Control Delay (s)	8.6	8.9	6.1	0.0
Lane LOS	A	A	A	
Approach Delay (s)	8.6	8.9	6.1	0.0
Approach LOS	A	A		

Intersection Summary			
Average Delay	7.1		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
2: SW Wildrose Place & South Site Access

10/21/2014

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	30	19	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.64	0.64	0.64	0.64	0.64	0.64
Hourly flow rate (vph)	0	0	0	47	30	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	77	30	30			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	77	30	30			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	932	1051	1596			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	47	30
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1596	1700
Volume to Capacity	0.00	0.00	0.02
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
3: SW Oregon Street & SW Tualatin Sherwood Road

10/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	722	173	140	586	10	153	1	411	8	2	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5			5.0	5.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85		0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.97	
Satd. Flow (prot)	1805	1759	1468	1687	1695			1632	1524		1798	
Flt Permitted	0.34	1.00	1.00	0.15	1.00			0.72	1.00		0.84	
Satd. Flow (perm)	647	1759	1468	264	1695			1230	1524		1569	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	785	188	152	637	11	166	1	447	9	2	2
RTOR Reduction (vph)	0	0	49	0	0	0	0	0	189	0	2	0
Lane Group Flow (vph)	3	785	139	152	648	0	0	167	258	0	11	0
Heavy Vehicles (%)	0%	8%	10%	7%	12%	0%	11%	0%	6%	0%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	39.0	38.1	38.1	47.3	42.4			14.7	14.7		15.7	
Effective Green, g (s)	39.0	38.1	38.1	47.3	42.4			14.7	14.7		15.7	
Actuated g/C Ratio	0.54	0.53	0.53	0.65	0.58			0.20	0.20		0.22	
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5			5.0	5.0		4.0	
Vehicle Extension (s)	1.0	3.5	3.5	1.0	3.5			1.0	1.0		1.0	
Lane Grp Cap (vph)	362	924	771	274	991			249	309		339	
v/s Ratio Prot	0.00	c0.45		c0.04	0.38							
v/s Ratio Perm	0.00		0.09	0.32				0.14	c0.17		0.01	
v/c Ratio	0.01	0.85	0.18	0.55	0.65			0.67	0.84		0.03	
Uniform Delay, d1	8.1	14.7	9.0	10.5	10.1			26.7	27.7		22.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.0	7.6	0.1	1.4	1.6			5.5	16.7		0.0	
Delay (s)	8.1	22.3	9.1	11.9	11.7			32.1	44.4		22.4	
Level of Service	A	C	A	B	B			C	D		C	
Approach Delay (s)		19.7			11.8			41.1			22.4	
Approach LOS		B			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	72.5	Sum of lost time (s)	14.5
Intersection Capacity Utilization	79.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	11	1130	725	20	7	11
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	12	1215	780	22	8	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)		668	1181			
pX, platoon unblocked	0.70				0.74	0.70
vC, conflicting volume	801				2029	790
vC1, stage 1 conf vol					790	
vC2, stage 2 conf vol					1239	
vCu, unblocked vol	499				1298	483
tC, single (s)	4.1				6.4	6.8
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.8
p0 queue free %	98				96	97
cM capacity (veh/h)	751				189	341

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	12	1215	801	19
Volume Left	12	0	0	8
Volume Right	0	0	22	12
cSH	751	1700	1700	260
Volume to Capacity	0.02	0.71	0.47	0.07
Queue Length 95th (ft)	1	0	0	6
Control Delay (s)	9.9	0.0	0.0	20.0
Lane LOS	A			C
Approach Delay (s)	0.1		0.0	20.0
Approach LOS				C

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	122	1017	679	73	34	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	5.5	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1612	1776	1727	1455	1211	1482
Flt Permitted	0.26	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	437	1776	1727	1455	1211	1482
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	134	1118	746	80	37	60
RTOR Reduction (vph)	0	0	0	21	0	56
Lane Group Flow (vph)	134	1118	746	59	37	4
Heavy Vehicles (%)	12%	7%	10%	11%	49%	9%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	53.8	53.8	44.7	44.7	5.0	5.0
Effective Green, g (s)	53.8	53.8	44.7	44.7	5.0	5.0
Actuated g/C Ratio	0.78	0.78	0.65	0.65	0.07	0.07
Clearance Time (s)	4.0	5.5	5.5	5.5	5.0	5.0
Vehicle Extension (s)	2.0	5.0	5.0	5.0	1.0	1.0
Lane Grp Cap (vph)	425	1378	1113	938	87	106
v/s Ratio Prot	0.02	c0.63	0.43		c0.03	
v/s Ratio Perm	0.22			0.04		0.00
v/c Ratio	0.32	0.81	0.67	0.06	0.43	0.04
Uniform Delay, d1	4.2	4.7	7.7	4.6	30.8	29.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	4.2	2.1	0.1	1.2	0.1
Delay (s)	4.3	8.9	9.8	4.6	32.0	30.0
Level of Service	A	A	A	A	C	C
Approach Delay (s)		8.4	9.3		30.7	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	69.3	Sum of lost time (s)	14.5
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
1: SW Wildrose Place & Site Access

10/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	20	5	0	0	11	0	4	0	2	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	0	0	27	7	0	0	15	0	5	0	3	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	35	37	3	61	35	3	3			5		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	35	37	3	61	35	3	3			5		
tC, single (s)	7.1	6.5	6.4	7.1	6.5	6.2	4.4			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.0	3.3	2.4			2.2		
p0 queue free %	100	100	97	99	100	100	99			100		
cM capacity (veh/h)	969	850	1044	908	853	1087	1470			1629		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	27	7	20	3
Volume Left	0	7	15	0
Volume Right	27	0	5	0
cSH	1044	908	1470	1629
Volume to Capacity	0.03	0.01	0.01	0.00
Queue Length 95th (ft)	2	1	1	0
Control Delay (s)	8.5	9.0	5.5	0.0
Lane LOS	A	A	A	
Approach Delay (s)	8.5	9.0	5.5	0.0
Approach LOS	A	A		

Intersection Summary			
Average Delay	7.1		
Intersection Capacity Utilization	18.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
2: SW Wildrose Place & South Site Access

10/21/2014

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	17	38	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69
Hourly flow rate (vph)	0	0	0	25	55	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	80	55	55			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	80	55	55			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	928	1017	1563			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	25	55
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1563	1700
Volume to Capacity	0.00	0.00	0.03
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
3: SW Oregon Street & SW Tualatin Sherwood Road

10/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	714	193	427	793	6	192	3	234	16	4	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5			5.0	5.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85		0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.96	
Satd. Flow (prot)	1805	1827	1482	1770	1843			1694	1524		1734	
Flt Permitted	0.32	1.00	1.00	0.10	1.00			0.71	1.00		0.78	
Satd. Flow (perm)	615	1827	1482	178	1843			1266	1524		1401	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2	752	203	449	835	6	202	3	246	17	4	2
RTOR Reduction (vph)	0	0	66	0	0	0	0	0	205	0	2	0
Lane Group Flow (vph)	2	752	137	449	841	0	0	205	41	0	21	0
Heavy Vehicles (%)	0%	4%	9%	2%	3%	0%	7%	0%	6%	6%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	41.9	40.9	40.9	64.2	59.2			15.1	15.1		16.1	
Effective Green, g (s)	41.9	40.9	40.9	64.2	59.2			15.1	15.1		16.1	
Actuated g/C Ratio	0.47	0.46	0.46	0.71	0.66			0.17	0.17		0.18	
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5			5.0	5.0		4.0	
Vehicle Extension (s)	1.0	3.5	3.5	1.0	3.5			1.0	1.0		1.0	
Lane Grp Cap (vph)	300	832	674	469	1214			212	256		251	
v/s Ratio Prot	0.00	0.41		c0.21	0.46							
v/s Ratio Perm	0.00		0.09	c0.48				c0.16	0.03		0.02	
v/c Ratio	0.01	0.90	0.20	0.96	0.69			0.97	0.16		0.09	
Uniform Delay, d1	12.8	22.6	14.7	26.7	9.6			37.1	31.9		30.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.0	13.4	0.2	30.4	1.8			51.6	0.1		0.1	
Delay (s)	12.8	36.0	14.9	57.1	11.4			88.7	32.0		30.8	
Level of Service	B	D	B	E	B			F	C		C	
Approach Delay (s)		31.5			27.3			57.8			30.8	
Approach LOS		C			C			E			C	

Intersection Summary			
HCM 2000 Control Delay	33.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	89.8	Sum of lost time (s)	14.5
Intersection Capacity Utilization	86.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
4: SW Tualatin Sherwood Road & SW Wildrose Place

10/21/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	6	954	1196	18	22	25
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	1037	1300	20	24	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)		668	1181			
pX, platoon unblocked	0.34				0.54	0.34
vC, conflicting volume	1320				2360	1310
vC1, stage 1 conf vol					1310	
vC2, stage 2 conf vol					1050	
vCu, unblocked vol	973				1406	944
tC, single (s)	4.1				6.4	6.4
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.4
p0 queue free %	97				80	73
cM capacity (veh/h)	245				123	102

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	7	1037	1320	51
Volume Left	7	0	0	24
Volume Right	0	0	20	27
cSH	245	1700	1700	111
Volume to Capacity	0.03	0.61	0.78	0.46
Queue Length 95th (ft)	2	0	0	50
Control Delay (s)	20.1	0.0	0.0	62.5
Lane LOS	C			F
Approach Delay (s)	0.1		0.0	62.5
Approach LOS				F

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	55	934	1052	22	83	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	5.5	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1656	1827	1845	1417	1626	1553
Flt Permitted	0.08	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	133	1827	1845	1417	1626	1553
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	60	1026	1156	24	91	188
RTOR Reduction (vph)	0	0	0	3	0	148
Lane Group Flow (vph)	60	1026	1156	21	91	40
Heavy Vehicles (%)	9%	4%	3%	14%	11%	4%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	70.5	70.5	62.5	62.5	8.5	8.5
Effective Green, g (s)	70.5	70.5	62.5	62.5	8.5	8.5
Actuated g/C Ratio	0.79	0.79	0.70	0.70	0.09	0.09
Clearance Time (s)	4.0	5.5	5.5	5.5	5.0	5.0
Vehicle Extension (s)	2.0	5.0	5.0	5.0	1.0	1.0
Lane Grp Cap (vph)	172	1439	1288	989	154	147
v/s Ratio Prot	0.02	c0.56	c0.63		c0.06	
v/s Ratio Perm	0.26			0.01		0.03
v/c Ratio	0.35	0.71	0.90	0.02	0.59	0.28
Uniform Delay, d1	16.3	4.6	10.9	4.1	38.8	37.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	2.1	9.1	0.0	4.0	0.4
Delay (s)	16.7	6.7	20.0	4.2	42.8	38.0
Level of Service	B	A	B	A	D	D
Approach Delay (s)		7.3	19.7		39.6	
Approach LOS		A	B		D	

Intersection Summary			
HCM 2000 Control Delay	16.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	89.5	Sum of lost time (s)	14.5
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
1: SW Wildrose Place & Site Access

10/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	13	1	0	0	30	4	3	0	0	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	0	0	17	1	0	0	38	5	4	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	84	86	0	101	84	7	0			9		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	84	86	0	101	84	7	0			9		
tC, single (s)	7.1	6.5	6.5	7.1	6.5	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.5	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	100	100	98	100	100	100	98			100		
cM capacity (veh/h)	891	789	1016	855	791	1081	1597			1624		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	17	1	47	0
Volume Left	0	1	38	0
Volume Right	17	0	4	0
cSH	1016	855	1597	1700
Volume to Capacity	0.02	0.00	0.02	0.00
Queue Length 95th (ft)	1	0	2	0
Control Delay (s)	8.6	9.2	6.0	0.0
Lane LOS	A	A	A	
Approach Delay (s)	8.6	9.2	6.0	0.0
Approach LOS	A	A		

Intersection Summary			
Average Delay	6.7		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
2: SW Wildrose Place & South Site Access

10/21/2014

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	2	9	48	21	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.64	0.64	0.64	0.64	0.64	0.64
Hourly flow rate (vph)	0	3	14	75	33	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	136	33	33			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	136	33	33			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	99			
cM capacity (veh/h)	855	1047	1592			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	3	89	33
Volume Left	0	14	0
Volume Right	3	0	0
cSH	1047	1592	1700
Volume to Capacity	0.00	0.01	0.02
Queue Length 95th (ft)	0	1	0
Control Delay (s)	8.5	1.2	0.0
Lane LOS	A	A	
Approach Delay (s)	8.5	1.2	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	19.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
3: SW Oregon Street & SW Tualatin Sherwood Road

10/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	727	173	141	587	10	153	1	415	8	2	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5			5.0	5.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85		0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.97	
Satd. Flow (prot)	1805	1759	1468	1687	1695			1632	1524		1798	
Flt Permitted	0.34	1.00	1.00	0.15	1.00			0.72	1.00		0.84	
Satd. Flow (perm)	643	1759	1468	258	1695			1230	1524		1571	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	790	188	153	638	11	166	1	451	9	2	2
RTOR Reduction (vph)	0	0	49	0	0	0	0	0	188	0	2	0
Lane Group Flow (vph)	3	790	139	153	649	0	0	167	263	0	11	0
Heavy Vehicles (%)	0%	8%	10%	7%	12%	0%	11%	0%	6%	0%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	39.4	38.5	38.5	47.7	42.8			15.0	15.0		16.0	
Effective Green, g (s)	39.4	38.5	38.5	47.7	42.8			15.0	15.0		16.0	
Actuated g/C Ratio	0.54	0.53	0.53	0.65	0.58			0.20	0.20		0.22	
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5			5.0	5.0		4.0	
Vehicle Extension (s)	1.0	3.5	3.5	1.0	3.5			1.0	1.0		1.0	
Lane Grp Cap (vph)	360	925	772	269	991			252	312		343	
v/s Ratio Prot	0.00	c0.45		c0.04	0.38							
v/s Ratio Perm	0.00		0.09	0.33				0.14	c0.17		0.01	
v/c Ratio	0.01	0.85	0.18	0.57	0.65			0.66	0.84		0.03	
Uniform Delay, d1	8.2	14.9	9.1	10.8	10.2			26.8	28.0		22.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.0	7.9	0.1	1.6	1.6			5.0	17.8		0.0	
Delay (s)	8.2	22.9	9.2	12.4	11.9			31.8	45.7		22.5	
Level of Service	A	C	A	B	B			C	D		C	
Approach Delay (s)		20.2			12.0			42.0			22.5	
Approach LOS		C			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	23.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	73.2	Sum of lost time (s)	14.5
Intersection Capacity Utilization	80.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	20	1130	725	38	9	13
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	22	1215	780	41	10	14
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)		668	1181			
pX, platoon unblocked	0.68				0.75	0.68
vC, conflicting volume	820				2058	800
vC1, stage 1 conf vol					800	
vC2, stage 2 conf vol					1258	
vCu, unblocked vol	504				1290	474
tC, single (s)	4.1				6.4	6.8
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.8
p0 queue free %	97				95	96
cM capacity (veh/h)	731				180	338

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	22	1215	820	24
Volume Left	22	0	0	10
Volume Right	0	0	41	14
cSH	731	1700	1700	249
Volume to Capacity	0.03	0.71	0.48	0.10
Queue Length 95th (ft)	2	0	0	8
Control Delay (s)	10.1	0.0	0.0	21.0
Lane LOS	B			C
Approach Delay (s)	0.2		0.0	21.0
Approach LOS				C

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	122	1019	696	73	34	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	5.5	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1612	1776	1727	1455	1211	1482
Flt Permitted	0.25	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	419	1776	1727	1455	1211	1482
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	134	1120	765	80	37	62
RTOR Reduction (vph)	0	0	0	20	0	58
Lane Group Flow (vph)	134	1120	765	60	37	4
Heavy Vehicles (%)	12%	7%	10%	11%	49%	9%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	53.9	53.9	44.8	44.8	5.0	5.0
Effective Green, g (s)	53.9	53.9	44.8	44.8	5.0	5.0
Actuated g/C Ratio	0.78	0.78	0.65	0.65	0.07	0.07
Clearance Time (s)	4.0	5.5	5.5	5.5	5.0	5.0
Vehicle Extension (s)	2.0	5.0	5.0	5.0	1.0	1.0
Lane Grp Cap (vph)	413	1379	1114	939	87	106
v/s Ratio Prot	0.02	c0.63	0.44		c0.03	
v/s Ratio Perm	0.23			0.04		0.00
v/c Ratio	0.32	0.81	0.69	0.06	0.43	0.04
Uniform Delay, d1	4.4	4.7	7.8	4.5	30.8	30.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	4.3	2.3	0.1	1.2	0.1
Delay (s)	4.6	8.9	10.1	4.6	32.0	30.0
Level of Service	A	A	B	A	C	C
Approach Delay (s)		8.5	9.6		30.8	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	69.4	Sum of lost time (s)	14.5
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
1: SW Wildrose Place & Site Access

10/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	46	5	0	0	24	4	4	0	10	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	0	0	61	7	0	0	32	5	5	0	13	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	85	88	13	147	85	8	13			11		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	85	88	13	147	85	8	13			11		
tC, single (s)	7.1	6.5	6.4	7.1	6.5	6.2	4.4			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.0	3.3	2.4			2.2		
p0 queue free %	100	100	94	99	100	100	98			100		
cM capacity (veh/h)	891	788	1030	764	791	1080	1457			1622		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	61	7	43	13
Volume Left	0	7	32	0
Volume Right	61	0	5	0
cSH	1030	764	1457	1622
Volume to Capacity	0.06	0.01	0.02	0.00
Queue Length 95th (ft)	5	1	2	0
Control Delay (s)	8.7	9.8	5.7	0.0
Lane LOS	A	A	A	
Approach Delay (s)	8.7	9.8	5.7	0.0
Approach LOS	A	A		

Intersection Summary			
Average Delay	6.8		
Intersection Capacity Utilization	19.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
2: SW Wildrose Place & South Site Access

10/21/2014

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	18	9	35	72	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69
Hourly flow rate (vph)	0	26	13	51	104	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	181	104	104			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	181	104	104			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	97	99			
cM capacity (veh/h)	806	956	1500			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	26	64	104
Volume Left	0	13	0
Volume Right	26	0	0
cSH	956	1500	1700
Volume to Capacity	0.03	0.01	0.06
Queue Length 95th (ft)	2	1	0
Control Delay (s)	8.9	1.6	0.0
Lane LOS	A	A	
Approach Delay (s)	8.9	1.6	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	19.0%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
3: SW Oregon Street & SW Tualatin Sherwood Road

10/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	719	193	435	803	6	192	3	238	16	4	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5			5.0	5.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85		0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.96	
Satd. Flow (prot)	1805	1827	1482	1770	1843			1694	1524		1734	
Flt Permitted	0.32	1.00	1.00	0.09	1.00			0.71	1.00		0.78	
Satd. Flow (perm)	610	1827	1482	174	1843			1266	1524		1403	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2	757	203	458	845	6	202	3	251	17	4	2
RTOR Reduction (vph)	0	0	68	0	0	0	0	0	208	0	2	0
Lane Group Flow (vph)	2	757	135	458	851	0	0	205	43	0	21	0
Heavy Vehicles (%)	0%	4%	9%	2%	3%	0%	7%	0%	6%	6%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	39.7	38.8	38.8	62.7	57.8			15.1	15.1		16.1	
Effective Green, g (s)	39.7	38.8	38.8	62.7	57.8			15.1	15.1		16.1	
Actuated g/C Ratio	0.45	0.44	0.44	0.71	0.65			0.17	0.17		0.18	
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5			5.0	5.0		4.0	
Vehicle Extension (s)	1.0	3.5	3.5	1.0	3.5			1.0	1.0		1.0	
Lane Grp Cap (vph)	286	802	651	483	1206			216	260		255	
v/s Ratio Prot	0.00	0.41		c0.21	0.46							
v/s Ratio Perm	0.00		0.09	c0.46				c0.16	0.03		0.02	
v/c Ratio	0.01	0.94	0.21	0.95	0.71			0.95	0.17		0.08	
Uniform Delay, d1	13.4	23.7	15.3	26.4	9.8			36.2	31.2		30.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.0	19.5	0.2	27.8	2.0			46.0	0.1		0.1	
Delay (s)	13.4	43.2	15.5	54.2	11.8			82.3	31.3		30.0	
Level of Service	B	D	B	D	B			F	C		C	
Approach Delay (s)		37.3			26.6			54.2			30.0	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	34.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	88.3	Sum of lost time (s)	14.5
Intersection Capacity Utilization	87.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	15	954	1196	36	56	43
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	1037	1300	39	61	47
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)		668	1181			
pX, platoon unblocked	0.32				0.53	0.32
vC, conflicting volume	1339				2389	1320
vC1, stage 1 conf vol					1320	
vC2, stage 2 conf vol					1070	
vCu, unblocked vol	998				1429	936
tC, single (s)	4.1				6.4	6.4
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.4
p0 queue free %	93				47	52
cM capacity (veh/h)	225				115	97

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	16	1037	1339	108
Volume Left	16	0	0	61
Volume Right	0	0	39	47
cSH	225	1700	1700	106
Volume to Capacity	0.07	0.61	0.79	1.01
Queue Length 95th (ft)	6	0	0	161
Control Delay (s)	22.3	0.0	0.0	165.8
Lane LOS	C			F
Approach Delay (s)	0.3		0.0	165.8
Approach LOS				F

Intersection Summary			
Average Delay	7.3		
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	58	965	1069	22	83	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	5.5	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1656	1827	1845	1417	1626	1553
Flt Permitted	0.08	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	143	1827	1845	1417	1626	1553
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	64	1060	1175	24	91	189
RTOR Reduction (vph)	0	0	0	3	0	147
Lane Group Flow (vph)	64	1060	1175	21	91	42
Heavy Vehicles (%)	9%	4%	3%	14%	11%	4%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	76.9	76.9	69.1	69.1	8.9	8.9
Effective Green, g (s)	76.9	76.9	69.1	69.1	8.9	8.9
Actuated g/C Ratio	0.80	0.80	0.72	0.72	0.09	0.09
Clearance Time (s)	4.0	5.5	5.5	5.5	5.0	5.0
Vehicle Extension (s)	2.0	5.0	5.0	5.0	1.0	1.0
Lane Grp Cap (vph)	173	1458	1323	1016	150	143
v/s Ratio Prot	0.01	c0.58	c0.64		c0.06	
v/s Ratio Perm	0.28			0.01		0.03
v/c Ratio	0.37	0.73	0.89	0.02	0.61	0.29
Uniform Delay, d1	17.0	4.7	10.6	3.9	42.0	40.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	2.3	8.1	0.0	4.7	0.4
Delay (s)	17.5	6.9	18.7	3.9	46.7	41.2
Level of Service	B	A	B	A	D	D
Approach Delay (s)		7.5	18.4		43.0	
Approach LOS		A	B		D	

Intersection Summary			
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	96.3	Sum of lost time (s)	14.5
Intersection Capacity Utilization	75.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX E

MITIGATED CAPACITY CALCULATIONS

HCM Unsignalized Intersection Capacity Analysis
4: SW Tualatin Sherwood Road & SW Wildrose Place

10/21/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	15	954	1196	36	56	43
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	1037	1300	39	61	47
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)		668	1181			
pX, platoon unblocked	0.32				0.53	0.32
vC, conflicting volume	1339				2389	1320
vC1, stage 1 conf vol					1320	
vC2, stage 2 conf vol					1070	
vCu, unblocked vol	998				1429	936
tC, single (s)	4.1				6.4	6.4
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.4
p0 queue free %	93				47	52
cM capacity (veh/h)	225				115	97

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	16	1037	1339	61	47
Volume Left	16	0	0	61	0
Volume Right	0	0	39	0	47
cSH	225	1700	1700	115	97
Volume to Capacity	0.07	0.61	0.79	0.53	0.48
Queue Length 95th (ft)	6	0	0	62	52
Control Delay (s)	22.3	0.0	0.0	67.1	72.8
Lane LOS	C			F	F
Approach Delay (s)	0.3		0.0	69.6	
Approach LOS				F	

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	75.1%	ICU Level of Service	D
Analysis Period (min)	15		

APPENDIX F

QUEUING CALCULATIONS

Queues
3: SW Oregon Street & SW Tualatin Sherwood Road

10/20/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	3	762	183	148	629	163	434	13
v/c Ratio	0.01	0.87	0.23	0.50	0.60	0.66	0.86	0.04
Control Delay	5.7	29.0	6.0	12.0	13.6	38.9	30.1	19.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.7	29.0	6.0	12.0	13.6	38.9	30.1	19.9
Queue Length 50th (ft)	0	260	16	20	130	68	81	4
Queue Length 95th (ft)	4	#567	55	#53	386	127	#195	17
Internal Link Dist (ft)		813			588	830		92
Turn Bay Length (ft)	150		100	260				
Base Capacity (vph)	496	1042	912	298	1091	416	678	554
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.73	0.20	0.50	0.58	0.39	0.64	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
5: SW Tualatin Sherwood Road & SW Cipole Road

10/20/2014

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	130	1085	724	78	36	58
v/c Ratio	0.26	0.72	0.58	0.07	0.40	0.35
Control Delay	2.9	8.0	9.6	2.3	52.1	17.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.9	8.0	9.6	2.3	52.1	17.0
Queue Length 50th (ft)	9	206	177	3	20	0
Queue Length 95th (ft)	23	464	341	18	49	35
Internal Link Dist (ft)		1101	1089		1092	
Turn Bay Length (ft)	365			125	175	
Base Capacity (vph)	501	1497	1243	1064	269	374
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.72	0.58	0.07	0.13	0.16

Intersection Summary

Queues
3: SW Oregon Street & SW Tualatin Sherwood Road

10/20/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	2	753	203	451	844	237	215	23
v/c Ratio	0.01	0.98	0.28	0.93	0.68	0.93	0.46	0.08
Control Delay	6.5	56.1	9.0	50.7	13.2	78.5	8.4	28.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.5	56.1	9.0	50.7	13.2	78.5	8.4	28.3
Queue Length 50th (ft)	0	~437	29	191	230	136	0	10
Queue Length 95th (ft)	2	#677	76	#358	489	#291	62	31
Internal Link Dist (ft)		813			588	830		92
Turn Bay Length (ft)	150		100	260				
Base Capacity (vph)	351	768	723	548	1247	260	469	297
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.98	0.28	0.82	0.68	0.91	0.46	0.08

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
5: SW Tualatin Sherwood Road & SW Cipole Road

10/20/2014

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	58	986	1110	23	88	180
v/c Ratio	0.24	0.67	0.84	0.02	0.55	0.61
Control Delay	4.3	7.3	18.9	3.8	51.8	16.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.3	7.3	18.9	3.8	51.8	16.7
Queue Length 50th (ft)	5	181	409	2	49	6
Queue Length 95th (ft)	14	367	#853	10	93	65
Internal Link Dist (ft)		1101	1089		1092	
Turn Bay Length (ft)	365			125	175	
Base Capacity (vph)	246	1478	1323	1127	393	483
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.67	0.84	0.02	0.22	0.37

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
3: SW Oregon Street & SW Tualatin Sherwood Road

10/20/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	3	785	188	152	648	167	447	13
v/c Ratio	0.01	0.90	0.24	0.55	0.63	0.64	0.88	0.04
Control Delay	6.0	32.3	6.3	15.4	14.7	37.6	32.5	19.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.0	32.3	6.3	15.4	14.7	37.6	32.5	19.7
Queue Length 50th (ft)	1	291	18	22	149	70	93	4
Queue Length 95th (ft)	4	#593	57	#64	#429	131	#240	17
Internal Link Dist (ft)		813			588	830		92
Turn Bay Length (ft)	150		100	260				
Base Capacity (vph)	470	1006	884	276	1073	401	657	537
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.78	0.21	0.55	0.60	0.42	0.68	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
5: SW Tualatin Sherwood Road & SW Cipole Road

10/20/2014

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	134	1118	746	80	37	60
v/c Ratio	0.30	0.78	0.66	0.08	0.33	0.31
Control Delay	3.7	10.6	11.6	2.4	40.4	14.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.7	10.6	11.6	2.4	40.4	14.4
Queue Length 50th (ft)	9	215	175	3	16	0
Queue Length 95th (ft)	23	#517	326	17	46	33
Internal Link Dist (ft)		1101	1089		1092	
Turn Bay Length (ft)	365			125	175	
Base Capacity (vph)	442	1532	1310	1118	363	487
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.73	0.57	0.07	0.10	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles

Queues

3: SW Oregon Street & SW Tualatin Sherwood Road

10/20/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	2	752	203	449	841	205	246	23
v/c Ratio	0.01	0.95	0.29	0.93	0.67	0.93	0.53	0.09
Control Delay	5.5	46.7	8.0	50.5	11.8	84.1	9.2	30.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.5	46.7	8.0	50.5	11.8	84.1	9.2	30.1
Queue Length 50th (ft)	0	395	27	188	209	117	0	10
Queue Length 95th (ft)	2	#636	70	#366	461	#255	64	32
Internal Link Dist (ft)		813			588	830		92
Turn Bay Length (ft)	150		100	260				
Base Capacity (vph)	446	838	745	517	1281	221	468	261
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.90	0.27	0.87	0.66	0.93	0.53	0.09

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
5: SW Tualatin Sherwood Road & SW Cipole Road

10/20/2014

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	60	1026	1156	24	91	188
v/c Ratio	0.31	0.71	0.89	0.02	0.59	0.64
Control Delay	6.5	8.8	22.9	3.8	53.6	19.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.5	8.8	22.9	3.8	53.6	19.4
Queue Length 50th (ft)	5	209	469	2	50	13
Queue Length 95th (ft)	15	440	#928	11	98	76
Internal Link Dist (ft)		1101	1089		1092	
Turn Bay Length (ft)	365			125	175	
Base Capacity (vph)	191	1435	1300	1002	367	476
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.71	0.89	0.02	0.25	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
3: SW Oregon Street & SW Tualatin Sherwood Road

10/20/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	3	790	188	153	649	167	451	13
v/c Ratio	0.01	0.90	0.24	0.56	0.63	0.64	0.88	0.04
Control Delay	6.0	32.9	6.4	16.2	14.9	37.3	33.3	19.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.0	32.9	6.4	16.2	14.9	37.3	33.3	19.6
Queue Length 50th (ft)	1	298	19	23	153	70	96	4
Queue Length 95th (ft)	4	#599	58	#67	#432	131	#246	17
Internal Link Dist (ft)		813			588	830		92
Turn Bay Length (ft)	150		100	260				
Base Capacity (vph)	469	996	875	272	1067	398	652	533
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.79	0.21	0.56	0.61	0.42	0.69	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles

Queues
5: SW Tualatin Sherwood Road & SW Cipole Road

10/20/2014

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	134	1120	765	80	37	62
v/c Ratio	0.31	0.78	0.68	0.08	0.33	0.32
Control Delay	3.8	10.6	12.0	2.5	40.5	14.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.8	10.6	12.0	2.5	40.5	14.3
Queue Length 50th (ft)	9	216	184	3	16	0
Queue Length 95th (ft)	23	#526	342	18	46	34
Internal Link Dist (ft)		1101	1089		1092	
Turn Bay Length (ft)	365			125	175	
Base Capacity (vph)	429	1528	1310	1118	363	488
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.73	0.58	0.07	0.10	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
3: SW Oregon Street & SW Tualatin Sherwood Road

10/20/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	2	757	203	458	851	205	251	23
v/c Ratio	0.01	0.99	0.29	0.92	0.68	0.92	0.53	0.09
Control Delay	6.5	58.0	9.0	47.4	12.2	80.5	9.1	29.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.5	58.0	9.0	47.4	12.2	80.5	9.1	29.7
Queue Length 50th (ft)	0	~415	27	187	214	112	0	10
Queue Length 95th (ft)	2	#692	77	#344	473	#255	64	32
Internal Link Dist (ft)		813			588	830		92
Turn Bay Length (ft)	150		100	260				
Base Capacity (vph)	372	764	690	594	1273	224	476	266
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.99	0.29	0.77	0.67	0.92	0.53	0.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
5: SW Tualatin Sherwood Road & SW Cipole Road

10/20/2014

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	64	1060	1175	24	91	189
v/c Ratio	0.33	0.73	0.88	0.02	0.60	0.65
Control Delay	6.6	9.0	21.5	3.5	59.7	21.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.6	9.0	21.5	3.5	59.7	21.2
Queue Length 50th (ft)	6	236	505	2	56	16
Queue Length 95th (ft)	16	484	#1008	11	108	84
Internal Link Dist (ft)		1101	1089		1092	
Turn Bay Length (ft)	365			125	175	
Base Capacity (vph)	195	1526	1376	1060	343	456
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.69	0.85	0.02	0.27	0.41

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles

Exhibit J-a

Additional Information to Trip Analysis (By Others)

MACKENZIE.

DESIGN DRIVEN | CLIENT FOCUSED

November 20, 2014

City of Sherwood
Attention: Bob Galati
22560 SW Pine Street
Sherwood, OR 97140

Re: **LAM Wildrose Industrial Park**
TIA Incompleteness Response
Project Number 2140370.00

Dear Mr. Galati:

This letter has been prepared to address comments provided in a memorandum dated November 13, 2014, from DKS regarding the completeness of the TIA prepared for the LAM Wildrose Industrial Park (SP 14-03 20551). Our responses to each item are detailed below.

- *Page 1 - The new purpose of the site is not clearly identified. Clearly define and clarify the intended use of the site and general activity.*

Response: The building will be used for warehousing and light assembly and will support the existing LAM facility on Leveton Drive in Tualatin.

- *Page 5 – Trip Generation section needs additional clarification to address the following:*
  - *Provide citation for the source of 'expected' Trip Generation. Provide data/information supporting the use of 'expected' Trip Generation instead of typical ITE rate. If a non-ITE rate is used, information shall be provided that is relevant to trip generation assumptions (including but not limited to: a description of site users, employee shift patterns, expected site activities, etc.). This description should described and quantify all types of anticipated site traffic, including employee vehicles, site visitors/customers, and delivery vehicles.*

  Response: Expected site activity was provided by LAM research and presented in table 3 of the original TIA. This table outlines employee patterns, deliveries, and types of vehicles visiting the site. This table was presented in an email dated September 29, 2014, and approved by Bob Galati with the City of Sherwood in an email dated October 15, 2014. This email correspondence is attached.

  - *If a comparison of 'expected' Trip Generation and ITE Trip Generation is included for ADT (as provided), also provide a summary of the AM and PM peak hours in addition to the ADT comparison. If no such comparison is provided, state why typical ITE rates are not appropriate for comparison.*

  Response: The following table presents the comparison of ADT and AM and PM peak hour trips for land uses similar to LAM Wildrose Industrial Park. As shown, the ADT is consistent with other land uses. The AM peak hour

expected trip generation is lower, and the PM peak hour expected trip generation is greater, than similar land uses. This is due to the expected employee shift changes for the LAM development.

TRIP GENERATION COMPARISON (125 EMPLOYEES)			
Land Use	ADT	AM	PM
LAM Wildrose Trip Generation	416	39	89
General Light Industrial (ITE 110)	378	55	53
Industrial Park (ITE 130)	418	59	58
Manufacturing (ITE 140)	266	50	45
Warehousing (ITE 150)	486	64	74

- *Determine and document existing site trips from existing traffic counts and compare with the prior reference Kittleson TIA. Net new trips shall be based on a comparison to actual existing trips rather than the theoretical increase from the prior TIA so that total driveway and intersection trips are included.*

Response: As shown in the October 21, 2014, TIA, the Kittelson TIA expected 39 ADT, 4 AM, and 5 PM peak hour trips. The counts collected on October 14, 2014, indicate 27 AM and 31 PM peak hour trips at the site driveway. These site trips are for both the subject site as well as the building to the south. Because we are unable to distinguish between the trips for each building, and to provide a conservative analysis, the net new trips were calculated using the trip generation from the Kittelson TIA as it is less than the existing driveway counts.

- *Page 8 – Operation Analysis section needs to be revised to address the following:*
  - *Provide explanation for the reduction in V/C at Oregon Ave/Tualatin-Sherwood Rd and Cipole Rd/Tualatin-Sherwood Rd when the volume is increased with post-development volumes. Note: Signal timing modifications should not be assumed in the analysis when determining development impact.*

Response: Signal timing was adjusted to be consistent throughout the PM Peak Hour scenarios at the Tualatin Sherwood Road/Oregon Street intersection, and the revised summary results are attached. The existing v/c ratio is 0.97, the pre-development v/c ratio is 0.97, and the post-development v/c ratio is 0.98.

- *Provide a summary of the mitigated scenario that is described. The summary should include a description of the necessary mitigations, desired lane widths, length of necessary striping improvements, and the results of mitigated operational analysis*

Response: As described in the TIA, the only mitigation necessary for this project is at SW Tualatin Sherwood Road and SW Wildrose Place. The TIA describes having separate southbound right and left turn lanes. The lane widths would be approximately 12 feet in width and 75 feet in length, within the existing roadway width. The capacity calculations with mitigation for the Post-Development PM peak hour were included in the original TIA, and a 0.53 v/c ratio was calculated for this intersection. As the intersection operated within operational standards, the Post-Development AM peak hour capacity calculations were not included in the original TIA. The v/c ratio with mitigation for the Post-Development AM peak hour is 0.05 at this intersection.

- *Page 8-9 – Queuing Analysis section is missing data and supporting information including the following:*
  - *The queuing worksheets indicate a note for several intersection movements that "#95th percentile volume exceeds capacity, queue may be longer. Queue shown in maximum after two cycles." This note from a deterministic analysis method (Synchro) indicates that the methodology has limitations and is not appropriate for this analysis. Provide simulation-based (such as SimTraffic) queuing results, consistent with ODOT Analysis Procedure Manual analysis methods for 95th-percentile queuing analysis.*

Response: Neither the previous or current Municipal Code (updated after submittal of the LAM TIA) requires queuing analysis. The queuing analysis was provided to determine if queues from signals at Cipole Road and Oregon Street would extend to the Wildrose intersection, and to address the anticipated queue lengths at the Wildrose Place approach.

  - *Provide queue summary for all intersection approaches which experience an increase in volume due to project traffic. Only selected approaches and movements are currently included.*

Response: As previously stated, queuing is not a requirement in the City of Sherwood Municipal Code for Transportation Impact Analysis Section 16.106.080(C); therefore, it is not included in this analysis. It should be noted the LAM development trip generation has less than a 4% impact at the study area intersections along SW Tualatin Sherwood Road; it therefore has little effect on existing queues. The following table presents project impact at these intersections.

PROJECT IMPACT		
Intersection	AM % Impact	PM % Impact
SW Oregon Street/SW Tualatin Sherwood Road	0.51%	1.08%
SW Wildrose Place/SW Tualatin Sherwood Road	1.68%	3.66%
SW Cipole Road/SW Tualatin Sherwood Road	1.04%	2.31%

  - *Provide queue summary for the mitigate scenario described in the Operational Analysis. This summary may be limited to movements that would be modified by the proposed mitigation.*

Response: Queue summaries for the AM and PM peak hour for the suggested mitigated measures are attached. The proposed design would accommodate the longest queue of 60 feet.

  - *Explain the discrepancy in 95th percentile queue for the westbound left turn at Oregon/Tualatin-Sherwood Road. Under all PM scenarios the queue is shown exceeding available storage. How does the addition of project traffic in 2015 decrease the length of the queue?*

Response: As described in the Operational Analysis section of this letter, the PM Peak Hour Scenarios were rerun with consistent signal timing at the intersection of Tualatin Sherwood Road/Oregon Street. Updated queuing results are provided with this letter. The WB left turn queue at this intersection still exceeds available storage in all scenarios. The existing queue is 350 feet, pre-development queue is 350 feet, and post-development queue is 375 feet. It should be noted these queues can be accommodated in the taper length of the turn lane, allowing vehicles to queue without blocking the westbound through movement.

- *Include SimTraffic worksheets for all reported queue lengths*

  Response: Queuing is not a requirement in the City of Sherwood Municipal Code for Transportation Impact Analysis Section 16.106.080(C); therefore, it is not included in this analysis. The queuing calculations that were provided are Synchro 95th percentile queuing analysis.

- *Page 10 – Indicate if the mitigation described (adding a southbound turn lane at SW Wildrose Place/SW Tualatin Sherwood Road) is a recommended improvement.*

Response: Yes, this is a recommended improvement, which includes striping separate southbound right and left turn lanes approximately 12 feet in width and 75 feet in length, within the existing roadway width.

Sincerely,

Brent Ahrend, P.E.
Senior Associate | Traffic Engineer

REGISTERED PROFESSIONAL ENGINEER
OREGON
MARCH 02, 1998
BRENT T. AHREND
EXPIRES: 12/31/15

Enclosure(s): Capacity Analysis Results for PM Scenarios
Capacity Analysis Results for Mitigated Scenarios
Trip Generation email correspondence

c: Will Naito, Bob Naito, Steve Naito – Naito Development
Katie Atkins – Mackenzie

HCM Signalized Intersection Capacity Analysis
3: SW Oregon Street & SW Tualatin Sherwood Road

11/18/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	693	187	415	770	6	186	3	227	16	4	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5			5.0	5.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			0.95	0.95		1.00	
Frt	1.00	1.00	0.85	1.00	1.00			0.98	0.85		0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.96	
Satd. Flow (prot)	1770	1863	1583	1770	1860			1663	1504		1775	
Flt Permitted	0.29	1.00	1.00	0.10	1.00			0.74	1.00		0.78	
Satd. Flow (perm)	539	1863	1583	194	1860			1285	1504		1434	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	753	203	451	837	7	202	3	247	17	4	2
RTOR Reduction (vph)	0	0	72	0	0	0	0	6	171	0	2	0
Lane Group Flow (vph)	2	753	131	451	844	0	0	231	44	0	21	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	35.3	34.4	34.4	56.8	51.9			17.3	17.3		18.3	
Effective Green, g (s)	35.3	34.4	34.4	56.8	51.9			17.3	17.3		18.3	
Actuated g/C Ratio	0.42	0.41	0.41	0.67	0.61			0.20	0.20		0.22	
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5			5.0	5.0		4.0	
Vehicle Extension (s)	1.0	3.5	3.5	1.0	3.5			1.0	1.0		1.0	
Lane Grp Cap (vph)	237	757	643	473	1141			262	307		310	
v/s Ratio Prot	0.00	0.40		c0.21	0.45							
v/s Ratio Perm	0.00		0.08	c0.43				c0.18	0.03		0.01	
v/c Ratio	0.01	0.99	0.20	0.95	0.74			0.88	0.14		0.07	
Uniform Delay, d1	14.6	25.0	16.2	25.1	11.6			32.6	27.6		26.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.0	31.2	0.2	29.5	2.6			26.5	0.1		0.0	
Delay (s)	14.6	56.2	16.4	54.5	14.2			59.2	27.7		26.4	
Level of Service	B	E	B	D	B			E	C		C	
Approach Delay (s)		47.7			28.3			44.2			26.4	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	37.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	84.6	Sum of lost time (s)	14.5
Intersection Capacity Utilization	88.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: SW Oregon Street & SW Tualatin Sherwood Road

11/18/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	714	193	427	793	6	192	3	234	16	4	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5			5.0	5.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			0.95	0.95		1.00	
Frt	1.00	1.00	0.85	1.00	1.00			0.98	0.85		0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.96	
Satd. Flow (prot)	1805	1827	1482	1770	1843			1589	1447		1734	
Flt Permitted	0.29	1.00	1.00	0.10	1.00			0.74	1.00		0.78	
Satd. Flow (perm)	548	1827	1482	195	1843			1228	1447		1403	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2	752	203	449	835	6	202	3	246	17	4	2
RTOR Reduction (vph)	0	0	72	0	0	0	0	6	169	0	2	0
Lane Group Flow (vph)	2	752	131	449	841	0	0	231	45	0	21	0
Heavy Vehicles (%)	0%	4%	9%	2%	3%	0%	7%	0%	6%	6%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	35.2	34.3	34.3	56.8	51.9			17.8	17.8		18.8	
Effective Green, g (s)	35.2	34.3	34.3	56.8	51.9			17.8	17.8		18.8	
Actuated g/C Ratio	0.41	0.40	0.40	0.67	0.61			0.21	0.21		0.22	
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5			5.0	5.0		4.0	
Vehicle Extension (s)	1.0	3.5	3.5	1.0	3.5			1.0	1.0		1.0	
Lane Grp Cap (vph)	239	736	597	472	1123			256	302		309	
v/s Ratio Prot	0.00	c0.41		c0.21	0.46							
v/s Ratio Perm	0.00		0.09	0.43				c0.19	0.03		0.02	
v/c Ratio	0.01	1.02	0.22	0.95	0.75			0.90	0.15		0.07	
Uniform Delay, d1	14.9	25.4	16.6	25.1	11.9			32.8	27.5		26.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.0	38.8	0.2	29.1	2.9			31.0	0.1		0.0	
Delay (s)	14.9	64.2	16.9	54.3	14.8			63.8	27.5		26.3	
Level of Service	B	E	B	D	B			E	C		C	
Approach Delay (s)		54.0			28.5			46.6			26.3	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	40.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	85.1	Sum of lost time (s)	14.5
Intersection Capacity Utilization	90.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: SW Oregon Street & SW Tualatin Sherwood Road

11/18/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	719	193	435	803	6	192	3	238	16	4	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5			5.0	5.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			0.95	0.95		1.00	
Frt	1.00	1.00	0.85	1.00	1.00			0.98	0.85		0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.96	
Satd. Flow (prot)	1805	1827	1482	1770	1843			1588	1447		1734	
Flt Permitted	0.28	1.00	1.00	0.10	1.00			0.74	1.00		0.78	
Satd. Flow (perm)	540	1827	1482	195	1843			1228	1447		1403	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2	757	203	458	845	6	202	3	251	17	4	2
RTOR Reduction (vph)	0	0	73	0	0	0	0	7	172	0	2	0
Lane Group Flow (vph)	2	757	130	458	851	0	0	231	46	0	21	0
Heavy Vehicles (%)	0%	4%	9%	2%	3%	0%	7%	0%	6%	6%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	35.1	34.2	34.2	57.3	52.4			17.9	17.9		18.9	
Effective Green, g (s)	35.1	34.2	34.2	57.3	52.4			17.9	17.9		18.9	
Actuated g/C Ratio	0.41	0.40	0.40	0.67	0.61			0.21	0.21		0.22	
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5			5.0	5.0		4.0	
Vehicle Extension (s)	1.0	3.5	3.5	1.0	3.5			1.0	1.0		1.0	
Lane Grp Cap (vph)	234	729	591	481	1126			256	302		309	
v/s Ratio Prot	0.00	c0.41		c0.21	0.46							
v/s Ratio Perm	0.00		0.09	0.42				c0.19	0.03		0.02	
v/c Ratio	0.01	1.04	0.22	0.95	0.76			0.90	0.15		0.07	
Uniform Delay, d1	15.2	25.8	17.0	25.3	12.0			33.0	27.7		26.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.0	43.7	0.2	28.9	3.0			31.1	0.1		0.0	
Delay (s)	15.2	69.4	17.2	54.2	15.1			64.1	27.8		26.5	
Level of Service	B	E	B	D	B			E	C		C	
Approach Delay (s)		58.3			28.7			46.8			26.5	
Approach LOS		E			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	42.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	85.7	Sum of lost time (s)	14.5
Intersection Capacity Utilization	91.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
4: SW Tualatin Sherwood Road & SW Wildrose Place

11/18/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	20	1130	725	38	9	13
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	22	1215	780	41	10	14
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)		668	1181			
pX, platoon unblocked	0.68				0.75	0.68
vC, conflicting volume	820				2058	800
vC1, stage 1 conf vol					800	
vC2, stage 2 conf vol					1258	
vCu, unblocked vol	504				1290	474
tC, single (s)	4.1				6.4	6.8
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.8
p0 queue free %	97				95	96
cM capacity (veh/h)	731				180	338

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	22	1215	820	10	14
Volume Left	22	0	0	10	0
Volume Right	0	0	41	0	14
cSH	731	1700	1700	180	338
Volume to Capacity	0.03	0.71	0.48	0.05	0.04
Queue Length 95th (ft)	2	0	0	4	3
Control Delay (s)	10.1	0.0	0.0	26.1	16.1
Lane LOS	B			D	C
Approach Delay (s)	0.2		0.0	20.2	
Approach LOS				C	

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
4: SW Tualatin Sherwood Road & SW Wildrose Place

10/21/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	15	954	1196	36	56	43
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	1037	1300	39	61	47
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)		668	1181			
pX, platoon unblocked	0.32				0.53	0.32
vC, conflicting volume	1339				2389	1320
vC1, stage 1 conf vol					1320	
vC2, stage 2 conf vol					1070	
vCu, unblocked vol	998				1429	936
tC, single (s)	4.1				6.4	6.4
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.4
p0 queue free %	93				47	52
cM capacity (veh/h)	225				115	97

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	16	1037	1339	61	47
Volume Left	16	0	0	61	0
Volume Right	0	0	39	0	47
cSH	225	1700	1700	115	97
Volume to Capacity	0.07	0.61	0.79	0.53	0.48
Queue Length 95th (ft)	6	0	0	62	52
Control Delay (s)	22.3	0.0	0.0	67.1	72.8
Lane LOS	C			F	F
Approach Delay (s)	0.3		0.0	69.6	
Approach LOS				F	

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	75.1%	ICU Level of Service	D
Analysis Period (min)	15		

Katie Atkins

From: Bob Galati <GalatiB@SherwoodOregon.gov>
Sent: Wednesday, October 15, 2014 11:11 AM
To: Katie Atkins
Cc: Jo Guediri; Bradley Kilby
Subject: RE: LAM Wildrose Traffic Study

Katie,

I have received this email and will respond to the background growth information. The traffic assumptions data from the ITE appears acceptable.

Bob Galati, PE
City Engineer

From: Katie Atkins [mailto:KAtkins@mcknze.com]
Sent: Wednesday, October 15, 2014 11:05 AM
To: Bob Galati
Cc: Brent Ahrend
Subject: RE: LAM Wildrose Traffic Study

Bob,

We are going ahead and preparing the traffic study for this project. Are there any In-Process projects we need to consider? Is there a specific background growth you would like us to use?

Thank you,
Katie

From: Katie Atkins
Sent: Monday, September 29, 2014 5:24 PM
To: 'GalatiB@SherwoodOregon.gov'
Cc: Brent Ahrend; Tyler.Maloney@lamresearch.com
Subject: LAM Wildrose Traffic Study

Bob,

I spoke with you on the phone about a month ago about a change of use warehouse development on Wildrose Pl. We discussed the need for a traffic study dependent on trip generation and whether it exceeds City standards.

We have calculated trip generation based on expected site activity. A traffic study is required if the additional daily trip generation of the proposed development will exceed 400 daily trips. The prior land use approval was based on a tenant-specific study that estimated 39 trips per day would be generated by the site. We have calculated 416 daily trips using the expected site activity provided (377 tips more than the existing use); therefore, not triggering a traffic study. County staff will require a study at the intersection of Wildrose Pl and SW Tualatin Sherwood Road regardless of trip generation. The table below presents expected trip generation.

Typical Weekday

Type	Type	Quantity	ADT	AM (7:30-8:30 AM)	PM (4:30-5:30 PM)
				Total	Total

Employees	8AM-5PM	25	88	25	25
	5AM-5PM	25	88	0	25
	5PM-5AM	25	88	0	25
Deliveries	53' Trailers	5	10	2	2
	UPS Freight	2	4	2	2
	26' Box	2	128	8	8
	UPS	5	10	2	2
LAM Wildrose Trip Generation			**416**	**39**	**89**
Existing Trip Generation			**39**	**4**	**5**
Net New Trip Generation			**377**	**35**	**84**

We compared this trip generation to ITE land uses using the estimated 125 employees. General Light Industrial (ITE 110) generates 378 ADT, Industrial Park (ITE 130) generates 418 ADT, Manufacturing (ITE 140) generates 266 ADT, and Warehousing (ITE 150) generates 486 ADT. The 416 ADT estimated trips is consistent with similar land uses.

Please confirm a traffic study is not needed for the proposed development. If you would like us to present this information in a formal letter, we can do so. Please let me know if you have any questions or comments.

Thank you,

Katie Atkins, PE
Transportation Planning

MACKENZIE.

Architecture · Interiors · Engineering · Planning

P 503.224.9560 W mcknze.com C vcard

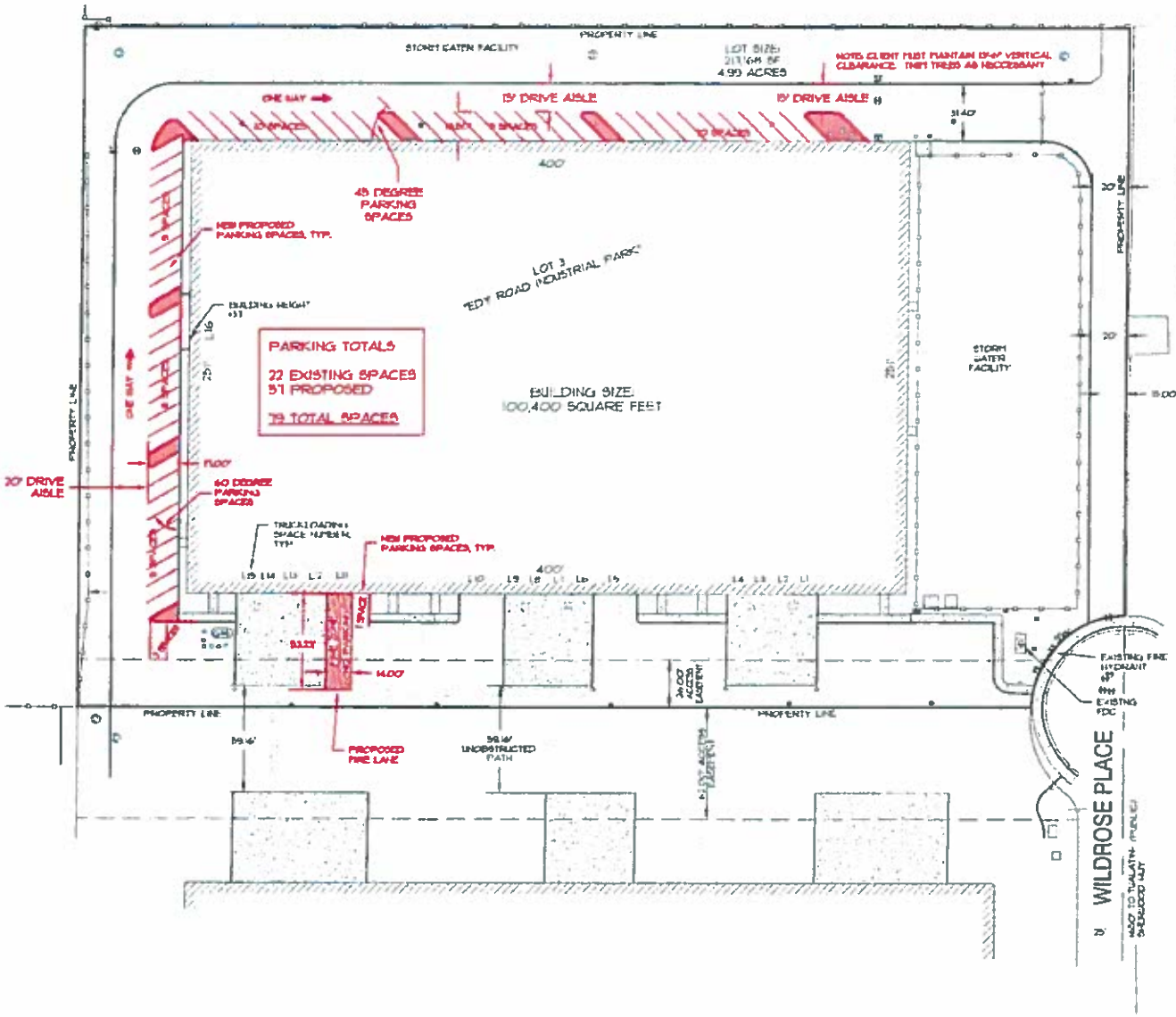
RiverEast Center
1515 SE Water Ave, Suite 100
Portland OR 97214

This email is confidential, may be legally privileged, and is intended solely for the addressee. If you are not the intended recipient, access is prohibited. As email can be altered, its integrity is not guaranteed.

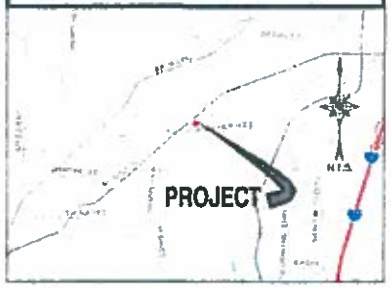
Exhibit K

Fire Department Approval

"20551 SW WILDROSE PLACE"



VICINITY MAP



TUALATIN VALLEY FIRE & RESCUE

APPROVED _____ ☐

CONDITIONALLY APPROVED _____ ☐

APPROVAL OF PLANS IS NOT AN APPROVAL OF OMISSIONS OR OVERSIGHTS.

SEE ATTACHED LETTER _____ ☐

PLANS EXAMINER _____ DATE 7-3-14

SCALE: 1" = 40'

0 20 40 60 80

REGISTERED PROFESSIONAL ENGINEER — RAY E. MOORE — RENEWAL DATE 12/31/2014

CLIENT: BRAD PICKING

All County Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730

DRAWING NUMBER: 10-148-PARKING.dwg
DATE OF PLOT: 07-07-14